

## Online Data Supplement

### Section I: Methods

#### A. Sample Collection

Mean BAL return volumes from Bronchiolitis Obliterans Syndrome (BOS) subjects were lower ( $111\pm 19.5$  ml) as compared to the non-BOS ( $129\pm 12.8$ ml) subjects, though not statistically different ( $p=0.113$ , independent sample T test). For this study, 15 cc of first fraction of BAL return (B1) and 15 cc of sixth fraction of BAL return (B6) were collected as possible. The remnant BAL was pooled and sent for standard microbial, fungal, viral PCR and cytology as per the clinician's preference.

#### B. ELISA for detection of SP-D and RAGE

Cell-free B1 and B6 samples were prepared and measurements were made using ELISA kits for surfactant protein-D (SP-D; R & D systems, Minneapolis, MN) and receptor for advanced glycation end products (RAGE; R & D systems, Minneapolis, MN) following the manufacturers' recommendations.

#### C. Flow-cytometry and Cytospin preparations

Fresh BAL fraction 1 and 6 were used to enumerate subsets of airway MDSCs. BAL cells collected from BAL samples 1 and 6 were used for flow cytometry and cytospin slide preparation. After performing a manual cell count (neubauer chamber), 200 microliters each from BAL 1 and 6 were used to make cytospin slides. Cytospins were then fixed and stained using diff quik staining method and BAL differential was evaluated. The remaining cells from BAL fraction 1 and 6 were pelleted by centrifugation and resuspended in RPMI- 1640 medium containing 10% human AB Serum (negative for HBsAb, HIV1/2, and HCV; Mediatech, Inc., VA) and supplemented with 1 mM sodium pyruvate, 2 mM L- glutamine, 10  $\mu$ g/ml penicillin-streptomycin, 25  $\mu$ M 2- $\beta$  mercaptoethanol and 0.1 mM non-essential amino acids (Life Technologies) and incubated for 20 min on ice. Then cells were stained with antibodies against HLA-DR (APC), CD11b (ICRF44), CD14 (M5E2), CD16 (3G8), CD66b (G10F5), CD163 (GHI/61), CD15 (HI98), CD11c (3.9) and CD33 (HIM3-4) (all from BD Biosciences or eBioscience, CA) for 30 min. Isotype control antibodies (BD Biosciences, CA) and single color compensation controls were used in all analyses. After staining with the indicated antibodies, cells

28 were washed twice with PBS before analysis using a Becton Dickinson LSR II with FACS Diva  
29 software (BD Biosciences, San Jose, CA). Data were further analyzed using FlowJo 7.6 (Tree Star,  
30 Ashland, OR). Gating Strategies used are depicted in the supplementary Figure E5.

#### 31 **D. Isolation of Microbial DNA and Creation of 16S V4 amplicon Library.**

32 Microbial genomic DNA was isolated using the Fecal DNA isolation kit (Zymo Research, Irvine, CA)  
33 following the manufacturer's instructions. Once the sample DNA was prepared, PCR was used with  
34 unique bar coded primers to amplify the V4 region of the 16S rRNA gene to create an "amplicon  
35 library" from individual samples (Kozich et. al, Kumar et. al.)

#### 36 **5'PRIMER:**

37 5'AATGATACGGCGACCACCGAGATCTACACTATGGTAATTGTGTGCCAGCMGCCGCGGTAA 3'

#### 38 **3' PRIMER:**

39 5'CAAGAGAAGACGGCATAACGAGATNNNNNAGTCAGTCAGCCGGACTACHVGGGTWTCTAAT3'

40 The primers were synthesized at 50nmol scale with desalting purification (Eurofins-mwg-operon,  
41 Huntsville, AL). The primers were diluted with 10 mM Tris pH 8.0 to 100  $\mu$ M, then diluted 10X in  
42 water to 10 $\mu$ M for use in PCR reactions. The individual PCR reactions were set up as follows  
43 (Kumar et. al.):

44 10  $\mu$ L of 5X Reaction Buffer

45 1.5 $\mu$ L of dNTPs

46 2 $\mu$ L of the 5 'Primer diluted as described above

47 2  $\mu$ L of the 3' Primer diluted as described above

48 1.5  $\mu$ L of the "LongAmp" enzyme kit (New England Biolabs LongAmp Taq PCR kit,

49 30  $\mu$ L of the Template DNA prepared using the "Fecal DNA Isolation kit with the concentration of

50 DNA at 2-5 ng/ $\mu$ L.

51 3 $\mu$ L of H<sub>2</sub>O

52 The total reaction volume is 50  $\mu$ L

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54 Cycling conditions for the PCR were as follows:

55 Initial denature 94° C 1 minute

56 32 cycles of:

57 94°C 30 seconds

58 50°C 1 minute

59 65°C 1 minute

60 Final extension: 65°C 3 minutes

61 Final hold: 4° C

62 Following PCR, the entire PCR reaction was electrophoresed on a 1.0% agarose/Tris-  
63 borate-EDTA gel. The PCR product (approximately 380 base pair predicted product size) was  
64 visualized by UV illumination. The band was excised and purified from the agarose using QIAquick  
65 Gel Extraction Kit according to manufacturer's instructions. (Qiagen, Valencia, CA).

#### 66 **DNA sequencing.**

67 The PCR products were sequenced using NextGen sequencing Illumina MiSeq platform  
68 (Kozich et al., Kumar et. al.). The MiSeq is a single flowcell, single lane instrument that can  
69 generate approximately 9Gb of sequence data from a paired end 250bp run (Caparoso et. al.). The  
70 paired 250 base pair end kits from Illumina were used for the V4 region in the microbiome analysis.  
71 The samples were first quantitated using Pico Green, adjusted to a concentration of 4nM and then  
72 used for sequencing on the Illumina MiSeq (Kumar et. al.).

73 Fastq conversion of the raw data files was performed following de-multiplexing. Quality  
74 control of the fastq files was performed then subject to quality assessment and filtering using the  
75 FASTX toolkit (FASTX). The remainder of the steps was performed with the Quantitative Insight into  
76 Microbial Ecology (QIIME) suite, version 1.7. (Lozupone et. al., Kumar et al., Navas-Molina et. al.)

#### 77 **Bioinformatics.**

78 The sequence data covered the 16S rRNA V4 region with a PCR product length of ~255  
79 bases and 250 base paired-end reads. Since the overlap between fragments was approximately  
80 245 bases, the information from both ends of the paired reads was merged to generate a single

81 high quality read using the module “fastq\_mergepairs” of USEARCH (Edgar RC). Read pairs with  
82 an overlap of less than 50 bases or with too many mismatches (> 20) in the overlapping region were  
83 discarded. Chimeric sequences were also filtered using the “identify\_chimeric\_seqs.py” module of  
84 USEARCH (Edgar RC). Overall read quality was assessed before and after filtering using FASTQC  
85 (FASTQC). The QIIME data analysis package was used for subsequent 16S rRNA data analysis  
86 (Caparoso et al.). Sequences were grouped into operational taxonomic units (OTUs) using the  
87 clustering program UCLUST at a similarity threshold of 0.97% (Edgar RC). The Ribosomal  
88 Database Program (RDP) classifier was used to make taxonomic assignments (to the species level)  
89 for all OTUs at confidence threshold of 60% (0.6) (Wang et al.). The RDP classifier was trained  
90 using the Greengenes (v13\_8) 16S rRNA database (McDonald,et al.). The resulting OTU table  
91 included all OTUs, their taxonomic identification, and abundance information. OTUs whose average  
92 abundance was less than 0.0005% were filtered out. OTUs were then grouped together to  
93 summarize taxon abundance at different hierarchical levels of classification (e.g. phylum, class,  
94 order, family, genus, and species). These taxonomy tables were also used to generate bar charts of  
95 taxon abundance. Multiple sequence alignment of OTUs was performed with PyNAST (Caporaso,  
96 et al. 2010a). Alpha diversity (within sample diversity) was calculated using a variety of diversity  
97 metrics including Shannon’s, Chao1, and Simpson, as implemented in QIIME (Caporaso, et al.  
98 2010b). Beta diversity (between sample diversity) among different samples was measured using  
99 Unifrac analysis (Lozupone et al 2006). Principal coordinates analysis (PCoA) was performed by  
100 QIIME to visualize the dissimilarity matrix (beta-diversity) between all the samples, such that  
101 samples that are more similar are closer in space than samples that are more divergent. 3D PCoA  
102 plots were generated using EMPEROR (Vázquez-Baeza Y et al.). A heatmap with the top 50 most  
103 highly abundant taxa across all samples was generated using the “heatmap.2” function in R  
104 package (available at <http://CRAN.R-project.org/package=gplots>).

#### 105 **D. Real Time PCR analysis:**

106 Quantitative real time PCR (qRT-PCR) analysis was carried out using either SsoFast Evagreen  
107 Supermix (Bio-Rad, USA) fluorescent dye or TaqMan (Applied Biosystem) one step PCR master  
108 mix. Total cDNA (250ng) was used in a 10µl reaction mixture with sequence specific primers. qPCR

109 were carried out using 7500 fast Real-Time PCR system (Applied Biosystem). Cycling conditions  
110 were 20 s at 95<sup>0</sup> C followed by 40 cycles at 95<sup>0</sup> C for 3 s and 60<sup>0</sup> C for 30 s. Relative quantification  
111 of the steady state target mRNA levels was calculated after normalization of total amount of cDNA  
112 to GAPDH endogenous reference. Real time and TaqMan PCR Primers employed in this study are  
113 listed below.

| <b>Real Time Primers</b>  | <b>Sequences</b>                          |
|---------------------------|---|
| Chop                      | F-5'-GGTGGCAGCGACAGAGCCAA-3'              |
|                           | R-5'-CAGCTGCCATCTCTGCAGTTGGA-3'           |
| sXBP-1                    | F-5'-GGTCTGCTGAGTCCGCAGCAGG-3'            |
|                           | R-5'-GGGCTTGGTATATATGTGG-3'               |
| <b>TaqMan PCR Primers</b> | <b>Cat. No. (ThermoFisher Scientific)</b> |
| Nox2                      | Hs00166163                                |

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185 **Supplementary Figure Legend**

186  
187 **Figure E1.** Rarefaction curve showing the number of observed OTUs per sample in the oro-  
188 pharyngeal wash (O), nasal (N) and bronchoalveolar lavage of airways (B1 and B6) of lung  
189 transplant subjects. The Y- axis denotes the number of observed OTUs at the corresponding  
190 sequencing depths shown along X-axis. Vertical lines represent error bars.

191 **Figure E2. Principal component analysis showing Weighted Unifrac distance between nasal**  
192 **and airway microbiome in lung transplant recipients**

193 **A.** Principal coordinate analyses (PCoA) along PC1, PC2 and PC3 showing spatial relationship  
194 of the variance between proximal airway (B1), and nasal (N) microbiomes in lung transplant  
195 recipients. Weighted UniFrac distances were calculated between B1 and N, and then each  
196 sample type was plotted in 3D space by PCoA. B1 is shown in blue and N in red.

197 **B.** Principal coordinate analyses (PCoA) along PC1, PC2 and PC3 showing spatial relationship  
198 of the variance between distal airway (B6), and nasal (N) microbiomes in lung transplant  
199 recipients. Weighted UniFrac distances were calculated between B6 and N, and then each  
200 sample type was plotted in 3D space by PCoA. B6 is shown in blue and N in red.

201 **C.** Box Plot analysis showing no significant difference in Unifrac-weighted distance between  
202 proximal airway (B1) – nasal (N) and distal airway (B6) – nasal microbiome (N). Y-axis  
203 represents Unifrac-weighted distance and samples are represented on the X-axis. \* $P=0.386$   
204 (paired t-test).

205 **Figure E3.** Venn diagram showing the distinct and common OTUs present in the nasal and airway  
206 samples.

207 **A.** Venn diagram showing the number of distinct and common OTUs present in the proximal  
208 airway (B1) and nasal samples. Details of OTUs are provided in supplementary table S1

209 **B.** Venn diagram showing the number of distinct and common OTUs present in the distal  
210 airway (B6) and nasal samples. Details of OTUs are provided in supplementary table S2

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212 **Figure E4. Principal component analysis showing Weighted UniFrac distance between**  
213 **bronchoscopic control and airway microbiome lung transplant recipients**

214 **A.** Relationship between proximal airway (B1) and bronchoscopic control sample (C) bacterial  
215 communities within individual subjects. Weighted UniFrac distances were calculated  
216 between all pairs of samples within B1 or C, and then each sample type was plotted  
217 separately in 3D space by principal coordinate analysis. The two plots (B1 and C) were then  
218 transformed by Procrustes analysis to achieve maximum alignment. Each point corresponds  
219 to a bacterial community, with B1 communities shown in *blue*, C communities shown in *red*,  
220 and the two communities from each subject connected by a *bar*. The *red* end of each bar  
221 connects to the C sample data; the *blue* end connects to the B1 sample data from the same  
222 individual. If B1 and C plots are similar, then the relative distance between connected points  
223 (residuals) will be small. The overall similarity is summarized by the  $M^2$  value, and statistical  
224 goodness of fit is measured by a Monte Carlo label permutation approach (10,000  
225 iterations). The  $M^2$  value ranges from 0-1, with 0 suggesting complete overlap i.e. similarity  
226 and 1 suggesting maximum variation.

227 **B.** Relationship between distal airway (B6) and bronchoscopic control samples (C) bacterial  
228 communities within individual subjects. Weighted UniFrac distances were calculated  
229 between all pairs of samples within B6 or C, and then each sample type was plotted  
230 separately in 3D space by principal coordinate analysis. The two plots (B6 and C) were then  
231 transformed by Procrustes analysis to achieve maximum alignment. Each point corresponds  
232 to a bacterial community, with B6 communities shown in *blue*, C communities shown in *red*,  
233 and the two communities from each subject connected by a *bar*. The *red* end of each bar  
234 connects to the C sample data; the *blue* end connects to the B6 sample data from the same  
235 individual. If B6 and C plots are similar, then the relative distance between connected points  
236 (residuals) will be small. The overall similarity is summarized by the  $M^2$  value, and statistical  
237 goodness of fit is measured by a Monte Carlo label permutation approach (10,000  
238 iterations). The  $M^2$  value ranges from 0-1, with 0 suggesting complete overlap i.e. similarity  
239 and 1 suggesting maximum variation.

240 **Figure E5. Gating Strategies used for enumeration of MDSCs subsets in the bronchoalveolar**  
241 **lavage.** BAL cells in the live cell gate were first gated on HLA-DR expression. To characterize  
242 population A, cells in the HLA-DR<sup>neg</sup> gate were further gated on CD14 and CD11b. The  
243 CD14<sup>+</sup>CD11b<sup>+</sup>HLA-DR<sup>neg</sup> cells were then gated based on CD16 expression. Population A was  
244 CD14<sup>+</sup>CD11b<sup>+</sup>HLA-DR<sup>neg</sup>CD16<sup>neg</sup>. To characterize population B, cells in the HLA-DR<sup>neg</sup> gate were  
245 further gated on CD66b and CD11b expression. The CD66b<sup>+</sup>CD11b<sup>+</sup>HLA-DR<sup>neg</sup> cells were further  
246 gated for CD16 and CD15. The CD66b<sup>+</sup>CD11b<sup>+</sup>CD16<sup>+</sup>CD15<sup>+</sup>HLA-DR<sup>neg</sup> cells which were also  
247 negative for CD14 expression was designated as population B. To characterize population C, cells  
248 in the HLA-DR<sup>pos</sup> gate were further gated on CD163 and CD11b. The CD163<sup>+</sup>CD11b<sup>+</sup>HLA-DR<sup>pos</sup>  
249 cells were then gated based on CD16 and CD66b expression. Population C was  
250 CD163<sup>+</sup>CD11b<sup>+</sup>HLA-DR<sup>pos</sup>CD16<sup>neg</sup>CD66b<sup>neg</sup>. This population was also CD33<sup>+</sup>.

251

252 **Figure E6. Correlation matrix of myeloid-derived regulatory cells with phylum level-OTU.**

253 Heat map showing correlations of subsets of myeloid-derived suppressor cells (MDSCs) with  
254 microbiome at the phyla level. Phyla level-OTUs are along the X-axis and MDSC subsets along the  
255 Y-axis. Positive value indicates the degree of positive correlation and negative value suggests the  
256 degree of negative correlations between MDSC subsets and phylum level-OTUs. F1A- indicates  
257 proportion of CD14<sup>+</sup>CD11b<sup>+</sup>CD16<sup>-</sup>HLA<sup>-</sup>DR<sup>-</sup> MDSCs - subset (A) in the proximal airways, F1B-  
258 proportion of CD66<sup>+</sup>CD16<sup>+</sup>CD14<sup>-</sup>HLA<sup>-</sup>DR<sup>-</sup>CD11b<sup>+</sup> MDSC - subset (B) in the proximal airways, F1C-  
259 proportion of CD163<sup>+</sup>HLA<sup>-</sup>DR<sup>+</sup>CD11b<sup>+</sup>CD66b<sup>-</sup>CD16<sup>-</sup>MDSC - subset (C) in the proximal airways.  
260 F6A- proportion of CD14<sup>+</sup>CD11b<sup>+</sup>CD16<sup>-</sup>HLA<sup>-</sup>DR<sup>-</sup> MDSCs - subset (A) in the distal airways, F6B-  
261 proportion of CD66<sup>+</sup>CD16<sup>+</sup>CD14<sup>-</sup>HLA<sup>-</sup>DR<sup>-</sup>CD11b<sup>+</sup> MDSCs - subset (B) in the distal airways, F6C-  
262 proportion of CD163<sup>+</sup>HLA<sup>-</sup>DR<sup>+</sup>CD11b<sup>+</sup>CD66b<sup>-</sup>CD16<sup>-</sup> MDSCs subset (C) in distal airways.

263 **Figure E7. Significant correlation of myeloid-derived suppressor cells with phylum level-**  
264 **OTUs in the proximal (B1) and distal (B6) airways.**

265 *P* values less than <0.05 are deemed significant and are highlighted in red.

266 **Figure E8. Significant differences in myeloid derived suppressor cells-Phylum level OTUs**  
267 **correlations between proximal (B1) and distal (B6) airways.**

268 *P* values less than <0.05 are deemed significant and are highlighted in red.

269 **Figure E9. Myeloid derived suppressor cells-Phylum level OTU correlations between**  
270 **proximal and distal airways.**

271 Interaction plot made using multiple linear regression analysis showing significance of correlations.

272 **A.** Positive correlation between phyla *Bacteroidetes* and neutrophilic MDSCs in the proximal  
273 airways and negative correlation in the distal airways. **B.** Negative correlation between phyla

274 *Proteobacteria* and neutrophilic MDSCs in the proximal airways and positive correlation in the distal  
275 airways. **C.** Negative correlation between phyla *TM7* and neutrophilic MDSCs in the proximal

276 airways and positive correlation in the distal airways. **D.** Positive correlation between phyla  
277 *Firmicutes* and neutrophilic MDSCs in the proximal and negative correlation in the distal airways. **E.**

278 Negative correlation between phyla *Thermi* and neutrophilic MDSCs in the proximal and positive  
279 correlation in the distal airways. **F.** The interaction between proportion of neutrophilic MDSCs and

280 proximal/distal microbiomes is significant in predicting the total gram+ bacterial abundance  
281 ( $P=0.046$ ). Specifically, the total gram+ bacterial abundance and neutrophilic MDSCs were

282 significantly correlated in proximal airway (B1) ( $P=0.036$ ), but not in the distal airways (B6)  
283 ( $P=0.684$ ).

284 **Figure E10: Differential expression of stress response sensors Chop and XBP-1 and NADPH**  
285 **oxidase 2 that regulates ROS production in pro-inflammatory MDSCs**

286 Histograms showing mRNA expression levels determined by real time PCR analysis in MDSC  
287 subsets and presented in terms of fold change compared to GAPDH. *P* values were determined by

288 Mann Whitney tests.  $P=0.002$ ,  $P=0.007$ , and  $P=0.028$  for Chop, XBP1 and Nox2 respectively.

289 **Figure E11: Analysis of significance of biological and technical replicate samples.**

290 Box Plot analysis showing Unifrac-weighted distance between quadruplicate samples of proximal  
291 airway (B1)-proximal airway (B1), distal airway (B6)-distal airway (B6) and proximal (B1)-distal

292 airway (B6) microbiome. Y-axis represents Unifrac-weighted distance and X-axis replicate samples.

293 \* B1B1 vs. B6B6:  $p = 0.141$ , B1B1 vs. B1B6:  $p = 0.075$ . B6B6 vs. B1B6:  $p = 0.292$  (paired t-test).

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Figure E1

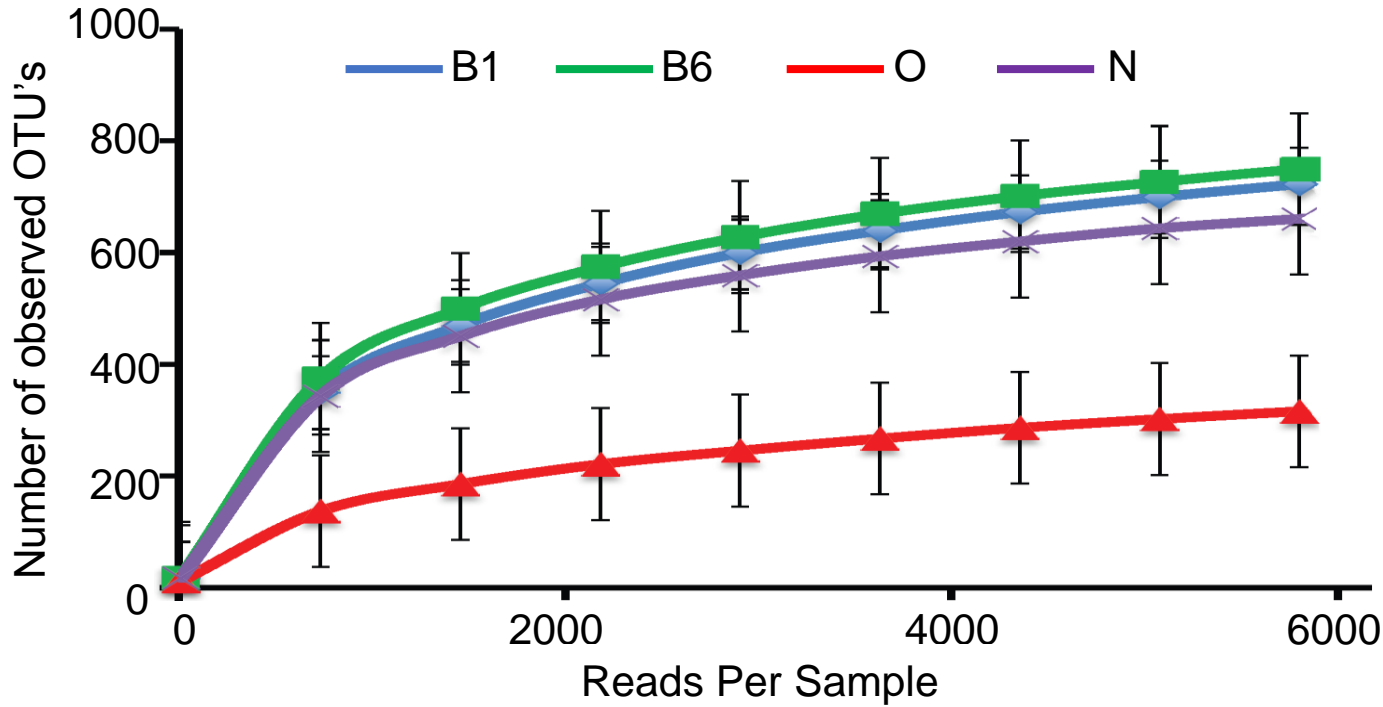


Figure E2

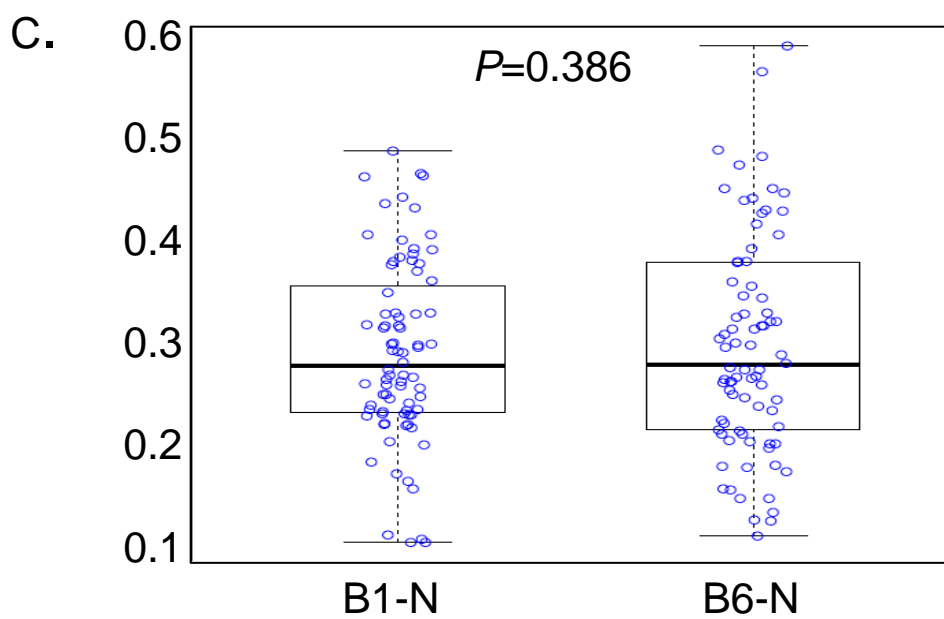
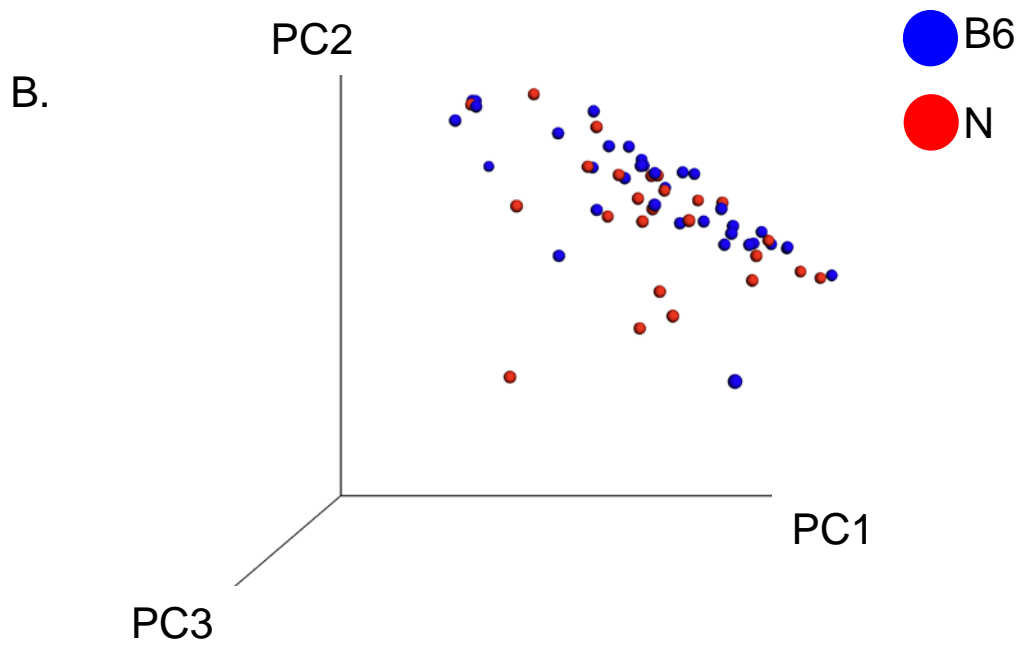
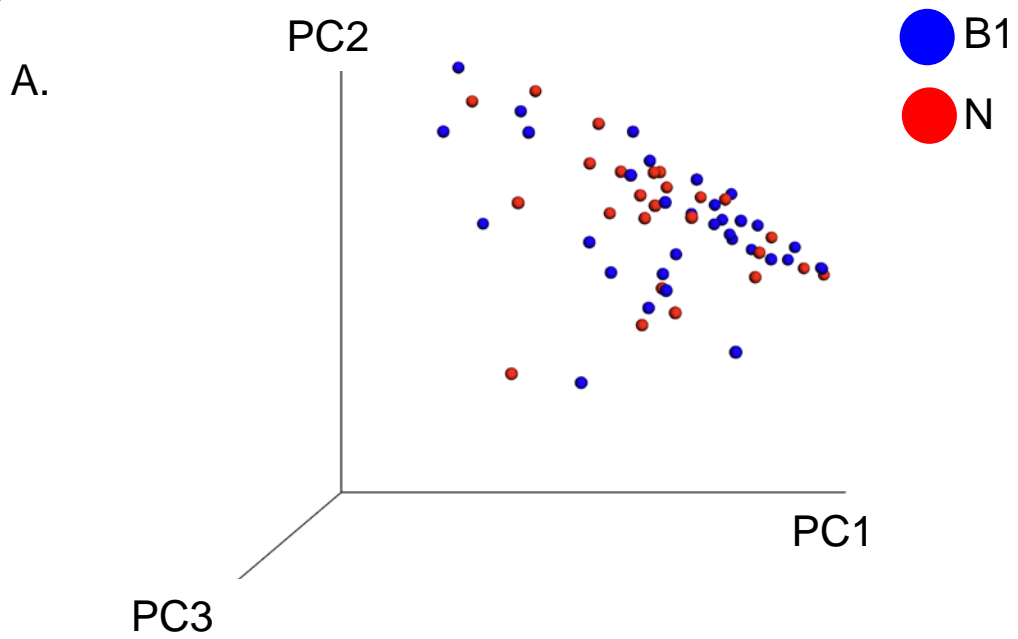


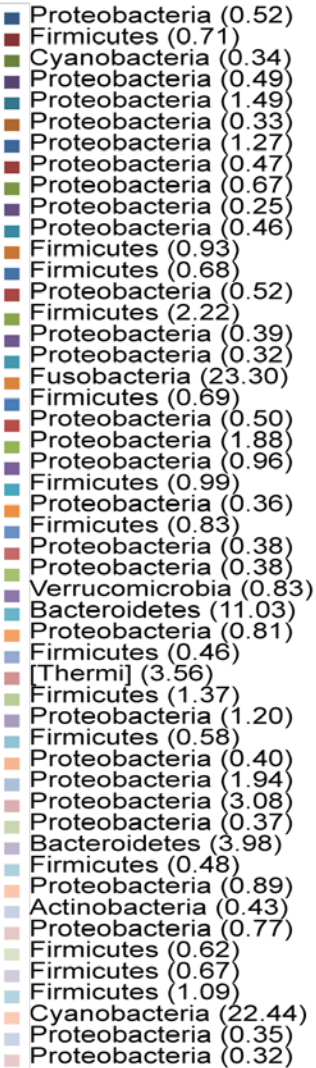
Figure E3

A.

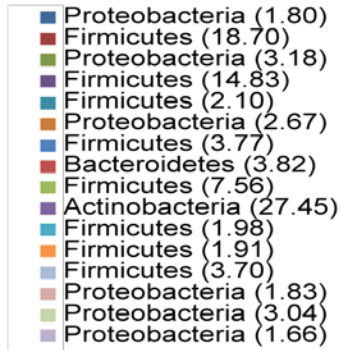
Nasal Proximal Airway (B1)



Phyla

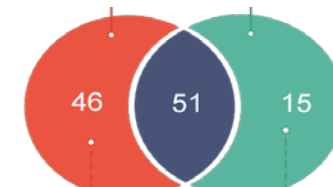


Phyla

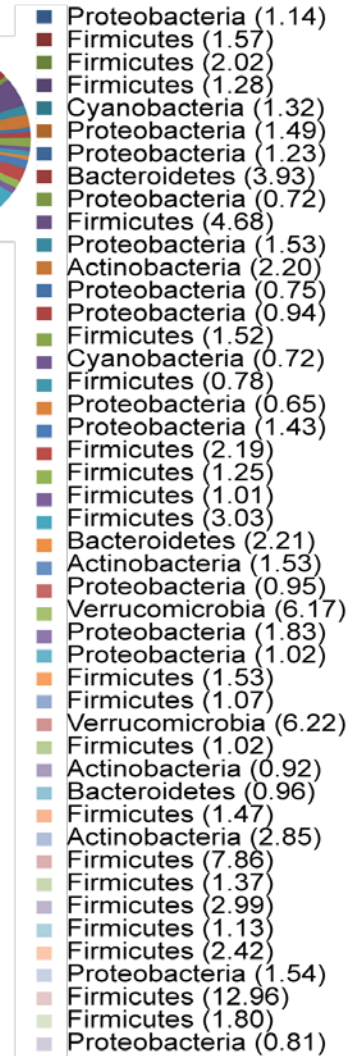


B.

Nasal Distal Airway (B6)



Phyla



Phyla

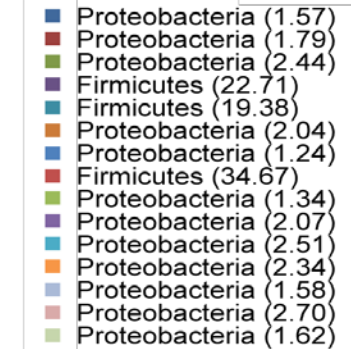
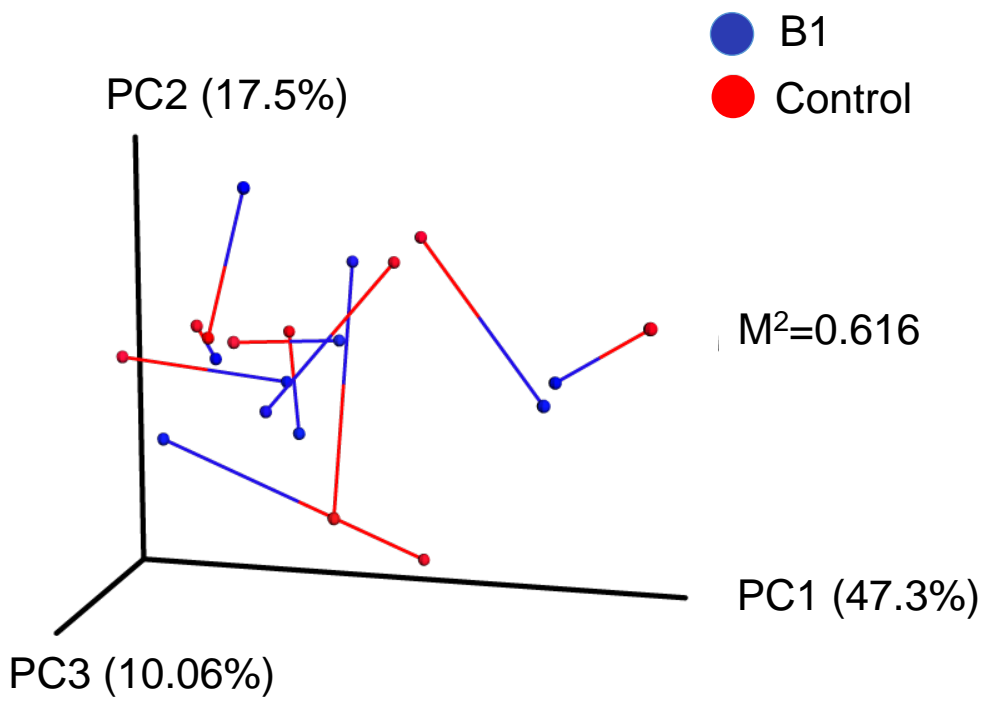


Figure E4.

A.



B.

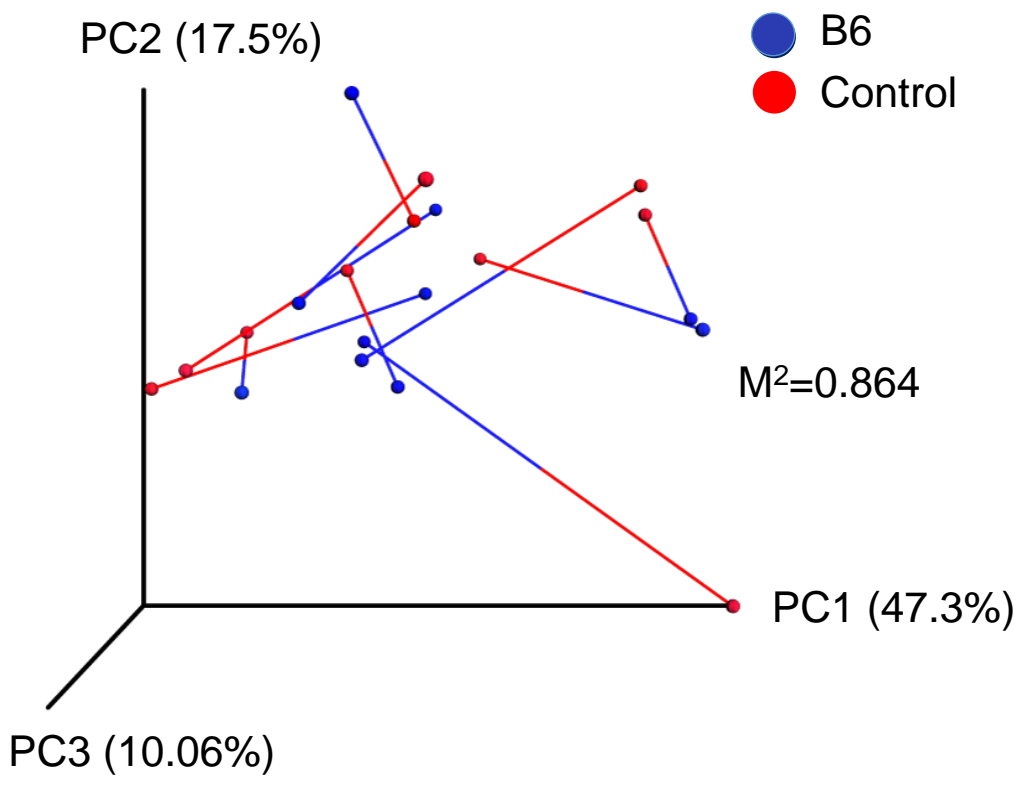




Figure E5

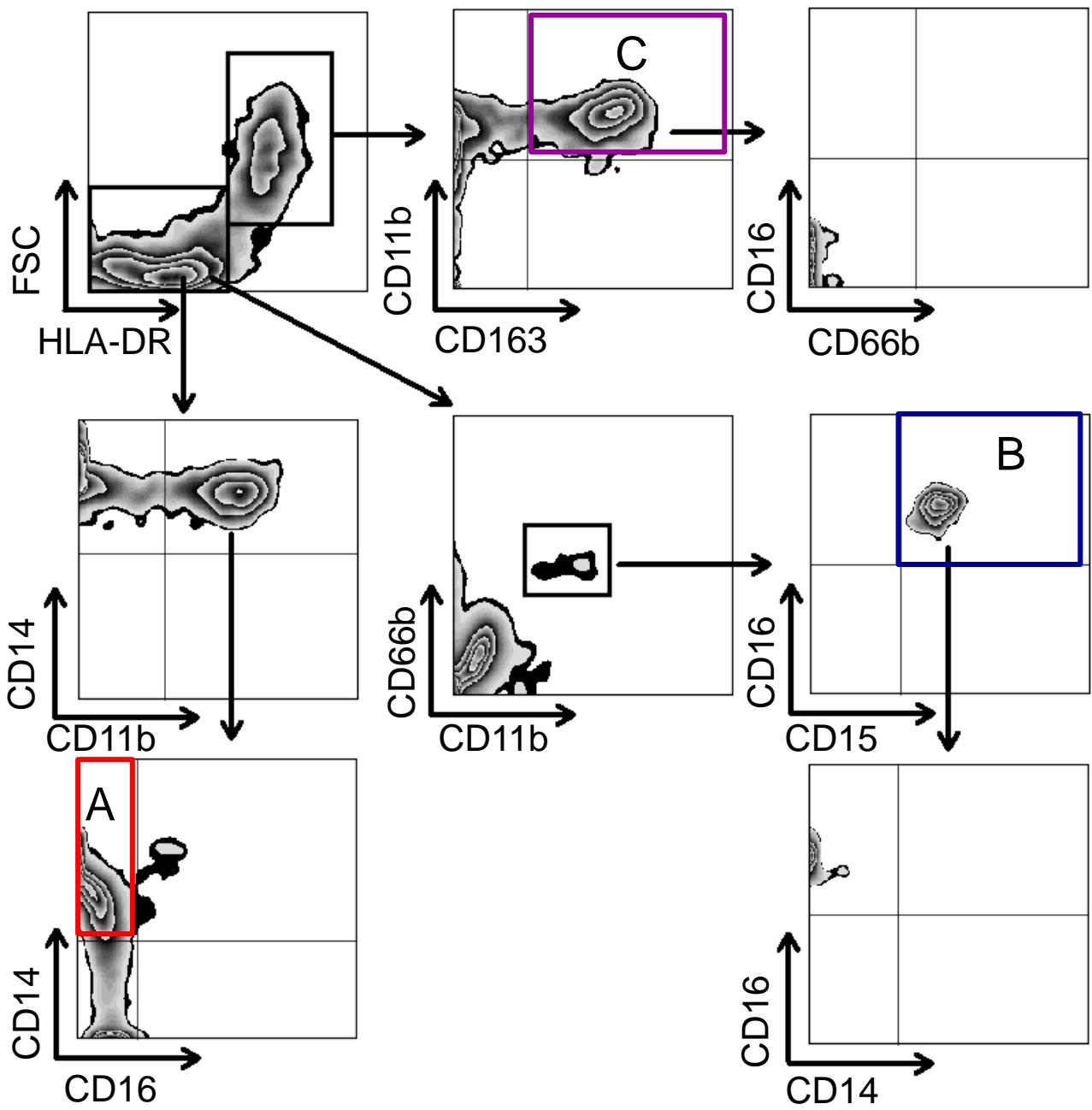
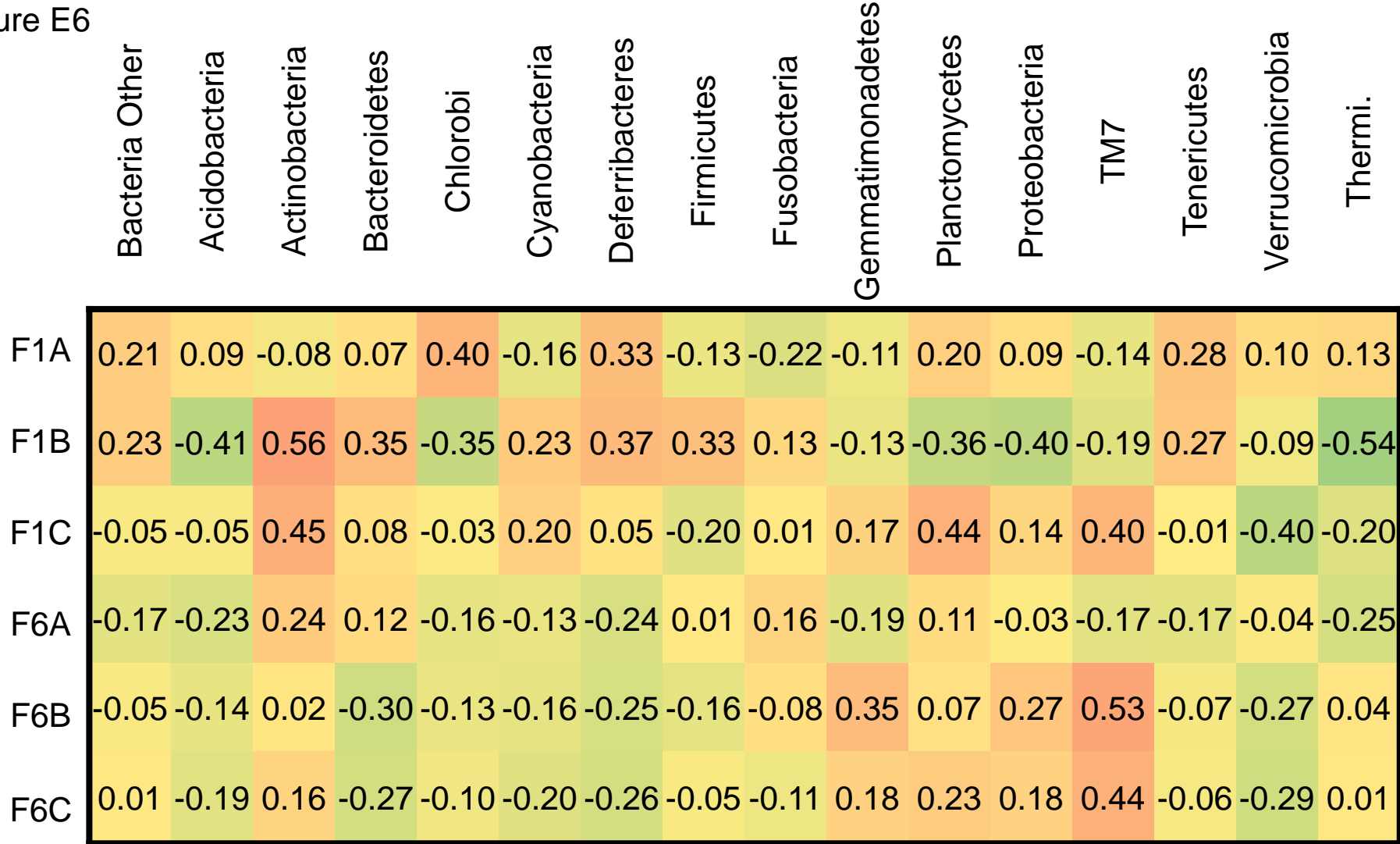
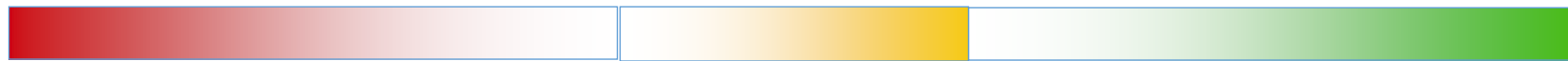


Figure E6



Gradient of Correlation



Dark Red- Strong Positive Correlation to Dark Green-Strong Negative Correlation

Figure E7

|     | Bacteria Other | Acidobacteria | Actinobacteria | Bacteroidetes | Chlorobi | Cyanobacteria | Deferribacteres | Firmicutes | Fusobacteria | Gemmatimonadetes | Planctomycetes | Proteobacteria | TM7   | Tenericutes | Verrucomicrobia | Thermi. |
|-----|----------------|---------------|----------------|---------------|----------|---------------|-----------------|------------|--------------|------------------|----------------|----------------|-------|-------------|-----------------|---------|
| F1A | 0.2            | 0.6           | 0.6            | 0.7           | 0.03     | 0.4           | 0.09            | 0.5        | 0.2          | 0.5              | 0.3            | 0.6            | 0.4   | 0.1         | 0.5             | 0.51    |
| F1B | 0.2            | 0.03          | 0.002          | 0.07          | 0.07     | 0.2           | 0.06            | 0.09       | 0.5          | 0.5              | 0.06           | 0.03           | 0.3   | 0.1         | 0.6             | 0.003   |
| F1C | 0.7            | 0.7           | 0.02           | 0.6           | 0.8      | 0.32          | 0.8             | 0.3        | 0.9          | 0.3              | 0.02           | 0.4            | 0.04  | 0.9         | 0.03            | 0.3     |
| F6A | 0.3            | 0.2           | 0.2            | 0.5           | 0.4      | 0.48          | 0.2             | 0.9        | 0.3          | 0.3              | 0.5            | 0.8            | 0.3   | 0.3         | 0.8             | 0.1     |
| F6B | 0.7            | 0.4           | 0.9            | 0.1           | 0.4      | 0.39          | 0.19            | 0.3        | 0.9          | 0.06             | 0.7            | 0.16           | 0.003 | 0.7         | 0.1             | 0.8     |
| F6C | 0.9            | 0.3           | 0.4            | 0.1           | 0.6      | 0.29          | 0.16            | 0.7        | 0.5          | 0.3              | 0.2            | 0.3            | 0.01  | 0.7         | 0.1             | 0.9     |

p values for correlation of cells with OTUs in B1 or B6

Figure E8

|   | Bacteria Other | Acidobacteria | Actinobacteria | Bacteroidetes | Chlorobi | Cyanobacteria | Deferribacteres | Firmicutes | Fusobacteria | Gemmatimonadetes | Planctomycetes | Proteobacteria | TM7  | Tenericutes | Verrucomicrobia | Thermi. |
|---|----------------|---------------|----------------|---------------|----------|---------------|-----------------|------------|--------------|------------------|----------------|----------------|------|-------------|-----------------|---------|
| A | 0.23           | 0.11          | 0.11           | 0.57          | 0.20     | 0.33          | 0.08            | 0.84       | 0.40         | 0.44             | 0.7            | 0.81           | 0.52 | 0.24        | 0.75            | 0.10    |
| B | 0.36           | 0.68          | 0.14           | 0.01          | 0.91     | 0.46          | 0.06            | 0.05       | 0.49         | 0.11             | 0.06           | 0.01           | 0.01 | 0.19        | 0.69            | 0.05    |
| C | 0.82           | 0.69          | 0.34           | 0.32          | 0.82     | 0.50          | 0.36            | 0.36       | 0.78         | 0.63             | 0.06           | 0.79           | 0.20 | 0.91        | 0.18            | 0.43    |

p values for difference in cell-OTU correlations between B1 and B6

Figure E9

— B1 — B6

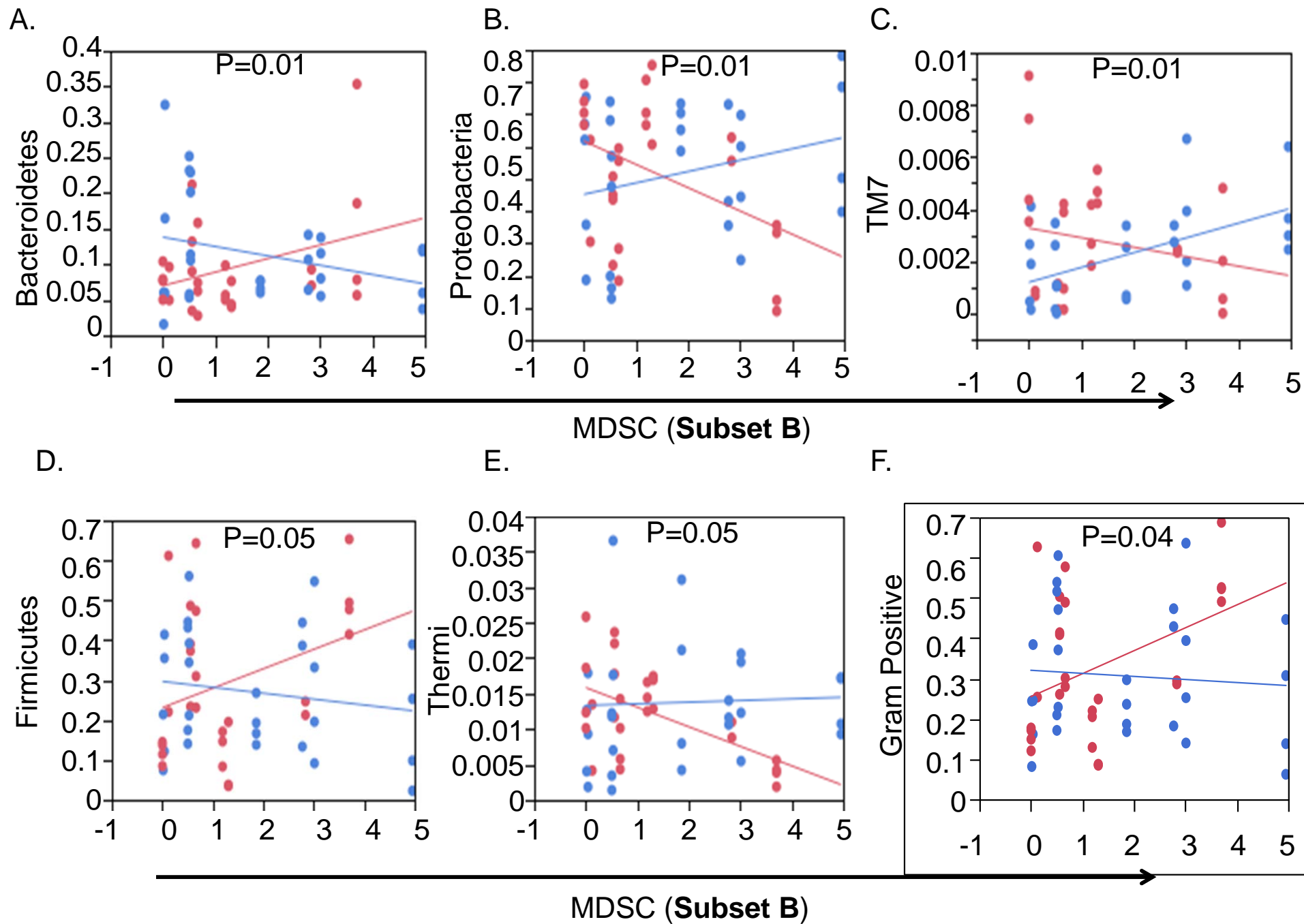


Figure E10

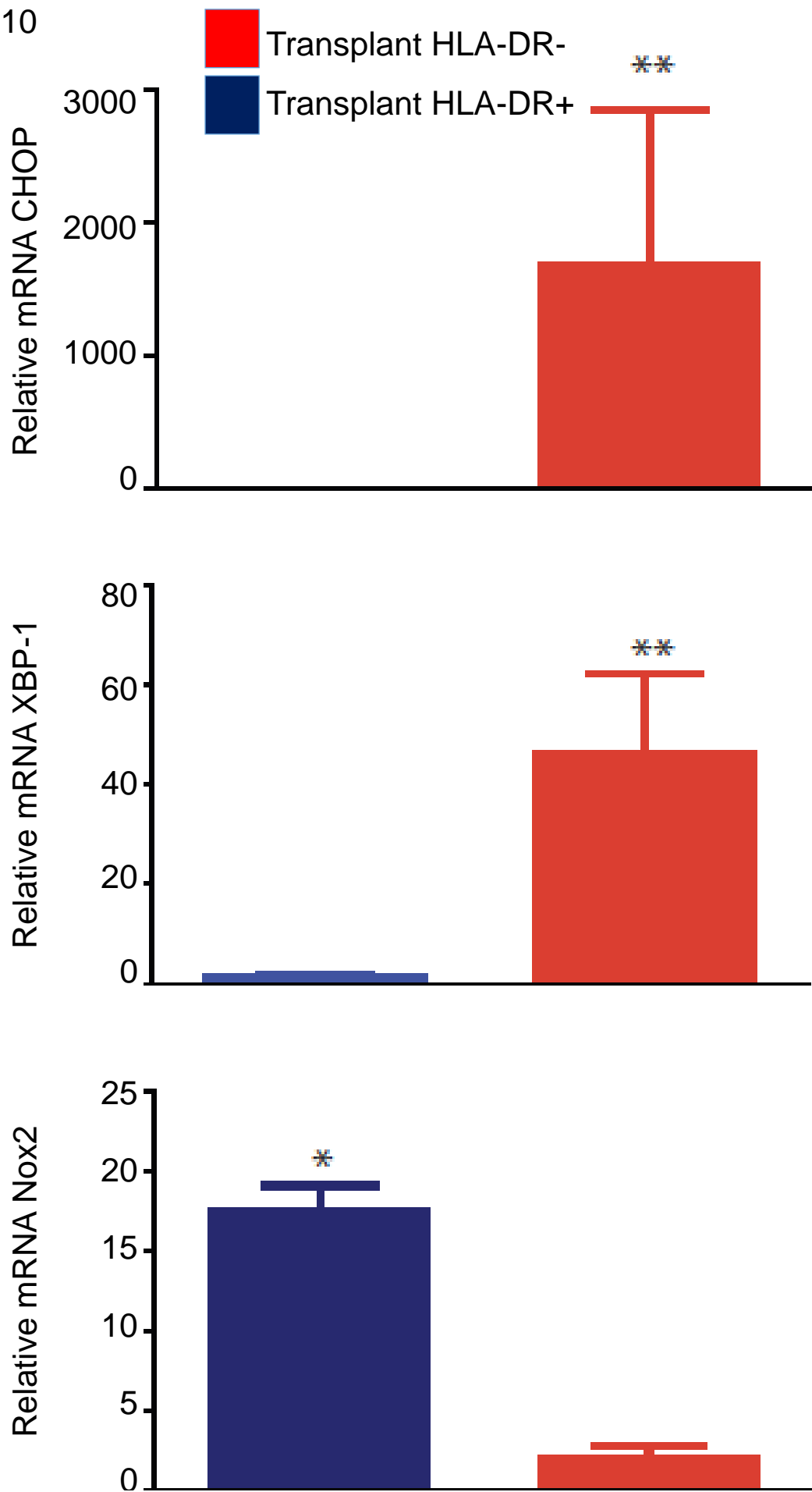
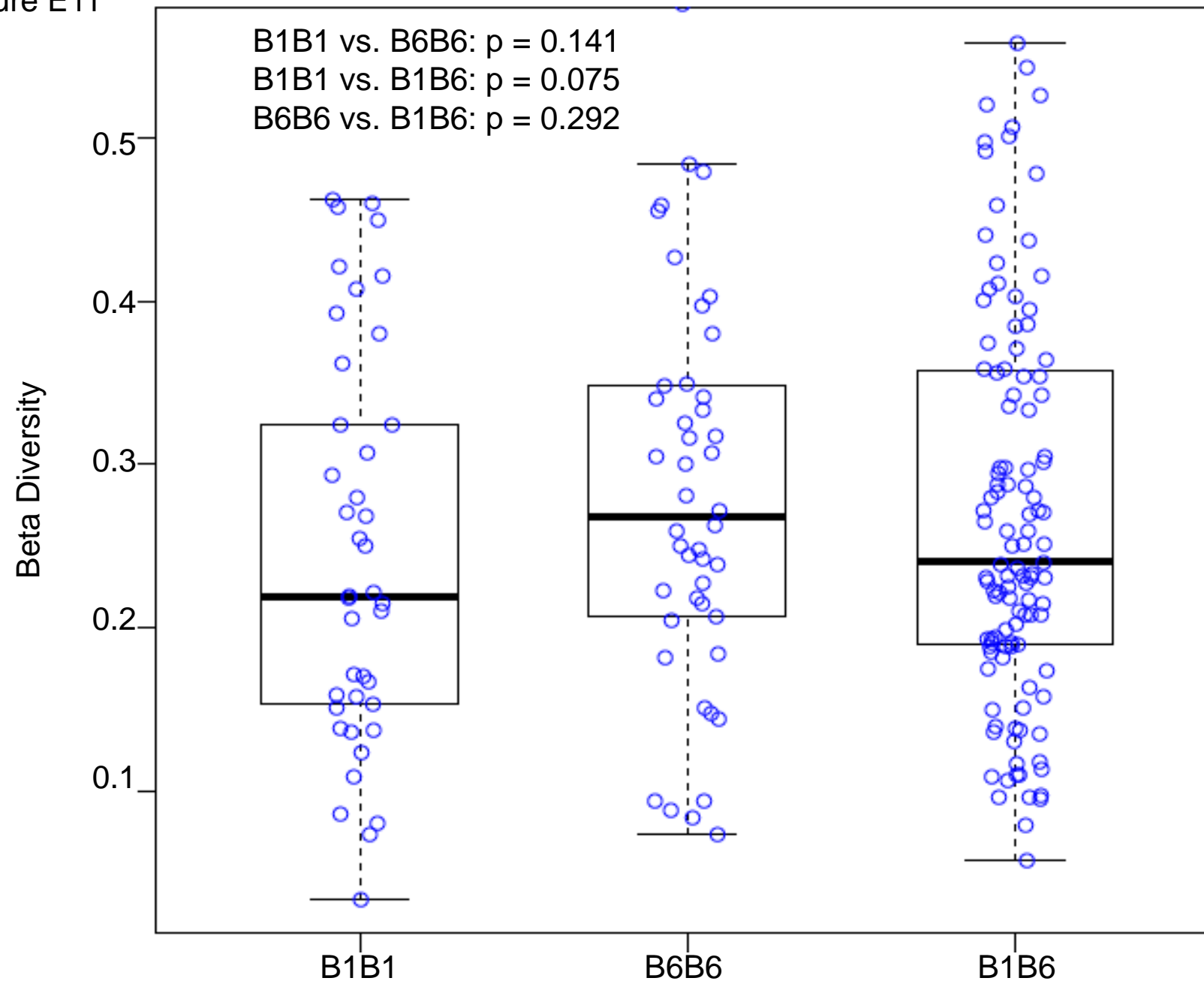


Figure E11



**Table S1: Statistical comparison of OTU relative abundance in oral and airway compartments (B1 and B6)**

| Comparison  | Phylum level OTU        | Difference in OTU abundance | P value  |
|---|-------------------------|-----------------------------|----------|
| A. Oral (O) versus proximal airway (B1)<br>(O-B1) | <i>Acidobacteria</i>    | -0.000389978                | 9.89E-05 |
|   | <i>Actinobacteria</i>   | 0.14840683                  | 1.69E-14 |
|   | <i>Chlorobi</i>         | -0.00029131                 | 9.98E-04 |
|   | <i>Cyanobacteria</i>    | -0.001691701                | 3.80E-07 |
|   | <i>Firmicutes</i>       | 0.334692251                 | 5.75E-12 |
|   | <i>Gemmatimonadetes</i> | -0.001044976                | 3.51E-06 |
|   | <i>Planctomycetes</i>   | -0.000441805                | 2.73E-05 |
|   | <i>Proteobacteria</i>   | -0.445118277                | 9.16E-15 |
|   | <i>TM7</i>              | -0.002247631                | 1.54E-06 |
|   | <i>Tenericutes</i>      | -0.001671399                | 6.47E-03 |
| <i>Thermi</i>                                     | -0.012189972            | 1.41E-12                    |          |
| B. Oral (O) versus distal airway (B6)<br>(O-B6)   | <i>Acidobacteria</i>    | 0.000646599                 | 1.61E-03 |
|   | <i>Actinobacteria</i>   | 0.14864775                  | 5.68E-14 |
|   | <i>Chlorobi</i>         | -0.000444226                | 1.63E-02 |
|   | <i>Deferribacteres</i>  | -0.0005438                  | 1.59E-02 |
|   | <i>Firmicutes</i>       | 0.339550245                 | 4.17E-14 |
|   | <i>Gemmatimonadetes</i> | -0.00085226                 | 3.77E-05 |
|   | <i>Planctomycetes</i>   | -0.000269122                | 5.15E-03 |
|   | <i>Proteobacteria</i>   | -0.409541153                | 1.97E-13 |
|   | <i>TM7</i>              | -0.001875206                | 1.25E-06 |
|   | <i>Tenericutes</i>      | -0.001685306                | 4.78E-03 |
| <i>Thermi</i>                                     | -0.01323718             | 4.25 E-09                   |          |

The above table details the significant operational taxonomic unit (OTU) differences between the oral and proximal and distal airway samples (determined by Wilcoxon signed rank test). Difference in relative abundance of various OTUs in the oral and proximal airway (O-B1) and oral and distal airway (O-B6) have been shown under difference in OTU abundance column. Bonferroni adjustment has been performed for multiple testing correction.



Table S2

| Unique in Nasal |                   |  | Unique in Proximal Airway |                  |  | Both in Proximal Airway and Nasal |                  |  |
|-----------------|-------------------|--|---------------------------|------------------|--|-----------------------------------|------------------|--|
| OTU ID          | phylum            | Family/Genus                           | OTU ID                    | phylum           | Family/Genus                           | OTU ID                            | phylum           | Family/Genus                           |
| denovo5525      | p Proteobacteria  | f Oxalobacteraceae                     | denovo24056               | p Proteobacteria |  | denovo12956                       | p Actinobacteria | f Nocardiaceae/g Rhodococcus           |
| denovo6170      | p Firmicutes      | f Streptococcaceae/g Streptococcus     | denovo49928               | p Firmicutes     | f /g                                   | denovo20287                       | p Firmicutes     | f /g                                   |
| denovo7568      | p Cyanobacteria   | f /g                                   | denovo77994               | p Proteobacteria | f Xanthomonadaceae/g Lysobacter        | denovo30082                       | p Firmicutes     | f Ruminococcaceae                      |
| denovo18133     | p Proteobacteria  | f Oxalobacteraceae                     | denovo85329               | p Firmicutes     | f Ruminococcaceae                      | denovo33552                       | p Firmicutes     | f /g                                   |
| denovo31999     | p Proteobacteria  | f Xanthomonadaceae/g                   | denovo106156              | p Firmicutes     |  | denovo34296                       | p Proteobacteria | f Caulobacteraceae                     |
| denovo36756     | p Proteobacteria  | f Xanthomonadaceae/g Stenotrophomonas  | denovo132757              | p Proteobacteria | f Oxalobacteraceae                     | denovo45799                       | p Firmicutes     | f Ruminococcaceae                      |
| denovo53865     | p Proteobacteria  | f Caulobacteraceae                     | denovo163977              | p Firmicutes     |  | denovo52145                       | p Actinobacteria | f Sporichthyaceae/g                    |
| denovo61473     | p Proteobacteria  | f Oxalobacteraceae/g Massilia          | denovo181833              | p Bacteroidetes  | f Prevotellaceae/g Prevotella          | denovo52382                       | p Firmicutes     | f Tissierellaceae/g Anaerococcus       |
| denovo75006     | p Proteobacteria  | f Comamonadaceae                       | denovo192952              | p Firmicutes     | f Lactobacillaceae/g Lactobacillus     | denovo55622                       | p Firmicutes     | f Lachnospiraceae/g                    |
| denovo82076     | p Proteobacteria  | f Oxalobacteraceae                     | denovo231233              | p Actinobacteria | f Bifidobacteriaceae/g Bifidobacterium | denovo59594                       | p Actinobacteria | f Corynebacteriaceae/g Corynebacterium |
| denovo89170     | p Proteobacteria  | f Rhodospirillaceae/g Azospirillum     | denovo272702              | p Firmicutes     | f /g                                   | denovo67726                       | p Proteobacteria | f Comamonadaceae/g Aquabacterium       |
| denovo91083     | p Firmicutes      |  | denovo311044              | p Firmicutes     |  | denovo78145                       | p Actinobacteria | f Corynebacteriaceae/g Corynebacterium |
| denovo108405    | p Firmicutes      | f Lachnospiraceae                      | denovo312676              | p Firmicutes     |  | denovo79638                       | p Firmicutes     |  |
| denovo111306    | p Proteobacteria  | f Oxalobacteraceae                     | denovo334031              | p Proteobacteria | f Oxalobacteraceae                     | denovo90320                       | p Bacteroidetes  | f Bacteroidaceae/g Bacteroides         |
| denovo112854    | p Firmicutes      |  | denovo338517              | p Proteobacteria |  | denovo92463                       | p Firmicutes     | f Streptococcaceae/g Streptococcus     |
| denovo114801    | p Proteobacteria  | f Comamonadaceae                       | denovo394300              | p Proteobacteria | f Rhodospirillaceae                    | denovo94369                       | p Firmicutes     | f Staphylococcaceae/g Staphylococcus   |
| denovo116998    | p Proteobacteria  | f Comamonadaceae                       |                           |                  |  | denovo94925                       | p Bacteroidetes  | f Bacteroidaceae/g Bacteroides         |
| denovo119040    | p Fusobacteria    | f Fusobacteriaceae/g Cetobacterium     |                           |                  |  | denovo96507                       | p Proteobacteria | f Comamonadaceae                       |
| denovo136135    | p Firmicutes      | f Lactobacillaceae/g Lactobacillus     |                           |                  |  | denovo99800                       | p Firmicutes     | f Carnobacteriaceae/g Granulicatella   |
| denovo150103    | p Proteobacteria  |  |                           |                  |  | denovo112126                      | p Firmicutes     |  |
| denovo151668    | p Proteobacteria  | f Rhodobacteraceae/g Amaricoccus       |                           |                  |  | denovo114897                      | p Firmicutes     |  |
| denovo164331    | p Proteobacteria  | f Enterobacteriaceae                   |                           |                  |  | denovo127493                      | p Bacteroidetes  | f S24-7/g                              |
| denovo166934    | p Firmicutes      | f Lachnospiraceae                      |                           |                  |  | denovo136663                      | p Firmicutes     | f Ruminococcaceae                      |
| denovo180520    | p Proteobacteria  | f Caulobacteraceae                     |                           |                  |  | denovo155465                      | p Proteobacteria | f Comamonadaceae/g Aquabacterium       |
| denovo180848    | p Firmicutes      | f Lactobacillaceae/g Lactobacillus     |                           |                  |  | denovo169185                      | p Proteobacteria | f Caulobacteraceae                     |
| denovo186533    | p Proteobacteria  | f Oxalobacteraceae                     |                           |                  |  | denovo180949                      | p Proteobacteria | f Sphingomonadaceae                    |
| denovo191073    | p Proteobacteria  | f Caulobacteraceae                     |                           |                  |  | denovo189232                      | p Firmicutes     | f Lachnospiraceae                      |
| denovo216505    | p Verrucomicrobia | f Verrucomicrobiaceae/g Akkermansia    |                           |                  |  | denovo192205                      | p Firmicutes     | f Streptococcaceae/g Streptococcus     |
| denovo218667    | p Bacteroidetes   | f S24-7/g                              |                           |                  |  | denovo194520                      | p Actinobacteria | f Corynebacteriaceae/g Corynebacterium |
| denovo220588    | p Proteobacteria  |  |                           |                  |  | denovo216588                      | p Bacteroidetes  | f Prevotellaceae/g Prevotella          |
| denovo223482    | p Firmicutes      | f Lactobacillaceae/g Lactobacillus     |                           |                  |  | denovo219333                      | p Firmicutes     | f Lachnospiraceae/g                    |
| denovo231141    | p (Thermi)        | f Trueperaceae/g Truepera              |                           |                  |  | denovo224627                      | p Proteobacteria |  |
| denovo238411    | p Firmicutes      | f Streptococcaceae/g Streptococcus     |                           |                  |  | denovo247152                      | p Actinobacteria | f Bifidobacteriaceae/g Bifidobacterium |
| denovo245769    | p Proteobacteria  | f Rhizobiaceae/g Agrobacterium         |                           |                  |  | denovo262368                      | p Firmicutes     | f Ruminococcaceae                      |
| denovo248180    | p Firmicutes      |  |                           |                  |  | denovo310848                      | p Firmicutes     | f Streptococcaceae/g Streptococcus     |
| denovo275262    | p Proteobacteria  | f Comamonadaceae/g Alicyclophillus     |                           |                  |  | denovo335027                      | p Bacteroidetes  | f Odoribacteriaceae/g Odoribacter      |
| denovo293180    | p Proteobacteria  | f Moraxellaceae/g Acinetobacter        |                           |                  |  | denovo345448                      | p Bacteroidetes  | f /g                                   |
| denovo296431    | p Proteobacteria  | f Methylophilaceae                     |                           |                  |  |                                   |                  |  |
| denovo296534    | p Proteobacteria  | f Caulobacteraceae                     |                           |                  |  |                                   |                  |  |
| denovo303264    | p Bacteroidetes   | f Bacteroidaceae/g Bacteroides         |                           |                  |  |                                   |                  |  |
| denovo305083    | p Firmicutes      | f Streptococcaceae/g Streptococcus     |                           |                  |  |                                   |                  |  |
| denovo324895    | p Proteobacteria  |  |                           |                  |  |                                   |                  |  |
| denovo357734    | p Actinobacteria  | f Corynebacteriaceae/g Corynebacterium |                           |                  |  |                                   |                  |  |
| denovo358307    | p Proteobacteria  | f Rhodospirillaceae/g Azospirillum     |                           |                  |  |                                   |                  |  |
| denovo368968    | p Firmicutes      | f Ruminococcaceae                      |                           |                  |  |                                   |                  |  |
| denovo374027    | p Firmicutes      | f /g                                   |                           |                  |  |                                   |                  |  |
| denovo386418    | p Firmicutes      | f Streptococcaceae/g Streptococcus     |                           |                  |  |                                   |                  |  |
| denovo395603    | p Cyanobacteria   | f /g                                   |                           |                  |  |                                   |                  |  |
| denovo416808    | p Proteobacteria  | f Caulobacteraceae                     |                           |                  |  |                                   |                  |  |
| denovo419490    | p Proteobacteria  | f Oxalobacteraceae                     |                           |                  |  |                                   |                  |  |

Table S3

| Unique in Nasal samples |                   |  | Unique in Distal Airway |                  |                                    | Both in both Distal Airway and Nasal |                  |  |
|-------------------------|-------------------|--|-------------------------|------------------|------------------------------------|--------------------------------------|------------------|--|
| OTU ID                  | phylum            | Family/Genus                                 | OTU ID                  | phylum           | Family/Genus                       | OTU ID                               | phylum           | Family/Genus                           |
| denovo5525              | p Proteobacteria  | f Oxalobacteraceae                           | denovo18396             | p Proteobacteria |                                    | denovo2864                           | p Proteobacteria | f Neisseriaceae/g Chitinomonas         |
| denovo8170              | p Firmicutes      | f Streptococcaceae/g Streptococcus           | denovo32512             | p Proteobacteria |                                    | denovo5016                           | p Proteobacteria | f Neisseriaceae/g                      |
| denovo17152             | p Firmicutes      | f Peptostreptococcaceae/g Peptostreptococcus | denovo42629             | p Proteobacteria | f Comamonadaceae                   | denovo9724                           | p Proteobacteria | f Xanthomonadaceae/g Aquimonas         |
| denovo14109             | p Firmicutes      | f Ruminococcaceae/g Faecalibacterium         | denovo85329             | p Firmicutes     | f Ruminococcaceae                  | denovo29190                          | p Proteobacteria |  |
| denovo59086             | p Cyanobacteria   | f /g   | denovo113148            | p Firmicutes     | f Lachnospiraceae                  | denovo30110                          | p Proteobacteria |  |
| denovo52006             | p Proteobacteria  | f Comamonadaceae                             | denovo118216            | p Proteobacteria | f Rhodospirillaceae/g Azospirillum | denovo52382                          | p Firmicutes     | f [Tissierellaceae]/g Anaerococcus     |
| denovo84351             | p Proteobacteria  | f Rhodospirillaceae/g Azospirillum           | denovo150468            | p Proteobacteria |                                    | denovo55551                          | p Firmicutes     | f Ruminococcaceae/g Ruminococcus       |
| denovo84676             | p Bacteroidetes   | f Bacteroidaceae/g Bacteroides               | denovo211791            | p Firmicutes     | f Veillonellaceae/g Selenomonas    | denovo59594                          | p Actinobacteria | f Corynebacteriaceae/g Corynebacterium |
| denovo116998            | p Proteobacteria  | f Comamonadaceae                             | denovo285270            | p Proteobacteria | f Rhodospirillaceae/g Azospirillum | denovo63203                          | p Bacteroidetes  | f Bacteroidaceae/g Bacteroides         |
| denovo120285            | p Firmicutes      | f /g   | denovo294542            | p Proteobacteria | f Comamonadaceae                   | denovo89605                          | p Proteobacteria | f /g                                   |
| denovo126829            | p Proteobacteria  | f Oxalobacteraceae                           | denovo308718            | p Proteobacteria | f Xanthomonadaceae/g Lysobacter    | denovo90320                          | p Bacteroidetes  | f Bacteroidaceae/g Bacteroides         |
| denovo128206            | p Actinobacteria  | f Bifidobacteriaceae/g Bifidobacterium       | denovo338517            | p Proteobacteria |                                    | denovo91083                          | p Firmicutes     |  |
| denovo131978            | p Proteobacteria  | f Oxalobacteraceae                           | denovo365085            | p Proteobacteria |                                    | denovo94369                          | p Firmicutes     | f Staphylococcaceae/g Staphylococcus   |
| denovo134482            | p Proteobacteria  | f Caulobacteraceae                           | denovo372184            | p Proteobacteria | f Comamonadaceae                   | denovo106754                         | p Proteobacteria | f Acetobacteraceae                     |
| denovo136135            | p Firmicutes      | f Lactobacillaceae/g Lactobacillus           | denovo376554            | p Proteobacteria | f Caulobacteraceae                 | denovo113509                         | p Proteobacteria | f Ovalobacteraceae                     |
| denovo141060            | p Cyanobacteria   | f /g   |                         |                  |                                    | denovo113807                         | p Proteobacteria | f Enterobacteriaceae                   |
| denovo147279            | p Firmicutes      |  |                         |                  |                                    | denovo127493                         | p Bacteroidetes  | f S24-7/g                              |
| denovo156914            | p Proteobacteria  |  |                         |                  |                                    | denovo127998                         | p Firmicutes     | f Turicibacteraceae/g Turicibacter     |
| denovo160959            | p Proteobacteria  | f Oxalobacteraceae                           |                         |                  |                                    | denovo136368                         | p Proteobacteria | f Pasteurellaceae                      |
| denovo166934            | p Firmicutes      | f Lachnospiraceae                            |                         |                  |                                    | denovo141871                         | p Bacteroidetes  | f Prevotellaceae/g Prevotella          |
| denovo176599            | p Firmicutes      | f Ruminococcaceae/g Faecalibacterium         |                         |                  |                                    | denovo150520                         | p Proteobacteria | f Xanthomonadaceae/g Lysobacter        |
| denovo223482            | p Firmicutes      | f Lactobacillaceae/g Lactobacillus           |                         |                  |                                    | denovo154445                         | p Proteobacteria | f Comamonadaceae                       |
| denovo238411            | p Firmicutes      | f Streptococcaceae/g Streptococcus           |                         |                  |                                    | denovo155465                         | p Proteobacteria | f Comamonadaceae/g Aquabacterium       |
| denovo245765            | p Bacteroidetes   | f Bacteroidaceae/g Bacteroides               |                         |                  |                                    | denovo163827                         | p Firmicutes     | f Streptococcaceae/g Streptococcus     |
| denovo251236            | p Actinobacteria  | f Corynebacteriaceae/g Corynebacterium       |                         |                  |                                    | denovo165262                         | p Bacteroidetes  | f Prevotellaceae/g Prevotella          |
| denovo269314            | p Proteobacteria  | f Rhodobacteraceae/g Rubellimicrobium        |                         |                  |                                    | denovo169185                         | p Proteobacteria | f Caulobacteraceae                     |
| denovo281662            | p Verrucomicrobia | f Verrucomicrobiaceae/g Akkermansia          |                         |                  |                                    | denovo170878                         | p Proteobacteria | f Comamonadaceae                       |
| denovo281769            | p Proteobacteria  | f Enterobacteriaceae                         |                         |                  |                                    | denovo179465                         | p Actinobacteria | f Actinomycetaceae/g Actinomyces       |
| denovo285233            | p Proteobacteria  | f Comamonadaceae/g Alicyclophilus            |                         |                  |                                    | denovo198598                         | p Firmicutes     | f Lachnospiraceae/g Dorea              |
| denovo290371            | p Firmicutes      | f Peptostreptococcaceae/g Peptostreptococcus |                         |                  |                                    | denovo199848                         | p Proteobacteria | f Desulfovibrionaceae/g Bilophila      |
| denovo305083            | p Firmicutes      | f Streptococcaceae/g Streptococcus           |                         |                  |                                    | denovo213702                         | p Proteobacteria | f Caulobacteraceae                     |
| denovo311416            | p Verrucomicrobia | f Verrucomicrobiaceae/g Akkermansia          |                         |                  |                                    | denovo215737                         | p Firmicutes     | f [Tissierellaceae]/g Anaerococcus     |
| denovo314996            | p Firmicutes      | f Turicibacteraceae/g Turicibacter           |                         |                  |                                    | denovo230575                         | p Firmicutes     |  |
| denovo318529            | p Actinobacteria  | f Bifidobacteriaceae/g Bifidobacterium       |                         |                  |                                    | denovo243249                         | p Proteobacteria | f Oxalobacteraceae/g Janthinobacterium |
| denovo320315            | p Bacteroidetes   | f Bacteroidaceae/g Bacteroides               |                         |                  |                                    | denovo247152                         | p Actinobacteria | f Bifidobacteriaceae/g Bifidobacterium |
| denovo329819            | p Firmicutes      | f Streptococcaceae/g Streptococcus           |                         |                  |                                    | denovo254204                         | p Bacteroidetes  | f S24-7/g                              |
| denovo337798            | p Actinobacteria  | f Corynebacteriaceae/g Corynebacterium       |                         |                  |                                    | denovo258946                         | p Bacteroidetes  | f Prevotellaceae/g Prevotella          |
| denovo366877            | p Firmicutes      | f Streptococcaceae/g Streptococcus           |                         |                  |                                    | denovo262738                         | p Firmicutes     | f /g                                   |
| denovo368968            | p Firmicutes      | f Ruminococcaceae                            |                         |                  |                                    | denovo265358                         | p Firmicutes     | f Ruminococcaceae/g Oscillospira       |
| denovo379567            | p Firmicutes      | f Lachnospiraceae/g Blautia                  |                         |                  |                                    | denovo309053                         | p Proteobacteria |  |
| denovo384820            | p Firmicutes      | f Streptococcaceae/g Streptococcus           |                         |                  |                                    | denovo316183                         | p Firmicutes     | f [Tissierellaceae]/g Finegoldia       |
| denovo386418            | p Firmicutes      | f Streptococcaceae/g Streptococcus           |                         |                  |                                    | denovo323968                         | p Firmicutes     | f /g                                   |
| denovo394517            | p Proteobacteria  | f Beijerinckiaceae                           |                         |                  |                                    | denovo338843                         | p Bacteroidetes  | f Prevotellaceae/g Prevotella          |
| denovo395630            | p Firmicutes      | f Aerococcaceae/g Facklamia                  |                         |                  |                                    | denovo351837                         | p Proteobacteria | f Caulobacteraceae                     |
| denovo411522            | p Firmicutes      | f Turicibacteraceae/g Turicibacter           |                         |                  |                                    | denovo368015                         | p Proteobacteria | f Oxalobacteraceae                     |
| denovo419337            | p Proteobacteria  | f Pseudomonadaceae                           |                         |                  |                                    | denovo372844                         | p Bacteroidetes  | f Porphyromonadaceae/g Parabacteroides |
|                         |                   |  |                         |                  |                                    | denovo381694                         | p Cyanobacteria  | f /g                                   |
|                         |                   |  |                         |                  |                                    | denovo399652                         | p Bacteroidetes  | f Prevotellaceae/g Prevotella          |
|                         |                   |  |                         |                  |                                    | denovo400427                         | p Firmicutes     | f Lachnospiraceae/g Coprococcus        |
|                         |                   |  |                         |                  |                                    | denovo404289                         | p Proteobacteria | f Comamonadaceae                       |
|                         |                   |  |                         |                  |                                    | denovo418999                         | p Proteobacteria | f Burkholderiaceae/g Salinispora       |

Table S4

Differences between microbiome signatures of proximal airway (B1) and distal airway (B6)

| SI No. | Operational Taxonomic Unit | Phylum            | Proximal Airway | Distal Airway | B6-B1     | B1-B6     | P Value  | FDR       |
|--------|----------------------------|-------------------|-----------------|---------------|-----------|-----------|----------|-----------|
| 1      | denovo14089                | p__Proteobacteria | 4.6908E-6       | 0.0009287     | 0.000924  | -0.000924 | 0.025125 | 0.0398524 |
| 2      | denovo29174                | p__Proteobacteria | 7.0329E-6       | 6.376E-7      | -6.395E-6 | 6.3953E-6 | 0.032508 | 0.0398524 |
| 3      | denovo75376                | p__Proteobacteria | 0.0000117       | 6.376E-7      | -0.000011 | 0.000011  | 0.032508 | 0.0398524 |
| 4      | denovo86197                | p__Firmicutes     | 0.0000169       | 3.9338E-6     | -0.000013 | 0.000013  | 0.041200 | 0.0450738 |
| 5      | denovo92168                | p__Firmicutes     | 9.7148E-6       | 0             | -9.715E-6 | 9.7148E-6 | 0.032508 | 0.0398524 |
| 6      | denovo93365                | p__Tenericutes    | 0.0001471       | 0             | -0.000147 | 0.0001471 | 0.032508 | 0.0398524 |
| 7      | denovo101789               | p__Proteobacteria | 0.0000104       | 0             | -0.00001  | 0.0000104 | 0.032508 | 0.0398524 |
| 8      | denovo106754               | p__Proteobacteria | 0.0000544       | 0.0005434     | 0.000489  | -0.000489 | 0.049536 | 0.0495356 |
| 9      | denovo110937               | p__Firmicutes     | 0.0000197       | 1.0476E-6     | -0.000019 | 0.0000187 | 0.010836 | 0.0398524 |
| 10     | denovo112126               | p__Firmicutes     | 0.0000503       | 0.0001001     | 0.0000497 | -0.00005  | 0.041200 | 0.0450738 |
| 11     | denovo114897               | p__Firmicutes     | 0.0000212       | 0.0002809     | 0.0002597 | -0.00026  | 0.007859 | 0.0398524 |
| 12     | denovo123014               | p__Proteobacteria | 0.000037        | 2.7215E-6     | -0.000034 | 0.0000343 | 0.012622 | 0.0398524 |
| 13     | denovo126420               | p__Proteobacteria | 0.0000159       | 1.9128E-6     | -0.000014 | 0.000014  | 0.034056 | 0.0398524 |
| 14     | denovo128163               | p__Bacteroidetes  | 0.0000194       | 1.8091E-6     | -0.000018 | 0.0000176 | 0.018576 | 0.0398524 |
| 15     | denovo128623               | p__Proteobacteria | 0.00018         | 0.0006074     | 0.0004274 | -0.000427 | 0.028059 | 0.0398524 |
| 16     | denovo133654               | p__Proteobacteria | 0.00002         | 3.3254E-6     | -0.000017 | 0.0000167 | 0.034056 | 0.0398524 |
| 17     | denovo141871               | p__Bacteroidetes  | 0.0000582       | 0.0000129     | -0.000045 | 0.0000453 | 0.014571 | 0.0398524 |
| 18     | denovo144911               | p__Firmicutes     | 0.0041893       | 0.0107059     | 0.0065166 | -0.006517 | 0.014690 | 0.0398524 |
| 19     | denovo145145               | p__Proteobacteria | 0.0000171       | 0             | -0.000017 | 0.0000171 | 0.032508 | 0.0398524 |
| 20     | denovo159106               | p__Firmicutes     | 2.4923E-6       | 0.0000123     | 9.837E-6  | -9.837E-6 | 0.049536 | 0.0495356 |

|    |              |                   |           |           |           |           |          |           |
|----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 21 | denovo168600 | p__Proteobacteria | 0.0000205 | 4.277E-6  | -0.000016 | 0.0000162 | 0.032919 | 0.0398524 |
| 22 | denovo180607 | p__Proteobacteria | 8.7471E-6 | 0         | -8.747E-6 | 8.7471E-6 | 0.032508 | 0.0398524 |
| 23 | denovo181833 | p__Bacteroidetes  | 0         | 0.0000198 | 0.0000198 | -0.00002  | 0.032508 | 0.0398524 |
| 24 | denovo199848 | p__Proteobacteria | 0.000038  | 0.0003913 | 0.0003533 | -0.000353 | 0.021975 | 0.0398524 |
| 25 | denovo202511 | p__Firmicutes     | 0.0000137 | 0.000186  | 0.0001723 | -0.000172 | 0.003096 | 0.0398524 |
| 26 | denovo204640 | p__Proteobacteria | 0.000073  | 0.0000205 | -0.000052 | 0.0000524 | 0.049536 | 0.0495356 |
| 27 | denovo212138 | p__Firmicutes     | 1.3094E-6 | 0.0000216 | 0.0000202 | -0.00002  | 0.032508 | 0.0398524 |
| 28 | denovo230990 | p__Proteobacteria | 0.0000122 | 5.2382E-7 | -0.000012 | 0.0000117 | 0.032508 | 0.0398524 |
| 29 | denovo231233 | p__Actinobacteria | 1.1684E-6 | 0.0001419 | 0.0001407 | -0.000141 | 0.032508 | 0.0398524 |
| 30 | denovo232482 | p__Proteobacteria | 9.2948E-6 | 7.2315E-7 | -8.572E-6 | 8.5716E-6 | 0.032508 | 0.0398524 |

The 2-sided p-value is presented.

Table S4  
Differences between microbiome signatures of proximal airway (B1) and distal airway (B6)

| SI No. | Operational Taxonomic Unit | Phylum            | Proximal Airway | Distal Airway | B6-B1     | B1-B6     | P Value  | FDR       |
|--------|----------------------------|-------------------|-----------------|---------------|-----------|-----------|----------|-----------|
| 31     | denovo245167               | p__Firmicutes     | 0               | 0.0000101     | 0.0000101 | -0.00001  | 0.032508 | 0.0398524 |
| 32     | denovo246205               | p__Bacteroidetes  | 0.0000586       | 5.2382E-7     | -0.000058 | 0.0000581 | 0.032508 | 0.0398524 |
| 33     | denovo247706               | p__Proteobacteria | 0.0000128       | 3.2771E-6     | -9.526E-6 | 9.5264E-6 | 0.049536 | 0.0495356 |
| 34     | denovo258946               | p__Bacteroidetes  | 0.0000371       | 7.1191E-6     | -0.00003  | 0.0000299 | 0.032919 | 0.0398524 |
| 35     | denovo281324               | p__Proteobacteria | 0.0000109       | 2.0303E-6     | -8.916E-6 | 8.9164E-6 | 0.041796 | 0.0450738 |

|    |              |                    |           |           |           |           |          |           |
|----|--------------|--------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 36 | denovo282232 | p__Firmicutes      | 0.0000218 | 0.0003478 | 0.000326  | -0.000326 | 0.004601 | 0.0398524 |
| 37 | denovo294542 | p__Proteobacteria  | 0.0000117 | 0         | -0.000012 | 0.0000117 | 0.032508 | 0.0398524 |
| 38 | denovo297817 | p__Proteobacteria  | 0.0000141 | 0         | -0.000014 | 0.0000141 | 0.032508 | 0.0398524 |
| 39 | denovo311416 | p__Verrucomicrobia | 0         | 0.0000238 | 0.0000238 | -0.000024 | 0.032508 | 0.0398524 |
| 40 | denovo312676 | p__Firmicutes      | 0         | 0.0000191 | 0.0000191 | -0.000019 | 0.032508 | 0.0398524 |
| 41 | denovo314718 | p__Cyanobacteria   | 0         | 0.0000777 | 0.0000777 | -0.000078 | 0.032508 | 0.0398524 |
| 42 | denovo316186 | p__Firmicutes      | 0.0018029 | 0.0057452 | 0.0039423 | -0.003942 | 0.028059 | 0.0398524 |
| 43 | denovo323677 | p__Firmicutes      | 0         | 0.0000367 | 0.0000367 | -0.000037 | 0.010836 | 0.0398524 |
| 44 | denovo327542 | p__Firmicutes      | 0.0002417 | 0.0005101 | 0.0002684 | -0.000268 | 0.025612 | 0.0398524 |
| 45 | denovo350230 | p__Proteobacteria  | 0.0000124 | 2.772E-6  | -9.582E-6 | 9.5824E-6 | 0.017385 | 0.0398524 |
| 46 | denovo358736 | p__Proteobacteria  | 0.0000126 | 6.376E-7  | -0.000012 | 0.0000119 | 0.018576 | 0.0398524 |
| 47 | denovo372241 | p__Proteobacteria  | 0.0000349 | 1.2752E-6 | -0.000034 | 0.0000336 | 0.018576 | 0.0398524 |
| 48 | denovo372675 | p__Proteobacteria  | 0.0000793 | 0.0000204 | -0.000059 | 0.000059  | 0.015263 | 0.0398524 |
| 49 | denovo376554 | p__Proteobacteria  | 9.1468E-6 | 7.2315E-7 | -8.424E-6 | 8.4236E-6 | 0.032508 | 0.0398524 |
| 50 | denovo391308 | p__Bacteroidetes   | 0.0000254 | 0.0002853 | 0.00026   | -0.00026  | 0.032508 | 0.0398524 |
| 51 | denovo401744 | p__Proteobacteria  | 0.0000146 | 3.3254E-6 | -0.000011 | 0.0000113 | 0.015004 | 0.0398524 |
| 52 | denovo412519 | p__Proteobacteria  | 6.7401E-6 | 5.2382E-7 | -6.216E-6 | 6.2163E-6 | 0.032508 | 0.0398524 |
| 53 | denovo414490 | p__Firmicutes      | 0.0009478 | 0.0030014 | 0.0020536 | -0.002054 | 0.029552 | 0.0398524 |
| 54 | denovo415197 | p__Firmicutes      | 8.6546E-6 | 0.0000578 | 0.0000492 | -0.000049 | 0.041200 | 0.0450738 |
| 55 | denovo415677 | p__Firmicutes      | 0.0001024 | 0.0004116 | 0.0003092 | -0.000309 | 0.023252 | 0.0398524 |
|    |              |                    |           |           |           |           |          |           |

The 2-sided p-value is presented.

The above table details the significant operational taxonomic unit (OTU) differences between the proximal and distal airway samples (determined by Wilcoxon signed rank test). Difference in relative abundance of various OTU's in the proximal and distal airway have been shown under B1-B6 and B6-B1 column. Multiple testing correction has been performed by calculating false discovery rate (FDR) for each test performed. Details provided under FDR column.

**Table S5. Percentage of unique OTUs in B1 and B6 samples of BOS subjects**

A.

| Unique OTU in B1 of BOS | Phyla-Genus/Family                      | n (%) of subjects with OTU present |
|-------------------------|---|------------------------------------|
| denovo191408            | <i>Bacteroidetes- Flavobacterium sp</i> | 4/5(80%)                           |
| denovo226600            | <i>Proteobacteria- Comamonadaceae</i>   | 4/5(80%)                           |
| denovo31802             | <i>Verrucomicrobia-Akkermansia</i>      | 4/5(80%)                           |
| denovo67852             | <i>Firmicutes- Jeotgalicoccus sp</i>    | 4/5(80%)                           |

Each unique OTU described above was present in at least 4/5 B1 samples. BOS subjects S3, S4 had 4/4 unique OTUs present in B1 samples, while S2, S6 had 3/4 unique OTUs present and S9 had 2/4 unique OTUs present.

B.

| Unique OTU in B6 of BOS | Phyla-Genus/Family                     | n (%) of subjects with OTU present |
|-------------------------|--|------------------------------------|
| denovo134778            | <i>Proteobacteria-Caulobacteraceae</i> | 4/5(80%)                           |
| denovo22704             | <i>Proteobacteria-Halomonas sp.</i>    | 4/5(80%)                           |
| denovo317687            | <i>Proteobacteria-Halomonas sp.</i>    | 4/5(80%)                           |
| denovo323749            | <i>Firmicutes-Clostridiales</i>        | 4/5(80%)                           |
| denovo338843            | <i>Bacteroidetes-Bacteroides sp.</i>   | 4/5(80%)                           |
| denovo34845             | <i>Firmicutes-Ruminococcaceae</i>      | 4/5(80%)                           |
| denovo93241             | <i>Firmicutes-Streptococcus sp.</i>    | 4/5(80%)                           |
| denovo95813             | <i>Bacteroidetes-Prevotella sp.</i>    | 4/5(80%)                           |

Each unique OTU described above was present in at least 4/5 B6 samples. BOS subjects S9, S4 had 8/8 unique OTUs present in B6 samples, while S2, S3 had 7/8 unique OTUs present.

Table S6

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the proximal airway (B1).

| SI No. | Operational Taxonomic Unit | Phylum            | Proximal Airway | Control   | B1-C1     | C1-B1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-----------------|-----------|-----------|-----------|----------|-----------|
| 1      | denovo2864                 | p__Proteobacteria | 0.0005228       | 0.0001754 | 0.0003474 | -0.000347 | 0.006408 | 0.042719  |
| 2      | denovo7074                 | p__Proteobacteria | 1.2857E-6       | 0.0000239 | -0.000023 | 0.0000226 | 0.007859 | 0.042719  |
| 3      | denovo9724                 | p__Proteobacteria | 0.0000867       | 0.0000112 | 0.0000754 | -0.000075 | 0.041200 | 0.0442724 |
| 4      | denovo22111                | p__Firmicutes     | 0.0000762       | 0.0003078 | -0.000232 | 0.0002317 | 0.028059 | 0.042719  |
| 5      | denovo26501                | p__Proteobacteria | 0               | 7.9533E-6 | -7.953E-6 | 7.9533E-6 | 0.032508 | 0.042719  |
| 6      | denovo28972                | p__[Thermi]       | 0.0065669       | 0.0207542 | -0.014187 | 0.0141874 | 0.043257 | 0.0445019 |
| 7      | denovo30110                | p__Proteobacteria | 0.0000247       | 1.9628E-6 | 0.0000227 | -0.000023 | 0.006668 | 0.042719  |
| 8      | denovo33230                | p__Firmicutes     | 0.000409        | 0.0009234 | -0.000514 | 0.0005144 | 0.029552 | 0.042719  |
| 9      | denovo36331                | p__Proteobacteria | 0               | 7.248E-6  | -7.248E-6 | 7.248E-6  | 0.032508 | 0.042719  |
| 10     | denovo36720                | p__Firmicutes     | 0.0004707       | 0.0017974 | -0.001327 | 0.0013267 | 0.017764 | 0.042719  |
| 11     | denovo42629                | p__Proteobacteria | 0.0000137       | 7.8174E-7 | 0.000013  | -0.000013 | 0.025125 | 0.042719  |
| 12     | denovo43049                | p__Firmicutes     | 0               | 0.0000563 | -0.000056 | 0.0000563 | 0.032508 | 0.042719  |
| 13     | denovo45884                | p__Firmicutes     | 0.0000935       | 0.0009496 | -0.000856 | 0.0008561 | 0.037606 | 0.0442724 |
| 14     | denovo49233                | p__Firmicutes     | 0.0002115       | 0.0009827 | -0.000771 | 0.0007712 | 0.025612 | 0.042719  |
| 15     | denovo50448                | p__Proteobacteria | 0.000011        | 3.9927E-7 | 0.0000106 | -0.000011 | 0.032508 | 0.042719  |
| 16     | denovo52145                | p__Actinobacteria | 0.0000882       | 4.4381E-6 | 0.0000838 | -0.000084 | 0.021553 | 0.042719  |
| 17     | denovo54761                | p__Proteobacteria | 0.0000369       | 0         | 0.0000369 | -0.000037 | 0.032508 | 0.042719  |
| 18     | denovo54809                | p__Acidobacteria  | 0.0007863       | 0.0024479 | -0.001662 | 0.0016615 | 0.028806 | 0.042719  |
| 19     | denovo55551                | p__Firmicutes     | 0.0000295       | 0.0001948 | -0.000165 | 0.0001653 | 0.032919 | 0.042719  |
| 20     | denovo55622                | p__Firmicutes     | 0.0000121       | 0.0000707 | -0.000059 | 0.0000586 | 0.000877 | 0.0417957 |
| 21     | denovo57030                | p__Firmicutes     | 0.0005504       | 0.0000632 | 0.0004872 | -0.000487 | 0.032919 | 0.042719  |
| 22     | denovo58943                | p__Firmicutes     | 0               |           |           |           |          | 0.042719  |

|    |             |                   |           |           |           |           |          |          |
|----|-------------|-------------------|-----------|-----------|-----------|-----------|----------|----------|
|    |             |                   |           | 6.7097E-6 | -6.71E-6  | 6.7097E-6 | 0.032508 |          |
| 23 | denovo59594 | p__Actinobacteria | 0.0013458 | 0.0021438 | -0.000798 | 0.000798  | 0.005196 | 0.042719 |
| 24 | denovo60150 | p__Proteobacteria | 0.0000202 | 3.5304E-6 | 0.0000167 | -0.000017 | 0.020416 | 0.042719 |
| 25 | denovo64091 | p__Firmicutes     | 0.0000693 | 0.0002037 | -0.000134 | 0.0001344 | 0.012557 | 0.042719 |
| 26 | denovo66453 | p__Proteobacteria | 0.0000611 | 0.0008538 | -0.000793 | 0.0007927 | 0.004330 | 0.042719 |
| 27 | denovo69054 | p__Firmicutes     | 0.0000117 | 0.0001304 | -0.000119 | 0.0001187 | 0.034056 | 0.042719 |
| 28 | denovo73122 | p__Proteobacteria | 0.0002643 | 0.0000683 | 0.000196  | -0.000196 | 0.028622 | 0.042719 |
| 29 | denovo77566 | p__Firmicutes     | 0         | 4.1664E-6 | -4.166E-6 | 4.1664E-6 | 0.032508 | 0.042719 |
| 30 | denovo93225 | p__Proteobacteria | 5.0266E-6 | 0.0000194 | -0.000014 | 0.0000144 | 0.030722 | 0.042719 |

The 2-sided p-value is presented.

Table S6

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the proximal airway (B1).

| SI No. | Operational Taxonomic Unit | Phylum            | Proximal Airway | Control   | B1-C1     | C1-B1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-----------------|-----------|-----------|-----------|----------|-----------|
| 31     | denovo93365                | p__Tenericutes    | 0.0001471       | 0         | 0.0001471 | -0.000147 | 0.032508 | 0.042719  |
| 32     | denovo93532                | p__Proteobacteria | 1.3094E-6       | 0.0000124 | -0.000011 | 0.0000111 | 0.034056 | 0.042719  |
| 33     | denovo94369                | p__Firmicutes     | 0.0146997       | 0.0112312 | 0.0034686 | -0.003469 | 0.018543 | 0.042719  |
| 34     | denovo95269                | p__Proteobacteria | 0               | 0.0000262 | -0.000026 | 0.0000262 | 0.000714 | 0.0417957 |
| 35     | denovo97226                | p__Proteobacteria | 0.0001536       | 6.3368E-6 | 0.0001472 | -0.000147 | 0.041200 | 0.0442724 |
| 36     | denovo98783                | p__Proteobacteria | 0.0001712       | 0.0000429 | 0.0001283 | -0.000128 | 0.028903 | 0.042719  |
| 37     | denovo100990               | p__Proteobacteria | 0               | 0.0000115 | -0.000012 | 0.0000115 | 0.010836 | 0.042719  |
| 38     | denovo103412               | p__Bacteroidetes  | 0.0001222       | 0.0000318 | 0.0000904 | -0.00009  | 0.023252 | 0.042719  |
| 39     | denovo104881               | p__Proteobacteria | 0.0001894       | 0.0000134 | 0.000176  | -0.000176 | 0.012622 | 0.042719  |
| 40     | denovo106754               |                   | 0.0000544       |           |           |           |          | 0.042719  |



|    |              |                   |           |           |           |           |             |           |
|----|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
|    |              | p__Proteobacteria |           | 0.0021986 | -0.002144 | 0.0021442 | 0.034056    |           |
| 41 | denovo110377 | p__Proteobacteria | 0.0007582 | 0.004031  | -0.003273 | 0.0032728 | 0.042986    | 0.0445019 |
| 42 | denovo112673 | p__Proteobacteria | 0.0004245 | 0.000035  | 0.0003895 | -0.000389 | 0.000043300 | 0.006192  |
| 43 | denovo113807 | p__Proteobacteria | 0.0020876 | 0.0060753 | -0.003988 | 0.0039877 | 0.028806    | 0.042719  |
| 44 | denovo114897 | p__Firmicutes     | 0.0000212 | 0.0003535 | -0.000332 | 0.0003323 | 0.018576    | 0.042719  |
| 45 | denovo115655 | p__Bacteroidetes  | 8.5613E-7 | 0.0000121 | -0.000011 | 0.0000113 | 0.026316    | 0.042719  |
| 46 | denovo116262 | p__Proteobacteria | 2.1526E-6 | 0.0000155 | -0.000013 | 0.0000133 | 0.008887    | 0.042719  |
| 47 | denovo120104 | p__Firmicutes     | 1.9924E-6 | 6.7767E-6 | -4.784E-6 | 4.7842E-6 | 0.049536    | 0.0495356 |
| 48 | denovo123014 | p__Proteobacteria | 0.000037  | 6.2523E-6 | 0.0000308 | -0.000031 | 0.016194    | 0.042719  |
| 49 | denovo126420 | p__Proteobacteria | 0.0000159 | 1.0768E-6 | 0.0000148 | -0.000015 | 0.025125    | 0.042719  |
| 50 | denovo128163 | p__Bacteroidetes  | 0.0000194 | 2.5219E-6 | 0.0000169 | -0.000017 | 0.041200    | 0.0442724 |
| 51 | denovo128206 | p__Actinobacteria | 0         | 0.0000643 | -0.000064 | 0.0000643 | 0.032508    | 0.042719  |
| 52 | denovo128805 | p__Firmicutes     | 0         | 8.6129E-6 | -8.613E-6 | 8.6129E-6 | 0.032508    | 0.042719  |
| 53 | denovo131968 | p__Bacteroidetes  | 0.0013657 | 0.0033629 | -0.001997 | 0.0019972 | 0.011496    | 0.042719  |
| 54 | denovo145566 | p__Proteobacteria | 3.2882E-6 | 0.0000151 | -0.000012 | 0.0000119 | 0.015004    | 0.042719  |
| 55 | denovo147810 | p__Proteobacteria | 0.0000174 | 0         | 0.0000174 | -0.000017 | 0.010836    | 0.042719  |
| 56 | denovo150520 | p__Proteobacteria | 0.0000146 | 3.9927E-7 | 0.0000142 | -0.000014 | 0.003096    | 0.042719  |
| 57 | denovo152701 | p__Firmicutes     | 0.0003524 | 6.4969E-6 | 0.0003459 | -0.000346 | 0.041200    | 0.0442724 |
| 58 | denovo156643 | p__Firmicutes     | 4.8165E-7 | 0.0000125 | -0.000012 | 0.000012  | 0.018576    | 0.042719  |
| 59 | denovo161243 | p__Proteobacteria | 9.4246E-6 | 0.0000251 | -0.000016 | 0.0000157 | 0.033958    | 0.042719  |
| 60 | denovo163243 | p__Actinobacteria | 0.0005183 | 0.0010593 | -0.000541 | 0.0005411 | 0.043257    | 0.0445019 |

The 2-sided p-value is presented.

|  |  |             |
|--|--|-------------|
|  |  | Page 3 of 5 |
| Table S6   |  |             |
| Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the proximal airway (B1). |  |             |
|  |  |             |

| SI No. | Operational Taxonomic Unit | Phylum            | Proximal Airway | Control   | B1-C1     | C1-B1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-----------------|-----------|-----------|-----------|----------|-----------|
| 61     | denovo164958               | p__Bacteroidetes  | 0.0014737       | 0.0043896 | -0.002916 | 0.0029159 | 0.035463 | 0.0429763 |
| 62     | denovo171541               | p__Firmicutes     | 0.0003193       | 0.0021968 | -0.001877 | 0.0018775 | 0.003886 | 0.042719  |
| 63     | denovo175537               | p__Proteobacteria | 0.0000333       | 0.0001819 | -0.000149 | 0.0001486 | 0.033958 | 0.042719  |
| 64     | denovo189411               | p__Proteobacteria | 0.0248953       | 0.001757  | 0.0231383 | -0.023138 | 0.028806 | 0.042719  |
| 65     | denovo190020               | p__Proteobacteria | 0.0000671       | 2.2004E-6 | 0.0000649 | -0.000065 | 0.032508 | 0.042719  |
| 66     | denovo190604               | p__Proteobacteria | 1.0067E-6       | 0.000017  | -0.000016 | 0.0000159 | 0.026316 | 0.042719  |
| 67     | denovo204640               | p__Proteobacteria | 0.000073        | 0.0000157 | 0.0000573 | -0.000057 | 0.041796 | 0.0442724 |
| 68     | denovo215086               | p__Proteobacteria | 0.0000911       | 7.4272E-6 | 0.0000836 | -0.000084 | 0.030483 | 0.042719  |
| 69     | denovo220996               | p__Proteobacteria | 0               | 7.0596E-6 | -7.06E-6  | 7.0596E-6 | 0.010836 | 0.042719  |
| 70     | denovo221706               | p__Proteobacteria | 5.1119E-6       | 0.0000337 | -0.000029 | 0.0000286 | 0.016974 | 0.042719  |
| 71     | denovo224815               | p__Proteobacteria | 2.1023E-6       | 0.0000111 | -9.033E-6 | 9.0329E-6 | 0.026911 | 0.042719  |
| 72     | denovo232632               | p__Proteobacteria | 0.0000344       | 0.0001386 | -0.000104 | 0.0001042 | 0.010684 | 0.042719  |
| 73     | denovo236654               | p__Firmicutes     | 0.0002205       | 0.0000103 | 0.0002102 | -0.00021  | 0.021553 | 0.042719  |
| 74     | denovo237676               | p__Proteobacteria | 0.0000155       | 9.4201E-7 | 0.0000145 | -0.000015 | 0.005477 | 0.042719  |
| 75     | denovo238549               | p__Bacteroidetes  | 0.0016301       | 0.0068392 | -0.005209 | 0.0052091 | 0.003886 | 0.042719  |
| 76     | denovo242647               | p__Proteobacteria | 7.5424E-6       | 0         | 7.5424E-6 | -7.542E-6 | 0.032508 | 0.042719  |
| 77     | denovo243882               | p__Bacteroidetes  | 0.0024761       | 0.0062538 | -0.003778 | 0.0037778 | 0.018543 | 0.042719  |
| 78     | denovo247090               | p__Proteobacteria | 0.0000112       | 3.8247E-7 | 0.0000108 | -0.000011 | 0.032508 | 0.042719  |
| 79     | denovo247152               | p__Actinobacteria | 1.6492E-6       | 0.0000182 | -0.000017 | 0.0000165 | 0.026316 | 0.042719  |
| 80     | denovo247189               | p__Proteobacteria | 4.8165E-7       | 6.7733E-6 | -6.292E-6 | 6.2917E-6 | 0.005477 | 0.042719  |
| 81     | denovo247816               | p__Bacteroidetes  | 3.2386E-6       | 0.0000195 | -0.000016 | 0.0000162 | 0.034056 | 0.042719  |
| 82     | denovo251917               | p__Proteobacteria | 3.5763E-6       | 0.0000122 | -8.665E-6 | 8.6653E-6 | 0.017385 | 0.042719  |
| 83     | denovo255830               | p__Proteobacteria | 0.0000283       | 0         | 0.0000283 | -0.000028 | 0.032508 | 0.042719  |
| 84     | denovo258946               | p__Bacteroidetes  | 0.0000371       | 7.4416E-6 | 0.0000296 | -0.00003  | 0.032919 | 0.042719  |
| 85     | denovo259523               | p__Proteobacteria | 5.678E-6        | 0.0000191 | -0.000013 | 0.0000135 | 0.037606 | 0.0442724 |
| 86     | denovo271880               | p__Firmicutes     | 0.0000694       |           |           |           |          |           |

|    |              |                   |           |           |           |           |          |           |
|----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|    |              |                   |           | 0.0002762 | -0.000207 | 0.0002068 | 0.042986 | 0.0445019 |
| 87 | denovo272485 | p__Proteobacteria | 0.0000477 | 5.7087E-6 | 0.000042  | -0.000042 | 0.041200 | 0.0442724 |
| 88 | denovo275410 | p__Proteobacteria | 0.0000103 | 0         | 0.0000103 | -0.00001  | 0.032508 | 0.042719  |
| 89 | denovo275714 | p__Proteobacteria | 0.0000153 | 0         | 0.0000153 | -0.000015 | 0.010836 | 0.042719  |
| 90 | denovo281324 | p__Proteobacteria | 0.0000109 | 0         | 0.0000109 | -0.000011 | 0.010836 | 0.042719  |

The 2-sided p-value is presented.

Table S6

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the proximal airway (B1).

| SI No. | Operational Taxonomic Unit | Phylum            | Proximal Airway | Control   | B1-C1     | C1-B1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-----------------|-----------|-----------|-----------|----------|-----------|
| 91     | denovo282453               | p__Firmicutes     | 8.9515E-6       | 0.0000386 | -0.00003  | 0.0000297 | 0.026911 | 0.042719  |
| 92     | denovo285270               | p__Proteobacteria | 7.5535E-6       | 3.9927E-7 | 7.1542E-6 | -7.154E-6 | 0.032508 | 0.042719  |
| 93     | denovo285627               | p__Proteobacteria | 0.0001006       | 0         | 0.0001006 | -0.000101 | 0.032508 | 0.042719  |
| 94     | denovo297009               | p__Bacteroidetes  | 0.0002504       | 0.0000535 | 0.0001968 | -0.000197 | 0.003302 | 0.042719  |
| 95     | denovo303583               | p__Firmicutes     | 0               | 0.0000177 | -0.000018 | 0.0000177 | 0.032508 | 0.042719  |
| 96     | denovo304659               | p__Firmicutes     | 0.0000191       | 0.0001116 | -0.000093 | 0.0000925 | 0.034056 | 0.042719  |
| 97     | denovo305695               | p__Proteobacteria | 0.0129992       | 0.0082294 | 0.0047698 | -0.00477  | 0.035463 | 0.0429763 |
| 98     | denovo309053               | p__Proteobacteria | 0.0000146       | 1.5754E-6 | 0.0000131 | -0.000013 | 0.034056 | 0.042719  |
| 99     | denovo311889               | p__Proteobacteria | 4.8165E-7       | 7.0134E-6 | -6.532E-6 | 6.5317E-6 | 0.026316 | 0.042719  |
| 100    | denovo315669               | p__Proteobacteria | 2.9575E-6       | 0.0000157 | -0.000013 | 0.0000128 | 0.040876 | 0.0442724 |
| 101    | denovo319979               | p__Proteobacteria | 0.0000138       | 1.5819E-6 | 0.0000122 | -0.000012 | 0.030483 | 0.042719  |
| 102    | denovo320295               | p__Proteobacteria | 2.0995E-6       | 0.0000132 | -0.000011 | 0.0000111 | 0.041200 | 0.0442724 |
| 103    | denovo323491               | p__Bacteroidetes  | 1.3094E-6       | 0.0000215 | -0.00002  | 0.0000202 | 0.034056 | 0.042719  |
| 104    | denovo325348               | p__Bacteroidetes  | 0.0005873       | 0.001918  | -0.001331 | 0.0013307 | 0.044459 | 0.0450893 |

|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 105 | denovo327542 | p__Firmicutes     | 0.0002417 | 0.0012096 | -0.000968 | 0.0009679 | 0.019723 | 0.042719  |
| 106 | denovo329246 | p__Proteobacteria | 0.0001992 | 0.0000152 | 0.000184  | -0.000184 | 0.012622 | 0.042719  |
| 107 | denovo330106 | p__Proteobacteria | 5.0334E-7 | 0.0000181 | -0.000018 | 0.0000176 | 0.018576 | 0.042719  |
| 108 | denovo330671 | p__Proteobacteria | 0.0001594 | 0.000029  | 0.0001305 | -0.00013  | 0.038180 | 0.0442724 |
| 109 | denovo334729 | p__Proteobacteria | 1.3595E-6 | 0.0000123 | -0.000011 | 0.000011  | 0.041200 | 0.0442724 |
| 110 | denovo336715 | p__Bacteroidetes  | 0         | 8.3105E-6 | -8.31E-6  | 8.3105E-6 | 0.032508 | 0.042719  |
| 111 | denovo340210 | p__Firmicutes     | 0.0005828 | 0.0000737 | 0.0005091 | -0.000509 | 0.009981 | 0.042719  |
| 112 | denovo346688 | p__Proteobacteria | 9.5447E-6 | 2.3882E-6 | 7.1566E-6 | -7.157E-6 | 0.041200 | 0.0442724 |
| 113 | denovo350230 | p__Proteobacteria | 0.0000124 | 1.9094E-6 | 0.0000104 | -0.00001  | 0.012622 | 0.042719  |
| 114 | denovo351400 | p__Firmicutes     | 0         | 0.0000324 | -0.000032 | 0.0000324 | 0.032508 | 0.042719  |
| 115 | denovo351415 | p__Firmicutes     | 0.0018201 | 0.0086435 | -0.006823 | 0.0068234 | 0.002089 | 0.042719  |
| 116 | denovo352782 | p__Actinobacteria | 0.0000794 | 0.0001489 | -0.00007  | 0.0000695 | 0.008324 | 0.042719  |
| 117 | denovo352934 | p__Actinobacteria | 0.0000704 | 0         | 0.0000704 | -0.00007  | 0.032508 | 0.042719  |
| 118 | denovo352963 | p__Proteobacteria | 0         | 3.4875E-6 | -3.488E-6 | 3.4875E-6 | 0.032508 | 0.042719  |
| 119 | denovo356788 | p__Firmicutes     | 0.0026353 | 0.0076016 | -0.004966 | 0.0049663 | 0.035463 | 0.0429763 |
| 120 | denovo358736 | p__Proteobacteria | 0.0000126 | 3.1509E-6 | 9.417E-6  | -9.417E-6 | 0.041796 | 0.0442724 |

The 2-sided p-value is presented.

Table S6

Differences between microbiome signatures present in the Bronchoscope controls(C1), versus those present in the proximal airway (B1).

| SI No. | Operational Taxonomic Unit | Phylum            | Proximal Airway | Control   | B1-C1     | C1-B1     | P Value  | FDR      |
|--------|----------------------------|-------------------|-----------------|-----------|-----------|-----------|----------|----------|
| 121    | denovo362719               | p__Proteobacteria | 0.0000112       | 0         | 0.0000112 | -0.000011 | 0.032508 | 0.042719 |
| 122    | denovo363285               | p__Proteobacteria | 0               | 7.5834E-6 | -7.583E-6 | 7.5834E-6 | 0.032508 | 0.042719 |
| 123    | denovo367790               | p__Proteobacteria | 0.0007298       | 0.0001961 | 0.0005337 | -0.000534 | 0.006841 | 0.042719 |
| 124    | denovo368531               |                   | 0.0000803       |           |           |           |          | 0.042719 |

|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|     |              | p__Proteobacteria |           | 0.0000265 | 0.0000537 | -0.000054 | 0.028622 |           |
| 125 | denovo376701 | p__Proteobacteria | 8.5297E-6 | 3.9927E-7 | 8.1304E-6 | -8.13E-6  | 0.032508 | 0.042719  |
| 126 | denovo376909 | p__Firmicutes     | 0         | 7.9967E-6 | -7.997E-6 | 7.9967E-6 | 0.032508 | 0.042719  |
| 127 | denovo381094 | p__Firmicutes     | 9.6329E-7 | 0.0000477 | -0.000047 | 0.0000468 | 0.032508 | 0.042719  |
| 128 | denovo384163 | p__Firmicutes     | 0.0033849 | 0.0132221 | -0.009837 | 0.0098372 | 0.006841 | 0.042719  |
| 129 | denovo388946 | p__Actinobacteria | 0.001314  | 0.0024375 | -0.001123 | 0.0011235 | 0.035463 | 0.0429763 |
| 130 | denovo389119 | p__Cyanobacteria  | 0.000321  | 0.0012633 | -0.000942 | 0.0009422 | 0.014690 | 0.042719  |
| 131 | denovo396349 | p__Actinobacteria | 0.0001095 | 0.000026  | 0.0000835 | -0.000083 | 0.040876 | 0.0442724 |
| 132 | denovo400697 | p__Firmicutes     | 0.0002843 | 0.0009541 | -0.00067  | 0.0006698 | 0.028806 | 0.042719  |
| 133 | denovo401744 | p__Proteobacteria | 0.0000146 | 1.534E-6  | 0.0000131 | -0.000013 | 0.010241 | 0.042719  |
| 134 | denovo402529 | p__Actinobacteria | 1.6492E-6 | 7.8349E-6 | -6.186E-6 | 6.1856E-6 | 0.041796 | 0.0442724 |
| 135 | denovo404289 | p__Proteobacteria | 8.5613E-7 | 0.0000138 | -0.000013 | 0.0000129 | 0.005477 | 0.042719  |
| 136 | denovo406546 | p__Firmicutes     | 0         | 0.0000199 | -0.00002  | 0.0000199 | 0.032508 | 0.042719  |
| 137 | denovo406587 | p__Bacteroidetes  | 2.4082E-6 | 0.0000569 | -0.000054 | 0.0000545 | 0.032508 | 0.042719  |
| 138 | denovo407444 | p__Proteobacteria | 1.1145E-6 | 0.0000137 | -0.000013 | 0.0000126 | 0.041796 | 0.0442724 |
| 139 | denovo410205 | p__Proteobacteria | 0.0000638 | 7.6495E-7 | 0.000063  | -0.000063 | 0.032508 | 0.042719  |
| 140 | denovo413706 | p__Proteobacteria | 0         | 8.6217E-6 | -8.622E-6 | 8.6217E-6 | 0.032508 | 0.042719  |
| 141 | denovo413976 | p__Proteobacteria | 0.0000611 | 2.1433E-6 | 0.0000589 | -0.000059 | 0.032508 | 0.042719  |
| 142 | denovo414287 | p__Firmicutes     | 0.0000689 | 0.0002525 | -0.000184 | 0.0001836 | 0.049536 | 0.0495356 |
| 143 | denovo414490 | p__Firmicutes     | 0.0009478 | 0.0024252 | -0.001477 | 0.0014773 | 0.044459 | 0.0450893 |
|     |              |                   |           |           |           |           |          |           |

The 2-sided p-value is presented.

The above table details the significant operational taxonomic unit (OTU) differences between the proximal airway and control samples (determined by Wilcoxon signed rank test). Difference in relative abundance of various OTU's in the proximal airway and control samples have been shown under B1-C1 and C1-B1 column. Multiple testing correction has been performed by calculating false discovery rate (FDR) for each test performed. Details provided under FDR column.

Table S7

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the distal airway (B6).

| SI No. | Operational Taxonomic Unit | Phylum            | Distal Airway | Control   | B6-C1     | C1-B6     | P Value  | FDR       |
|--------|----------------------------|-------------------|---------------|-----------|-----------|-----------|----------|-----------|
| 1      | denovo1178                 | p__Proteobacteria | 0             | 0.0000111 | -0.000011 | 0.0000111 | 0.032508 | 0.0419757 |
| 2      | denovo2864                 | p__Proteobacteria | 0.0004771     | 0.0001754 | 0.0003017 | -0.000302 | 0.032919 | 0.0419757 |
| 3      | denovo24931                | p__Proteobacteria | 8.6235E-6     | 3.8247E-7 | 8.241E-6  | -8.241E-6 | 0.032508 | 0.0419757 |
| 4      | denovo26425                | p__Proteobacteria | 0.0000224     | 3.316E-6  | 0.0000191 | -0.000019 | 0.025125 | 0.0419757 |
| 5      | denovo100990               | p__Proteobacteria | 2.3851E-6     | 0.0000115 | -9.116E-6 | 9.1159E-6 | 0.041796 | 0.0443034 |
| 6      | denovo101789               | p__Proteobacteria | 0             | 0.0000173 | -0.000017 | 0.0000173 | 0.003096 | 0.0410217 |
| 7      | denovo102928               | p__Proteobacteria | 5.2382E-7     | 0.0000206 | -0.00002  | 0.0000201 | 0.000714 | 0.0378662 |
| 8      | denovo110820               | p__Proteobacteria | 1.2752E-6     | 8.4526E-6 | -7.177E-6 | 7.1774E-6 | 0.034056 | 0.0419757 |
| 9      | denovo112126               | p__Firmicutes     | 0.0001001     | 0.0000188 | 0.0000812 | -0.000081 | 0.015870 | 0.0419757 |
| 10     | denovo131968               | p__Bacteroidetes  | 0.0012807     | 0.0033629 | -0.002082 | 0.0020822 | 0.014690 | 0.0419757 |
| 11     | denovo132757               | p__Proteobacteria | 0.0000138     | 6.7758E-7 | 0.0000131 | -0.000013 | 0.032508 | 0.0419757 |
| 12     | denovo145566               | p__Proteobacteria | 0             | 0.0000151 | -0.000015 | 0.0000151 | 0.003096 | 0.0410217 |
| 13     | denovo149343               | p__Proteobacteria | 9.2311E-6     | 8.7027E-7 | 8.3608E-6 | -8.361E-6 | 0.026316 | 0.0419757 |
| 14     | denovo151558               | p__Proteobacteria | 1.2884E-6     | 0.0000129 | -0.000012 | 0.0000116 | 0.026316 | 0.0419757 |
| 15     | denovo152253               | p__Proteobacteria | 3.6621E-6     | 0.000015  | -0.000011 | 0.0000113 | 0.014571 | 0.0419757 |
| 16     | denovo152701               | p__Firmicutes     | 0.0002987     | 6.4969E-6 | 0.0002922 | -0.000292 | 0.041200 | 0.0443034 |
| 17     | denovo153719               | p__Proteobacteria | 0             | 8.3921E-6 | -8.392E-6 | 8.3921E-6 | 0.010836 | 0.0419757 |
| 18     | denovo159106               | p__Firmicutes     | 0.0000123     | 7.6495E-7 | 0.0000116 | -0.000012 | 0.018576 | 0.0419757 |
| 19     | denovo164958               | p__Bacteroidetes  | 0.0015121     | 0.0043896 | -0.002878 | 0.0028775 | 0.043257 | 0.0449534 |
| 20     | denovo170878               | p__Proteobacteria | 7.6986E-6     | 0.0000284 | -0.000021 | 0.0000207 | 0.049536 | 0.0495356 |
| 21     | denovo175492               | p__Firmicutes     | 8.5723E-6     | 0.0002209 | -0.000212 | 0.0002123 | 0.026316 | 0.0419757 |

|    |              |                   |           |           |           |           |          |           |
|----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 22 | denovo186811 | p__Proteobacteria | 0.0000157 | 8.5348E-7 | 0.0000148 | -0.000015 | 0.025125 | 0.0419757 |
| 23 | denovo187632 | p__Firmicutes     | 2.7233E-6 | 9.3923E-6 | -6.669E-6 | 6.669E-6  | 0.049536 | 0.0495356 |
| 24 | denovo188692 | p__Proteobacteria | 3.3689E-6 | 0.0000177 | -0.000014 | 0.0000144 | 0.034056 | 0.0419757 |
| 25 | denovo220735 | p__Fusobacteria   | 0.0000124 | 0.0000541 | -0.000042 | 0.0000418 | 0.026911 | 0.0419757 |
| 26 | denovo220996 | p__Proteobacteria | 0         | 7.0596E-6 | -7.06E-6  | 7.0596E-6 | 0.010836 | 0.0419757 |
| 27 | denovo221706 | p__Proteobacteria | 6.0746E-6 | 0.0000337 | -0.000028 | 0.0000277 | 0.016974 | 0.0419757 |
| 28 | denovo223724 | p__Firmicutes     | 0.0002681 | 0.0009836 | -0.000715 | 0.0007155 | 0.036946 | 0.0443034 |
| 29 | denovo224627 | p__Proteobacteria | 0.0000341 | 9.2617E-6 | 0.0000248 | -0.000025 | 0.028903 | 0.0419757 |
| 30 | denovo226787 | p__Proteobacteria | 0         | 0.00009   | -0.00009  | 0.00009   | 0.032508 | 0.0419757 |

The 2-sided p-value is presented.

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Table S7  
Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the distal airway (B6).

| SI No. | Operational Taxonomic Unit | Phylum            | Distal Airway | Control   | B6-C1     | C1-B6     | P Value  | FDR       |
|--------|----------------------------|-------------------|---------------|-----------|-----------|-----------|----------|-----------|
| 31     | denovo229406               | p__Firmicutes     | 1.8385E-6     | 0.0000155 | -0.000014 | 0.0000137 | 0.026316 | 0.0419757 |
| 32     | denovo237676               | p__Proteobacteria | 0.0000185     | 9.4201E-7 | 0.0000175 | -0.000018 | 0.003096 | 0.0410217 |
| 33     | denovo246775               | p__Actinobacteria | 0.0003154     | 0.0001298 | 0.0001856 | -0.000186 | 0.041796 | 0.0443034 |
| 34     | denovo247152               | p__Actinobacteria | 1.8385E-6     | 0.0000182 | -0.000016 | 0.0000163 | 0.026316 | 0.0419757 |
| 35     | denovo247189               | p__Proteobacteria | 1.277E-6      | 6.7733E-6 | -5.496E-6 | 5.4963E-6 | 0.015004 | 0.0419757 |
| 36     | denovo247338               | p__Proteobacteria | 0             | 9.8143E-6 | -9.814E-6 | 9.8143E-6 | 0.010836 | 0.0419757 |
| 37     | denovo247816               | p__Bacteroidetes  | 6.3705E-6     | 0.0000195 | -0.000013 | 0.0000131 | 0.041200 | 0.0443034 |
| 38     | denovo254891               | p__Proteobacteria | 7.3237E-6     | 3.9927E-7 | 6.9245E-6 | -6.924E-6 | 0.032508 | 0.0419757 |
| 39     | denovo262368               | p__Firmicutes     | 0.0000177     | 4.7705E-6 | 0.0000129 | -0.000013 | 0.040876 | 0.0443034 |

|    |              |                    |           |           |           |           |          |           |
|----|--------------|--------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 40 | denovo271406 | p__Proteobacteria  | 0.0002826 | 0.0000384 | 0.0002442 | -0.000244 | 0.032919 | 0.0419757 |
| 41 | denovo271880 | p__Firmicutes      | 0.0000494 | 0.0002762 | -0.000227 | 0.0002268 | 0.031555 | 0.0419757 |
| 42 | denovo275714 | p__Proteobacteria  | 0.0000154 | 0         | 0.0000154 | -0.000015 | 0.032508 | 0.0419757 |
| 43 | denovo282232 | p__Firmicutes      | 0.0003478 | 0.0000221 | 0.0003257 | -0.000326 | 0.006257 | 0.0419757 |
| 44 | denovo285627 | p__Proteobacteria  | 0.0000281 | 0         | 0.0000281 | -0.000028 | 0.032508 | 0.0419757 |
| 45 | denovo297009 | p__Bacteroidetes   | 0.0002675 | 0.0000535 | 0.0002139 | -0.000214 | 0.007502 | 0.0419757 |
| 46 | denovo299972 | p__Proteobacteria  | 2.5545E-6 | 0.0000151 | -0.000013 | 0.0000126 | 0.034056 | 0.0419757 |
| 47 | denovo307461 | p__Firmicutes      | 0         | 6.6802E-6 | -6.68E-6  | 6.6802E-6 | 0.032508 | 0.0419757 |
| 48 | denovo311416 | p__Verrucomicrobia | 0.0000238 | 7.3347E-7 | 0.0000231 | -0.000023 | 0.032508 | 0.0419757 |
| 49 | denovo311889 | p__Proteobacteria  | 1.386E-6  | 7.0134E-6 | -5.627E-6 | 5.6273E-6 | 0.041796 | 0.0443034 |
| 50 | denovo312676 | p__Firmicutes      | 0.0000191 | 7.6495E-7 | 0.0000183 | -0.000018 | 0.032508 | 0.0419757 |
| 51 | denovo314718 | p__Cyanobacteria   | 0.0000777 | 0         | 0.0000777 | -0.000078 | 0.032508 | 0.0419757 |
| 52 | denovo317936 | p__Bacteroidetes   | 0.0000796 | 1.0469E-6 | 0.0000786 | -0.000079 | 0.032508 | 0.0419757 |
| 53 | denovo323677 | p__Firmicutes      | 0.0000367 | 3.8247E-7 | 0.0000363 | -0.000036 | 0.010836 | 0.0419757 |
|    |              |                    |           |           |           |           |          |           |

The 2-sided p-value is presented.

The above table details the significant operational taxonomic unit (OTU) differences between the distal airway and control samples (determined by Wilcoxon signed rank test). Difference in relative abundance of various OTU's in the distal airway and control samples have been shown under B6-C1 and C1-B6 column. Multiple testing correction has been performed by calculating false discovery rate (FDR) for each test performed. Details provided under FDR column.



Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 1      | denovo286                  | p__Actinobacteria | 5.373E-6    | 0.0004759      | -0.000471 | 0.0004705 | 0.003096    | 0.0108688 |
| 2      | denovo420                  | p__Bacteroidetes  | 0.0000665   | 0.0010812      | -0.001015 | 0.0010147 | 0.026262    | 0.0344837 |
| 3      | denovo446                  | p__Firmicutes     | 0.0000535   | 2.2218E-6      | 0.0000512 | -0.000051 | 0.010836    | 0.0201715 |
| 4      | denovo693                  | p__Firmicutes     | 0.0000407   | 1.7955E-6      | 0.0000389 | -0.000039 | 0.012622    | 0.0225927 |
| 5      | denovo936                  |                   | 0.0000211   | 0              | 0.0000211 | -0.000021 | 0.032508    | 0.0344837 |
| 6      | denovo1156                 | p__Proteobacteria | 4.6781E-6   | 0.0000184      | -0.000014 | 0.0000137 | 0.049536    | 0.0495356 |
| 7      | denovo1283                 | p__Firmicutes     | 0.0000257   | 7.9854E-7      | 0.0000249 | -0.000025 | 0.032508    | 0.0344837 |
| 8      | denovo1452                 | p__Firmicutes     | 2.4182E-6   | 0.0010465      | -0.001044 | 0.0010441 | 0.004016    | 0.0131338 |
| 9      | denovo1607                 | p__Firmicutes     | 8.3001E-6   | 0.0000533      | -0.000045 | 0.000045  | 0.021975    | 0.0344837 |
| 10     | denovo1656                 | p__Firmicutes     | 0.0000416   | 9.4734E-6      | 0.0000322 | -0.000032 | 0.041200    | 0.0419868 |
| 11     | denovo1741                 | p__Proteobacteria | 3.7226E-6   | 0.0000422      | -0.000038 | 0.0000385 | 0.034056    | 0.0354016 |
| 12     | denovo1745                 | p__Firmicutes     | 0           | 0.000024       | -0.000024 | 0.000024  | 0.032508    | 0.0344837 |
| 13     | denovo1952                 | p__Proteobacteria | 2.672E-6    | 0.0000413      | -0.000039 | 0.0000386 | 0.030483    | 0.0344837 |
| 14     | denovo2248                 | p__Proteobacteria | 0.0001141   | 0.0010672      | -0.000953 | 0.0009531 | 0.018424    | 0.030734  |
| 15     | denovo2313                 | p__Proteobacteria | 2.9146E-6   | 0.0000228      | -0.00002  | 0.0000199 | 0.012622    | 0.0225927 |
| 16     | denovo2470                 | p__Firmicutes     | 0.0000214   | 3.1509E-6      | 0.0000182 | -0.000018 | 0.034056    | 0.0354016 |
| 17     | denovo2765                 | p__Firmicutes     | 0.0000472   | 3.9927E-7      | 0.0000468 | -0.000047 | 0.000714    | 0.0047523 |
| 18     | denovo2802                 | p__Actinobacteria | 0.0000431   | 0              | 0.0000431 | -0.000043 | 0.032508    | 0.0344837 |
| 19     | denovo2904                 | p__Firmicutes     | 0.0000223   | 0.0009404      | -0.000918 | 0.0009181 | 0.021975    | 0.0344837 |
| 20     | denovo3205                 | p__Firmicutes     | 0.0001074   | 5.0485E-6      | 0.0001023 | -0.000102 | 0.000010825 | 0.000517  |
| 21     | denovo3464                 | p__Firmicutes     | 0.0000546   | 1.1109E-6      | 0.0000535 | -0.000054 | 0.000336    | 0.0034411 |

|    |            |                   |           |           |           |           |             |           |
|----|------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 22 | denovo3745 | p__Firmicutes     | 0         | 0.0000335 | -0.000034 | 0.0000335 | 0.032508    | 0.0344837 |
| 23 | denovo3780 | p__Proteobacteria | 0.002538  | 0.0392027 | -0.036665 | 0.0366648 | 0.000010825 | 0.000517  |
| 24 | denovo3883 | p__Proteobacteria | 0         | 0.0000101 | -0.00001  | 0.0000101 | 0.032508    | 0.0344837 |
| 25 | denovo3899 | p__Bacteroidetes  | 8.7685E-6 | 0.0001094 | -0.000101 | 0.0001006 | 0.021553    | 0.0344837 |
| 26 | denovo4401 | p__Firmicutes     | 0.0001102 | 0         | 0.0001102 | -0.00011  | 0.003096    | 0.0108688 |
| 27 | denovo4417 | p__Actinobacteria | 0.0000124 | 0         | 0.0000124 | -0.000012 | 0.032508    | 0.0344837 |
| 28 | denovo4699 | p__Firmicutes     | 0.0000205 | 0         | 0.0000205 | -0.000021 | 0.003096    | 0.0108688 |
| 29 | denovo4756 | p__Firmicutes     | 0.0001652 | 0.0019678 | -0.001803 | 0.0018027 | 0.047403    | 0.0477186 |
| 30 | denovo4819 | p__Firmicutes     | 0.0000166 | 0         | 0.0000166 | -0.000017 | 0.032508    | 0.0344837 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 31     | denovo4822                 | p__Actinobacteria | 0.0000277   | 0.0001743      | -0.000147 | 0.0001467 | 0.016194 | 0.0281809 |
| 32     | denovo5573                 | p__Firmicutes     | 0.0015051   | 0.0049077      | -0.003403 | 0.0034026 | 0.002078 | 0.0101119 |
| 33     | denovo5610                 | p__Firmicutes     | 0           | 0.0004712      | -0.000471 | 0.0004712 | 0.010836 | 0.0201715 |
| 34     | denovo6170                 | p__Firmicutes     | 0.0000334   | 1.534E-6       | 0.0000319 | -0.000032 | 0.010836 | 0.0201715 |
| 35     | denovo6607                 | p__Proteobacteria | 0           | 0.0000134      | -0.000013 | 0.0000134 | 0.032508 | 0.0344837 |
| 36     | denovo7074                 | p__Proteobacteria | 2.5839E-6   | 0.0000239      | -0.000021 | 0.0000213 | 0.012622 | 0.0225927 |
| 37     | denovo7416                 | p__Actinobacteria | 0.0000312   | 1.0631E-6      | 0.0000301 | -0.00003  | 0.025125 | 0.0344837 |
| 38     | denovo7511                 | p__Firmicutes     | 0.0000483   | 0              | 0.0000483 | -0.000048 | 0.000714 | 0.0047523 |
| 39     | denovo7590                 | p__Firmicutes     | 9.2059E-6   |                |           |           |          |           |

|    |             |                   |           |           |           |           |             |           |
|----|-------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
|    |             |                   |           | 0         | 9.2059E-6 | -9.206E-6 | 0.032508    | 0.0344837 |
| 40 | denovo8059  | p__Proteobacteria | 9.9809E-7 | 0.0000267 | -0.000026 | 0.0000257 | 0.032508    | 0.0344837 |
| 41 | denovo8258  | p__Proteobacteria | 0.0000645 | 0.0011973 | -0.001133 | 0.0011328 | 0.000010825 | 0.000517  |
| 42 | denovo8968  | p__Firmicutes     | 0.0000189 | 0         | 0.0000189 | -0.000019 | 0.010836    | 0.0201715 |
| 43 | denovo9216  | p__Actinobacteria | 0.0000236 | 0         | 0.0000236 | -0.000024 | 0.032508    | 0.0344837 |
| 44 | denovo9326  | p__Firmicutes     | 0.0000336 | 0         | 0.0000336 | -0.000034 | 0.010836    | 0.0201715 |
| 45 | denovo9520  | p__Firmicutes     | 0.0000244 | 2.2218E-6 | 0.0000221 | -0.000022 | 0.026316    | 0.0344837 |
| 46 | denovo9597  | p__Firmicutes     | 0.0000447 | 3.8004E-6 | 0.0000409 | -0.000041 | 0.041200    | 0.0419868 |
| 47 | denovo10111 | p__Firmicutes     | 0.000041  | 0         | 0.000041  | -0.000041 | 0.032508    | 0.0344837 |
| 48 | denovo10527 | p__Firmicutes     | 0.0000398 | 4.2551E-6 | 0.0000355 | -0.000036 | 0.033958    | 0.0354016 |
| 49 | denovo11168 | p__Firmicutes     | 0.0000138 | 0         | 0.0000138 | -0.000014 | 0.003096    | 0.0108688 |
| 50 | denovo11679 | p__Firmicutes     | 0.0025414 | 0.0001097 | 0.0024317 | -0.002432 | 0.000010825 | 0.000517  |
| 51 | denovo12036 | p__Firmicutes     | 0.0000313 | 2.8677E-6 | 0.0000284 | -0.000028 | 0.003691    | 0.0124301 |
| 52 | denovo12825 | p__Actinobacteria | 0.0000681 | 0.00074   | -0.000672 | 0.000672  | 0.000021650 | 0.0006237 |
| 53 | denovo12846 | p__Firmicutes     | 0.0000174 | 0         | 0.0000174 | -0.000017 | 0.032508    | 0.0344837 |
| 54 | denovo13312 | p__Proteobacteria | 1.84E-6   | 0.000046  | -0.000044 | 0.0000442 | 0.032508    | 0.0344837 |
| 55 | denovo13759 | p__Firmicutes     | 0.0000356 | 1.8262E-6 | 0.0000338 | -0.000034 | 0.006668    | 0.0190297 |
| 56 | denovo13900 | p__Actinobacteria | 0.034171  | 0.0013455 | 0.0328255 | -0.032826 | 0.000075776 | 0.0014477 |
| 57 | denovo13998 | p__Proteobacteria | 0.0001432 | 0.0017339 | -0.001591 | 0.0015907 | 0.034132    | 0.0354195 |
| 58 | denovo14203 | p__Firmicutes     | 0.0001637 | 2.9745E-6 | 0.0001607 | -0.000161 | 0.000021650 | 0.0006237 |
| 59 | denovo14354 | p__Firmicutes     | 0.0000685 | 5.2761E-6 | 0.0000632 | -0.000063 | 0.003572    | 0.0121645 |
| 60 | denovo14372 | p__Firmicutes     | 0.0003319 | 0.0016829 | -0.001351 | 0.001351  | 0.018424    | 0.030734  |
|    |             |                   |           |           |           |           |             |           |

The 2-sided p-value is presented.

## Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 61     | denovo14535                | p__Actinobacteria | 0.0000466   | 2.1433E-6      | 0.0000444 | -0.000044 | 0.032508 | 0.0344837 |
| 62     | denovo15093                | p__Firmicutes     | 0.000294    | 8.166E-6       | 0.0002858 | -0.000286 | 0.000617 | 0.0047523 |
| 63     | denovo15237                | p__Firmicutes     | 0.0000583   | 4.71E-7        | 0.0000578 | -0.000058 | 0.000119 | 0.0018162 |
| 64     | denovo15422                | p__Firmicutes     | 0.0000502   | 0              | 0.0000502 | -0.00005  | 0.032508 | 0.0344837 |
| 65     | denovo15426                | p__Actinobacteria | 0.0000195   | 0              | 0.0000195 | -0.000019 | 0.032508 | 0.0344837 |
| 66     | denovo15643                | p__Bacteroidetes  | 0.0001432   | 0.0000132      | 0.00013   | -0.00013  | 0.000704 | 0.0047523 |
| 67     | denovo15670                | p__Firmicutes     | 0.0000147   | 0              | 0.0000147 | -0.000015 | 0.032508 | 0.0344837 |
| 68     | denovo15922                | p__Firmicutes     | 0.0000242   | 6.7758E-7      | 0.0000235 | -0.000024 | 0.010836 | 0.0201715 |
| 69     | denovo16211                | p__Firmicutes     | 0.000031    | 0              | 0.000031  | -0.000031 | 0.032508 | 0.0344837 |
| 70     | denovo16380                | p__Firmicutes     | 0.0000103   | 0              | 0.0000103 | -0.00001  | 0.032508 | 0.0344837 |
| 71     | denovo16449                | p__Bacteroidetes  | 0.0002406   | 0.0028023      | -0.002562 | 0.0025617 | 0.004980 | 0.0156907 |
| 72     | denovo16721                | p__Actinobacteria | 0.0000175   | 0              | 0.0000175 | -0.000017 | 0.032508 | 0.0344837 |
| 73     | denovo16834                | p__Actinobacteria | 0.0000179   | 7.3347E-7      | 0.0000172 | -0.000017 | 0.032508 | 0.0344837 |
| 74     | denovo16927                | p__Firmicutes     | 0.0006417   | 0.0020367      | -0.001395 | 0.001395  | 0.004871 | 0.015484  |
| 75     | denovo17258                | p__Firmicutes     | 0.000021    | 0              | 0.000021  | -0.000021 | 0.010836 | 0.0201715 |
| 76     | denovo17653                | p__Proteobacteria | 5.1678E-6   | 0.0000226      | -0.000017 | 0.0000175 | 0.006668 | 0.0190297 |
| 77     | denovo17793                | p__Firmicutes     | 0.0000272   | 1.2527E-6      | 0.0000259 | -0.000026 | 0.030483 | 0.0344837 |
| 78     | denovo17801                | p__Firmicutes     | 0.0000142   | 0              | 0.0000142 | -0.000014 | 0.010836 | 0.0201715 |
| 79     | denovo17851                | p__Firmicutes     | 0.0000357   | 0              | 0.0000357 | -0.000036 | 0.003096 | 0.0108688 |
| 80     | denovo18389                | p__Firmicutes     | 0.0000111   | 0              | 0.0000111 | -0.000011 | 0.032508 | 0.0344837 |
| 81     | denovo18546                | p__Firmicutes     | 0.0000114   | 0              | 0.0000114 | -0.000011 | 0.032508 | 0.0344837 |
| 82     | denovo18765                | p__Firmicutes     | 0.000025    | 0              | 0.000025  | -0.000025 | 0.032508 | 0.0344837 |
| 83     | denovo19451                | p__Firmicutes     | 0.0002115   |                |           |           |          | 0.003096  |

|    |             |                   |           |           |           |           |             |           |
|----|-------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
|    |             |                   |           | 1.531E-6  | 0.00021   | -0.00021  | 0.000281    |           |
| 84 | denovo19455 | p__Firmicutes     | 0.0001374 | 6.3982E-6 | 0.000131  | -0.000131 | 0.000010825 | 0.000517  |
| 85 | denovo19613 | p__Proteobacteria | 0         | 0.0000111 | -0.000011 | 0.0000111 | 0.032508    | 0.0344837 |
| 86 | denovo19924 | p__Firmicutes     | 0.0000594 | 3.1361E-6 | 0.0000562 | -0.000056 | 0.009050    | 0.0201715 |
| 87 | denovo20122 | p__Firmicutes     | 0.000035  | 1.1109E-6 | 0.0000339 | -0.000034 | 0.010241    | 0.0201715 |
| 88 | denovo20429 | p__Bacteroidetes  | 7.089E-7  | 0.0002133 | -0.000213 | 0.0002126 | 0.010836    | 0.0201715 |
| 89 | denovo20467 | p__Actinobacteria | 0.0005502 | 0.0035916 | -0.003041 | 0.0030413 | 0.005196    | 0.0160388 |
| 90 | denovo20557 | p__Firmicutes     | 0.0000214 | 4.71E-7   | 0.000021  | -0.000021 | 0.000714    | 0.0047523 |

The 2-sided p-value is presented.

|   |
|---|
| Page 4 of 61  |
| Table S8  |
| Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample. |

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 91     | denovo20642                | p__Firmicutes     | 7.9962E-6   | 0              | 7.9962E-6 | -7.996E-6 | 0.032508 | 0.0344837 |
| 92     | denovo20700                | p__Proteobacteria | 0           | 0.0000179      | -0.000018 | 0.0000179 | 0.003096 | 0.0108688 |
| 93     | denovo20814                | p__Actinobacteria | 0.0000619   | 0              | 0.0000619 | -0.000062 | 0.032508 | 0.0344837 |
| 94     | denovo21357                | p__Firmicutes     | 0.0000164   | 0              | 0.0000164 | -0.000016 | 0.032508 | 0.0344837 |
| 95     | denovo22111                | p__Firmicutes     | 0.0001101   | 0.0003078      | -0.000198 | 0.0001977 | 0.004774 | 0.0152814 |
| 96     | denovo22165                | p__Proteobacteria | 1.8416E-6   | 0.0000288      | -0.000027 | 0.000027  | 0.025125 | 0.0344837 |
| 97     | denovo22228                | p__Firmicutes     | 0.0000183   | 1.3476E-6      | 0.000017  | -0.000017 | 0.032508 | 0.0344837 |
| 98     | denovo22849                | p__Actinobacteria | 0.000022    | 0              | 0.000022  | -0.000022 | 0.032508 | 0.0344837 |
| 99     | denovo22932                | p__Bacteroidetes  | 0.0001461   | 0.001886       | -0.00174  | 0.0017399 | 0.003702 | 0.0124434 |
| 100    | denovo23237                |                   | 0.0000303   |                |           |           |          |           |

|     |             |                   |           |           |           |           |          |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|     |             | p__Actinobacteria |           | 6.7758E-7 | 0.0000297 | -0.00003  | 0.003096 | 0.0108688 |
| 101 | denovo23362 | p__Bacteroidetes  | 0.0003232 | 0.0034132 | -0.00309  | 0.00309   | 0.001050 | 0.0062281 |
| 102 | denovo23874 | p__Firmicutes     | 0.0001207 | 1.7692E-6 | 0.000119  | -0.000119 | 0.001256 | 0.007078  |
| 103 | denovo23900 | p__Firmicutes     | 0.0000126 | 0         | 0.0000126 | -0.000013 | 0.010836 | 0.0201715 |
| 104 | denovo24056 | p__Proteobacteria | 9.9809E-7 | 0.0000142 | -0.000013 | 0.0000132 | 0.032508 | 0.0344837 |
| 105 | denovo24077 | p__Proteobacteria | 0.0000792 | 0.0014765 | -0.001397 | 0.0013973 | 0.000455 | 0.0043769 |
| 106 | denovo24543 | p__Firmicutes     | 6.4624E-6 | 0.0009203 | -0.000914 | 0.0009139 | 0.002457 | 0.0108688 |
| 107 | denovo24612 | p__Firmicutes     | 0.0000253 | 1.1109E-6 | 0.0000242 | -0.000024 | 0.007859 | 0.0201715 |
| 108 | denovo24827 | p__Actinobacteria | 0.000591  | 0.0000191 | 0.000572  | -0.000572 | 0.000336 | 0.0034411 |
| 109 | denovo25111 | p__Proteobacteria | 6.6869E-6 | 0.0000541 | -0.000047 | 0.0000474 | 0.011258 | 0.020808  |
| 110 | denovo25152 | p__Proteobacteria | 0.0008912 | 0.0057875 | -0.004896 | 0.0048963 | 0.018543 | 0.030734  |
| 111 | denovo25610 | p__Firmicutes     | 9.2629E-6 | 0         | 9.2629E-6 | -9.263E-6 | 0.032508 | 0.0344837 |
| 112 | denovo25933 | p__Firmicutes     | 0.0000165 | 7.3347E-7 | 0.0000158 | -0.000016 | 0.005477 | 0.0165144 |
| 113 | denovo26377 | p__Firmicutes     | 0.0000126 | 0         | 0.0000126 | -0.000013 | 0.010836 | 0.0201715 |
| 114 | denovo26501 | p__Proteobacteria | 0         | 7.9533E-6 | -7.953E-6 | 7.9533E-6 | 0.032508 | 0.0344837 |
| 115 | denovo26743 | p__Firmicutes     | 0.0000598 | 0         | 0.0000598 | -0.00006  | 0.032508 | 0.0344837 |
| 116 | denovo27063 | p__Proteobacteria | 2.9366E-6 | 0.0000295 | -0.000027 | 0.0000266 | 0.012622 | 0.0225927 |
| 117 | denovo27068 | p__Firmicutes     | 0.0000427 | 0         | 0.0000427 | -0.000043 | 0.032508 | 0.0344837 |
| 118 | denovo27361 | p__Bacteroidetes  | 0.0004034 | 0.0000268 | 0.0003766 | -0.000377 | 0.000736 | 0.0048059 |
| 119 | denovo27769 | p__Firmicutes     | 0.0000523 | 2.6489E-6 | 0.0000496 | -0.00005  | 0.000173 | 0.0022138 |
| 120 | denovo28002 | p__Actinobacteria | 0.0000303 | 3.8563E-6 | 0.0000264 | -0.000026 | 0.012622 | 0.0225927 |

The 2-sided p-value is presented.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 121    | denovo28608                | p__Proteobacteria | 0.0000591   | 0.000245       | -0.000186 | 0.0001858 | 0.014571    | 0.0257253 |
| 122    | denovo28671                | p__Actinobacteria | 0.0000669   | 3.1509E-6      | 0.0000637 | -0.000064 | 0.032508    | 0.0344837 |
| 123    | denovo28762                | p__Firmicutes     | 0.0000184   | 0              | 0.0000184 | -0.000018 | 0.003096    | 0.0108688 |
| 124    | denovo28790                | p__Firmicutes     | 0.0000307   | 0              | 0.0000307 | -0.000031 | 0.032508    | 0.0344837 |
| 125    | denovo28972                | p__[Thermi]       | 0.0002787   | 0.0207542      | -0.020476 | 0.0204755 | 0.000010825 | 0.000517  |
| 126    | denovo29169                | p__Firmicutes     | 0.0000458   | 0              | 0.0000458 | -0.000046 | 0.000119    | 0.0018162 |
| 127    | denovo29668                | p__Bacteroidetes  | 1.4178E-6   | 0.0001096      | -0.000108 | 0.0001082 | 0.032508    | 0.0344837 |
| 128    | denovo29772                | p__Actinobacteria | 7.5594E-6   | 0.0002605      | -0.000253 | 0.000253  | 0.020416    | 0.0335038 |
| 129    | denovo29799                | p__Firmicutes     | 0.0000307   | 9.4201E-7      | 0.0000298 | -0.00003  | 0.003096    | 0.0108688 |
| 130    | denovo30082                | p__Firmicutes     | 1.84E-6     | 0.0000201      | -0.000018 | 0.0000183 | 0.010241    | 0.0201715 |
| 131    | denovo30146                | p__Firmicutes     | 0.0002138   | 0.0055387      | -0.005325 | 0.0053249 | 0.046754    | 0.0472482 |
| 132    | denovo30245                | p__Firmicutes     | 0.000043    | 0              | 0.000043  | -0.000043 | 0.032508    | 0.0344837 |
| 133    | denovo30373                | p__Bacteroidetes  | 0.0000247   | 0.0002822      | -0.000257 | 0.0002574 | 0.004438    | 0.0144623 |
| 134    | denovo30575                | p__Firmicutes     | 2.5839E-6   | 0.0003678      | -0.000365 | 0.0003653 | 0.003096    | 0.0108688 |
| 135    | denovo31615                | p__Actinobacteria | 0.0000147   | 3.8247E-7      | 0.0000143 | -0.000014 | 0.032508    | 0.0344837 |
| 136    | denovo32139                | p__Proteobacteria | 0.0019309   | 0.014213       | -0.012282 | 0.0122821 | 0.000487    | 0.0043769 |
| 137    | denovo32541                | p__Proteobacteria | 0.0001602   | 0.0009114      | -0.000751 | 0.0007512 | 0.034132    | 0.0354195 |
| 138    | denovo32879                | p__Firmicutes     | 0.0000761   | 0.0003337      | -0.000258 | 0.0002576 | 0.047403    | 0.0477186 |
| 139    | denovo33050                | p__Firmicutes     | 1.9182E-6   | 0.000694       | -0.000692 | 0.0006921 | 0.025125    | 0.0344837 |
| 140    | denovo33230                | p__Firmicutes     | 0.0000731   | 0.0009234      | -0.00085  | 0.0008503 | 0.000704    | 0.0047523 |
| 141    | denovo33352                | p__Firmicutes     | 0.0000249   | 0              | 0.0000249 | -0.000025 | 0.032508    | 0.0344837 |
| 142    | denovo33457                | p__Firmicutes     | 0.0000227   | 0              | 0.0000227 | -0.000023 | 0.003096    | 0.0108688 |
| 143    | denovo33552                | p__Firmicutes     | 0.0000665   | 0.0024993      | -0.002433 | 0.0024328 | 0.009688    | 0.0201715 |

|     |             |                   |           |           |           |           |          |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 144 | denovo33695 | p__Proteobacteria | 0         | 4.9038E-6 | -4.904E-6 | 4.9038E-6 | 0.032508 | 0.0344837 |
| 145 | denovo34296 | p__Proteobacteria | 0.0001925 | 0.0032849 | -0.003092 | 0.0030923 | 0.003670 | 0.0124263 |
| 146 | denovo34933 | p__Firmicutes     | 0.0000309 | 9.4201E-7 | 0.00003   | -0.00003  | 0.003096 | 0.0108688 |
| 147 | denovo35117 | p__[Thermi]       | 4.9623E-6 | 0.0001617 | -0.000157 | 0.0001567 | 0.032508 | 0.0344837 |
| 148 | denovo35306 | p__Firmicutes     | 0.0000264 | 0         | 0.0000264 | -0.000026 | 0.010836 | 0.0201715 |
| 149 | denovo35450 | p__Firmicutes     | 0.00001   | 0         | 0.00001   | -0.00001  | 0.032508 | 0.0344837 |
| 150 | denovo36010 | p__Firmicutes     | 0.0000147 | 0         | 0.0000147 | -0.000015 | 0.010836 | 0.0201715 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 151    | denovo36331                | p__Proteobacteria | 0           | 7.248E-6       | -7.248E-6 | 7.248E-6  | 0.032508    | 0.0344837 |
| 152    | denovo36425                | p__Firmicutes     | 0.0000464   | 4.0916E-6      | 0.0000423 | -0.000042 | 0.000043300 | 0.0009948 |
| 153    | denovo36720                | p__Firmicutes     | 0.0001398   | 0.0017974      | -0.001658 | 0.0016576 | 0.002436    | 0.0108688 |
| 154    | denovo36722                | p__Firmicutes     | 0.0002341   | 0.0027918      | -0.002558 | 0.0025577 | 0.003832    | 0.0128089 |
| 155    | denovo36762                | p__Firmicutes     | 0.0000253   | 0              | 0.0000253 | -0.000025 | 0.003096    | 0.0108688 |
| 156    | denovo37203                | p__Bacteroidetes  | 0.0000162   | 0.0002652      | -0.000249 | 0.0002491 | 0.041200    | 0.0419868 |
| 157    | denovo37604                | p__Firmicutes     | 0.0000546   | 0.0006022      | -0.000548 | 0.0005476 | 0.040876    | 0.0419868 |
| 158    | denovo37772                | p__Firmicutes     | 0.0000102   | 0              | 0.0000102 | -0.00001  | 0.032508    | 0.0344837 |
| 159    | denovo38655                | p__Proteobacteria | 0.0004516   | 0.0027364      | -0.002285 | 0.0022848 | 0.004871    | 0.015484  |
| 160    | denovo38677                | p__Firmicutes     | 0.0000143   | 0              | 0.0000143 | -0.000014 | 0.010836    | 0.0201715 |
| 161    | denovo38993                | p__Actinobacteria | 0.0001216   | 4.176E-6       | 0.0001174 | -0.000117 | 0.001851    | 0.0093326 |



|     |             |                   |           |           |           |           |          |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 162 | denovo39108 | p__Firmicutes     | 0         | 0.0001265 | -0.000126 | 0.0001265 | 0.032508 | 0.0344837 |
| 163 | denovo39357 | p__Firmicutes     | 0.0000121 | 0         | 0.0000121 | -0.000012 | 0.032508 | 0.0344837 |
| 164 | denovo39686 | p__Proteobacteria | 0         | 0.0000182 | -0.000018 | 0.0000182 | 0.032508 | 0.0344837 |
| 165 | denovo39700 |                   | 0.0000563 | 0         | 0.0000563 | -0.000056 | 0.010836 | 0.0201715 |
| 166 | denovo40341 | p__Bacteroidetes  | 0.0004224 | 0.0023008 | -0.001878 | 0.0018784 | 0.029985 | 0.0344837 |
| 167 | denovo40678 | p__Firmicutes     | 0.0100653 | 0.0014077 | 0.0086576 | -0.008658 | 0.011496 | 0.0211619 |
| 168 | denovo40725 | p__Firmicutes     | 0.0000198 | 0         | 0.0000198 | -0.00002  | 0.010836 | 0.0201715 |
| 169 | denovo40753 | p__Proteobacteria | 0         | 0.0000389 | -0.000039 | 0.0000389 | 0.032508 | 0.0344837 |
| 170 | denovo40873 | p__Firmicutes     | 0.000015  | 0.000113  | -0.000098 | 0.0000979 | 0.002533 | 0.0108688 |
| 171 | denovo41135 | p__Firmicutes     | 0.0001402 | 0         | 0.0001402 | -0.00014  | 0.003096 | 0.0108688 |
| 172 | denovo41866 | p__Firmicutes     | 0.000032  | 0         | 0.000032  | -0.000032 | 0.010836 | 0.0201715 |
| 173 | denovo41906 | p__Proteobacteria | 0         | 0.0000163 | -0.000016 | 0.0000163 | 0.010836 | 0.0201715 |
| 174 | denovo42039 | p__Actinobacteria | 0.000071  | 0.0008985 | -0.000828 | 0.0008275 | 0.000898 | 0.0057219 |
| 175 | denovo42096 | p__Firmicutes     | 0.001226  | 0.0000176 | 0.0012085 | -0.001208 | 0.001797 | 0.0092656 |
| 176 | denovo42658 | p__Actinobacteria | 0.0000342 | 0         | 0.0000342 | -0.000034 | 0.032508 | 0.0344837 |
| 177 | denovo42821 | p__Actinobacteria | 0.0000153 | 0         | 0.0000153 | -0.000015 | 0.032508 | 0.0344837 |
| 178 | denovo43251 | p__Proteobacteria | 0         | 8.3976E-6 | -8.398E-6 | 8.3976E-6 | 0.032508 | 0.0344837 |
| 179 | denovo43339 | p__Firmicutes     | 0.0000307 | 2.9865E-6 | 0.0000277 | -0.000028 | 0.001851 | 0.0093326 |
| 180 | denovo43408 | p__Firmicutes     | 0.0000999 | 0.0000228 | 0.000077  | -0.000077 | 0.016313 | 0.0282797 |

The 2-sided p-value is presented.

|   |  |              |
|---|--|--------------|
|   |  | Page 7 of 61 |
| Table S8  |  |              |
| Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample. |  |              |
|   |  |              |

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 181    | denovo43926                | p__Proteobacteria | 0           | 0.0000125      | -0.000012 | 0.0000125 | 0.032508    | 0.0344837 |
| 182    | denovo44100                | p__Firmicutes     | 0.0001555   | 0.0024725      | -0.002317 | 0.002317  | 0.011897    | 0.0218328 |
| 183    | denovo44221                | p__Firmicutes     | 0.0035656   | 0.0162689      | -0.012703 | 0.0127032 | 0.001050    | 0.0062281 |
| 184    | denovo44224                | p__Proteobacteria | 0.0000356   | 0.0002072      | -0.000172 | 0.0001716 | 0.006517    | 0.0190297 |
| 185    | denovo44238                | p__Proteobacteria | 0.0001209   | 0.0025362      | -0.002415 | 0.0024153 | 0.000021650 | 0.0006237 |
| 186    | denovo44271                | p__Firmicutes     | 8.5818E-6   | 0              | 8.5818E-6 | -8.582E-6 | 0.032508    | 0.0344837 |
| 187    | denovo44648                | p__Firmicutes     | 0.0000148   | 1.7324E-6      | 0.000013  | -0.000013 | 0.041796    | 0.0424031 |
| 188    | denovo44845                | p__Proteobacteria | 0.000019    | 0.0007121      | -0.000693 | 0.000693  | 0.011258    | 0.020808  |
| 189    | denovo45288                | p__Firmicutes     | 0.0000364   | 0              | 0.0000364 | -0.000036 | 0.003096    | 0.0108688 |
| 190    | denovo45799                | p__Firmicutes     | 0.0000185   | 0.0001679      | -0.000149 | 0.0001494 | 0.008205    | 0.0201715 |
| 191    | denovo45884                | p__Firmicutes     | 6.5755E-6   | 0.0009496      | -0.000943 | 0.000943  | 0.012135    | 0.0221133 |
| 192    | denovo46020                | p__Actinobacteria | 0.0000244   | 0              | 0.0000244 | -0.000024 | 0.032508    | 0.0344837 |
| 193    | denovo46051                | p__Firmicutes     | 0.0005389   | 0.0061575      | -0.005619 | 0.0056186 | 0.000206    | 0.0024559 |
| 194    | denovo46277                | p__Firmicutes     | 0.0000188   | 0              | 0.0000188 | -0.000019 | 0.010836    | 0.0201715 |
| 195    | denovo47037                | p__Firmicutes     | 0.0000414   | 0              | 0.0000414 | -0.000041 | 0.003096    | 0.0108688 |
| 196    | denovo47199                | p__Proteobacteria | 0.0008523   | 0.0077754      | -0.006923 | 0.0069231 | 0.000130    | 0.0018277 |
| 197    | denovo48009                | p__Proteobacteria | 0           | 8.5238E-6      | -8.524E-6 | 8.5238E-6 | 0.032508    | 0.0344837 |
| 198    | denovo48194                | p__Firmicutes     | 0.0017432   | 0.0284893      | -0.026746 | 0.0267461 | 0.000206    | 0.0024559 |
| 199    | denovo48492                | p__Proteobacteria | 0           | 0.0000194      | -0.000019 | 0.0000194 | 0.003096    | 0.0108688 |
| 200    | denovo48933                | p__Firmicutes     | 0.000517    | 0.0000513      | 0.0004657 | -0.000466 | 0.002078    | 0.0101119 |
| 201    | denovo49233                | p__Firmicutes     | 0.0000457   | 0.0009827      | -0.000937 | 0.000937  | 0.003572    | 0.0121645 |
| 202    | denovo49236                | p__Firmicutes     | 0.000219    | 3.5221E-6      | 0.0002154 | -0.000215 | 0.000010825 | 0.000517  |
| 203    | denovo49245                | p__Firmicutes     | 0.0000602   | 2.621E-6       | 0.0000575 | -0.000058 | 0.009050    | 0.0201715 |
| 204    | denovo49419                | p__Proteobacteria | 0.0004972   | 0.0031889      | -0.002692 | 0.0026916 | 0.005196    | 0.0160388 |

|     |             |                   |           |           |           |           |             |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 205 | denovo49509 | p__Firmicutes     | 0         | 0.0000161 | -0.000016 | 0.0000161 | 0.032508    | 0.0344837 |
| 206 | denovo49750 | p__Proteobacteria | 0.000902  | 0.0079487 | -0.007047 | 0.0070467 | 0.000043300 | 0.0009948 |
| 207 | denovo50044 | p__Proteobacteria | 0.0002089 | 0.001715  | -0.001506 | 0.0015061 | 0.000206    | 0.0024559 |
| 208 | denovo50111 | p__Firmicutes     | 0.000063  | 4.7047E-6 | 0.0000583 | -0.000058 | 0.000931    | 0.005867  |
| 209 | denovo50768 | p__Firmicutes     | 0.0000159 | 7.3347E-7 | 0.0000152 | -0.000015 | 0.032508    | 0.0344837 |
| 210 | denovo50778 | p__Firmicutes     | 0.0000215 | 0         | 0.0000215 | -0.000022 | 0.010836    | 0.0201715 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 211    | denovo51008                | p__Actinobacteria | 0.0000919   | 0              | 0.0000919 | -0.000092 | 0.032508    | 0.0344837 |
| 212    | denovo51022                | p__Firmicutes     | 0.0000377   | 3.7189E-6      | 0.000034  | -0.000034 | 0.027366    | 0.0344837 |
| 213    | denovo51035                | p__Actinobacteria | 0.000069    | 0              | 0.000069  | -0.000069 | 0.010836    | 0.0201715 |
| 214    | denovo51049                | p__Firmicutes     | 0.000018    | 1.0469E-6      | 0.0000169 | -0.000017 | 0.032508    | 0.0344837 |
| 215    | denovo51135                | p__Proteobacteria | 0           | 9.6321E-6      | -9.632E-6 | 9.6321E-6 | 0.032508    | 0.0344837 |
| 216    | denovo51158                | p__Proteobacteria | 0.0007758   | 0.0047093      | -0.003934 | 0.0039335 | 0.000725    | 0.0047523 |
| 217    | denovo51311                | p__Proteobacteria | 0.0007421   | 0.0153157      | -0.014574 | 0.0145735 | 0.000075776 | 0.0014477 |
| 218    | denovo52000                | p__Firmicutes     | 0.0000119   | 6.8058E-7      | 0.0000112 | -0.000011 | 0.010836    | 0.0201715 |
| 219    | denovo52528                | p__Firmicutes     | 0.0002691   | 0.001759       | -0.00149  | 0.0014899 | 0.019258    | 0.0317754 |
| 220    | denovo53163                | p__Firmicutes     | 0.0000175   | 0              | 0.0000175 | -0.000018 | 0.003096    | 0.0108688 |
| 221    | denovo53253                | p__Firmicutes     | 1.6242E-6   | 0.0000208      | -0.000019 | 0.0000191 | 0.026316    | 0.0344837 |
| 222    | denovo53313                | p__Firmicutes     | 0.0000372   |                |           |           |             |           |

|     |             |                   |           |           |           |           |             |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
|     |             |                   |           | 0.0000969 | -0.00006  | 0.0000597 | 0.034056    | 0.0354016 |
| 223 | denovo53657 | p__Firmicutes     | 0.00001   | 0         | 0.00001   | -0.00001  | 0.032508    | 0.0344837 |
| 224 | denovo53729 | p__Firmicutes     | 0.000218  | 8.0681E-6 | 0.00021   | -0.00021  | 0.000444    | 0.0043769 |
| 225 | denovo53790 | p__Firmicutes     | 0.0000187 | 0         | 0.0000187 | -0.000019 | 0.032508    | 0.0344837 |
| 226 | denovo54123 | p__Firmicutes     | 0.0001302 | 7.6898E-6 | 0.0001225 | -0.000122 | 0.000130    | 0.0018277 |
| 227 | denovo54289 | p__Firmicutes     | 0.0000319 | 2.5037E-6 | 0.0000294 | -0.000029 | 0.016194    | 0.0281809 |
| 228 | denovo54293 | p__Firmicutes     | 0.0000302 | 0         | 0.0000302 | -0.00003  | 0.010836    | 0.0201715 |
| 229 | denovo54313 | p__Firmicutes     | 0.0000267 | 7.3347E-7 | 0.0000259 | -0.000026 | 0.018576    | 0.030734  |
| 230 | denovo54809 | p__Acidobacteria  | 0.0000368 | 0.0024479 | -0.002411 | 0.002411  | 0.000010825 | 0.000517  |
| 231 | denovo55429 | p__Firmicutes     | 0.0000287 | 0         | 0.0000287 | -0.000029 | 0.032508    | 0.0344837 |
| 232 | denovo55551 | p__Firmicutes     | 5.4053E-6 | 0.0001948 | -0.000189 | 0.0001894 | 0.012622    | 0.0225927 |
| 233 | denovo55584 | p__Proteobacteria | 0         | 7.4059E-6 | -7.406E-6 | 7.4059E-6 | 0.010836    | 0.0201715 |
| 234 | denovo55622 | p__Firmicutes     | 1.84E-6   | 0.0000707 | -0.000069 | 0.0000688 | 0.000032475 | 0.0009068 |
| 235 | denovo55813 | p__Bacteroidetes  | 0.000018  | 0         | 0.000018  | -0.000018 | 0.032508    | 0.0344837 |
| 236 | denovo55956 | p__Firmicutes     | 0.01212   | 0.0506663 | -0.038546 | 0.0385463 | 0.035203    | 0.0364691 |
| 237 | denovo56028 | p__Firmicutes     | 0.000079  | 0.0005487 | -0.00047  | 0.0004697 | 0.025612    | 0.0344837 |
| 238 | denovo56204 | p__Firmicutes     | 0.0000123 | 0         | 0.0000123 | -0.000012 | 0.032508    | 0.0344837 |
| 239 | denovo56273 | p__Firmicutes     | 0.0000456 | 0         | 0.0000456 | -0.000046 | 0.003096    | 0.0108688 |
| 240 | denovo56365 | p__Firmicutes     | 0.0002132 | 2.0529E-6 | 0.0002112 | -0.000211 | 0.000010825 | 0.000517  |

The 2-sided p-value is presented.

Table S8  
Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic | Phylum | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value | FDR |
|--------|-----------------------|--------|-------------|----------------|-------|-------|---------|-----|
|--------|-----------------------|--------|-------------|----------------|-------|-------|---------|-----|

|     | Unit        |                   |           |           |           |           |             |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 241 | denovo56442 | p__Proteobacteria | 1.6242E-6 | 0.0000173 | -0.000016 | 0.0000156 | 0.012622    | 0.0225927 |
| 242 | denovo56801 | p__Firmicutes     | 6.4969E-6 | 0.0000214 | -0.000015 | 0.0000149 | 0.049536    | 0.0495356 |
| 243 | denovo56930 | p__Proteobacteria | 0         | 7.3023E-6 | -7.302E-6 | 7.3023E-6 | 0.032508    | 0.0344837 |
| 244 | denovo56968 | p__Firmicutes     | 0.0001537 | 0.0009353 | -0.000782 | 0.0007816 | 0.047403    | 0.0477186 |
| 245 | denovo57369 | p__Firmicutes     | 0.0000176 | 1.9379E-6 | 0.0000157 | -0.000016 | 0.030483    | 0.0344837 |
| 246 | denovo57437 | p__Firmicutes     | 0.0001326 | 0.0006351 | -0.000502 | 0.0005025 | 0.002425    | 0.0108688 |
| 247 | denovo57712 | p__Bacteroidetes  | 0         | 0.0000313 | -0.000031 | 0.0000313 | 0.032508    | 0.0344837 |
| 248 | denovo57902 | p__Proteobacteria | 0.000174  | 0.0020338 | -0.00186  | 0.0018598 | 0.000130    | 0.0018277 |
| 249 | denovo57974 | p__Firmicutes     | 8.4355E-7 | 0.0000845 | -0.000084 | 0.0000836 | 0.032508    | 0.0344837 |
| 250 | denovo58022 | p__Firmicutes     | 2.5489E-6 | 0.0004046 | -0.000402 | 0.000402  | 0.002934    | 0.0108688 |
| 251 | denovo58147 | p__Firmicutes     | 0.0000346 | 0         | 0.0000346 | -0.000035 | 0.032508    | 0.0344837 |
| 252 | denovo58324 | p__Firmicutes     | 0.0000517 | 4.8637E-6 | 0.0000468 | -0.000047 | 0.006257    | 0.0186168 |
| 253 | denovo58355 | p__Firmicutes     | 0.000494  | 0.0021449 | -0.001651 | 0.0016509 | 0.000898    | 0.0057219 |
| 254 | denovo58493 | p__Firmicutes     | 0.0000185 | 0         | 0.0000185 | -0.000018 | 0.010836    | 0.0201715 |
| 255 | denovo58888 | p__Bacteroidetes  | 0.0002706 | 0.0000111 | 0.0002595 | -0.000259 | 0.001440    | 0.0077083 |
| 256 | denovo58957 | p__Firmicutes     | 0.0000198 | 8.5346E-7 | 0.0000189 | -0.000019 | 0.032508    | 0.0344837 |
| 257 | denovo59018 | p__Firmicutes     | 0.0000396 | 3.1509E-6 | 0.0000364 | -0.000036 | 0.034056    | 0.0354016 |
| 258 | denovo59065 | p__Firmicutes     | 0.0000237 | 4.5058E-6 | 0.0000192 | -0.000019 | 0.041200    | 0.0419868 |
| 259 | denovo59151 | p__Firmicutes     | 0.0000174 | 0         | 0.0000174 | -0.000017 | 0.010836    | 0.0201715 |
| 260 | denovo59211 | p__Firmicutes     | 0.0000197 | 8.5346E-7 | 0.0000188 | -0.000019 | 0.003096    | 0.0108688 |
| 261 | denovo59553 | p__Firmicutes     | 0.0000835 | 5.6895E-6 | 0.0000778 | -0.000078 | 0.011258    | 0.020808  |
| 262 | denovo59593 | p__Proteobacteria | 8.8263E-6 | 0.0000617 | -0.000053 | 0.0000528 | 0.008887    | 0.0201715 |
| 263 | denovo59594 | p__Actinobacteria | 0.0002787 | 0.0021438 | -0.001865 | 0.0018651 | 0.000010825 | 0.000517  |
| 264 | denovo59644 | p__Firmicutes     | 0.0000794 | 4.0527E-6 | 0.0000753 | -0.000075 | 0.004601    | 0.0147791 |
| 265 | denovo59687 | p__Firmicutes     | 9.3476E-6 |           |           |           |             |           |

|     |             |                   |           |           |           |           |          |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|     |             |                   |           | 0         | 9.3476E-6 | -9.348E-6 | 0.032508 | 0.0344837 |
| 266 | denovo59884 | p__Bacteroidetes  | 9.1957E-6 | 0.0000427 | -0.000034 | 0.0000335 | 0.049536 | 0.0495356 |
| 267 | denovo59967 | p__Proteobacteria | 0         | 0.0000158 | -0.000016 | 0.0000158 | 0.032508 | 0.0344837 |
| 268 | denovo60286 | p__Firmicutes     | 0.0000364 | 0         | 0.0000364 | -0.000036 | 0.032508 | 0.0344837 |
| 269 | denovo60482 | p__Firmicutes     | 0.0000506 | 1.1109E-6 | 0.0000495 | -0.00005  | 0.000227 | 0.0026792 |
| 270 | denovo60549 | p__Firmicutes     | 1.6242E-6 | 0.0000638 | -0.000062 | 0.0000622 | 0.032508 | 0.0344837 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 271    | denovo60826                | p__Firmicutes     | 6.3345E-6   | 0              | 6.3345E-6 | -6.334E-6 | 0.032508 | 0.0344837 |
| 272    | denovo61117                | p__Firmicutes     | 0.0000207   | 3.3949E-6      | 0.0000173 | -0.000017 | 0.034056 | 0.0354016 |
| 273    | denovo61423                | p__Firmicutes     | 0.0003059   | 0.0000353      | 0.0002706 | -0.000271 | 0.000595 | 0.0047523 |
| 274    | denovo61759                | p__Proteobacteria | 0           | 9.3283E-6      | -9.328E-6 | 9.3283E-6 | 0.032508 | 0.0344837 |
| 275    | denovo62426                | p__Actinobacteria | 0.0000414   | 0              | 0.0000414 | -0.000041 | 0.010836 | 0.0201715 |
| 276    | denovo62627                | p__Firmicutes     | 0.0002339   | 0.0000125      | 0.0002214 | -0.000221 | 0.006452 | 0.0189788 |
| 277    | denovo62743                | p__Firmicutes     | 0.0000475   | 0              | 0.0000475 | -0.000048 | 0.000714 | 0.0047523 |
| 278    | denovo62768                | p__Proteobacteria | 0           | 0.0000163      | -0.000016 | 0.0000163 | 0.010836 | 0.0201715 |
| 279    | denovo63119                | p__Firmicutes     | 0.000138    | 0              | 0.000138  | -0.000138 | 0.003096 | 0.0108688 |
| 280    | denovo63250                | p__Firmicutes     | 0.0000429   | 0              | 0.0000429 | -0.000043 | 0.003096 | 0.0108688 |
| 281    | denovo63636                | p__Proteobacteria | 0.0000988   | 0.0008153      | -0.000717 | 0.0007165 | 0.013661 | 0.0242852 |
| 282    | denovo64017                | p__Firmicutes     | 0.0000151   |                |           |           |          |           |

|     |             |                   |           |           |           |           |          |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|     |             |                   |           | 3.9927E-7 | 0.0000147 | -0.000015 | 0.032508 | 0.0344837 |
| 283 | denovo64091 | p__Firmicutes     | 9.8985E-6 | 0.0002037 | -0.000194 | 0.0001938 | 0.000617 | 0.0047523 |
| 284 | denovo64154 | p__Firmicutes     | 0.0000123 | 0         | 0.0000123 | -0.000012 | 0.010836 | 0.0201715 |
| 285 | denovo64194 | p__Firmicutes     | 0.0000239 | 0         | 0.0000239 | -0.000024 | 0.032508 | 0.0344837 |
| 286 | denovo64643 | p__Firmicutes     | 0.0000399 | 7.3347E-7 | 0.0000392 | -0.000039 | 0.001310 | 0.0071392 |
| 287 | denovo64875 | p__Firmicutes     | 0.0000606 | 0         | 0.0000606 | -0.000061 | 0.000119 | 0.0018162 |
| 288 | denovo65113 | p__Firmicutes     | 0.0000139 | 0         | 0.0000139 | -0.000014 | 0.032508 | 0.0344837 |
| 289 | denovo65119 | p__Firmicutes     | 0.0000116 | 0         | 0.0000116 | -0.000012 | 0.032508 | 0.0344837 |
| 290 | denovo65228 | p__Firmicutes     | 0.000023  | 0         | 0.000023  | -0.000023 | 0.003096 | 0.0108688 |
| 291 | denovo65394 | p__Firmicutes     | 0.0000418 | 1.7324E-6 | 0.0000401 | -0.00004  | 0.007859 | 0.0201715 |
| 292 | denovo65616 | p__Proteobacteria | 0         | 0.0000228 | -0.000023 | 0.0000228 | 0.032508 | 0.0344837 |
| 293 | denovo65626 | p__Firmicutes     | 0.00002   | 0         | 0.00002   | -0.00002  | 0.000714 | 0.0047523 |
| 294 | denovo66453 | p__Proteobacteria | 0.0000138 | 0.0008538 | -0.00084  | 0.0008401 | 0.000487 | 0.0043769 |
| 295 | denovo66543 | p__Actinobacteria | 0.0001967 | 5.1971E-6 | 0.0001915 | -0.000192 | 0.000119 | 0.0018162 |
| 296 | denovo66723 | p__Firmicutes     | 0.0000297 | 0         | 0.0000297 | -0.00003  | 0.032508 | 0.0344837 |
| 297 | denovo66784 | p__Firmicutes     | 0.0000254 | 2.0465E-6 | 0.0000233 | -0.000023 | 0.006668 | 0.0190297 |
| 298 | denovo66821 | p__Firmicutes     | 0.0000316 | 3.1229E-6 | 0.0000285 | -0.000028 | 0.007859 | 0.0201715 |
| 299 | denovo67528 | p__Proteobacteria | 0         | 0.0000148 | -0.000015 | 0.0000148 | 0.010836 | 0.0201715 |
| 300 | denovo67612 | p__Bacteroidetes  | 1.6242E-6 | 0.0002638 | -0.000262 | 0.0002622 | 0.010836 | 0.0201715 |

The 2-sided p-value is presented.

Table S7  
Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic | Phylum | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value | FDR |
|--------|-----------------------|--------|-------------|----------------|-------|-------|---------|-----|
|--------|-----------------------|--------|-------------|----------------|-------|-------|---------|-----|

|     | Unit        |                   |           |           |           |           |             |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 301 | denovo67620 | p__Firmicutes     | 0.0000423 | 3.0526E-6 | 0.0000393 | -0.000039 | 0.002457    | 0.0108688 |
| 302 | denovo67812 | p__Bacteroidetes  | 0.0000882 | 0.0003987 | -0.00031  | 0.0003104 | 0.028903    | 0.0344837 |
| 303 | denovo67862 | p__Bacteroidetes  | 0.0000497 | 0.0012926 | -0.001243 | 0.0012429 | 0.016313    | 0.0282797 |
| 304 | denovo68048 | p__Firmicutes     | 0.0000589 | 4.2466E-6 | 0.0000547 | -0.000055 | 0.012135    | 0.0221133 |
| 305 | denovo68291 | p__Firmicutes     | 0.0000148 | 0         | 0.0000148 | -0.000015 | 0.032508    | 0.0344837 |
| 306 | denovo68569 | p__Firmicutes     | 0.000015  | 0         | 0.000015  | -0.000015 | 0.010836    | 0.0201715 |
| 307 | denovo68582 | p__Firmicutes     | 0.0007747 | 8.9719E-6 | 0.0007657 | -0.000766 | 0.000043300 | 0.0009948 |
| 308 | denovo68752 | p__Firmicutes     | 0.0000181 | 0         | 0.0000181 | -0.000018 | 0.010836    | 0.0201715 |
| 309 | denovo68797 | p__Firmicutes     | 0.0000209 | 0         | 0.0000209 | -0.000021 | 0.032508    | 0.0344837 |
| 310 | denovo69002 | p__Firmicutes     | 7.089E-7  | 0.0001382 | -0.000137 | 0.0001375 | 0.032508    | 0.0344837 |
| 311 | denovo69145 | p__Firmicutes     | 0.000027  | 0         | 0.000027  | -0.000027 | 0.000714    | 0.0047523 |
| 312 | denovo69456 | p__Firmicutes     | 0.0000198 | 0         | 0.0000198 | -0.00002  | 0.010836    | 0.0201715 |
| 313 | denovo69988 | p__Proteobacteria | 1.84E-6   | 0.0000231 | -0.000021 | 0.0000213 | 0.003691    | 0.0124301 |
| 314 | denovo70339 | p__Firmicutes     | 0.0000205 | 0         | 0.0000205 | -0.00002  | 0.003096    | 0.0108688 |
| 315 | denovo70560 | p__Firmicutes     | 0.0000499 | 4.8052E-6 | 0.0000451 | -0.000045 | 0.040876    | 0.0419868 |
| 316 | denovo70824 | p__Proteobacteria | 0.0014211 | 0.0083976 | -0.006976 | 0.0069765 | 0.005196    | 0.0160388 |
| 317 | denovo71060 | p__Proteobacteria | 0         | 0.0000151 | -0.000015 | 0.0000151 | 0.010836    | 0.0201715 |
| 318 | denovo71110 | p__Proteobacteria | 0.0000955 | 0.0062131 | -0.006118 | 0.0061176 | 0.000010825 | 0.000517  |
| 319 | denovo71565 | p__Firmicutes     | 0.0000104 | 8.5346E-7 | 9.5714E-6 | -9.571E-6 | 0.018576    | 0.030734  |
| 320 | denovo71863 | p__Firmicutes     | 0.0000152 | 6.7758E-7 | 0.0000146 | -0.000015 | 0.010836    | 0.0201715 |
| 321 | denovo71900 | p__Firmicutes     | 0.000078  | 9.5168E-6 | 0.0000685 | -0.000069 | 0.002078    | 0.0101119 |
| 322 | denovo72476 | p__Proteobacteria | 0         | 9.9428E-6 | -9.943E-6 | 9.9428E-6 | 0.032508    | 0.0344837 |
| 323 | denovo72802 | p__Firmicutes     | 0.0000368 | 2.6863E-6 | 0.0000341 | -0.000034 | 0.006668    | 0.0190297 |
| 324 | denovo73052 | p__Firmicutes     | 0.000016  | 0         | 0.000016  | -0.000016 | 0.010836    | 0.0201715 |
| 325 | denovo73122 |                   | 3.6053E-6 |           |           |           |             |           |



|     |             |                   |           |           |           |           |          |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|     |             | p__Proteobacteria |           | 0.0000683 | -0.000065 | 0.0000647 | 0.004016 | 0.0131338 |
| 326 | denovo73349 | p__Firmicutes     | 0.0000308 | 0         | 0.0000308 | -0.000031 | 0.032508 | 0.0344837 |
| 327 | denovo73828 | p__Bacteroidetes  | 0.0004362 | 0.0000715 | 0.0003647 | -0.000365 | 0.005153 | 0.0160388 |
| 328 | denovo74145 | p__Actinobacteria | 0.0003151 | 0.0017256 | -0.001411 | 0.0014105 | 0.004871 | 0.015484  |
| 329 | denovo74233 | p__Firmicutes     | 0.0000119 | 0         | 0.0000119 | -0.000012 | 0.032508 | 0.0344837 |
| 330 | denovo74359 | p__Proteobacteria | 3.2484E-6 | 0.0000794 | -0.000076 | 0.0000762 | 0.000552 | 0.0047523 |

The 2-sided p-value is presented.

Table S8 Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample. Page 12 of 61

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 331    | denovo74449                | p__Firmicutes     | 0.0000397   | 0              | 0.0000397 | -0.00004  | 0.032508    | 0.0344837 |
| 332    | denovo74672                | p__Firmicutes     | 0.0003314   | 1.7324E-6      | 0.0003297 | -0.00033  | 0.000021650 | 0.0006237 |
| 333    | denovo74860                | p__Firmicutes     | 0.0001003   | 5.751E-6       | 0.0000946 | -0.000095 | 0.000476    | 0.0043769 |
| 334    | denovo75253                | p__Bacteroidetes  | 0.0000297   | 0.0004581      | -0.000428 | 0.0004283 | 0.015805    | 0.0277154 |
| 335    | denovo75376                | p__Proteobacteria | 0           | 7.1315E-6      | -7.131E-6 | 7.1315E-6 | 0.032508    | 0.0344837 |
| 336    | denovo75448                | p__Firmicutes     | 0.0000394   | 2.6247E-6      | 0.0000368 | -0.000037 | 0.025125    | 0.0344837 |
| 337    | denovo75643                | p__Actinobacteria | 0.0002027   | 0              | 0.0002027 | -0.000203 | 0.000119    | 0.0018162 |
| 338    | denovo76231                | p__Firmicutes     | 0.0008066   | 0.002205       | -0.001398 | 0.0013984 | 0.006517    | 0.0190297 |
| 339    | denovo76292                | p__Proteobacteria | 0           | 0.0000136      | -0.000014 | 0.0000136 | 0.010836    | 0.0201715 |
| 340    | denovo76683                | p__Firmicutes     | 0.0000374   | 0.0000124      | 0.000025  | -0.000025 | 0.021975    | 0.0344837 |
| 341    | denovo76864                | p__Proteobacteria | 3.582E-6    | 0.0000518      | -0.000048 | 0.0000482 | 0.016194    | 0.0281809 |
| 342    | denovo77235                | p__Firmicutes     | 0.0000175   | 0              | 0.0000175 | -0.000017 | 0.032508    | 0.0344837 |

|     |             |                    |           |           |           |           |             |           |
|-----|-------------|--------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 343 | denovo77353 | p__Firmicutes      | 1.84E-6   | 0.0000238 | -0.000022 | 0.0000219 | 0.026316    | 0.0344837 |
| 344 | denovo77566 | p__Firmicutes      | 0         | 4.1664E-6 | -4.166E-6 | 4.1664E-6 | 0.032508    | 0.0344837 |
| 345 | denovo77595 | p__Actinobacteria  | 0.0000602 | 1.5754E-6 | 0.0000586 | -0.000059 | 0.032508    | 0.0344837 |
| 346 | denovo77604 | p__Verrucomicrobia | 0.0075779 | 0.0222883 | -0.01471  | 0.0147105 | 0.001039    | 0.0062281 |
| 347 | denovo78111 | p__Firmicutes      | 0.0005096 | 0         | 0.0005096 | -0.00051  | 0.000010825 | 0.000517  |
| 348 | denovo78395 | p__Firmicutes      | 0.0000475 | 3.9927E-7 | 0.0000471 | -0.000047 | 0.010836    | 0.0201715 |
| 349 | denovo78415 | p__Firmicutes      | 0.0002463 | 0.0000138 | 0.0002326 | -0.000233 | 0.023252    | 0.0344837 |
| 350 | denovo78751 | p__Firmicutes      | 0.0002017 | 0         | 0.0002017 | -0.000202 | 0.010836    | 0.0201715 |
| 351 | denovo78755 | p__Actinobacteria  | 2.6657E-6 | 0.0000755 | -0.000073 | 0.0000729 | 0.001256    | 0.007078  |
| 352 | denovo78818 | p__Proteobacteria  | 0         | 7.2075E-6 | -7.207E-6 | 7.2075E-6 | 0.032508    | 0.0344837 |
| 353 | denovo78957 | p__Firmicutes      | 0.0000643 | 4.71E-7   | 0.0000638 | -0.000064 | 0.032508    | 0.0344837 |
| 354 | denovo79883 | p__Proteobacteria  | 8.4355E-7 | 0.0000403 | -0.000039 | 0.0000395 | 0.010836    | 0.0201715 |
| 355 | denovo80006 | p__Firmicutes      | 0.0001529 | 9.0881E-6 | 0.0001438 | -0.000144 | 0.000010825 | 0.000517  |
| 356 | denovo80416 | p__Firmicutes      | 0.0000153 | 0         | 0.0000153 | -0.000015 | 0.010836    | 0.0201715 |
| 357 | denovo80532 | p__Firmicutes      | 7.222E-6  | 6.8058E-7 | 6.5414E-6 | -6.541E-6 | 0.032508    | 0.0344837 |
| 358 | denovo80777 | p__Firmicutes      | 0.0000995 | 0         | 0.0000995 | -0.000099 | 0.032508    | 0.0344837 |
| 359 | denovo81091 | p__Firmicutes      | 6.5219E-6 | 0         | 6.5219E-6 | -6.522E-6 | 0.032508    | 0.0344837 |
| 360 | denovo81275 | p__Proteobacteria  | 0         | 0.0000168 | -0.000017 | 0.0000168 | 0.010836    | 0.0201715 |

The 2-sided p-value is presented.

Table S8  
Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value | FDR |
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|

|     |             |                   |           |           |           |           |             |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 361 | denovo81286 | p__Firmicutes     | 0.0000644 | 2.1465E-6 | 0.0000623 | -0.000062 | 0.001256    | 0.007078  |
| 362 | denovo81388 | p__Firmicutes     | 0.0001009 | 7.3347E-7 | 0.0001002 | -0.0001   | 0.032508    | 0.0344837 |
| 363 | denovo81541 | p__Bacteroidetes  | 0.000784  | 0.0105274 | -0.009743 | 0.0097434 | 0.000010825 | 0.000517  |
| 364 | denovo81555 | p__Proteobacteria | 0.0003054 | 0.0014187 | -0.001113 | 0.0011134 | 0.001050    | 0.0062281 |
| 365 | denovo81846 | p__Proteobacteria | 0         | 0.0000131 | -0.000013 | 0.0000131 | 0.010836    | 0.0201715 |
| 366 | denovo82124 | p__Firmicutes     | 0.0000314 | 1.5754E-6 | 0.0000298 | -0.00003  | 0.007859    | 0.0201715 |
| 367 | denovo82131 | p__Proteobacteria | 0.000013  | 0.0002003 | -0.000187 | 0.0001873 | 0.013564    | 0.0241356 |
| 368 | denovo82884 | p__Firmicutes     | 7.9213E-6 | 1.531E-6  | 6.3902E-6 | -6.39E-6  | 0.041200    | 0.0419868 |
| 369 | denovo82898 | p__Firmicutes     | 0.0000968 | 1.5754E-6 | 0.0000952 | -0.000095 | 0.032508    | 0.0344837 |
| 370 | denovo83286 | p__Proteobacteria | 0.0002208 | 0.0028673 | -0.002647 | 0.0026466 | 0.000043300 | 0.0009948 |
| 371 | denovo83363 | p__Actinobacteria | 0.0003983 | 0.0000156 | 0.0003827 | -0.000383 | 0.000064951 | 0.0014034 |
| 372 | denovo83502 | p__Bacteroidetes  | 0.0001259 | 6.4689E-6 | 0.0001194 | -0.000119 | 0.027366    | 0.0344837 |
| 373 | denovo83914 | p__Firmicutes     | 0.0001176 | 1.1486E-6 | 0.0001164 | -0.000116 | 0.000010825 | 0.000517  |
| 374 | denovo83999 | p__Firmicutes     | 0.0000144 | 0         | 0.0000144 | -0.000014 | 0.032508    | 0.0344837 |
| 375 | denovo84029 | p__Actinobacteria | 0.0001007 | 3.8563E-6 | 0.0000969 | -0.000097 | 0.030483    | 0.0344837 |
| 376 | denovo84194 | p__Firmicutes     | 0.0000375 | 3.9927E-7 | 0.0000371 | -0.000037 | 0.000714    | 0.0047523 |
| 377 | denovo84259 | p__Firmicutes     | 0.0000267 | 3.9927E-7 | 0.0000263 | -0.000026 | 0.003096    | 0.0108688 |
| 378 | denovo84297 | p__Firmicutes     | 0.0000298 | 8.7027E-7 | 0.0000289 | -0.000029 | 0.003096    | 0.0108688 |
| 379 | denovo84668 | p__Firmicutes     | 0.0001414 | 0.0004913 | -0.00035  | 0.0003499 | 0.009981    | 0.0201715 |
| 380 | denovo84670 | p__Proteobacteria | 0.003523  | 0.0191395 | -0.015617 | 0.0156165 | 0.005196    | 0.0160388 |
| 381 | denovo84774 | p__Proteobacteria | 0.0001571 | 0.0020523 | -0.001895 | 0.0018952 | 0.022668    | 0.0344837 |
| 382 | denovo84780 | p__Cyanobacteria  | 0.0000904 | 0.0013914 | -0.001301 | 0.001301  | 0.000325    | 0.0033875 |
| 383 | denovo85255 | p__Proteobacteria | 0.0000117 | 0.0000602 | -0.000049 | 0.0000485 | 0.002436    | 0.0108688 |
| 384 | denovo85326 | p__Firmicutes     | 0.0001116 | 4.907E-6  | 0.0001067 | -0.000107 | 0.000130    | 0.0018277 |
| 385 | denovo85426 | p__Actinobacteria | 0.000167  | 5.3578E-6 | 0.0001617 | -0.000162 | 0.005889    | 0.0175794 |

|     |             |                   |           |           |           |           |          |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 386 | denovo85888 | p__Proteobacteria | 0.0003655 | 0.0029307 | -0.002565 | 0.0025651 | 0.017223 | 0.0297141 |
| 387 | denovo85917 | p__Firmicutes     | 0.0000163 | 0         | 0.0000163 | -0.000016 | 0.003096 | 0.0108688 |
| 388 | denovo86131 | p__Firmicutes     | 0.000037  | 1.2982E-6 | 0.0000357 | -0.000036 | 0.026316 | 0.0344837 |
| 389 | denovo86158 | p__Proteobacteria | 3.2484E-6 | 0.0000266 | -0.000023 | 0.0000234 | 0.010241 | 0.0201715 |
| 390 | denovo86197 | p__Firmicutes     | 0.0001718 | 0.0000131 | 0.0001587 | -0.000159 | 0.027366 | 0.0344837 |

The 2-sided p-value is presented.

|  |  |               |
|--|--|---------------|
|  |  | Page 14 of 61 |
| Table S8   |  |               |
| Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample. |  |               |

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 391    | denovo86229                | p__Firmicutes     | 0.0000163   | 1.7692E-6      | 0.0000146 | -0.000015 | 0.041200 | 0.0419868 |
| 392    | denovo86454                | p__Actinobacteria | 0.0001035   | 3.845E-6       | 0.0000997 | -0.0001   | 0.012135 | 0.0221133 |
| 393    | denovo86521                | p__Actinobacteria | 0.0000424   | 0              | 0.0000424 | -0.000042 | 0.003096 | 0.0108688 |
| 394    | denovo86525                | p__Firmicutes     | 0.0000323   | 0              | 0.0000323 | -0.000032 | 0.000714 | 0.0047523 |
| 395    | denovo86537                | p__Firmicutes     | 0.0000264   | 1.8443E-6      | 0.0000245 | -0.000025 | 0.006668 | 0.0190297 |
| 396    | denovo86720                | p__Proteobacteria | 0           | 0.0000297      | -0.00003  | 0.0000297 | 0.032508 | 0.0344837 |
| 397    | denovo86758                | p__Firmicutes     | 0.0000226   | 1.1109E-6      | 0.0000215 | -0.000021 | 0.012622 | 0.0225927 |
| 398    | denovo86801                | p__Firmicutes     | 0.0000427   | 0              | 0.0000427 | -0.000043 | 0.010836 | 0.0201715 |
| 399    | denovo87171                | p__Bacteroidetes  | 0.0001835   | 0.0018955      | -0.001712 | 0.001712  | 0.003302 | 0.0114361 |
| 400    | denovo87221                | p__Firmicutes     | 0.0004988   | 0.0039038      | -0.003405 | 0.0034049 | 0.018110 | 0.030734  |
| 401    | denovo87253                | p__Proteobacteria | 2.5839E-6   | 0.0000266      | -0.000024 | 0.000024  | 0.026316 | 0.0344837 |
| 402    | denovo87296                | p__Firmicutes     | 0.000024    | 4.71E-7        | 0.0000235 | -0.000023 | 0.032508 | 0.0344837 |

|     |             |                   |           |           |           |           |             |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 403 | denovo87641 | p__Firmicutes     | 0         | 0.0001483 | -0.000148 | 0.0001483 | 0.032508    | 0.0344837 |
| 404 | denovo87961 | p__Firmicutes     | 0.0002915 | 0.0021925 | -0.001901 | 0.001901  | 0.001494    | 0.007859  |
| 405 | denovo88215 | p__Bacteroidetes  | 0.0004503 | 0.0028807 | -0.00243  | 0.0024305 | 0.045043    | 0.0455959 |
| 406 | denovo88479 | p__Actinobacteria | 0.000188  | 5.7699E-6 | 0.0001823 | -0.000182 | 0.030483    | 0.0344837 |
| 407 | denovo88945 | p__Proteobacteria | 0.0001212 | 0.001506  | -0.001385 | 0.0013848 | 0.000130    | 0.0018277 |
| 408 | denovo89453 | p__Firmicutes     | 0.0000136 | 0         | 0.0000136 | -0.000014 | 0.003096    | 0.0108688 |
| 409 | denovo89598 | p__Firmicutes     | 0.0000336 | 0         | 0.0000336 | -0.000034 | 0.032508    | 0.0344837 |
| 410 | denovo90033 | p__Firmicutes     | 0.0003627 | 0.0017604 | -0.001398 | 0.0013977 | 0.038840    | 0.0400542 |
| 411 | denovo90202 | p__Firmicutes     | 0.0000383 | 2.253E-6  | 0.0000361 | -0.000036 | 0.025125    | 0.0344837 |
| 412 | denovo90432 | p__Firmicutes     | 0.0000107 | 0         | 0.0000107 | -0.000011 | 0.032508    | 0.0344837 |
| 413 | denovo90613 | p__Proteobacteria | 6.3024E-6 | 0.0000376 | -0.000031 | 0.0000313 | 0.021553    | 0.0344837 |
| 414 | denovo90785 | p__Firmicutes     | 0.0000376 | 0         | 0.0000376 | -0.000038 | 0.032508    | 0.0344837 |
| 415 | denovo91926 | p__Firmicutes     | 0.000128  | 4.2746E-6 | 0.0001237 | -0.000124 | 0.000021650 | 0.0006237 |
| 416 | denovo92034 | p__Firmicutes     | 0.0000243 | 1.3245E-6 | 0.0000229 | -0.000023 | 0.009050    | 0.0201715 |
| 417 | denovo92232 | p__Firmicutes     | 0.0000198 | 8.7027E-7 | 0.0000189 | -0.000019 | 0.032508    | 0.0344837 |
| 418 | denovo92424 | p__Firmicutes     | 0.0001166 | 7.3404E-6 | 0.0001092 | -0.000109 | 0.005477    | 0.0165144 |
| 419 | denovo92463 | p__Firmicutes     | 0.0000609 | 5.7109E-6 | 0.0000552 | -0.000055 | 0.004601    | 0.0147791 |
| 420 | denovo92637 | p__Bacteroidetes  | 0.0011984 | 0.0024442 | -0.001246 | 0.0012459 | 0.035874    | 0.0371008 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample.

| SI No. | Operational Taxonomic Unit | Phylum | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value | FDR |
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|

|     |             |                   |           |           |           |           |             |           |
|-----|-------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 421 | denovo92706 | p__Firmicutes     | 0.0000242 | 0         | 0.0000242 | -0.000024 | 0.010836    | 0.0201715 |
| 422 | denovo93005 | p__Firmicutes     | 0.0000316 | 3.4858E-6 | 0.0000281 | -0.000028 | 0.000877    | 0.0056635 |
| 423 | denovo93036 | p__Proteobacteria | 9.4046E-7 | 0.0000127 | -0.000012 | 0.0000117 | 0.018576    | 0.030734  |
| 424 | denovo93225 | p__Proteobacteria | 9.9809E-7 | 0.0000194 | -0.000018 | 0.0000184 | 0.003096    | 0.0108688 |
| 425 | denovo93241 | p__Firmicutes     | 0.0000861 | 4.6035E-6 | 0.0000815 | -0.000082 | 0.000021650 | 0.0006237 |
| 426 | denovo93485 | p__Firmicutes     | 0.000063  | 2.3153E-6 | 0.0000607 | -0.000061 | 0.001342    | 0.0072509 |
| 427 | denovo93532 | p__Proteobacteria | 0         | 0.0000124 | -0.000012 | 0.0000124 | 0.010836    | 0.0201715 |
| 428 | denovo94269 | p__Firmicutes     | 0.0000146 | 3.8247E-7 | 0.0000142 | -0.000014 | 0.032508    | 0.0344837 |
| 429 | denovo94369 | p__Firmicutes     | 0.0020783 | 0.0112312 | -0.009153 | 0.0091529 | 0.000075776 | 0.0014477 |
| 430 | denovo94393 | p__Firmicutes     | 0.0004044 | 0.0000303 | 0.000374  | -0.000374 | 0.036946    | 0.0381874 |
| 431 | denovo94898 | p__Firmicutes     | 0.0000153 | 1.2422E-6 | 0.0000141 | -0.000014 | 0.007859    | 0.0201715 |
| 432 | denovo94913 | p__Firmicutes     | 0.0000632 | 0         | 0.0000632 | -0.000063 | 0.000714    | 0.0047523 |
| 433 | denovo95057 | p__Actinobacteria | 0.0000705 | 0         | 0.0000705 | -0.00007  | 0.010836    | 0.0201715 |
| 434 | denovo95269 | p__Proteobacteria | 0         | 0.0000262 | -0.000026 | 0.0000262 | 0.000714    | 0.0047523 |
| 435 | denovo95416 | p__Firmicutes     | 0.0000325 | 5.8258E-6 | 0.0000267 | -0.000027 | 0.026911    | 0.0344837 |
| 436 | denovo95494 | p__Firmicutes     | 0.000068  | 0         | 0.000068  | -0.000068 | 0.010836    | 0.0201715 |
| 437 | denovo95689 | p__Actinobacteria | 0.0001945 | 0         | 0.0001945 | -0.000195 | 0.010836    | 0.0201715 |
| 438 | denovo95886 | p__Firmicutes     | 9.82E-6   | 0         | 9.82E-6   | -9.82E-6  | 0.010836    | 0.0201715 |
| 439 | denovo95992 | p__Proteobacteria | 0         | 6.8936E-6 | -6.894E-6 | 6.8936E-6 | 0.032508    | 0.0344837 |
| 440 | denovo96167 | p__Firmicutes     | 0.0000112 | 0.002034  | -0.002023 | 0.0020229 | 0.021975    | 0.0344837 |
| 441 | denovo97186 | p__Proteobacteria | 0.0002137 | 0.0004819 | -0.000268 | 0.0002681 | 0.041731    | 0.0424031 |
| 442 | denovo97282 | p__Bacteroidetes  | 1.0973E-6 | 0.0004623 | -0.000461 | 0.0004612 | 0.003096    | 0.0108688 |
| 443 | denovo97380 | p__Firmicutes     | 0.000011  | 0         | 0.000011  | -0.000011 | 0.032508    | 0.0344837 |
| 444 | denovo98230 | p__Firmicutes     | 0.0000926 | 1.1109E-6 | 0.0000914 | -0.000091 | 0.007859    | 0.0201715 |
| 445 | denovo98258 | p__Firmicutes     | 0         | 0.0000504 | -0.00005  | 0.0000504 | 0.032508    | 0.0344837 |

|     |             |               |           |           |           |           |          |           |
|-----|-------------|---------------|-----------|-----------|-----------|-----------|----------|-----------|
| 446 | denovo98584 | p__Firmicutes | 0.0000311 | 3.3255E-6 | 0.0000278 | -0.000028 | 0.021553 | 0.0344837 |
| 447 | denovo98776 | p__Firmicutes | 0.0000117 | 0         | 0.0000117 | -0.000012 | 0.032508 | 0.0344837 |
| 448 | denovo98953 | p__Firmicutes | 0.0000535 | 8.6618E-6 | 0.0000448 | -0.000045 | 0.034056 | 0.0354016 |
| 449 | denovo99015 | p__Firmicutes | 0         | 0.0000124 | -0.000012 | 0.0000124 | 0.032508 | 0.0344837 |
| 450 | denovo99127 | p__Firmicutes | 0.0000166 | 0         | 0.0000166 | -0.000017 | 0.010836 | 0.0201715 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 451    | denovo99228                | p__Firmicutes     | 0.000038    | 4.71E-7        | 0.0000375 | -0.000038 | 0.032508 | 0.0344837 |
| 452    | denovo99354                | p__Firmicutes     | 0           | 0.0000122      | -0.000012 | 0.0000122 | 0.032508 | 0.0344837 |
| 453    | denovo99626                | p__Bacteroidetes  | 0           | 0.000099       | -0.000099 | 0.000099  | 0.010836 | 0.0201715 |
| 454    | denovo99822                | p__Firmicutes     | 0.0000225   | 0              | 0.0000225 | -0.000023 | 0.010836 | 0.0201715 |
| 455    | denovo100220               | p__Firmicutes     | 0           | 0.0000651      | -0.000065 | 0.0000651 | 0.010836 | 0.0201715 |
| 456    | denovo100363               | p__Actinobacteria | 0.0000332   | 0              | 0.0000332 | -0.000033 | 0.032508 | 0.0344837 |
| 457    | denovo100459               | p__Actinobacteria | 9.4046E-7   | 0.0001498      | -0.000149 | 0.0001489 | 0.003096 | 0.0108688 |
| 458    | denovo100524               | p__Firmicutes     | 0.000017    | 0              | 0.000017  | -0.000017 | 0.032508 | 0.0344837 |
| 459    | denovo100990               | p__Proteobacteria | 0           | 0.0000115      | -0.000012 | 0.0000115 | 0.010836 | 0.0201715 |
| 460    | denovo101089               | p__Firmicutes     | 0.0006163   | 0              | 0.0006163 | -0.000616 | 0.003096 | 0.0108688 |
| 461    | denovo101164               | p__Firmicutes     | 0.0000362   | 1.1109E-6      | 0.0000351 | -0.000035 | 0.010836 | 0.0201715 |
| 462    | denovo101304               | p__Firmicutes     | 0.0009404   | 0.007799       | -0.006859 | 0.0068586 | 0.000487 | 0.0043769 |

|     |              |                   |           |           |           |           |             |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 463 | denovo101603 | p__Firmicutes     | 0.0001023 | 0         | 0.0001023 | -0.000102 | 0.003096    | 0.0108688 |
| 464 | denovo101678 | p__Firmicutes     | 0.000153  | 5.0957E-6 | 0.0001479 | -0.000148 | 0.000010825 | 0.000517  |
| 465 | denovo101789 | p__Proteobacteria | 1.6242E-6 | 0.0000173 | -0.000016 | 0.0000157 | 0.012622    | 0.0225927 |
| 466 | denovo102237 | p__Firmicutes     | 0.0000185 | 0         | 0.0000185 | -0.000019 | 0.032508    | 0.0344837 |
| 467 | denovo102703 | p__Firmicutes     | 0.0000108 | 0         | 0.0000108 | -0.000011 | 0.032508    | 0.0344837 |
| 468 | denovo102843 | p__Firmicutes     | 7.8536E-6 | 0         | 7.8536E-6 | -7.854E-6 | 0.032508    | 0.0344837 |
| 469 | denovo102928 | p__Proteobacteria | 1.6242E-6 | 0.0000206 | -0.000019 | 0.000019  | 0.003096    | 0.0108688 |
| 470 | denovo103125 | p__Proteobacteria | 0.0002079 | 0.0048466 | -0.004639 | 0.0046387 | 0.029985    | 0.0344837 |
| 471 | denovo103429 | p__Firmicutes     | 0.0000495 | 0         | 0.0000495 | -0.00005  | 0.000714    | 0.0047523 |
| 472 | denovo103464 | p__Proteobacteria | 2.5839E-6 | 0.0000398 | -0.000037 | 0.0000372 | 0.007859    | 0.0201715 |
| 473 | denovo103695 | p__Firmicutes     | 0.0000621 | 1.7955E-6 | 0.0000603 | -0.00006  | 0.001256    | 0.007078  |
| 474 | denovo104429 | p__Proteobacteria | 7.2125E-6 | 0.000057  | -0.00005  | 0.0000498 | 0.026262    | 0.0344837 |
| 475 | denovo104814 | p__Firmicutes     | 0.0001773 | 3.3949E-6 | 0.0001739 | -0.000174 | 0.018576    | 0.030734  |
| 476 | denovo105272 | p__Firmicutes     | 0.000013  | 0         | 0.000013  | -0.000013 | 0.010836    | 0.0201715 |
| 477 | denovo105568 | p__Firmicutes     | 0         | 8.2907E-6 | -8.291E-6 | 8.2907E-6 | 0.032508    | 0.0344837 |
| 478 | denovo105950 | p__Firmicutes     | 0.0000248 | 0         | 0.0000248 | -0.000025 | 0.003096    | 0.0108688 |
| 479 | denovo106420 | p__Firmicutes     | 0.0000103 | 0.0014173 | -0.001407 | 0.001407  | 0.002457    | 0.0108688 |
| 480 | denovo106507 | p__Actinobacteria | 0.0000326 | 6.7758E-7 | 0.0000319 | -0.000032 | 0.032508    | 0.0344837 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value | FDR |
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|



|     |              |                   |           |           |           |           |             |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 481 | denovo106536 | p__Actinobacteria | 0.0006441 | 0.004871  | -0.004227 | 0.004227  | 0.000725    | 0.0047523 |
| 482 | denovo106784 | p__Proteobacteria | 2.5839E-6 | 0.0000462 | -0.000044 | 0.0000436 | 0.034056    | 0.0354016 |
| 483 | denovo106802 | p__Proteobacteria | 0         | 7.9963E-6 | -7.996E-6 | 7.9963E-6 | 0.032508    | 0.0344837 |
| 484 | denovo106891 | p__Firmicutes     | 0.0000246 | 1.6037E-6 | 0.0000229 | -0.000023 | 0.001256    | 0.007078  |
| 485 | denovo106995 | p__Proteobacteria | 0         | 0.0000185 | -0.000019 | 0.0000185 | 0.032508    | 0.0344837 |
| 486 | denovo107114 | p__Proteobacteria | 0         | 0.000016  | -0.000016 | 0.000016  | 0.032508    | 0.0344837 |
| 487 | denovo107153 | p__Bacteroidetes  | 0.00045   | 0.0033342 | -0.002884 | 0.0028843 | 0.011258    | 0.020808  |
| 488 | denovo107274 | p__Proteobacteria | 0         | 0.0000141 | -0.000014 | 0.0000141 | 0.032508    | 0.0344837 |
| 489 | denovo107749 | p__Firmicutes     | 0.0001208 | 0.0003438 | -0.000223 | 0.0002231 | 0.031555    | 0.0344837 |
| 490 | denovo107992 | p__Proteobacteria | 0.0002959 | 0.0032724 | -0.002977 | 0.0029766 | 0.000075776 | 0.0014477 |
| 491 | denovo108113 | p__Bacteroidetes  | 0.0000635 | 7.951E-6  | 0.0000555 | -0.000056 | 0.041460    | 0.0422279 |
| 492 | denovo108357 | p__Proteobacteria | 0         | 7.668E-6  | -7.668E-6 | 7.668E-6  | 0.032508    | 0.0344837 |
| 493 | denovo108745 | p__Firmicutes     | 3.4894E-6 | 0.0002749 | -0.000271 | 0.0002715 | 0.012135    | 0.0221133 |
| 494 | denovo109201 | p__Bacteroidetes  | 0.0020543 | 0.0051167 | -0.003062 | 0.0030624 | 0.018424    | 0.030734  |
| 495 | denovo109718 | p__Firmicutes     | 0.0000131 | 0         | 0.0000131 | -0.000013 | 0.010836    | 0.0201715 |
| 496 | denovo110147 | p__Firmicutes     | 0.0000224 | 0         | 0.0000224 | -0.000022 | 0.032508    | 0.0344837 |
| 497 | denovo110377 | p__Proteobacteria | 0.0001258 | 0.004031  | -0.003905 | 0.0039052 | 0.005889    | 0.0175794 |
| 498 | denovo110459 | p__Firmicutes     | 0.0000202 | 0         | 0.0000202 | -0.00002  | 0.032508    | 0.0344837 |
| 499 | denovo110644 | p__Firmicutes     | 0.0000307 | 0         | 0.0000307 | -0.000031 | 0.003096    | 0.0108688 |
| 500 | denovo110820 | p__Proteobacteria | 0         | 8.4526E-6 | -8.453E-6 | 8.4526E-6 | 0.010836    | 0.0201715 |
| 501 | denovo110937 | p__Firmicutes     | 0.0000675 | 4.0339E-6 | 0.0000634 | -0.000063 | 0.012622    | 0.0225927 |
| 502 | denovo111239 | p__Proteobacteria | 3.938E-6  | 0.000052  | -0.000048 | 0.000048  | 0.003572    | 0.0121645 |
| 503 | denovo111476 | p__Proteobacteria | 6.9698E-6 | 0.0000871 | -0.00008  | 0.0000802 | 0.003226    | 0.0112595 |
| 504 | denovo111609 | p__Firmicutes     | 7.089E-7  | 0.0001962 | -0.000196 | 0.0001955 | 0.018576    | 0.030734  |
| 505 | denovo111639 | p__Firmicutes     | 0.0001764 | 6.6679E-6 | 0.0001698 | -0.00017  | 0.004330    | 0.0141349 |

|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 506 | denovo112161 | p__Proteobacteria | 0.00099   | 0.0006613 | 0.0003287 | -0.000329 | 0.004601 | 0.0147791 |
| 507 | denovo112230 | p__Firmicutes     | 0.0000194 | 0         | 0.0000194 | -0.000019 | 0.032508 | 0.0344837 |
| 508 | denovo112473 | p__Proteobacteria | 0.0000354 | 0.0017912 | -0.001756 | 0.0017558 | 0.030722 | 0.0344837 |
| 509 | denovo112696 | p__Firmicutes     | 0.0000118 | 7.3347E-7 | 0.000011  | -0.000011 | 0.032508 | 0.0344837 |
| 510 | denovo113330 | p__Proteobacteria | 0         | 0.0000108 | -0.000011 | 0.0000108 | 0.032508 | 0.0344837 |

The 2-sided p-value is presented.

|  |  |               |
|--|--|---------------|
|  |  | Page 18 of 61 |
| Table S8   |  |               |
| Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample. |  |               |

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 511    | denovo113561               | p__Proteobacteria | 0           | 0.0000102      | -0.00001  | 0.0000102 | 0.032508    | 0.0344837 |
| 512    | denovo113601               | p__Firmicutes     | 0.0000197   | 0              | 0.0000197 | -0.00002  | 0.010836    | 0.0201715 |
| 513    | denovo113648               | p__Firmicutes     | 0.0000364   | 0              | 0.0000364 | -0.000036 | 0.003096    | 0.0108688 |
| 514    | denovo113807               | p__Proteobacteria | 0.0004522   | 0.0060753      | -0.005623 | 0.005623  | 0.000043300 | 0.0009948 |
| 515    | denovo114036               | p__Firmicutes     | 0.0000304   | 4.4432E-6      | 0.0000259 | -0.000026 | 0.004016    | 0.0131338 |
| 516    | denovo114057               | p__Firmicutes     | 0.0000117   | 0              | 0.0000117 | -0.000012 | 0.010836    | 0.0201715 |
| 517    | denovo114294               | p__Firmicutes     | 0.0000313   | 1.9643E-6      | 0.0000294 | -0.000029 | 0.006668    | 0.0190297 |
| 518    | denovo114539               | p__Firmicutes     | 0.0001199   | 8.9202E-6      | 0.000111  | -0.000111 | 0.000206    | 0.0024559 |
| 519    | denovo114852               | p__Actinobacteria | 0.0001802   | 3.4647E-6      | 0.0001767 | -0.000177 | 0.018576    | 0.030734  |
| 520    | denovo114859               | p__Firmicutes     | 0.000195    | 0.0024811      | -0.002286 | 0.0022861 | 0.025612    | 0.0344837 |
| 521    | denovo114860               | p__Actinobacteria | 0.0000281   | 0              | 0.0000281 | -0.000028 | 0.010836    | 0.0201715 |
| 522    | denovo114897               | p__Firmicutes     | 7.089E-7    | 0.0003535      | -0.000353 | 0.0003528 | 0.018576    | 0.030734  |

|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 523 | denovo115427 | p__Firmicutes     | 0.000205  | 0.0000126 | 0.0001924 | -0.000192 | 0.005185 | 0.0160388 |
| 524 | denovo115655 | p__Bacteroidetes  | 3.2484E-6 | 0.0000121 | -8.859E-6 | 8.8593E-6 | 0.049536 | 0.0495356 |
| 525 | denovo115856 | p__Firmicutes     | 0.0000136 | 0         | 0.0000136 | -0.000014 | 0.032508 | 0.0344837 |
| 526 | denovo115980 | p__Firmicutes     | 0         | 0.0003633 | -0.000363 | 0.0003633 | 0.032508 | 0.0344837 |
| 527 | denovo116262 | p__Proteobacteria | 0         | 0.0000155 | -0.000015 | 0.0000155 | 0.000714 | 0.0047523 |
| 528 | denovo116885 | p__Proteobacteria | 1.84E-6   | 0.0000124 | -0.000011 | 0.0000105 | 0.017385 | 0.0298806 |
| 529 | denovo117556 | p__Firmicutes     | 0.0000892 | 5.6857E-6 | 0.0000835 | -0.000084 | 0.021553 | 0.0344837 |
| 530 | denovo118205 | p__Firmicutes     | 5.1678E-6 | 0.0004699 | -0.000465 | 0.0004647 | 0.018576 | 0.030734  |
| 531 | denovo118627 | p__Firmicutes     | 0.0000172 | 1.1109E-6 | 0.0000161 | -0.000016 | 0.018576 | 0.030734  |
| 532 | denovo118954 |                   | 0.0000976 | 0         | 0.0000976 | -0.000098 | 0.000714 | 0.0047523 |
| 533 | denovo118972 | p__Firmicutes     | 7.3641E-6 | 0         | 7.3641E-6 | -7.364E-6 | 0.032508 | 0.0344837 |
| 534 | denovo119132 | p__Firmicutes     | 0.0000186 | 0         | 0.0000186 | -0.000019 | 0.010836 | 0.0201715 |
| 535 | denovo119802 | p__Proteobacteria | 7.7252E-6 | 0.0001318 | -0.000124 | 0.0001241 | 0.000119 | 0.0018162 |
| 536 | denovo119854 | p__Firmicutes     | 7.4418E-6 | 0         | 7.4418E-6 | -7.442E-6 | 0.032508 | 0.0344837 |
| 537 | denovo120018 | p__Actinobacteria | 0.0000512 | 7.3347E-7 | 0.0000504 | -0.00005  | 0.003096 | 0.0108688 |
| 538 | denovo120104 | p__Firmicutes     | 0         | 6.7767E-6 | -6.777E-6 | 6.7767E-6 | 0.010836 | 0.0201715 |
| 539 | denovo120722 | p__Actinobacteria | 0.0000141 | 0         | 0.0000141 | -0.000014 | 0.032508 | 0.0344837 |
| 540 | denovo120795 | p__Firmicutes     | 0.0000188 | 0         | 0.0000188 | -0.000019 | 0.010836 | 0.0201715 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value | FDR |
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|

|     |              |                   |           |           |           |           |             |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 541 | denovo121023 | p__Firmicutes     | 0.0000261 | 0         | 0.0000261 | -0.000026 | 0.010836    | 0.0201715 |
| 542 | denovo121469 | p__Proteobacteria | 6.1467E-6 | 0.0000246 | -0.000018 | 0.0000185 | 0.020481    | 0.0335498 |
| 543 | denovo121483 | p__Firmicutes     | 0.0013607 | 0.0000517 | 0.001309  | -0.001309 | 0.000010825 | 0.000517  |
| 544 | denovo121589 | p__Bacteroidetes  | 0.0004469 | 8.5346E-7 | 0.0004461 | -0.000446 | 0.010836    | 0.0201715 |
| 545 | denovo122374 | p__Firmicutes     | 0.0000289 | 0         | 0.0000289 | -0.000029 | 0.003096    | 0.0108688 |
| 546 | denovo122385 | p__Firmicutes     | 0.0001262 | 5.6332E-6 | 0.0001205 | -0.000121 | 0.000693    | 0.0047523 |
| 547 | denovo122767 | p__Firmicutes     | 0.0000705 | 3.6012E-6 | 0.0000669 | -0.000067 | 0.012622    | 0.0225927 |
| 548 | denovo123263 | p__Actinobacteria | 0.0000337 | 1.7324E-6 | 0.000032  | -0.000032 | 0.032508    | 0.0344837 |
| 549 | denovo123377 | p__Bacteroidetes  | 0.0006506 | 0.0120973 | -0.011447 | 0.0114466 | 0.000021650 | 0.0006237 |
| 550 | denovo123821 | p__Actinobacteria | 0.0000335 | 0         | 0.0000335 | -0.000033 | 0.032508    | 0.0344837 |
| 551 | denovo124029 | p__Firmicutes     | 0.000034  | 0         | 0.000034  | -0.000034 | 0.010836    | 0.0201715 |
| 552 | denovo124528 | p__Proteobacteria | 2.5839E-6 | 0.0000112 | -8.654E-6 | 8.6543E-6 | 0.049536    | 0.0495356 |
| 553 | denovo124827 | p__Actinobacteria | 0.0002801 | 0.0000133 | 0.0002668 | -0.000267 | 0.006452    | 0.0189788 |
| 554 | denovo124984 | p__Bacteroidetes  | 0.0034343 | 0.0001468 | 0.0032875 | -0.003287 | 0.007058    | 0.0197688 |
| 555 | denovo124989 | p__Proteobacteria | 3.4275E-6 | 0.0000273 | -0.000024 | 0.0000239 | 0.016194    | 0.0281809 |
| 556 | denovo125266 | p__Actinobacteria | 0.0001556 | 0         | 0.0001556 | -0.000156 | 0.010836    | 0.0201715 |
| 557 | denovo125719 | p__Proteobacteria | 2.5839E-6 | 0.0000208 | -0.000018 | 0.0000182 | 0.015004    | 0.0263616 |
| 558 | denovo125792 | p__Actinobacteria | 0.0000186 | 0         | 0.0000186 | -0.000019 | 0.032508    | 0.0344837 |
| 559 | denovo125933 | p__Firmicutes     | 0.0000301 | 0         | 0.0000301 | -0.00003  | 0.032508    | 0.0344837 |
| 560 | denovo125936 | p__Actinobacteria | 0.0000189 | 0         | 0.0000189 | -0.000019 | 0.032508    | 0.0344837 |
| 561 | denovo126005 | p__Firmicutes     | 0.0000165 | 3.9927E-7 | 0.0000161 | -0.000016 | 0.032508    | 0.0344837 |
| 562 | denovo126007 | p__Firmicutes     | 0.0000694 | 1.7324E-6 | 0.0000677 | -0.000068 | 0.018576    | 0.030734  |
| 563 | denovo126124 | p__Firmicutes     | 0.0000312 | 0         | 0.0000312 | -0.000031 | 0.010836    | 0.0201715 |
| 564 | denovo127019 | p__Firmicutes     | 4.0674E-6 | 0.0011232 | -0.001119 | 0.0011192 | 0.006668    | 0.0190297 |
| 565 | denovo127021 | p__Proteobacteria | 0.0003977 | 0.0045733 | -0.004176 | 0.0041756 | 0.000487    | 0.0043769 |

|     |              |                  |           |           |           |           |          |           |
|-----|--------------|------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 566 | denovo127082 | p__Firmicutes    | 0.000011  | 0.0008107 | -0.0008   | 0.0007998 | 0.034056 | 0.0354016 |
| 567 | denovo127273 | p__Firmicutes    | 0.0000135 | 4.71E-7   | 0.0000131 | -0.000013 | 0.032508 | 0.0344837 |
| 568 | denovo127398 | p__Bacteroidetes | 0.0001795 | 0         | 0.0001795 | -0.000179 | 0.010836 | 0.0201715 |
| 569 | denovo127493 | p__Bacteroidetes | 0.0000258 | 0.0001207 | -0.000095 | 0.0000949 | 0.049536 | 0.0495356 |
| 570 | denovo127602 | p__Firmicutes    | 1.4178E-6 | 0.0000713 | -0.00007  | 0.0000699 | 0.032508 | 0.0344837 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 571    | denovo127666               | p__Proteobacteria | 0           | 0.0000394      | -0.000039 | 0.0000394 | 0.032508 | 0.0344837 |
| 572    | denovo127704               | p__Proteobacteria | 0.0001237   | 0.0011468      | -0.001023 | 0.001023  | 0.001494 | 0.007859  |
| 573    | denovo127945               | p__Firmicutes     | 0.000022    | 0              | 0.000022  | -0.000022 | 0.032508 | 0.0344837 |
| 574    | denovo127988               | p__Actinobacteria | 0.0000119   | 0              | 0.0000119 | -0.000012 | 0.032508 | 0.0344837 |
| 575    | denovo128163               | p__Bacteroidetes  | 0.0000849   | 2.5219E-6      | 0.0000824 | -0.000082 | 0.000173 | 0.0022138 |
| 576    | denovo128367               | p__Proteobacteria | 0.0000837   | 0.0007754      | -0.000692 | 0.0006917 | 0.047403 | 0.0477186 |
| 577    | denovo128623               | p__Proteobacteria | 0.0000652   | 0.0010227      | -0.000957 | 0.0009575 | 0.013564 | 0.0241356 |
| 578    | denovo128646               |                   | 8.4355E-7   | 0.0001045      | -0.000104 | 0.0001036 | 0.000714 | 0.0047523 |
| 579    | denovo128796               | p__Proteobacteria | 0           | 0.0000123      | -0.000012 | 0.0000123 | 0.032508 | 0.0344837 |
| 580    | denovo128805               | p__Firmicutes     | 0.0000739   | 8.6129E-6      | 0.0000653 | -0.000065 | 0.005889 | 0.0175794 |
| 581    | denovo128843               | p__Firmicutes     | 0.0000522   | 0.001361       | -0.001309 | 0.0013088 | 0.001797 | 0.0092656 |
| 582    | denovo129306               | p__Firmicutes     | 0.0000119   | 0              | 0.0000119 | -0.000012 | 0.032508 | 0.0344837 |
| 583    | denovo129812               | p__Firmicutes     | 0.0000263   | 0              | 0.0000263 | -0.000026 | 0.032508 | 0.0344837 |

|     |              |                   |           |           |           |           |             |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 584 | denovo130461 | p__Bacteroidetes  | 0         | 0.0000524 | -0.000052 | 0.0000524 | 0.010836    | 0.0201715 |
| 585 | denovo130948 | p__Firmicutes     | 0.0000132 | 0         | 0.0000132 | -0.000013 | 0.010836    | 0.0201715 |
| 586 | denovo131305 | p__Proteobacteria | 0.0012047 | 0.0097057 | -0.008501 | 0.0085011 | 0.001050    | 0.0062281 |
| 587 | denovo131407 | p__Actinobacteria | 0.0000225 | 0         | 0.0000225 | -0.000023 | 0.032508    | 0.0344837 |
| 588 | denovo131484 | p__Proteobacteria | 0.0045313 | 0.0317257 | -0.027194 | 0.0271944 | 0.006841    | 0.0192515 |
| 589 | denovo131867 | p__Cyanobacteria  | 0.0002424 | 0.0008913 | -0.000649 | 0.000649  | 0.017223    | 0.0297141 |
| 590 | denovo131954 | p__Firmicutes     | 0.0000684 | 0         | 0.0000684 | -0.000068 | 0.010836    | 0.0201715 |
| 591 | denovo131968 | p__Bacteroidetes  | 0.0002246 | 0.0033629 | -0.003138 | 0.0031383 | 0.000043300 | 0.0009948 |
| 592 | denovo132341 | p__Actinobacteria | 0.0000248 | 6.7758E-7 | 0.0000242 | -0.000024 | 0.032508    | 0.0344837 |
| 593 | denovo132410 | p__Firmicutes     | 0.0000121 | 0         | 0.0000121 | -0.000012 | 0.032508    | 0.0344837 |
| 594 | denovo132522 | p__Firmicutes     | 0.0000247 | 1.8443E-6 | 0.0000229 | -0.000023 | 0.030483    | 0.0344837 |
| 595 | denovo132540 | p__Firmicutes     | 0.0000418 | 0         | 0.0000418 | -0.000042 | 0.032508    | 0.0344837 |
| 596 | denovo132570 | p__Firmicutes     | 0.0000156 | 0         | 0.0000156 | -0.000016 | 0.010836    | 0.0201715 |
| 597 | denovo133399 | p__Proteobacteria | 0.000487  | 0.0042131 | -0.003726 | 0.0037262 | 0.000075776 | 0.0014477 |
| 598 | denovo133563 | p__Firmicutes     | 0.0000593 | 4.1591E-6 | 0.0000552 | -0.000055 | 0.016974    | 0.0293403 |
| 599 | denovo133661 | p__Firmicutes     | 0.0000114 | 4.71E-7   | 0.0000109 | -0.000011 | 0.010836    | 0.0201715 |
| 600 | denovo133750 | p__Proteobacteria | 0.000114  | 0.0005129 | -0.000399 | 0.0003989 | 0.004980    | 0.0156907 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value | FDR |
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|

|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 601 | denovo133779 | p__Firmicutes     | 0.0000251 | 0         | 0.0000251 | -0.000025 | 0.010836 | 0.0201715 |
| 602 | denovo133797 | p__Firmicutes     | 0.0000635 | 7.3347E-7 | 0.0000628 | -0.000063 | 0.001310 | 0.0071392 |
| 603 | denovo134589 | p__Bacteroidetes  | 9.2987E-6 | 0.0000475 | -0.000038 | 0.0000382 | 0.041200 | 0.0419868 |
| 604 | denovo134640 | p__Firmicutes     | 0.0000544 | 1.2527E-6 | 0.0000532 | -0.000053 | 0.001256 | 0.007078  |
| 605 | denovo134778 | p__Proteobacteria | 0         | 0.000018  | -0.000018 | 0.000018  | 0.032508 | 0.0344837 |
| 606 | denovo134796 | p__Firmicutes     | 4.0076E-6 | 0.0005736 | -0.00057  | 0.0005696 | 0.006668 | 0.0190297 |
| 607 | denovo135124 |                   | 0         | 0.0005607 | -0.000561 | 0.0005607 | 0.010836 | 0.0201715 |
| 608 | denovo135581 | p__Actinobacteria | 0.0000143 | 0         | 0.0000143 | -0.000014 | 0.032508 | 0.0344837 |
| 609 | denovo135845 | p__Actinobacteria | 0.0000345 | 0         | 0.0000345 | -0.000035 | 0.032508 | 0.0344837 |
| 610 | denovo135933 | p__Bacteroidetes  | 9.9809E-7 | 0.0000547 | -0.000054 | 0.0000537 | 0.026316 | 0.0344837 |
| 611 | denovo136328 | p__Bacteroidetes  | 0.000074  | 0.0005506 | -0.000477 | 0.0004765 | 0.016974 | 0.0293403 |
| 612 | denovo136439 | p__Firmicutes     | 0.0001536 | 0.0022216 | -0.002068 | 0.002068  | 0.002078 | 0.0101119 |
| 613 | denovo136663 | p__Firmicutes     | 1.0746E-6 | 0.0000227 | -0.000022 | 0.0000216 | 0.007859 | 0.0201715 |
| 614 | denovo136808 | p__Bacteroidetes  | 0.0000873 | 0.0026758 | -0.002589 | 0.0025885 | 0.003865 | 0.01287   |
| 615 | denovo137007 | p__Firmicutes     | 0.000044  | 1.2982E-6 | 0.0000427 | -0.000043 | 0.003096 | 0.0108688 |
| 616 | denovo137044 | p__Actinobacteria | 0.0324707 | 0.0003441 | 0.0321266 | -0.032127 | 0.011734 | 0.0215566 |
| 617 | denovo137469 | p__Firmicutes     | 0.0000293 | 0         | 0.0000293 | -0.000029 | 0.010836 | 0.0201715 |
| 618 | denovo137547 | p__Firmicutes     | 0.0000313 | 0         | 0.0000313 | -0.000031 | 0.032508 | 0.0344837 |
| 619 | denovo137824 | p__Firmicutes     | 0.0000162 | 0         | 0.0000162 | -0.000016 | 0.010836 | 0.0201715 |
| 620 | denovo137913 | p__Firmicutes     | 0         | 0.0000398 | -0.00004  | 0.0000398 | 0.003096 | 0.0108688 |
| 621 | denovo138025 | p__Firmicutes     | 0.0000142 | 0         | 0.0000142 | -0.000014 | 0.032508 | 0.0344837 |
| 622 | denovo138113 | p__Proteobacteria | 0.0010786 | 0.0074248 | -0.006346 | 0.0063462 | 0.000325 | 0.0033875 |
| 623 | denovo138141 | p__Firmicutes     | 0.0000753 | 2.0465E-6 | 0.0000733 | -0.000073 | 0.002934 | 0.0108688 |
| 624 | denovo138187 | p__Firmicutes     | 0.0000167 | 0         | 0.0000167 | -0.000017 | 0.032508 | 0.0344837 |
| 625 | denovo138333 | p__Bacteroidetes  | 0.0004487 | 0.0040785 | -0.00363  | 0.0036298 | 0.008855 | 0.0201715 |
| 626 | denovo138473 | p__Firmicutes     | 0.0000125 |           |           |           |          |           |

|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|     |              |                   |           | 7.3347E-7 | 0.0000118 | -0.000012 | 0.032508 | 0.0344837 |
| 627 | denovo138515 | p__Proteobacteria | 0         | 0.0000126 | -0.000013 | 0.0000126 | 0.032508 | 0.0344837 |
| 628 | denovo138538 | p__Firmicutes     | 0.0000792 | 7.3998E-6 | 0.0000718 | -0.000072 | 0.000130 | 0.0018277 |
| 629 | denovo139197 | p__Bacteroidetes  | 0.0000225 | 0         | 0.0000225 | -0.000022 | 0.010836 | 0.0201715 |
| 630 | denovo139254 | p__Firmicutes     | 0.0000202 | 0         | 0.0000202 | -0.00002  | 0.003096 | 0.0108688 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 631    | denovo139285               | p__Firmicutes     | 0.000133    | 8.4063E-6      | 0.0001246 | -0.000125 | 0.000054125 | 0.0012128 |
| 632    | denovo139286               | p__Firmicutes     | 0.0000162   | 0              | 0.0000162 | -0.000016 | 0.032508    | 0.0344837 |
| 633    | denovo139664               | p__Proteobacteria | 0           | 0.0000247      | -0.000025 | 0.0000247 | 0.003096    | 0.0108688 |
| 634    | denovo140376               | p__Proteobacteria | 0           | 0.0000137      | -0.000014 | 0.0000137 | 0.032508    | 0.0344837 |
| 635    | denovo140429               | p__Firmicutes     | 0.0000749   | 0              | 0.0000749 | -0.000075 | 0.032508    | 0.0344837 |
| 636    | denovo140585               | p__Firmicutes     | 0.0000111   | 0              | 0.0000111 | -0.000011 | 0.032508    | 0.0344837 |
| 637    | denovo140741               | p__Firmicutes     | 0.0000856   | 1.2422E-6      | 0.0000843 | -0.000084 | 0.018576    | 0.030734  |
| 638    | denovo140842               | p__Bacteroidetes  | 0.0000667   | 0.0000125      | 0.0000542 | -0.000054 | 0.014387    | 0.0254996 |
| 639    | denovo141232               | p__Bacteroidetes  | 1.84E-6     | 0.0000884      | -0.000087 | 0.0000866 | 0.000714    | 0.0047523 |
| 640    | denovo141871               | p__Bacteroidetes  | 0.0002051   | 0.0000182      | 0.0001869 | -0.000187 | 0.001028    | 0.0062281 |
| 641    | denovo142145               | p__Proteobacteria | 0.000125    | 0.0007951      | -0.00067  | 0.0006702 | 0.004601    | 0.0147791 |
| 642    | denovo142178               | p__Firmicutes     | 0.00028     | 5.6222E-6      | 0.0002743 | -0.000274 | 0.000281    | 0.003096  |
| 643    | denovo142190               |                   | 7.089E-7    |                |           |           |             |           |



|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|     |              | p__Proteobacteria |           | 0.0000763 | -0.000076 | 0.0000756 | 0.003096 | 0.0108688 |
| 644 | denovo142348 | p__Actinobacteria | 0.0000692 | 1.6974E-6 | 0.0000675 | -0.000068 | 0.032508 | 0.0344837 |
| 645 | denovo142433 | p__Actinobacteria | 0.0000232 | 1.1327E-6 | 0.0000221 | -0.000022 | 0.025125 | 0.0344837 |
| 646 | denovo142928 | p__Firmicutes     | 0.0000296 | 0         | 0.0000296 | -0.00003  | 0.032508 | 0.0344837 |
| 647 | denovo143040 | p__Bacteroidetes  | 0.0000182 | 0         | 0.0000182 | -0.000018 | 0.032508 | 0.0344837 |
| 648 | denovo143561 | p__Firmicutes     | 0.0000142 | 7.3347E-7 | 0.0000135 | -0.000013 | 0.010836 | 0.0201715 |
| 649 | denovo143632 | p__Firmicutes     | 0.0000915 | 4.7967E-6 | 0.0000867 | -0.000087 | 0.000260 | 0.0029471 |
| 650 | denovo143775 | p__Proteobacteria | 0         | 0.0000115 | -0.000012 | 0.0000115 | 0.032508 | 0.0344837 |
| 651 | denovo144056 | p__Firmicutes     | 0.0000158 | 0         | 0.0000158 | -0.000016 | 0.032508 | 0.0344837 |
| 652 | denovo144610 | p__Firmicutes     | 6.9511E-6 | 0         | 6.9511E-6 | -6.951E-6 | 0.032508 | 0.0344837 |
| 653 | denovo144786 | p__Firmicutes     | 0.0000244 | 4.71E-7   | 0.0000239 | -0.000024 | 0.010836 | 0.0201715 |
| 654 | denovo144911 | p__Firmicutes     | 0.0015527 | 0.0100449 | -0.008492 | 0.0084921 | 0.006722 | 0.0190941 |
| 655 | denovo145041 | p__Firmicutes     | 0.0000976 | 7.0388E-6 | 0.0000906 | -0.000091 | 0.000476 | 0.0043769 |
| 656 | denovo145286 | p__Firmicutes     | 0.0000526 | 3.9927E-7 | 0.0000522 | -0.000052 | 0.003096 | 0.0108688 |
| 657 | denovo145482 | p__Firmicutes     | 0.0001878 | 0.0000213 | 0.0001664 | -0.000166 | 0.018424 | 0.030734  |
| 658 | denovo145540 | p__Proteobacteria | 0         | 5.9483E-6 | -5.948E-6 | 5.9483E-6 | 0.032508 | 0.0344837 |
| 659 | denovo145553 | p__Firmicutes     | 0.0000472 | 2.903E-6  | 0.0000443 | -0.000044 | 0.002934 | 0.0108688 |
| 660 | denovo145566 | p__Proteobacteria | 0         | 0.0000151 | -0.000015 | 0.0000151 | 0.003096 | 0.0108688 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value | FDR |
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|

|     |              |                   |           |           |           |           |             |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 661 | denovo145640 | p__Firmicutes     | 0.0004597 | 0.002517  | -0.002057 | 0.0020573 | 0.008498    | 0.0201715 |
| 662 | denovo145752 | p__Firmicutes     | 0.0000328 | 1.2695E-6 | 0.0000316 | -0.000032 | 0.001310    | 0.0071392 |
| 663 | denovo146140 | p__Bacteroidetes  | 0.0000437 | 1.532E-6  | 0.0000421 | -0.000042 | 0.025125    | 0.0344837 |
| 664 | denovo146446 | p__Firmicutes     | 0         | 0.0003122 | -0.000312 | 0.0003122 | 0.010836    | 0.0201715 |
| 665 | denovo146757 | p__Firmicutes     | 0.0000491 | 0         | 0.0000491 | -0.000049 | 0.003096    | 0.0108688 |
| 666 | denovo147109 | p__Firmicutes     | 0.0000244 | 0         | 0.0000244 | -0.000024 | 0.010836    | 0.0201715 |
| 667 | denovo147157 | p__Firmicutes     | 0.0000162 | 0         | 0.0000162 | -0.000016 | 0.032508    | 0.0344837 |
| 668 | denovo147326 | p__Actinobacteria | 0.0000719 | 0         | 0.0000719 | -0.000072 | 0.032508    | 0.0344837 |
| 669 | denovo147404 | p__Firmicutes     | 0.0000925 | 1.7324E-6 | 0.0000907 | -0.000091 | 0.000021650 | 0.0006237 |
| 670 | denovo147472 | p__Bacteroidetes  | 0         | 0.0000395 | -0.000039 | 0.0000395 | 0.032508    | 0.0344837 |
| 671 | denovo147596 | p__Bacteroidetes  | 0         | 0.0000115 | -0.000012 | 0.0000115 | 0.032508    | 0.0344837 |
| 672 | denovo147831 | p__Firmicutes     | 0.0001672 | 0         | 0.0001672 | -0.000167 | 0.032508    | 0.0344837 |
| 673 | denovo148043 | p__Firmicutes     | 0.0000736 | 0         | 0.0000736 | -0.000074 | 0.000119    | 0.0018162 |
| 674 | denovo148480 | p__Firmicutes     | 8.2809E-6 | 0.0003503 | -0.000342 | 0.000342  | 0.040876    | 0.0419868 |
| 675 | denovo148941 | p__Firmicutes     | 0.0000292 | 3.8131E-6 | 0.0000253 | -0.000025 | 0.016194    | 0.0281809 |
| 676 | denovo149205 | p__Firmicutes     | 0.0004612 | 0.000013  | 0.0004482 | -0.000448 | 0.000010825 | 0.000517  |
| 677 | denovo149374 | p__Firmicutes     | 0         | 4.8531E-6 | -4.853E-6 | 4.8531E-6 | 0.032508    | 0.0344837 |
| 678 | denovo149403 | p__Firmicutes     | 0.0019117 | 5.5414E-6 | 0.0019061 | -0.001906 | 0.000010825 | 0.000517  |
| 679 | denovo149488 | p__Proteobacteria | 0.000051  | 0.0005527 | -0.000502 | 0.0005017 | 0.002089    | 0.0101119 |
| 680 | denovo149589 | p__Proteobacteria | 0         | 0.0000127 | -0.000013 | 0.0000127 | 0.032508    | 0.0344837 |
| 681 | denovo149882 | p__Proteobacteria | 1.0746E-6 | 0.0000182 | -0.000017 | 0.0000171 | 0.018576    | 0.030734  |
| 682 | denovo150156 | p__Proteobacteria | 0         | 0.0000243 | -0.000024 | 0.0000243 | 0.010836    | 0.0201715 |
| 683 | denovo150302 | p__Firmicutes     | 0.0000125 | 0         | 0.0000125 | -0.000012 | 0.032508    | 0.0344837 |
| 684 | denovo150329 | p__Actinobacteria | 0.0001172 | 6.2921E-6 | 0.0001109 | -0.000111 | 0.002457    | 0.0108688 |
| 685 | denovo150497 | p__Firmicutes     | 0.0000524 | 0         | 0.0000524 | -0.000052 | 0.010836    | 0.0201715 |

|     |              |               |           |           |           |           |             |           |
|-----|--------------|---------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 686 | denovo150530 | p__Firmicutes | 0.0000227 | 1.1109E-6 | 0.0000216 | -0.000022 | 0.012622    | 0.0225927 |
| 687 | denovo150716 | p__Firmicutes | 0.0000103 | 7.3347E-7 | 9.578E-6  | -9.578E-6 | 0.032508    | 0.0344837 |
| 688 | denovo150863 | p__Firmicutes | 0.0000164 | 6.7758E-7 | 0.0000157 | -0.000016 | 0.032508    | 0.0344837 |
| 689 | denovo151128 | p__Firmicutes | 0.0064056 | 0.0002055 | 0.0062001 | -0.0062   | 0.000021650 | 0.0006237 |
| 690 | denovo151552 | p__Firmicutes | 0.0000276 | 0         | 0.0000276 | -0.000028 | 0.000714    | 0.0047523 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 691    | denovo151558               | p__Proteobacteria | 0           | 0.0000129      | -0.000013 | 0.0000129 | 0.010836 | 0.0201715 |
| 692    | denovo151651               | p__Actinobacteria | 0.0000166   | 0.0001521      | -0.000136 | 0.0001356 | 0.026316 | 0.0344837 |
| 693    | denovo151927               | p__Proteobacteria | 2.5839E-6   | 0.0000155      | -0.000013 | 0.0000129 | 0.041796 | 0.0424031 |
| 694    | denovo152037               | p__Firmicutes     | 0.0004738   | 0.0026272      | -0.002153 | 0.0021533 | 0.002879 | 0.0108688 |
| 695    | denovo152058               | p__Firmicutes     | 0.0000296   | 7.3347E-7      | 0.0000288 | -0.000029 | 0.003096 | 0.0108688 |
| 696    | denovo152253               | p__Proteobacteria | 0           | 0.000015       | -0.000015 | 0.000015  | 0.000714 | 0.0047523 |
| 697    | denovo152353               | p__Actinobacteria | 0.0000218   | 0              | 0.0000218 | -0.000022 | 0.032508 | 0.0344837 |
| 698    | denovo152649               | p__Firmicutes     | 0.0000233   | 8.5346E-7      | 0.0000225 | -0.000022 | 0.010836 | 0.0201715 |
| 699    | denovo152887               | p__Bacteroidetes  | 0.0048409   | 0.0002359      | 0.004605  | -0.004605 | 0.030722 | 0.0344837 |
| 700    | denovo152888               | p__Tenericutes    | 0.0003443   | 0.0028166      | -0.002472 | 0.0024723 | 0.000693 | 0.0047523 |
| 701    | denovo153111               | p__Firmicutes     | 0.000028    | 2.6534E-6      | 0.0000253 | -0.000025 | 0.001678 | 0.008726  |
| 702    | denovo153719               | p__Proteobacteria | 2.5839E-6   | 8.3921E-6      | -5.808E-6 | 5.8081E-6 | 0.049536 | 0.0495356 |
| 703    | denovo154184               | p__Firmicutes     | 0.0000804   | 2.2179E-6      | 0.0000782 | -0.000078 | 0.001256 | 0.007078  |



|     |              |                    |           |           |           |           |             |           |
|-----|--------------|--------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 721 | denovo156722 | p__Actinobacteria  | 0.0008898 | 0.0060943 | -0.005205 | 0.0052046 | 0.001505    | 0.0078703 |
| 722 | denovo156743 | p__Firmicutes      | 0.0000159 | 0         | 0.0000159 | -0.000016 | 0.032508    | 0.0344837 |
| 723 | denovo157605 | p__Actinobacteria  | 0.0000636 | 1.6974E-6 | 0.0000619 | -0.000062 | 0.032508    | 0.0344837 |
| 724 | denovo157931 | p__Firmicutes      | 0.0000126 | 0         | 0.0000126 | -0.000013 | 0.032508    | 0.0344837 |
| 725 | denovo157945 | p__Firmicutes      | 0.0000211 | 0         | 0.0000211 | -0.000021 | 0.032508    | 0.0344837 |
| 726 | denovo158248 | p__Verrucomicrobia | 0.0001844 | 0.0017236 | -0.001539 | 0.0015392 | 0.018424    | 0.030734  |
| 727 | denovo158327 | p__Firmicutes      | 0.0000175 | 0         | 0.0000175 | -0.000018 | 0.010836    | 0.0201715 |
| 728 | denovo158822 | p__Firmicutes      | 0.0000118 | 0         | 0.0000118 | -0.000012 | 0.032508    | 0.0344837 |
| 729 | denovo159241 | p__Proteobacteria  | 0.0039944 | 0.0279688 | -0.023974 | 0.0239744 | 0.000130    | 0.0018277 |
| 730 | denovo159470 | p__Firmicutes      | 0.000027  | 6.7758E-7 | 0.0000263 | -0.000026 | 0.003096    | 0.0108688 |
| 731 | denovo159474 | p__Firmicutes      | 0.0000301 | 2.0327E-6 | 0.000028  | -0.000028 | 0.018576    | 0.030734  |
| 732 | denovo159981 | p__Proteobacteria  | 0.0004279 | 0.0028337 | -0.002406 | 0.0024058 | 0.040194    | 0.0414026 |
| 733 | denovo160120 | p__Firmicutes      | 0.0000353 | 0.0008484 | -0.000813 | 0.0008131 | 0.003572    | 0.0121645 |
| 734 | denovo160469 | p__Firmicutes      | 0.0000231 | 0         | 0.0000231 | -0.000023 | 0.010836    | 0.0201715 |
| 735 | denovo161231 | p__Proteobacteria  | 0.0001665 | 0.0018805 | -0.001714 | 0.001714  | 0.002750    | 0.0108688 |
| 736 | denovo161243 | p__Proteobacteria  | 1.6242E-6 | 0.0000251 | -0.000023 | 0.0000235 | 0.000714    | 0.0047523 |
| 737 | denovo161557 | p__Firmicutes      | 0.0000876 | 5.6895E-6 | 0.0000819 | -0.000082 | 0.000043300 | 0.0009948 |
| 738 | denovo161779 | p__Firmicutes      | 8.4355E-7 | 0.0000957 | -0.000095 | 0.0000948 | 0.010836    | 0.0201715 |
| 739 | denovo161836 | p__Firmicutes      | 0.0000296 | 0         | 0.0000296 | -0.00003  | 0.032508    | 0.0344837 |
| 740 | denovo162169 | p__Firmicutes      | 9.3007E-6 | 0         | 9.3007E-6 | -9.301E-6 | 0.032508    | 0.0344837 |
| 741 | denovo162361 | p__Proteobacteria  | 0         | 0.000016  | -0.000016 | 0.000016  | 0.032508    | 0.0344837 |
| 742 | denovo162539 | p__Firmicutes      | 7.089E-7  | 0.0000289 | -0.000028 | 0.0000282 | 0.010836    | 0.0201715 |
| 743 | denovo162689 | p__Firmicutes      | 0.0000371 | 0         | 0.0000371 | -0.000037 | 0.032508    | 0.0344837 |
| 744 | denovo163243 | p__Actinobacteria  | 0.0000316 | 0.0010593 | -0.001028 | 0.0010277 | 0.000021650 | 0.0006237 |
| 745 | denovo163819 | p__Firmicutes      | 0.0002184 | 0.0000203 | 0.000198  | -0.000198 | 0.000021650 | 0.0006237 |
| 746 | denovo164788 | p__Firmicutes      | 0.0003418 |           |           |           |             | 0.000517  |

|     |              |                  |           |           |           |           |             |           |
|-----|--------------|------------------|-----------|-----------|-----------|-----------|-------------|-----------|
|     |              |                  |           | 3.08E-6   | 0.0003387 | -0.000339 | 0.000010825 |           |
| 747 | denovo164958 | p__Bacteroidetes | 0.0000452 | 0.0043896 | -0.004344 | 0.0043444 | 0.000010825 | 0.000517  |
| 748 | denovo165237 | p__[Thermi]      | 0.0003089 | 0.0091368 | -0.008828 | 0.0088279 | 0.000021650 | 0.0006237 |
| 749 | denovo165262 | p__Bacteroidetes | 0.0001426 | 7.7609E-6 | 0.0001349 | -0.000135 | 0.000595    | 0.0047523 |
| 750 | denovo165415 | p__Firmicutes    | 0.0025922 | 0.0002099 | 0.0023823 | -0.002382 | 0.018110    | 0.030734  |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 751    | denovo165592               | p__Firmicutes     | 0.0000509   | 0              | 0.0000509 | -0.000051 | 0.010836    | 0.0201715 |
| 752    | denovo165678               | p__Firmicutes     | 0.0000472   | 0              | 0.0000472 | -0.000047 | 0.000119    | 0.0018162 |
| 753    | denovo165690               | p__Proteobacteria | 0.0001497   | 0.0017448      | -0.001595 | 0.0015951 | 0.006841    | 0.0192515 |
| 754    | denovo165841               | p__Firmicutes     | 0.0000142   | 4.71E-7        | 0.0000137 | -0.000014 | 0.010836    | 0.0201715 |
| 755    | denovo166273               | p__Proteobacteria | 0.0001519   | 0.0038017      | -0.00365  | 0.0036498 | 0.000206    | 0.0024559 |
| 756    | denovo166477               | p__Firmicutes     | 0.0000382   | 0              | 0.0000382 | -0.000038 | 0.010836    | 0.0201715 |
| 757    | denovo166616               | p__Proteobacteria | 3.4275E-6   | 0.0000447      | -0.000041 | 0.0000413 | 0.005477    | 0.0165144 |
| 758    | denovo166667               | p__Firmicutes     | 1.0746E-6   | 0.0004217      | -0.000421 | 0.0004206 | 0.032508    | 0.0344837 |
| 759    | denovo167087               | p__Firmicutes     | 0.0000182   | 0              | 0.0000182 | -0.000018 | 0.010836    | 0.0201715 |
| 760    | denovo167288               | p__Firmicutes     | 0.0001734   | 9.4521E-6      | 0.000164  | -0.000164 | 0.000021650 | 0.0006237 |
| 761    | denovo167397               | p__Firmicutes     | 0.0002873   | 0.0000103      | 0.0002769 | -0.000277 | 0.000010825 | 0.000517  |
| 762    | denovo167410               | p__Proteobacteria | 6.6599E-6   | 0.0001144      | -0.000108 | 0.0001077 | 0.001342    | 0.0072509 |
| 763    | denovo167534               | p__Actinobacteria | 0.0001206   | 0              | 0.0001206 | -0.000121 | 0.010836    | 0.0201715 |

|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 764 | denovo168133 | p__Proteobacteria | 0.0009571 | 0.0060298 | -0.005073 | 0.0050727 | 0.003886 | 0.0128948 |
| 765 | denovo168337 | p__Proteobacteria | 9.9809E-7 | 0.0000246 | -0.000024 | 0.0000236 | 0.007859 | 0.0201715 |
| 766 | denovo168560 | p__Firmicutes     | 0.000026  | 1.7376E-6 | 0.0000243 | -0.000024 | 0.021553 | 0.0344837 |
| 767 | denovo168724 | p__Proteobacteria | 0         | 7.5666E-6 | -7.567E-6 | 7.5666E-6 | 0.032508 | 0.0344837 |
| 768 | denovo169417 | p__Bacteroidetes  | 0.000719  | 0.0057137 | -0.004995 | 0.0049947 | 0.001018 | 0.0062281 |
| 769 | denovo169695 | p__Firmicutes     | 1.9003E-6 | 0.0008348 | -0.000833 | 0.0008329 | 0.000173 | 0.0022138 |
| 770 | denovo170205 | p__Firmicutes     | 0.0000254 | 1.3476E-6 | 0.000024  | -0.000024 | 0.003096 | 0.0108688 |
| 771 | denovo170212 | p__Firmicutes     | 0.000206  | 8.5407E-6 | 0.0001975 | -0.000197 | 0.002436 | 0.0108688 |
| 772 | denovo170520 | p__Proteobacteria | 0         | 8.1287E-6 | -8.129E-6 | 8.1287E-6 | 0.032508 | 0.0344837 |
| 773 | denovo170680 | p__Firmicutes     | 0.0000751 | 0.0009701 | -0.000895 | 0.0008951 | 0.000704 | 0.0047523 |
| 774 | denovo170878 | p__Proteobacteria | 9.4046E-7 | 0.0000284 | -0.000027 | 0.0000274 | 0.010836 | 0.0201715 |
| 775 | denovo170909 | p__Firmicutes     | 0.0000278 | 4.71E-7   | 0.0000273 | -0.000027 | 0.032508 | 0.0344837 |
| 776 | denovo171095 | p__Firmicutes     | 0.0000292 | 3.3669E-6 | 0.0000258 | -0.000026 | 0.032919 | 0.0348386 |
| 777 | denovo171541 | p__Firmicutes     | 0.0002458 | 0.0021968 | -0.001951 | 0.001951  | 0.000476 | 0.0043769 |
| 778 | denovo171588 | p__Firmicutes     | 0.0000323 | 4.71E-7   | 0.0000319 | -0.000032 | 0.032508 | 0.0344837 |
| 779 | denovo171606 | p__Firmicutes     | 0.0000103 | 0         | 0.0000103 | -0.00001  | 0.032508 | 0.0344837 |
| 780 | denovo171612 | p__Firmicutes     | 0.0002142 | 0.0020064 | -0.001792 | 0.0017921 | 0.046223 | 0.0467642 |

The 2-sided p-value is presented.

|  |                            |        |             |                |       |       |         |               |
|--|----------------------------|--------|-------------|----------------|-------|-------|---------|---------------|
|  |                            |        |             |                |       |       |         | Page 27 of 61 |
| Table S8   |                            |        |             |                |       |       |         |               |
| Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample. |                            |        |             |                |       |       |         |               |
| SI No.   | Operational Taxonomic Unit | Phylum | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value | FDR           |
| 781  | denovo172015               |        | 0.0000827   |                |       |       |         |               |

|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|     |              | p__Bacteroidetes  |           | 4.0388E-6 | 0.0000786 | -0.000079 | 0.003572 | 0.0121645 |
| 782 | denovo172030 | p__Firmicutes     | 0.0000242 | 0         | 0.0000242 | -0.000024 | 0.032508 | 0.0344837 |
| 783 | denovo172214 | p__Proteobacteria | 0         | 0.0000163 | -0.000016 | 0.0000163 | 0.032508 | 0.0344837 |
| 784 | denovo172356 | p__Proteobacteria | 0         | 0.0000239 | -0.000024 | 0.0000239 | 0.010836 | 0.0201715 |
| 785 | denovo172641 | p__Cyanobacteria  | 0.0001305 | 0.0009284 | -0.000798 | 0.0007979 | 0.028903 | 0.0344837 |
| 786 | denovo172683 | p__Firmicutes     | 0.0001499 | 6.1633E-6 | 0.0001437 | -0.000144 | 0.000476 | 0.0043769 |
| 787 | denovo172940 | p__Firmicutes     | 0.0001098 | 9.6028E-6 | 0.0001002 | -0.0001   | 0.013564 | 0.0241356 |
| 788 | denovo173423 | p__Firmicutes     | 0.0000667 | 9.4036E-6 | 0.0000573 | -0.000057 | 0.011258 | 0.020808  |
| 789 | denovo174003 | p__Firmicutes     | 0.0000199 | 0         | 0.0000199 | -0.00002  | 0.032508 | 0.0344837 |
| 790 | denovo174112 | p__Firmicutes     | 0.0000217 | 0         | 0.0000217 | -0.000022 | 0.010836 | 0.0201715 |
| 791 | denovo174223 | p__Proteobacteria | 9.4046E-7 | 0.000017  | -0.000016 | 0.0000161 | 0.018576 | 0.030734  |
| 792 | denovo174627 | p__Actinobacteria | 0.0000141 | 0         | 0.0000141 | -0.000014 | 0.032508 | 0.0344837 |
| 793 | denovo174710 | p__Firmicutes     | 0.0000152 | 1.5754E-6 | 0.0000136 | -0.000014 | 0.034056 | 0.0354016 |
| 794 | denovo174865 | p__Firmicutes     | 0.0000113 | 0         | 0.0000113 | -0.000011 | 0.032508 | 0.0344837 |
| 795 | denovo175302 | p__Proteobacteria | 0.0007909 | 0.0056054 | -0.004814 | 0.0048145 | 0.005196 | 0.0160388 |
| 796 | denovo175450 | p__Firmicutes     | 0.0000213 | 0         | 0.0000213 | -0.000021 | 0.010836 | 0.0201715 |
| 797 | denovo175492 | p__Firmicutes     | 0         | 0.0002209 | -0.000221 | 0.0002209 | 0.010836 | 0.0201715 |
| 798 | denovo175537 | p__Proteobacteria | 4.5252E-6 | 0.0001819 | -0.000177 | 0.0001774 | 0.002934 | 0.0108688 |
| 799 | denovo175540 | p__Firmicutes     | 0         | 0.0000551 | -0.000055 | 0.0000551 | 0.032508 | 0.0344837 |
| 800 | denovo175778 | p__Firmicutes     | 0.0000271 | 2.3464E-6 | 0.0000248 | -0.000025 | 0.006668 | 0.0190297 |
| 801 | denovo176063 | p__Firmicutes     | 0.0011106 | 0.0000396 | 0.001071  | -0.001071 | 0.000455 | 0.0043769 |
| 802 | denovo176201 | p__Firmicutes     | 0.0000223 | 1.1109E-6 | 0.0000212 | -0.000021 | 0.018576 | 0.030734  |
| 803 | denovo176300 | p__Firmicutes     | 0.0000178 | 0         | 0.0000178 | -0.000018 | 0.032508 | 0.0344837 |
| 804 | denovo176309 | p__Firmicutes     | 0.0000233 | 2.1433E-6 | 0.0000211 | -0.000021 | 0.007859 | 0.0201715 |
| 805 | denovo176541 | p__Firmicutes     | 0.0000117 | 0         | 0.0000117 | -0.000012 | 0.032508 | 0.0344837 |
| 806 | denovo176671 | p__Proteobacteria | 0.0019517 | 0.0133765 | -0.011425 | 0.0114248 | 0.000130 | 0.0018277 |



|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 807 | denovo176813 | p__Firmicutes     | 0.0010236 | 6.1304E-6 | 0.0010175 | -0.001017 | 0.000595 | 0.0047523 |
| 808 | denovo177459 | p__Proteobacteria | 0.0001036 | 0.0006885 | -0.000585 | 0.0005849 | 0.028903 | 0.0344837 |
| 809 | denovo177487 | p__Firmicutes     | 4.7224E-6 | 0         | 4.7224E-6 | -4.722E-6 | 0.032508 | 0.0344837 |
| 810 | denovo178029 | p__Proteobacteria | 3.4275E-6 | 0.0000278 | -0.000024 | 0.0000244 | 0.034056 | 0.0354016 |

The 2-sided p-value is presented.

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Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 811    | denovo178594               | p__Firmicutes     | 0.0000178   | 0              | 0.0000178 | -0.000018 | 0.003096 | 0.0108688 |
| 812    | denovo178684               | p__Firmicutes     | 3.5288E-6   | 0.001055       | -0.001051 | 0.0010515 | 0.041200 | 0.0419868 |
| 813    | denovo178771               | p__Firmicutes     | 0.0084421   | 0.0177444      | -0.009302 | 0.0093023 | 0.008931 | 0.0201715 |
| 814    | denovo179465               | p__Actinobacteria | 0.0003783   | 0.0000141      | 0.0003641 | -0.000364 | 0.021975 | 0.0344837 |
| 815    | denovo179507               | p__Firmicutes     | 0.0000143   | 7.3347E-7      | 0.0000136 | -0.000014 | 0.032508 | 0.0344837 |
| 816    | denovo179900               | p__Firmicutes     | 0.0001011   | 9.9223E-6      | 0.0000912 | -0.000091 | 0.012741 | 0.022761  |
| 817    | denovo180339               | p__Firmicutes     | 0           | 0.0000143      | -0.000014 | 0.0000143 | 0.032508 | 0.0344837 |
| 818    | denovo181006               | p__Firmicutes     | 0.0000251   | 0              | 0.0000251 | -0.000025 | 0.000714 | 0.0047523 |
| 819    | denovo181218               | p__Firmicutes     | 0.0000213   | 8.5346E-7      | 0.0000204 | -0.00002  | 0.018576 | 0.030734  |
| 820    | denovo182071               | p__Bacteroidetes  | 0.0003917   | 0.0045491      | -0.004157 | 0.0041573 | 0.001992 | 0.0098774 |
| 821    | denovo182197               | p__Firmicutes     | 0.0000171   | 0              | 0.0000171 | -0.000017 | 0.010836 | 0.0201715 |
| 822    | denovo182211               | p__Firmicutes     | 0.0003041   | 0.0011918      | -0.000888 | 0.0008877 | 0.002068 | 0.0101119 |
| 823    | denovo182515               | p__Firmicutes     | 0.0004138   | 0              | 0.0004138 | -0.000414 | 0.000119 | 0.0018162 |



|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 841 | denovo187680 | p__Firmicutes     | 0.0000406 | 0.0000783 | -0.000038 | 0.0000377 | 0.049536 | 0.0495356 |
| 842 | denovo187973 | p__Proteobacteria | 0.0006986 | 0.0021409 | -0.001442 | 0.0014424 | 0.018110 | 0.030734  |
| 843 | denovo188273 | p__Firmicutes     | 0.0000652 | 0.0010911 | -0.001026 | 0.0010259 | 0.003302 | 0.0114361 |
| 844 | denovo188692 | p__Proteobacteria | 2.5839E-6 | 0.0000177 | -0.000015 | 0.0000151 | 0.012622 | 0.0225927 |
| 845 | denovo189016 | p__Firmicutes     | 0.0000465 | 6.7758E-7 | 0.0000458 | -0.000046 | 0.003096 | 0.0108688 |
| 846 | denovo189346 | p__Bacteroidetes  | 0.0000107 | 0         | 0.0000107 | -0.000011 | 0.032508 | 0.0344837 |
| 847 | denovo189411 | p__Proteobacteria | 0.0003394 | 0.001757  | -0.001418 | 0.0014176 | 0.001505 | 0.0078703 |
| 848 | denovo189581 | p__Firmicutes     | 0.0000709 | 6.1232E-6 | 0.0000648 | -0.000065 | 0.033958 | 0.0354016 |
| 849 | denovo189736 | p__Proteobacteria | 0         | 0.0000175 | -0.000018 | 0.0000175 | 0.003096 | 0.0108688 |
| 850 | denovo189995 | p__Firmicutes     | 0.000068  | 0         | 0.000068  | -0.000068 | 0.032508 | 0.0344837 |
| 851 | denovo190113 | p__Firmicutes     | 0.0001272 | 0.0006099 | -0.000483 | 0.0004827 | 0.009721 | 0.0201715 |
| 852 | denovo190278 | p__Actinobacteria | 0.0000336 | 0         | 0.0000336 | -0.000034 | 0.010836 | 0.0201715 |
| 853 | denovo190360 | p__Proteobacteria | 9.4046E-7 | 0.0000122 | -0.000011 | 0.0000113 | 0.018576 | 0.030734  |
| 854 | denovo190604 | p__Proteobacteria | 0         | 0.000017  | -0.000017 | 0.000017  | 0.010836 | 0.0201715 |
| 855 | denovo190743 | p__Firmicutes     | 0.0000145 | 0         | 0.0000145 | -0.000014 | 0.010836 | 0.0201715 |
| 856 | denovo191015 | p__Firmicutes     | 7.4001E-6 | 4.71E-7   | 6.9291E-6 | -6.929E-6 | 0.032508 | 0.0344837 |
| 857 | denovo191201 | p__Proteobacteria | 0.000106  | 0.0013513 | -0.001245 | 0.0012453 | 0.000704 | 0.0047523 |
| 858 | denovo191248 | p__Firmicutes     | 0.000048  | 0         | 0.000048  | -0.000048 | 0.010836 | 0.0201715 |
| 859 | denovo191378 | p__Firmicutes     | 0.0001124 | 7.3347E-7 | 0.0001116 | -0.000112 | 0.003096 | 0.0108688 |
| 860 | denovo191396 |                   | 0.0000522 | 0         | 0.0000522 | -0.000052 | 0.010836 | 0.0201715 |
| 861 | denovo191405 | p__Firmicutes     | 4.55E-6   | 0         | 4.55E-6   | -4.55E-6  | 0.032508 | 0.0344837 |
| 862 | denovo191745 | p__Firmicutes     | 0.0000205 | 0.0007062 | -0.000686 | 0.0006857 | 0.010241 | 0.0201715 |
| 863 | denovo191859 | p__Firmicutes     | 0.000013  | 0         | 0.000013  | -0.000013 | 0.032508 | 0.0344837 |
| 864 | denovo192205 | p__Firmicutes     | 0.0000906 | 3.0219E-6 | 0.0000876 | -0.000088 | 0.012135 | 0.0221133 |
| 865 | denovo192856 | p__Firmicutes     | 0.0000359 | 1.4669E-6 | 0.0000344 | -0.000034 | 0.018576 | 0.030734  |
| 866 | denovo193572 | p__Firmicutes     | 0.0011789 |           |           |           |          |           |

|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|     |              |                   |           | 0.0001484 | 0.0010304 | -0.00103  | 0.008931 | 0.0201715 |
| 867 | denovo193734 | p__Firmicutes     | 9.6418E-6 | 0.0000709 | -0.000061 | 0.0000612 | 0.028903 | 0.0344837 |
| 868 | denovo193895 | p__Firmicutes     | 0.0000157 | 0         | 0.0000157 | -0.000016 | 0.032508 | 0.0344837 |
| 869 | denovo194520 | p__Actinobacteria | 0.0000147 | 0.0002907 | -0.000276 | 0.000276  | 0.010241 | 0.0201715 |
| 870 | denovo194652 | p__Firmicutes     | 0.0000546 | 0         | 0.0000546 | -0.000055 | 0.000714 | 0.0047523 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 871    | denovo194809               | p__Firmicutes     | 0.0000202   | 4.71E-7        | 0.0000198 | -0.00002  | 0.032508 | 0.0344837 |
| 872    | denovo194982               | p__Firmicutes     | 0.0000129   | 4.71E-7        | 0.0000125 | -0.000012 | 0.032508 | 0.0344837 |
| 873    | denovo195104               | p__Firmicutes     | 0.0000466   | 1.2982E-6      | 0.0000453 | -0.000045 | 0.026316 | 0.0344837 |
| 874    | denovo195545               | p__Firmicutes     | 0.0000545   | 0.0007393      | -0.000685 | 0.0006849 | 0.001256 | 0.007078  |
| 875    | denovo195801               | p__Actinobacteria | 0.0000101   | 0              | 0.0000101 | -0.00001  | 0.032508 | 0.0344837 |
| 876    | denovo195929               | p__Firmicutes     | 0.0000432   | 3.1509E-6      | 0.0000401 | -0.00004  | 0.034056 | 0.0354016 |
| 877    | denovo196062               | p__Actinobacteria | 0           | 0.0002266      | -0.000227 | 0.0002266 | 0.032508 | 0.0344837 |
| 878    | denovo196076               | p__Bacteroidetes  | 0.0000936   | 2.5219E-6      | 0.000091  | -0.000091 | 0.000173 | 0.0022138 |
| 879    | denovo196828               | p__Actinobacteria | 0.0000326   | 0              | 0.0000326 | -0.000033 | 0.010836 | 0.0201715 |
| 880    | denovo196858               | p__Firmicutes     | 0.0000304   | 0              | 0.0000304 | -0.00003  | 0.010836 | 0.0201715 |
| 881    | denovo196983               | p__Firmicutes     | 0.0000118   | 0              | 0.0000118 | -0.000012 | 0.032508 | 0.0344837 |
| 882    | denovo197435               | p__Firmicutes     | 0.0000288   | 2.1433E-6      | 0.0000267 | -0.000027 | 0.034056 | 0.0354016 |
| 883    | denovo197670               | p__Firmicutes     | 0.0000186   | 0              | 0.0000186 | -0.000019 | 0.010836 | 0.0201715 |
| 884    | denovo197843               |                   | 0.0000134   |                |           |           |          |           |

|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|     |              | p__Proteobacteria |           | 0.00006   | -0.000047 | 0.0000466 | 0.021975 | 0.0344837 |
| 885 | denovo197947 | p__Bacteroidetes  | 0.000078  | 0.0000119 | 0.0000661 | -0.000066 | 0.026262 | 0.0344837 |
| 886 | denovo198136 | p__Proteobacteria | 0         | 0.0000189 | -0.000019 | 0.0000189 | 0.010836 | 0.0201715 |
| 887 | denovo198541 | p__Proteobacteria | 0.0000186 | 0.0003817 | -0.000363 | 0.000363  | 0.001342 | 0.0072509 |
| 888 | denovo198791 | p__Firmicutes     | 0         | 0.0001532 | -0.000153 | 0.0001532 | 0.032508 | 0.0344837 |
| 889 | denovo198954 | p__Proteobacteria | 0         | 7.6297E-6 | -7.63E-6  | 7.6297E-6 | 0.032508 | 0.0344837 |
| 890 | denovo198962 | p__Bacteroidetes  | 0         | 0.0000276 | -0.000028 | 0.0000276 | 0.032508 | 0.0344837 |
| 891 | denovo199140 | p__Firmicutes     | 0.0000582 | 5.6853E-6 | 0.0000526 | -0.000053 | 0.006257 | 0.0186168 |
| 892 | denovo199593 |                   | 0.0002217 | 3.4647E-6 | 0.0002182 | -0.000218 | 0.000227 | 0.0026792 |
| 893 | denovo199615 | p__Firmicutes     | 0.000012  | 0         | 0.000012  | -0.000012 | 0.032508 | 0.0344837 |
| 894 | denovo199848 | p__Proteobacteria | 7.9892E-6 | 0.0005839 | -0.000576 | 0.0005759 | 0.025125 | 0.0344837 |
| 895 | denovo200223 | p__Proteobacteria | 0         | 0.0000176 | -0.000018 | 0.0000176 | 0.010836 | 0.0201715 |
| 896 | denovo200352 | p__Proteobacteria | 0         | 0.0000266 | -0.000027 | 0.0000266 | 0.000714 | 0.0047523 |
| 897 | denovo200416 | p__Firmicutes     | 0.0004088 | 0.0000162 | 0.0003926 | -0.000393 | 0.014387 | 0.0254996 |
| 898 | denovo200723 | p__Actinobacteria | 0.00003   | 0         | 0.00003   | -0.00003  | 0.032508 | 0.0344837 |
| 899 | denovo200910 | p__Firmicutes     | 9.7056E-6 | 0         | 9.7056E-6 | -9.706E-6 | 0.032508 | 0.0344837 |
| 900 | denovo201779 | p__Bacteroidetes  | 0.0023858 | 0.0119438 | -0.009558 | 0.0095579 | 0.000725 | 0.0047523 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 901    | denovo201929               | p__Proteobacteria | 0           | 6.4062E-6      | -6.406E-6 | 6.4062E-6 | 0.032508 | 0.0344837 |

|     |              |                   |           |           |           |           |             |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 902 | denovo202038 | p__Firmicutes     | 7.1381E-6 | 0         | 7.1381E-6 | -7.138E-6 | 0.032508    | 0.0344837 |
| 903 | denovo202039 | p__Bacteroidetes  | 0         | 0.0000173 | -0.000017 | 0.0000173 | 0.010836    | 0.0201715 |
| 904 | denovo202256 | p__Firmicutes     | 0.0013848 | 0.000083  | 0.0013018 | -0.001302 | 0.000314    | 0.0033875 |
| 905 | denovo202290 | p__Firmicutes     | 0.0000189 | 0         | 0.0000189 | -0.000019 | 0.032508    | 0.0344837 |
| 906 | denovo202521 | p__Firmicutes     | 0.000333  | 0.000024  | 0.000309  | -0.000309 | 0.011572    | 0.0212799 |
| 907 | denovo202562 | p__Firmicutes     | 0.0000149 | 0         | 0.0000149 | -0.000015 | 0.032508    | 0.0344837 |
| 908 | denovo203210 | p__Proteobacteria | 0.0035281 | 0.0221017 | -0.018574 | 0.0185735 | 0.002089    | 0.0101119 |
| 909 | denovo203448 | p__Actinobacteria | 0.0003727 | 0.0021246 | -0.001752 | 0.0017519 | 0.023231    | 0.0344837 |
| 910 | denovo203657 | p__Proteobacteria | 0         | 6.9588E-6 | -6.959E-6 | 6.9588E-6 | 0.032508    | 0.0344837 |
| 911 | denovo204323 | p__Firmicutes     | 0.0000349 | 0.0004237 | -0.000389 | 0.0003888 | 0.000931    | 0.005867  |
| 912 | denovo204411 | p__Firmicutes     | 0.0000146 | 0         | 0.0000146 | -0.000015 | 0.032508    | 0.0344837 |
| 913 | denovo204547 | p__Proteobacteria | 0         | 0.0000107 | -0.000011 | 0.0000107 | 0.010836    | 0.0201715 |
| 914 | denovo204755 | p__Firmicutes     | 0.0000136 | 0         | 0.0000136 | -0.000014 | 0.010836    | 0.0201715 |
| 915 | denovo204892 | p__Firmicutes     | 0.0000162 | 0         | 0.0000162 | -0.000016 | 0.032508    | 0.0344837 |
| 916 | denovo205214 | p__Firmicutes     | 4.8193E-6 | 0         | 4.8193E-6 | -4.819E-6 | 0.032508    | 0.0344837 |
| 917 | denovo205453 | p__Firmicutes     | 0.0000182 | 1.7069E-6 | 0.0000165 | -0.000016 | 0.010836    | 0.0201715 |
| 918 | denovo205751 | p__Firmicutes     | 0.0000558 | 2.3153E-6 | 0.0000534 | -0.000053 | 0.000260    | 0.0029471 |
| 919 | denovo206111 | p__Firmicutes     | 0.0000196 | 0         | 0.0000196 | -0.00002  | 0.032508    | 0.0344837 |
| 920 | denovo206229 | p__Firmicutes     | 0.0002083 | 3.0674E-6 | 0.0002052 | -0.000205 | 0.000064951 | 0.0014034 |
| 921 | denovo206582 | p__Firmicutes     | 0.000021  | 6.8058E-7 | 0.0000203 | -0.00002  | 0.032508    | 0.0344837 |
| 922 | denovo206714 | p__Firmicutes     | 0.0000112 | 3.9927E-7 | 0.0000108 | -0.000011 | 0.032508    | 0.0344837 |
| 923 | denovo207063 | p__Firmicutes     | 0.0003164 | 0.0019161 | -0.0016   | 0.0015997 | 0.000714    | 0.0047523 |
| 924 | denovo207078 | p__Actinobacteria | 0.0014089 | 0.0000319 | 0.001377  | -0.001377 | 0.011258    | 0.020808  |
| 925 | denovo207090 | p__Firmicutes     | 0.0000118 | 0         | 0.0000118 | -0.000012 | 0.032508    | 0.0344837 |
| 926 | denovo207647 | p__Firmicutes     | 0.0000379 | 0         | 0.0000379 | -0.000038 | 0.000714    | 0.0047523 |
| 927 | denovo207765 |                   | 0.0779838 |           |           |           |             |           |

|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|     |              | p__Bacteroidetes  |           | 0.0041762 | 0.0738075 | -0.073808 | 0.002089 | 0.0101119 |
| 928 | denovo207790 | p__Actinobacteria | 0.0001048 | 0         | 0.0001048 | -0.000105 | 0.010836 | 0.0201715 |
| 929 | denovo208021 | p__Actinobacteria | 0.0000114 | 0         | 0.0000114 | -0.000011 | 0.032508 | 0.0344837 |
| 930 | denovo208050 | p__Firmicutes     | 0.0000544 | 0.0007979 | -0.000743 | 0.0007435 | 0.001526 | 0.0079606 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 931    | denovo208409               | p__Firmicutes     | 0.0004207   | 7.2228E-6      | 0.0004135 | -0.000414 | 0.002436    | 0.0108688 |
| 932    | denovo208673               | p__Tenericutes    | 0.0000182   | 0.000583       | -0.000565 | 0.0005647 | 0.004774    | 0.0152814 |
| 933    | denovo208880               | p__Firmicutes     | 0.0000117   | 0              | 0.0000117 | -0.000012 | 0.032508    | 0.0344837 |
| 934    | denovo209095               | p__Proteobacteria | 0.0005408   | 0.0065628      | -0.006022 | 0.006022  | 0.000021650 | 0.0006237 |
| 935    | denovo209275               | p__Firmicutes     | 0.0000755   | 3.9927E-7      | 0.0000751 | -0.000075 | 0.000119    | 0.0018162 |
| 936    | denovo209453               | p__Bacteroidetes  | 0.000111    | 4.2908E-6      | 0.0001067 | -0.000107 | 0.002457    | 0.0108688 |
| 937    | denovo209549               | p__Firmicutes     | 0.000103    | 1.1978E-6      | 0.0001018 | -0.000102 | 0.005477    | 0.0165144 |
| 938    | denovo209712               | p__Actinobacteria | 0.0000829   | 0.0020037      | -0.001921 | 0.0019208 | 0.031090    | 0.0344837 |
| 939    | denovo209981               | p__Firmicutes     | 0.0007129   | 0.0000383      | 0.0006746 | -0.000675 | 0.000021650 | 0.0006237 |
| 940    | denovo209998               | p__Proteobacteria | 2.1492E-6   | 0.0000579      | -0.000056 | 0.0000557 | 0.001905    | 0.0094999 |
| 941    | denovo210026               | p__Actinobacteria | 0.0000916   | 0              | 0.0000916 | -0.000092 | 0.000714    | 0.0047523 |
| 942    | denovo210503               | p__Actinobacteria | 0.0000201   | 0              | 0.0000201 | -0.00002  | 0.032508    | 0.0344837 |
| 943    | denovo210787               | p__Firmicutes     | 0.000133    | 0              | 0.000133  | -0.000133 | 0.032508    | 0.0344837 |
| 944    | denovo210816               | p__Firmicutes     | 0.000032    |                |           |           |             |           |

|     |              |                   |           |           |           |           |          |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|     |              |                   |           | 0         | 0.000032  | -0.000032 | 0.003096 | 0.0108688 |
| 945 | denovo210860 | p__Firmicutes     | 0.0002482 | 0         | 0.0002482 | -0.000248 | 0.010836 | 0.0201715 |
| 946 | denovo211248 | p__Firmicutes     | 0.0000407 | 0         | 0.0000407 | -0.000041 | 0.010836 | 0.0201715 |
| 947 | denovo211286 | p__Firmicutes     | 0.0000197 | 0         | 0.0000197 | -0.00002  | 0.010836 | 0.0201715 |
| 948 | denovo211325 | p__Firmicutes     | 0.0002475 | 8.3954E-6 | 0.0002391 | -0.000239 | 0.008509 | 0.0201715 |
| 949 | denovo211368 | p__Firmicutes     | 0.0000323 | 1.6246E-6 | 0.0000307 | -0.000031 | 0.009050 | 0.0201715 |
| 950 | denovo211475 | p__Proteobacteria | 6.6185E-6 | 0.0000411 | -0.000035 | 0.0000345 | 0.000411 | 0.0041478 |
| 951 | denovo211531 | p__Proteobacteria | 0         | 9.9674E-6 | -9.967E-6 | 9.9674E-6 | 0.010836 | 0.0201715 |
| 952 | denovo211643 | p__Firmicutes     | 0.000018  | 0         | 0.000018  | -0.000018 | 0.010836 | 0.0201715 |
| 953 | denovo212151 | p__Bacteroidetes  | 0.0000272 | 3.9927E-7 | 0.0000268 | -0.000027 | 0.003096 | 0.0108688 |
| 954 | denovo212386 | p__Firmicutes     | 0.0001408 | 0.0000102 | 0.0001306 | -0.000131 | 0.001310 | 0.0071392 |
| 955 | denovo212491 | p__Proteobacteria | 0         | 4.879E-6  | -4.879E-6 | 4.879E-6  | 0.032508 | 0.0344837 |
| 956 | denovo212554 | p__Proteobacteria | 0.0005408 | 0.0028626 | -0.002322 | 0.0023218 | 0.008855 | 0.0201715 |
| 957 | denovo212850 | p__Firmicutes     | 0.0000121 | 0         | 0.0000121 | -0.000012 | 0.010836 | 0.0201715 |
| 958 | denovo212882 | p__Proteobacteria | 1.8416E-6 | 0.0000557 | -0.000054 | 0.0000538 | 0.001256 | 0.007078  |
| 959 | denovo213098 | p__Firmicutes     | 0.0000763 | 8.609E-6  | 0.0000676 | -0.000068 | 0.003302 | 0.0114361 |
| 960 | denovo213491 | p__Firmicutes     | 3.1035E-6 | 0.0001199 | -0.000117 | 0.0001168 | 0.009050 | 0.0201715 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum             | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|--------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 961    | denovo213590               | p__Deferribacteres | 0.0003616   | 0.0010811      | -0.000719 | 0.0007195 | 0.006722 | 0.0190941 |



|     |              |                   |           |           |           |           |             |           |
|-----|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 962 | denovo213715 | p__Firmicutes     | 0.0000424 | 4.8055E-6 | 0.0000376 | -0.000038 | 0.001256    | 0.007078  |
| 963 | denovo213791 | p__Firmicutes     | 0.0000158 | 0         | 0.0000158 | -0.000016 | 0.032508    | 0.0344837 |
| 964 | denovo214339 | p__Firmicutes     | 0.0000129 | 0         | 0.0000129 | -0.000013 | 0.010836    | 0.0201715 |
| 965 | denovo214421 | p__Proteobacteria | 0.0000103 | 0.0000688 | -0.000058 | 0.0000585 | 0.015004    | 0.0263616 |
| 966 | denovo214426 | p__Firmicutes     | 0.0585287 | 0.0024368 | 0.0560919 | -0.056092 | 0.000010825 | 0.000517  |
| 967 | denovo215525 | p__Actinobacteria | 0.0000285 | 0         | 0.0000285 | -0.000029 | 0.032508    | 0.0344837 |
| 968 | denovo215636 | p__Proteobacteria | 0         | 0.0000805 | -0.000081 | 0.0000805 | 0.000714    | 0.0047523 |
| 969 | denovo215737 | p__Firmicutes     | 0.0001939 | 0.0009613 | -0.000767 | 0.0007674 | 0.008996    | 0.0201715 |
| 970 | denovo215763 | p__Proteobacteria | 0         | 0.0000113 | -0.000011 | 0.0000113 | 0.010836    | 0.0201715 |
| 971 | denovo215851 | p__Firmicutes     | 0.0000786 | 4.4488E-6 | 0.0000741 | -0.000074 | 0.021975    | 0.0344837 |
| 972 | denovo215917 | p__Firmicutes     | 0.0000393 | 0         | 0.0000393 | -0.000039 | 0.000714    | 0.0047523 |
| 973 | denovo216019 | p__Proteobacteria | 5.1678E-6 | 0.0000238 | -0.000019 | 0.0000186 | 0.017385    | 0.0298806 |
| 974 | denovo216188 | p__Firmicutes     | 3.4642E-6 | 0.0000454 | -0.000042 | 0.000042  | 0.021553    | 0.0344837 |
| 975 | denovo216740 | p__Firmicutes     | 0.0000194 | 0         | 0.0000194 | -0.000019 | 0.003096    | 0.0108688 |
| 976 | denovo217046 | p__Firmicutes     | 0.0000227 | 0         | 0.0000227 | -0.000023 | 0.032508    | 0.0344837 |
| 977 | denovo218269 | p__Bacteroidetes  | 0.0001663 | 0.0022428 | -0.002076 | 0.0020765 | 0.020481    | 0.0335498 |
| 978 | denovo218430 | p__Firmicutes     | 0.0000424 | 4.6101E-6 | 0.0000378 | -0.000038 | 0.004601    | 0.0147791 |
| 979 | denovo218760 | p__Firmicutes     | 0.0000463 | 0         | 0.0000463 | -0.000046 | 0.000119    | 0.0018162 |
| 980 | denovo219333 | p__Firmicutes     | 1.6693E-6 | 0.0008143 | -0.000813 | 0.0008127 | 0.002934    | 0.0108688 |
| 981 | denovo219764 | p__Firmicutes     | 0.0000117 | 0         | 0.0000117 | -0.000012 | 0.032508    | 0.0344837 |
| 982 | denovo219995 | p__Firmicutes     | 0.0001545 | 0.0000109 | 0.0001436 | -0.000144 | 0.000075776 | 0.0014477 |
| 983 | denovo220107 | p__Firmicutes     | 0.000068  | 1.7324E-6 | 0.0000662 | -0.000066 | 0.000119    | 0.0018162 |
| 984 | denovo220142 | p__Firmicutes     | 0.000163  | 0         | 0.000163  | -0.000163 | 0.003096    | 0.0108688 |
| 985 | denovo220149 | p__Chlorobi       | 0.0000383 | 0.002208  | -0.00217  | 0.0021698 | 0.000130    | 0.0018277 |
| 986 | denovo220337 | p__Proteobacteria | 0         | 0.0000187 | -0.000019 | 0.0000187 | 0.010836    | 0.0201715 |
| 987 | denovo220725 | p__Firmicutes     | 0.0000511 |           |           |           |             |           |

|     |              |               |           |           |           |           |          |           |
|-----|--------------|---------------|-----------|-----------|-----------|-----------|----------|-----------|
|     |              |               |           | 1.7069E-6 | 0.0000494 | -0.000049 | 0.032508 | 0.0344837 |
| 988 | denovo220727 | p__Firmicutes | 0.0000205 | 7.3347E-7 | 0.0000198 | -0.00002  | 0.005477 | 0.0165144 |
| 989 | denovo220738 | p__Firmicutes | 0.0000196 | 0         | 0.0000196 | -0.00002  | 0.032508 | 0.0344837 |
| 990 | denovo220947 | p__Firmicutes | 0.000029  | 0         | 0.000029  | -0.000029 | 0.000714 | 0.0047523 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 991    | denovo220996               | p__Proteobacteria | 0           | 7.0596E-6      | -7.06E-6  | 7.0596E-6 | 0.010836    | 0.0201715 |
| 992    | denovo221366               | p__Firmicutes     | 0.0001222   | 0.0014803      | -0.001358 | 0.0013581 | 0.033958    | 0.0354016 |
| 993    | denovo221367               | p__Firmicutes     | 0.0040529   | 0.0149613      | -0.010908 | 0.0109085 | 0.018543    | 0.030734  |
| 994    | denovo221387               | p__Proteobacteria | 2.6223E-6   | 0.0000606      | -0.000058 | 0.000058  | 0.000693    | 0.0047523 |
| 995    | denovo221605               | p__Actinobacteria | 0.0000327   | 0              | 0.0000327 | -0.000033 | 0.032508    | 0.0344837 |
| 996    | denovo221706               | p__Proteobacteria | 3.5244E-6   | 0.0000337      | -0.00003  | 0.0000302 | 0.006939    | 0.0194653 |
| 997    | denovo222503               | p__Firmicutes     | 0.0000448   | 1.2045E-6      | 0.0000436 | -0.000044 | 0.000010825 | 0.000517  |
| 998    | denovo222721               | p__Proteobacteria | 0.0008607   | 0.0074294      | -0.006569 | 0.0065687 | 0.000075776 | 0.0014477 |
| 999    | denovo223346               | p__Proteobacteria | 0.0006244   | 0.0021888      | -0.001564 | 0.0015644 | 0.042055    | 0.0426428 |
| 1000   | denovo223357               | p__Firmicutes     | 0.0000459   | 0.0000664      | -0.00002  | 0.0000205 | 0.022365    | 0.0344837 |
| 1001   | denovo223601               | p__Proteobacteria | 0.000017    | 0.0000646      | -0.000048 | 0.0000477 | 0.043972    | 0.0445359 |
| 1002   | denovo223617               | p__Firmicutes     | 0.0000166   | 8.5346E-7      | 0.0000157 | -0.000016 | 0.032508    | 0.0344837 |
| 1003   | denovo223724               | p__Firmicutes     | 0.0002139   | 0.0009836      | -0.00077  | 0.0007697 | 0.018598    | 0.0307418 |
| 1004   | denovo223804               |                   | 0.0000253   |                |           |           |             |           |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|      |              | p__Bacteroidetes  |           | 0.0004197 | -0.000394 | 0.0003944 | 0.004016 | 0.0131338 |
| 1005 | denovo223894 | p__Firmicutes     | 0.000091  | 2.4522E-6 | 0.0000885 | -0.000089 | 0.025125 | 0.0344837 |
| 1006 | denovo223898 | p__Proteobacteria | 0         | 6.533E-6  | -6.533E-6 | 6.533E-6  | 0.032508 | 0.0344837 |
| 1007 | denovo224036 | p__Bacteroidetes  | 0         | 0.0000144 | -0.000014 | 0.0000144 | 0.032508 | 0.0344837 |
| 1008 | denovo224205 | p__Firmicutes     | 0.0000371 | 8.5346E-7 | 0.0000363 | -0.000036 | 0.010836 | 0.0201715 |
| 1009 | denovo224459 | p__Proteobacteria | 7.3636E-6 | 0.0002368 | -0.000229 | 0.0002294 | 0.012135 | 0.0221133 |
| 1010 | denovo224502 | p__Proteobacteria | 0         | 0.0000208 | -0.000021 | 0.0000208 | 0.010836 | 0.0201715 |
| 1011 | denovo224539 | p__Proteobacteria | 3.5323E-6 | 0.0003867 | -0.000383 | 0.0003832 | 0.000173 | 0.0022138 |
| 1012 | denovo224586 | p__Firmicutes     | 0.0000272 | 1.1486E-6 | 0.0000261 | -0.000026 | 0.006668 | 0.0190297 |
| 1013 | denovo224607 | p__Bacteroidetes  | 0.0014405 | 0.0063191 | -0.004879 | 0.0048786 | 0.028806 | 0.0344837 |
| 1014 | denovo224663 | p__Proteobacteria | 0.0000342 | 0.0006658 | -0.000632 | 0.0006317 | 0.000249 | 0.0028968 |
| 1015 | denovo224750 | p__Firmicutes     | 0         | 0.000011  | -0.000011 | 0.000011  | 0.032508 | 0.0344837 |
| 1016 | denovo224815 | p__Proteobacteria | 0         | 0.0000111 | -0.000011 | 0.0000111 | 0.003096 | 0.0108688 |
| 1017 | denovo224934 | p__Proteobacteria | 7.6559E-6 | 0.0003978 | -0.00039  | 0.0003902 | 0.000931 | 0.005867  |
| 1018 | denovo225019 | p__Proteobacteria | 3.4361E-6 | 0.0000583 | -0.000055 | 0.0000549 | 0.004016 | 0.0131338 |
| 1019 | denovo225248 | p__Actinobacteria | 3.2484E-6 | 0.0000855 | -0.000082 | 0.0000822 | 0.032508 | 0.0344837 |
| 1020 | denovo225998 | p__Proteobacteria | 3.6801E-6 | 0.0000453 | -0.000042 | 0.0000416 | 0.010241 | 0.0201715 |

The 2-sided p-value is presented.

|   |                            |               |             |                |       |       |         |               |
|---|----------------------------|---------------|-------------|----------------|-------|-------|---------|---------------|
|   |                            |               |             |                |       |       |         | Page 35 of 61 |
| Table S8  |                            |               |             |                |       |       |         |               |
| Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample. |                            |               |             |                |       |       |         |               |
| SI No.  | Operational Taxonomic Unit | Phylum        | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value | FDR           |
| 1021  | denovo226152               | p__Firmicutes | 0.0003071   |                |       |       |         |               |

|      |              |                   |           |           |           |           |             |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
|      |              |                   |           | 0.0208956 | -0.020589 | 0.0205885 | 0.000043300 | 0.0009948 |
| 1022 | denovo226236 | p__Firmicutes     | 6.5063E-6 | 0.0003692 | -0.000363 | 0.0003627 | 0.008205    | 0.0201715 |
| 1023 | denovo226337 | p__Proteobacteria | 9.9809E-7 | 7.6305E-6 | -6.632E-6 | 6.6324E-6 | 0.034056    | 0.0354016 |
| 1024 | denovo226507 | p__Bacteroidetes  | 0.0000718 | 1.1327E-6 | 0.0000707 | -0.000071 | 0.025125    | 0.0344837 |
| 1025 | denovo226787 | p__Proteobacteria | 0         | 0.00009   | -0.00009  | 0.00009   | 0.032508    | 0.0344837 |
| 1026 | denovo227092 | p__Proteobacteria | 0.0001134 | 0.0002927 | -0.000179 | 0.0001793 | 0.021975    | 0.0344837 |
| 1027 | denovo227619 | p__Firmicutes     | 0.0000153 | 0         | 0.0000153 | -0.000015 | 0.032508    | 0.0344837 |
| 1028 | denovo228493 | p__Actinobacteria | 0.000034  | 0         | 0.000034  | -0.000034 | 0.010836    | 0.0201715 |
| 1029 | denovo228627 | p__Firmicutes     | 0.000019  | 0         | 0.000019  | -0.000019 | 0.010836    | 0.0201715 |
| 1030 | denovo228775 | p__Firmicutes     | 0.0000362 | 4.71E-7   | 0.0000358 | -0.000036 | 0.010836    | 0.0201715 |
| 1031 | denovo228793 | p__Fusobacteria   | 0         | 0.0001075 | -0.000107 | 0.0001075 | 0.032508    | 0.0344837 |
| 1032 | denovo228887 | p__Firmicutes     | 0.0000818 | 2.256E-6  | 0.0000796 | -0.00008  | 0.001256    | 0.007078  |
| 1033 | denovo229265 | p__Proteobacteria | 0         | 8.2732E-6 | -8.273E-6 | 8.2732E-6 | 0.032508    | 0.0344837 |
| 1034 | denovo229287 | p__Bacteroidetes  | 0.0001058 | 9.6391E-6 | 0.0000961 | -0.000096 | 0.001472    | 0.007836  |
| 1035 | denovo229343 | p__Actinobacteria | 0.0000265 | 0         | 0.0000265 | -0.000027 | 0.010836    | 0.0201715 |
| 1036 | denovo229406 | p__Firmicutes     | 0.0002633 | 0.0000155 | 0.0002478 | -0.000248 | 0.046754    | 0.0472482 |
| 1037 | denovo229566 | p__Proteobacteria | 0.0000132 | 0.0002621 | -0.000249 | 0.0002489 | 0.003334    | 0.0114828 |
| 1038 | denovo229572 | p__Proteobacteria | 0.0001383 | 0.0012958 | -0.001157 | 0.0011575 | 0.006820    | 0.0192515 |
| 1039 | denovo229650 | p__Firmicutes     | 0.0000515 | 4.2847E-6 | 0.0000472 | -0.000047 | 0.000249    | 0.0028968 |
| 1040 | denovo230187 | p__Proteobacteria | 2.6223E-6 | 0.0000149 | -0.000012 | 0.0000123 | 0.041200    | 0.0419868 |
| 1041 | denovo230324 | p__Firmicutes     | 0.0000336 | 1.0768E-6 | 0.0000325 | -0.000032 | 0.025125    | 0.0344837 |
| 1042 | denovo230602 | p__Firmicutes     | 0.0000164 | 6.7758E-7 | 0.0000157 | -0.000016 | 0.010836    | 0.0201715 |
| 1043 | denovo230626 | p__Actinobacteria | 0.000033  | 0         | 0.000033  | -0.000033 | 0.032508    | 0.0344837 |
| 1044 | denovo231816 | p__Actinobacteria | 0.0042963 | 0.0003192 | 0.0039771 | -0.003977 | 0.002068    | 0.0101119 |
| 1045 | denovo231849 | p__Firmicutes     | 0.0000609 | 0         | 0.0000609 | -0.000061 | 0.010836    | 0.0201715 |
| 1046 | denovo231864 | p__Firmicutes     | 1.4178E-6 | 0.0000682 | -0.000067 | 0.0000668 | 0.002501    | 0.0108688 |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1047 | denovo231877 | p__Firmicutes     | 0.0000429 | 0         | 0.0000429 | -0.000043 | 0.010836 | 0.0201715 |
| 1048 | denovo232096 | p__Firmicutes     | 0.0000233 | 1.2982E-6 | 0.000022  | -0.000022 | 0.007859 | 0.0201715 |
| 1049 | denovo232625 | p__Firmicutes     | 0.0000132 | 0         | 0.0000132 | -0.000013 | 0.032508 | 0.0344837 |
| 1050 | denovo232632 | p__Proteobacteria | 0.0000171 | 0.0001386 | -0.000122 | 0.0001215 | 0.000898 | 0.0057219 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 1051   | denovo232737               | p__Actinobacteria | 0.0001687   | 0.00136        | -0.001191 | 0.0011913 | 0.000725    | 0.0047523 |
| 1052   | denovo232944               | p__Bacteroidetes  | 0           | 0.0000981      | -0.000098 | 0.0000981 | 0.010836    | 0.0201715 |
| 1053   | denovo233322               | p__Bacteroidetes  | 3.2484E-6   | 0.0000523      | -0.000049 | 0.0000491 | 0.034056    | 0.0354016 |
| 1054   | denovo234079               | p__Firmicutes     | 0.0000489   | 1.2527E-6      | 0.0000476 | -0.000048 | 0.006668    | 0.0190297 |
| 1055   | denovo234146               | p__Firmicutes     | 0.0007078   | 0.0122916      | -0.011584 | 0.0115839 | 0.000325    | 0.0033875 |
| 1056   | denovo234227               | p__Bacteroidetes  | 3.2484E-6   | 0.0000537      | -0.00005  | 0.0000505 | 0.007859    | 0.0201715 |
| 1057   | denovo234319               | p__Firmicutes     | 0.0000181   | 0              | 0.0000181 | -0.000018 | 0.032508    | 0.0344837 |
| 1058   | denovo234431               | p__Firmicutes     | 0.0001015   | 0              | 0.0001015 | -0.000102 | 0.003096    | 0.0108688 |
| 1059   | denovo234559               | p__Firmicutes     | 0.0000104   | 0              | 0.0000104 | -0.00001  | 0.032508    | 0.0344837 |
| 1060   | denovo234746               | p__Firmicutes     | 0.0005696   | 0.002109       | -0.001539 | 0.0015394 | 0.014571    | 0.0257253 |
| 1061   | denovo234803               | p__Firmicutes     | 0.0013408   | 0.0143439      | -0.013003 | 0.0130032 | 0.000075776 | 0.0014477 |
| 1062   | denovo234805               | p__Firmicutes     | 0.2592955   | 0.0114367      | 0.2478588 | -0.247859 | 0.000010825 | 0.000517  |
| 1063   | denovo234882               | p__Proteobacteria | 0           | 0.0000134      | -0.000013 | 0.0000134 | 0.010836    | 0.0201715 |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1064 | denovo234987 | p__Proteobacteria | 0.0000494 | 0.001426  | -0.001377 | 0.0013766 | 0.001018 | 0.0062281 |
| 1065 | denovo235258 | p__Bacteroidetes  | 0.0000672 | 5.6787E-6 | 0.0000615 | -0.000062 | 0.002879 | 0.0108688 |
| 1066 | denovo235427 | p__Proteobacteria | 0.0026522 | 0.0146563 | -0.012004 | 0.0120041 | 0.006841 | 0.0192515 |
| 1067 | denovo235761 | p__Proteobacteria | 0         | 9.877E-6  | -9.877E-6 | 9.877E-6  | 0.032508 | 0.0344837 |
| 1068 | denovo236387 | p__Proteobacteria | 0         | 8.9525E-6 | -8.953E-6 | 8.9525E-6 | 0.010836 | 0.0201715 |
| 1069 | denovo236428 | p__Firmicutes     | 0.0000342 | 0         | 0.0000342 | -0.000034 | 0.010836 | 0.0201715 |
| 1070 | denovo236654 | p__Firmicutes     | 0.0006699 | 0.0000103 | 0.0006596 | -0.00066  | 0.012622 | 0.0225927 |
| 1071 | denovo236679 | p__Firmicutes     | 0.0000241 | 0         | 0.0000241 | -0.000024 | 0.032508 | 0.0344837 |
| 1072 | denovo236861 | p__Actinobacteria | 0.0003679 | 2.5604E-6 | 0.0003653 | -0.000365 | 0.000119 | 0.0018162 |
| 1073 | denovo236886 | p__Firmicutes     | 0.0000296 | 3.4613E-6 | 0.0000262 | -0.000026 | 0.020416 | 0.0335038 |
| 1074 | denovo236926 | p__Actinobacteria | 0.0043594 | 0.0003042 | 0.0040552 | -0.004055 | 0.000314 | 0.0033875 |
| 1075 | denovo237161 | p__Firmicutes     | 2.7805E-6 | 0.0000812 | -0.000078 | 0.0000784 | 0.025125 | 0.0344837 |
| 1076 | denovo237665 | p__Actinobacteria | 0.0000187 | 0         | 0.0000187 | -0.000019 | 0.010836 | 0.0201715 |
| 1077 | denovo237711 | p__Bacteroidetes  | 5.9886E-6 | 0.0002976 | -0.000292 | 0.0002917 | 0.032508 | 0.0344837 |
| 1078 | denovo237864 | p__Bacteroidetes  | 0.0003739 | 0.003669  | -0.003295 | 0.0032951 | 0.000704 | 0.0047523 |
| 1079 | denovo237907 | p__Firmicutes     | 2.1492E-6 | 0.0002239 | -0.000222 | 0.0002218 | 0.018576 | 0.030734  |
| 1080 | denovo238428 | p__Proteobacteria | 0         | 0.00002   | -0.00002  | 0.00002   | 0.032508 | 0.0344837 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value | FDR |
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|

|      |              |                   |           |           |           |           |             |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 1081 | denovo238483 | p__Firmicutes     | 6.7138E-6 | 0         | 6.7138E-6 | -6.714E-6 | 0.032508    | 0.0344837 |
| 1082 | denovo238512 | p__Proteobacteria | 0.0035316 | 0.0198283 | -0.016297 | 0.0162967 | 0.005120    | 0.0160388 |
| 1083 | denovo238549 | p__Bacteroidetes  | 0.0009742 | 0.0068392 | -0.005865 | 0.005865  | 0.000487    | 0.0043769 |
| 1084 | denovo238757 | p__Firmicutes     | 0.0001072 | 4.0504E-6 | 0.0001032 | -0.000103 | 0.000487    | 0.0043769 |
| 1085 | denovo239026 | p__Proteobacteria | 5.1678E-6 | 0.0000537 | -0.000049 | 0.0000486 | 0.000660    | 0.0047523 |
| 1086 | denovo239312 | p__Proteobacteria | 1.0746E-6 | 0.0000405 | -0.000039 | 0.0000394 | 0.032508    | 0.0344837 |
| 1087 | denovo239581 | p__Firmicutes     | 0.0000149 | 3.8247E-7 | 0.0000145 | -0.000015 | 0.032508    | 0.0344837 |
| 1088 | denovo239708 | p__Actinobacteria | 0.0000877 | 0         | 0.0000877 | -0.000088 | 0.000714    | 0.0047523 |
| 1089 | denovo239709 | p__Firmicutes     | 0.0000266 | 1.5819E-6 | 0.0000251 | -0.000025 | 0.012622    | 0.0225927 |
| 1090 | denovo239786 | p__Proteobacteria | 0         | 9.8514E-6 | -9.851E-6 | 9.8514E-6 | 0.032508    | 0.0344837 |
| 1091 | denovo240335 | p__Firmicutes     | 0.0000113 | 0         | 0.0000113 | -0.000011 | 0.010836    | 0.0201715 |
| 1092 | denovo241372 | p__Firmicutes     | 0.0000229 | 6.7758E-7 | 0.0000222 | -0.000022 | 0.032508    | 0.0344837 |
| 1093 | denovo241376 | p__Firmicutes     | 0.000019  | 1.1109E-6 | 0.0000179 | -0.000018 | 0.007859    | 0.0201715 |
| 1094 | denovo241466 | p__Proteobacteria | 5.1678E-6 | 0.000016  | -0.000011 | 0.0000108 | 0.049536    | 0.0495356 |
| 1095 | denovo241937 | p__Firmicutes     | 0.0000426 | 0         | 0.0000426 | -0.000043 | 0.010836    | 0.0201715 |
| 1096 | denovo242114 | p__Firmicutes     | 0.0000167 | 0         | 0.0000167 | -0.000017 | 0.003096    | 0.0108688 |
| 1097 | denovo242177 | p__Firmicutes     | 0         | 0.0000775 | -0.000078 | 0.0000775 | 0.032508    | 0.0344837 |
| 1098 | denovo242316 | p__Proteobacteria | 0.0003798 | 0.0036835 | -0.003304 | 0.0033037 | 0.002728    | 0.0108688 |
| 1099 | denovo242331 | p__Firmicutes     | 0.0000122 | 0         | 0.0000122 | -0.000012 | 0.032508    | 0.0344837 |
| 1100 | denovo243366 | p__Firmicutes     | 0.0000386 | 0         | 0.0000386 | -0.000039 | 0.010836    | 0.0201715 |
| 1101 | denovo243501 | p__Firmicutes     | 0.0000189 | 0         | 0.0000189 | -0.000019 | 0.010836    | 0.0201715 |
| 1102 | denovo243659 | p__Actinobacteria | 0.0003157 | 0.0026492 | -0.002334 | 0.0023335 | 0.008931    | 0.0201715 |
| 1103 | denovo243714 | p__Firmicutes     | 0.0000643 | 1.7324E-6 | 0.0000626 | -0.000063 | 0.000032475 | 0.0009068 |
| 1104 | denovo243882 | p__Bacteroidetes  | 0.0004461 | 0.0062538 | -0.005808 | 0.0058078 | 0.000043300 | 0.0009948 |
| 1105 | denovo243885 | p__Firmicutes     | 0.0000392 | 0.0008649 | -0.000826 | 0.0008256 | 0.001992    | 0.0098774 |
| 1106 | denovo243890 | p__Firmicutes     | 0.0000263 |           |           |           |             |           |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|      |              |                   |           | 0         | 0.0000263 | -0.000026 | 0.003096 | 0.0108688 |
| 1107 | denovo243992 | p__Firmicutes     | 0.0000357 | 2.1433E-6 | 0.0000336 | -0.000034 | 0.026316 | 0.0344837 |
| 1108 | denovo244390 | p__Firmicutes     | 0.000013  | 0         | 0.000013  | -0.000013 | 0.032508 | 0.0344837 |
| 1109 | denovo244505 | p__Proteobacteria | 0.0010711 | 0.0058569 | -0.004786 | 0.0047857 | 0.000487 | 0.0043769 |
| 1110 | denovo244664 | p__Firmicutes     | 0.0000391 | 0         | 0.0000391 | -0.000039 | 0.003096 | 0.0108688 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 1111   | denovo245084               | p__Bacteroidetes  | 0.0000456   | 7.3347E-7      | 0.0000449 | -0.000045 | 0.000714    | 0.0047523 |
| 1112   | denovo245826               | p__Firmicutes     | 0.0002831   | 0.0023738      | -0.002091 | 0.0020906 | 0.003832    | 0.0128089 |
| 1113   | denovo245900               | p__Firmicutes     | 0.00002     | 0.0011928      | -0.001173 | 0.0011727 | 0.008509    | 0.0201715 |
| 1114   | denovo246081               | p__Proteobacteria | 5.8316E-6   | 0.0000305      | -0.000025 | 0.0000247 | 0.041796    | 0.0424031 |
| 1115   | denovo246258               | p__Firmicutes     | 0.0002399   | 3.1199E-6      | 0.0002367 | -0.000237 | 0.000064951 | 0.0014034 |
| 1116   | denovo246263               | p__Firmicutes     | 0.0000463   | 1.0768E-6      | 0.0000452 | -0.000045 | 0.025125    | 0.0344837 |
| 1117   | denovo246668               | p__Firmicutes     | 0           | 0.0000167      | -0.000017 | 0.0000167 | 0.032508    | 0.0344837 |
| 1118   | denovo246775               | p__Actinobacteria | 0.0054461   | 0.0001298      | 0.0053163 | -0.005316 | 0.026316    | 0.0344837 |
| 1119   | denovo246862               | p__Bacteroidetes  | 0.0000563   | 7.7898E-6      | 0.0000485 | -0.000048 | 0.012471    | 0.0225927 |
| 1120   | denovo246992               | p__Firmicutes     | 0.000022    | 8.5346E-7      | 0.0000212 | -0.000021 | 0.032508    | 0.0344837 |
| 1121   | denovo247152               | p__Actinobacteria | 1.6242E-6   | 0.0000182      | -0.000017 | 0.0000166 | 0.026316    | 0.0344837 |
| 1122   | denovo247189               | p__Proteobacteria | 0           | 6.7733E-6      | -6.773E-6 | 6.7733E-6 | 0.003096    | 0.0108688 |
| 1123   | denovo247338               | p__Proteobacteria | 9.4046E-7   | 9.8143E-6      | -8.874E-6 | 8.8738E-6 | 0.034056    | 0.0354016 |





|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1141 | denovo250683 | p__Firmicutes     | 8.7077E-6 | 6.7758E-7 | 8.0301E-6 | -8.03E-6  | 0.032508 | 0.0344837 |
| 1142 | denovo250718 | p__Actinobacteria | 0.0000149 | 6.7758E-7 | 0.0000142 | -0.000014 | 0.032508 | 0.0344837 |
| 1143 | denovo250986 | p__Bacteroidetes  | 0         | 5.7974E-6 | -5.797E-6 | 5.7974E-6 | 0.032508 | 0.0344837 |
| 1144 | denovo251287 | p__Bacteroidetes  | 0.000018  | 0         | 0.000018  | -0.000018 | 0.032508 | 0.0344837 |
| 1145 | denovo251415 | p__Firmicutes     | 0.0000374 | 0         | 0.0000374 | -0.000037 | 0.000119 | 0.0018162 |
| 1146 | denovo251573 | p__Firmicutes     | 0.0000117 | 0         | 0.0000117 | -0.000012 | 0.010836 | 0.0201715 |
| 1147 | denovo251917 | p__Proteobacteria | 2.4924E-6 | 0.0000122 | -9.749E-6 | 9.7491E-6 | 0.041200 | 0.0419868 |
| 1148 | denovo252604 | p__Firmicutes     | 0.0000304 | 0         | 0.0000304 | -0.00003  | 0.003096 | 0.0108688 |
| 1149 | denovo252866 | p__Firmicutes     | 0.0000434 | 5.1249E-6 | 0.0000383 | -0.000038 | 0.033958 | 0.0354016 |
| 1150 | denovo252903 | p__Proteobacteria | 0         | 0.0000158 | -0.000016 | 0.0000158 | 0.010836 | 0.0201715 |
| 1151 | denovo253019 | p__Proteobacteria | 1.8416E-6 | 0.0000372 | -0.000035 | 0.0000354 | 0.025125 | 0.0344837 |
| 1152 | denovo254010 | p__Actinobacteria | 0.0001512 | 4.1423E-6 | 0.0001471 | -0.000147 | 0.001851 | 0.0093326 |
| 1153 | denovo254112 | p__Firmicutes     | 0.0000169 | 0         | 0.0000169 | -0.000017 | 0.032508 | 0.0344837 |
| 1154 | denovo254206 | p__Firmicutes     | 0.0000727 | 8.153E-6  | 0.0000646 | -0.000065 | 0.006452 | 0.0189788 |
| 1155 | denovo254806 | p__Firmicutes     | 8.8932E-6 | 0         | 8.8932E-6 | -8.893E-6 | 0.032508 | 0.0344837 |
| 1156 | denovo254959 | p__Firmicutes     | 0.0000269 | 1.2982E-6 | 0.0000256 | -0.000026 | 0.007859 | 0.0201715 |
| 1157 | denovo255366 | p__Firmicutes     | 0.0000457 | 0         | 0.0000457 | -0.000046 | 0.000714 | 0.0047523 |
| 1158 | denovo256281 | p__Bacteroidetes  | 0.0001115 | 0.0000107 | 0.0001008 | -0.000101 | 0.001028 | 0.0062281 |
| 1159 | denovo256401 | p__Firmicutes     | 0.0000132 | 0         | 0.0000132 | -0.000013 | 0.032508 | 0.0344837 |
| 1160 | denovo256458 | p__Proteobacteria | 9.9809E-7 | 0.0000133 | -0.000012 | 0.0000123 | 0.007859 | 0.0201715 |
| 1161 | denovo256714 | p__Firmicutes     | 0.0000841 | 2.4843E-6 | 0.0000816 | -0.000082 | 0.032508 | 0.0344837 |
| 1162 | denovo256807 | p__Firmicutes     | 9.5942E-6 | 0         | 9.5942E-6 | -9.594E-6 | 0.032508 | 0.0344837 |
| 1163 | denovo256959 | p__Firmicutes     | 0.0000264 | 0         | 0.0000264 | -0.000026 | 0.010836 | 0.0201715 |
| 1164 | denovo257183 | p__Firmicutes     | 0         | 0.0000132 | -0.000013 | 0.0000132 | 0.003096 | 0.0108688 |
| 1165 | denovo257210 | p__Firmicutes     | 0.0000287 | 0.000974  | -0.000945 | 0.0009453 | 0.006452 | 0.0189788 |
| 1166 | denovo257293 |                   | 0         |           |           |           |          |           |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|      |              | p__Proteobacteria |           | 0.0000127 | -0.000013 | 0.0000127 | 0.010836 | 0.0201715 |
| 1167 | denovo257613 | p__Firmicutes     | 5.9983E-6 | 0         | 5.9983E-6 | -5.998E-6 | 0.032508 | 0.0344837 |
| 1168 | denovo257661 | p__Firmicutes     | 4.2759E-6 | 0.0000798 | -0.000076 | 0.0000755 | 0.021553 | 0.0344837 |
| 1169 | denovo257960 | p__Firmicutes     | 0.0000187 | 0         | 0.0000187 | -0.000019 | 0.032508 | 0.0344837 |
| 1170 | denovo258316 | p__Bacteroidetes  | 0.0000423 | 0         | 0.0000423 | -0.000042 | 0.032508 | 0.0344837 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 1171   | denovo258453               | p__Proteobacteria | 0.002794    | 0.0214808      | -0.018687 | 0.0186869 | 0.000043300 | 0.0009948 |
| 1172   | denovo258488               | p__Firmicutes     | 0.0000563   | 0              | 0.0000563 | -0.000056 | 0.003096    | 0.0108688 |
| 1173   | denovo258773               | p__Firmicutes     | 0.0000331   | 0              | 0.0000331 | -0.000033 | 0.000714    | 0.0047523 |
| 1174   | denovo258946               | p__Bacteroidetes  | 0.0002082   | 7.4416E-6      | 0.0002008 | -0.000201 | 0.000260    | 0.0029471 |
| 1175   | denovo259386               | p__Firmicutes     | 0.0000333   | 0              | 0.0000333 | -0.000033 | 0.000714    | 0.0047523 |
| 1176   | denovo259509               | p__Proteobacteria | 0           | 0.0000145      | -0.000014 | 0.0000145 | 0.032508    | 0.0344837 |
| 1177   | denovo259523               | p__Proteobacteria | 1.6242E-6   | 0.0000191      | -0.000018 | 0.0000175 | 0.005477    | 0.0165144 |
| 1178   | denovo259541               | p__Proteobacteria | 2.5839E-6   | 0.000089       | -0.000086 | 0.0000864 | 0.001310    | 0.0071392 |
| 1179   | denovo259566               | p__Firmicutes     | 0.0000417   | 8.5346E-7      | 0.0000409 | -0.000041 | 0.001310    | 0.0071392 |
| 1180   | denovo259586               | p__Firmicutes     | 0.0000309   | 7.3347E-7      | 0.0000302 | -0.00003  | 0.010836    | 0.0201715 |
| 1181   | denovo259702               | p__Firmicutes     | 0           | 0.0000211      | -0.000021 | 0.0000211 | 0.032508    | 0.0344837 |
| 1182   | denovo259735               | p__Firmicutes     | 0.0000135   | 0              | 0.0000135 | -0.000013 | 0.032508    | 0.0344837 |
| 1183   | denovo259823               | p__Actinobacteria | 0.0001715   | 0.0000108      | 0.0001607 | -0.000161 | 0.003334    | 0.0114828 |

|      |              |                   |           |           |           |           |             |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 1184 | denovo259935 | p__Proteobacteria | 0         | 7.5653E-6 | -7.565E-6 | 7.5653E-6 | 0.010836    | 0.0201715 |
| 1185 | denovo260313 | p__Firmicutes     | 0.0000601 | 0         | 0.0000601 | -0.00006  | 0.032508    | 0.0344837 |
| 1186 | denovo260352 | p__Proteobacteria | 0.0000198 | 0.0000577 | -0.000038 | 0.0000379 | 0.015686    | 0.0275332 |
| 1187 | denovo261378 | p__Firmicutes     | 0.0053021 | 0.0002184 | 0.0050837 | -0.005084 | 0.012622    | 0.0225927 |
| 1188 | denovo261660 | p__Proteobacteria | 0.0000475 | 0.0001496 | -0.000102 | 0.0001021 | 0.002750    | 0.0108688 |
| 1189 | denovo262417 | p__Proteobacteria | 0         | 6.9628E-6 | -6.963E-6 | 6.9628E-6 | 0.032508    | 0.0344837 |
| 1190 | denovo263030 | p__Firmicutes     | 5.91E-6   | 0         | 5.91E-6   | -5.91E-6  | 0.032508    | 0.0344837 |
| 1191 | denovo263246 | p__Firmicutes     | 0.0000123 | 0         | 0.0000123 | -0.000012 | 0.032508    | 0.0344837 |
| 1192 | denovo263377 | p__Firmicutes     | 0.0000129 | 4.71E-7   | 0.0000124 | -0.000012 | 0.032508    | 0.0344837 |
| 1193 | denovo263389 | p__Firmicutes     | 0.0000335 | 0         | 0.0000335 | -0.000034 | 0.003096    | 0.0108688 |
| 1194 | denovo263407 | p__Firmicutes     | 0.0001163 | 0.0036721 | -0.003556 | 0.0035558 | 0.000010825 | 0.000517  |
| 1195 | denovo263505 | p__Firmicutes     | 0.0000224 | 0         | 0.0000224 | -0.000022 | 0.032508    | 0.0344837 |
| 1196 | denovo263898 | p__Proteobacteria | 9.5918E-6 | 0.0000589 | -0.000049 | 0.0000493 | 0.010836    | 0.0201715 |
| 1197 | denovo264135 | p__Proteobacteria | 0         | 7.9291E-6 | -7.929E-6 | 7.9291E-6 | 0.032508    | 0.0344837 |
| 1198 | denovo264277 | p__Firmicutes     | 8.1211E-6 | 0.0000533 | -0.000045 | 0.0000452 | 0.049536    | 0.0495356 |
| 1199 | denovo264512 | p__Firmicutes     | 0.0000986 | 4.316E-6  | 0.0000943 | -0.000094 | 0.000996    | 0.0062281 |
| 1200 | denovo265351 | p__Proteobacteria | 0.0013143 | 0.0193489 | -0.018035 | 0.0180346 | 0.003886    | 0.0128948 |

The 2-sided p-value is presented.

|  |                            |        |             |                |       |       | Page 41 of 61 |     |
|--|----------------------------|--------|-------------|----------------|-------|-------|---------------|-----|
| Table S8   |                            |        |             |                |       |       |               |     |
| Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample. |                            |        |             |                |       |       |               |     |
| SI No.   | Operational Taxonomic Unit | Phylum | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value       | FDR |

|      |              |                   |           |           |           |           |             |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 1201 | denovo265472 | p__Bacteroidetes  | 0.000571  | 0.0065043 | -0.005933 | 0.0059334 | 0.000487    | 0.0043769 |
| 1202 | denovo265596 | p__Firmicutes     | 0.0000695 | 0.000013  | 0.0000565 | -0.000056 | 0.003302    | 0.0114361 |
| 1203 | denovo266050 | p__[Thermi]       | 0.0000453 | 0.0026578 | -0.002612 | 0.0026125 | 0.004980    | 0.0156907 |
| 1204 | denovo266090 | p__Firmicutes     | 0.0000341 | 0.0001087 | -0.000075 | 0.0000746 | 0.049536    | 0.0495356 |
| 1205 | denovo266248 | p__Firmicutes     | 0.0000296 | 3.9927E-7 | 0.0000292 | -0.000029 | 0.010836    | 0.0201715 |
| 1206 | denovo266296 | p__Firmicutes     | 0.0000253 | 0         | 0.0000253 | -0.000025 | 0.032508    | 0.0344837 |
| 1207 | denovo266635 | p__Firmicutes     | 0.0000299 | 1.7324E-6 | 0.0000282 | -0.000028 | 0.007859    | 0.0201715 |
| 1208 | denovo266763 | p__Actinobacteria | 0.0000299 | 6.7758E-7 | 0.0000292 | -0.000029 | 0.010836    | 0.0201715 |
| 1209 | denovo267454 | p__Firmicutes     | 2.5839E-6 | 0.0020898 | -0.002087 | 0.0020872 | 0.032508    | 0.0344837 |
| 1210 | denovo267600 | p__Bacteroidetes  | 0.0000484 | 0.0025913 | -0.002543 | 0.0025429 | 0.000010825 | 0.000517  |
| 1211 | denovo267637 | p__Firmicutes     | 0.0000326 | 0         | 0.0000326 | -0.000033 | 0.010836    | 0.0201715 |
| 1212 | denovo267975 | p__Proteobacteria | 0         | 0.000012  | -0.000012 | 0.000012  | 0.032508    | 0.0344837 |
| 1213 | denovo268186 | p__Firmicutes     | 0.0002046 | 0.0000163 | 0.0001882 | -0.000188 | 0.020005    | 0.0329181 |
| 1214 | denovo268204 | p__Firmicutes     | 0.0000474 | 8.9235E-6 | 0.0000384 | -0.000038 | 0.014387    | 0.0254996 |
| 1215 | denovo268212 | p__Firmicutes     | 0.0000289 | 0         | 0.0000289 | -0.000029 | 0.003096    | 0.0108688 |
| 1216 | denovo268219 | p__Firmicutes     | 0.0000137 | 0         | 0.0000137 | -0.000014 | 0.032508    | 0.0344837 |
| 1217 | denovo268312 | p__Actinobacteria | 0.0001991 | 0         | 0.0001991 | -0.000199 | 0.032508    | 0.0344837 |
| 1218 | denovo268545 | p__Proteobacteria | 0.0000275 | 0.0004024 | -0.000375 | 0.0003749 | 0.000877    | 0.0056635 |
| 1219 | denovo268798 | p__[Thermi]       | 0.0001142 | 0.0069259 | -0.006812 | 0.0068117 | 0.000010825 | 0.000517  |
| 1220 | denovo269149 | p__Firmicutes     | 0.0001898 | 0         | 0.0001898 | -0.00019  | 0.000714    | 0.0047523 |
| 1221 | denovo269302 | p__Firmicutes     | 8.5344E-6 | 0         | 8.5344E-6 | -8.534E-6 | 0.032508    | 0.0344837 |
| 1222 | denovo270017 | p__Firmicutes     | 0.0000179 | 6.8058E-7 | 0.0000172 | -0.000017 | 0.032508    | 0.0344837 |
| 1223 | denovo270556 | p__Firmicutes     | 0         | 9.3004E-6 | -9.3E-6   | 9.3004E-6 | 0.010836    | 0.0201715 |
| 1224 | denovo270735 | p__Firmicutes     | 0.0001063 | 5.5731E-6 | 0.0001008 | -0.000101 | 0.010836    | 0.0201715 |
| 1225 | denovo270753 | p__Firmicutes     | 1.6242E-6 | 0.0000203 | -0.000019 | 0.0000187 | 0.032508    | 0.0344837 |
| 1226 | denovo270824 |                   | 1.6242E-6 |           |           |           |             |           |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|      |              | p__Proteobacteria |           | 0.0000301 | -0.000028 | 0.0000284 | 0.000444 | 0.0043769 |
| 1227 | denovo270881 | p__Firmicutes     | 0.0000485 | 3.8247E-7 | 0.0000481 | -0.000048 | 0.003096 | 0.0108688 |
| 1228 | denovo271077 | p__Proteobacteria | 2.5839E-6 | 0.0000166 | -0.000014 | 0.000014  | 0.041796 | 0.0424031 |
| 1229 | denovo271093 | p__Firmicutes     | 0.0000566 | 8.7027E-7 | 0.0000557 | -0.000056 | 0.000119 | 0.0018162 |
| 1230 | denovo271522 | p__Firmicutes     | 0.0009414 | 0.0000648 | 0.0008766 | -0.000877 | 0.000173 | 0.0022138 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 1231   | denovo271880               | p__Firmicutes     | 8.4355E-7   | 0.0002762      | -0.000275 | 0.0002754 | 0.000119    | 0.0018162 |
| 1232   | denovo273145               | p__Proteobacteria | 1.6514E-6   | 0.0002045      | -0.000203 | 0.0002028 | 0.032508    | 0.0344837 |
| 1233   | denovo273728               | p__Firmicutes     | 0.0000152   | 0              | 0.0000152 | -0.000015 | 0.032508    | 0.0344837 |
| 1234   | denovo273732               | p__Actinobacteria | 0.0024297   | 0.0311692      | -0.028739 | 0.0287395 | 0.000075776 | 0.0014477 |
| 1235   | denovo273942               | p__Proteobacteria | 0           | 7.3742E-6      | -7.374E-6 | 7.3742E-6 | 0.032508    | 0.0344837 |
| 1236   | denovo273965               | p__Firmicutes     | 0.0000398   | 4.71E-7        | 0.0000393 | -0.000039 | 0.003096    | 0.0108688 |
| 1237   | denovo274013               | p__Proteobacteria | 0.0002556   | 0.0018136      | -0.001558 | 0.0015581 | 0.001494    | 0.007859  |
| 1238   | denovo274054               | p__Firmicutes     | 0.0000199   | 6.7758E-7      | 0.0000192 | -0.000019 | 0.032508    | 0.0344837 |
| 1239   | denovo274501               | p__Firmicutes     | 8.4355E-7   | 0.0005963      | -0.000595 | 0.0005954 | 0.003096    | 0.0108688 |
| 1240   | denovo274931               | p__Firmicutes     | 0.0001428   | 0              | 0.0001428 | -0.000143 | 0.010836    | 0.0201715 |
| 1241   | denovo275084               | p__Firmicutes     | 8.039E-6    | 0              | 8.039E-6  | -8.039E-6 | 0.032508    | 0.0344837 |
| 1242   | denovo275140               | p__Firmicutes     | 0.0005968   | 0.0000154      | 0.0005814 | -0.000581 | 0.000336    | 0.0034411 |
| 1243   | denovo275458               | p__Firmicutes     | 0.0000362   |                |           |           |             |           |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|      |              |                   |           | 0         | 0.0000362 | -0.000036 | 0.010836 | 0.0201715 |
| 1244 | denovo275690 | p__Firmicutes     | 0.0000195 | 0         | 0.0000195 | -0.00002  | 0.010836 | 0.0201715 |
| 1245 | denovo275722 | p__Proteobacteria | 0.0000139 | 0.0002392 | -0.000225 | 0.0002253 | 0.000693 | 0.0047523 |
| 1246 | denovo276069 | p__Firmicutes     | 0.0000513 | 5.6524E-6 | 0.0000456 | -0.000046 | 0.004601 | 0.0147791 |
| 1247 | denovo276220 | p__Proteobacteria | 0         | 0.0000181 | -0.000018 | 0.0000181 | 0.003096 | 0.0108688 |
| 1248 | denovo277456 | p__Actinobacteria | 0.0000158 | 0         | 0.0000158 | -0.000016 | 0.032508 | 0.0344837 |
| 1249 | denovo277488 | p__Firmicutes     | 0.0000124 | 0         | 0.0000124 | -0.000012 | 0.032508 | 0.0344837 |
| 1250 | denovo277580 | p__Firmicutes     | 0.0006846 | 0         | 0.0006846 | -0.000685 | 0.000119 | 0.0018162 |
| 1251 | denovo277874 | p__Firmicutes     | 8.6717E-6 | 0         | 8.6717E-6 | -8.672E-6 | 0.032508 | 0.0344837 |
| 1252 | denovo278508 | p__Actinobacteria | 0.0002515 | 0         | 0.0002515 | -0.000252 | 0.003096 | 0.0108688 |
| 1253 | denovo278979 | p__Firmicutes     | 0.0001664 | 0         | 0.0001664 | -0.000166 | 0.010836 | 0.0201715 |
| 1254 | denovo279085 | p__Proteobacteria | 2.1492E-6 | 0.0000634 | -0.000061 | 0.0000613 | 0.005477 | 0.0165144 |
| 1255 | denovo279401 | p__Firmicutes     | 0.0000424 | 3.8291E-6 | 0.0000385 | -0.000039 | 0.005477 | 0.0165144 |
| 1256 | denovo279716 | p__Firmicutes     | 0.0000541 | 0         | 0.0000541 | -0.000054 | 0.010836 | 0.0201715 |
| 1257 | denovo279855 | p__Bacteroidetes  | 0.0000872 | 0.001669  | -0.001582 | 0.0015819 | 0.005185 | 0.0160388 |
| 1258 | denovo280312 | p__Firmicutes     | 0.0000199 | 3.9927E-7 | 0.0000195 | -0.000019 | 0.010836 | 0.0201715 |
| 1259 | denovo280464 | p__Firmicutes     | 5.6266E-6 | 6.7758E-7 | 4.949E-6  | -4.949E-6 | 0.032508 | 0.0344837 |
| 1260 | denovo281067 | p__Firmicutes     | 0.0015037 | 0.0129076 | -0.011404 | 0.0114039 | 0.000325 | 0.0033875 |
|      |              |                   |           |           |           |           |          |           |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample.

| SI No. | Operational Taxonomic Unit | Phylum | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value | FDR |
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|

|      |              |                   |           |           |           |           |             |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 1261 | denovo281522 | p__Firmicutes     | 0.000021  | 0         | 0.000021  | -0.000021 | 0.010836    | 0.0201715 |
| 1262 | denovo281592 | p__Firmicutes     | 0.0000169 | 6.7758E-7 | 0.0000162 | -0.000016 | 0.032508    | 0.0344837 |
| 1263 | denovo281734 | p__Firmicutes     | 0.0000753 | 1.7237E-6 | 0.0000736 | -0.000074 | 0.000173    | 0.0022138 |
| 1264 | denovo281842 | p__Firmicutes     | 0.0000259 | 0         | 0.0000259 | -0.000026 | 0.003096    | 0.0108688 |
| 1265 | denovo282453 | p__Firmicutes     | 1.84E-6   | 0.0000386 | -0.000037 | 0.0000368 | 0.007859    | 0.0201715 |
| 1266 | denovo282710 | p__Firmicutes     | 9.9978E-6 | 0         | 9.9978E-6 | -9.998E-6 | 0.010836    | 0.0201715 |
| 1267 | denovo283217 | p__Actinobacteria | 0.0000274 | 1.7324E-6 | 0.0000257 | -0.000026 | 0.007859    | 0.0201715 |
| 1268 | denovo283378 | p__Firmicutes     | 0.0000196 | 0         | 0.0000196 | -0.00002  | 0.000714    | 0.0047523 |
| 1269 | denovo283998 | p__Firmicutes     | 0.0000198 | 0         | 0.0000198 | -0.00002  | 0.032508    | 0.0344837 |
| 1270 | denovo284125 | p__Firmicutes     | 0.0000316 | 0         | 0.0000316 | -0.000032 | 0.010836    | 0.0201715 |
| 1271 | denovo284157 | p__Firmicutes     | 0.0000342 | 1.1109E-6 | 0.0000331 | -0.000033 | 0.010836    | 0.0201715 |
| 1272 | denovo284761 | p__Firmicutes     | 0.0000226 | 0         | 0.0000226 | -0.000023 | 0.032508    | 0.0344837 |
| 1273 | denovo284802 | p__Firmicutes     | 0.0000164 | 0         | 0.0000164 | -0.000016 | 0.032508    | 0.0344837 |
| 1274 | denovo285320 | p__Firmicutes     | 0.0000588 | 6.7758E-7 | 0.0000581 | -0.000058 | 0.000010825 | 0.000517  |
| 1275 | denovo285829 | p__Firmicutes     | 1.707E-6  | 0.0009169 | -0.000915 | 0.0009152 | 0.001256    | 0.007078  |
| 1276 | denovo286030 | p__Proteobacteria | 9.4046E-7 | 0.0000878 | -0.000087 | 0.0000869 | 0.003096    | 0.0108688 |
| 1277 | denovo286674 | p__Firmicutes     | 0.0000139 | 0         | 0.0000139 | -0.000014 | 0.032508    | 0.0344837 |
| 1278 | denovo286870 | p__Firmicutes     | 0.0000633 | 3.6618E-6 | 0.0000597 | -0.00006  | 0.027366    | 0.0344837 |
| 1279 | denovo287533 | p__Proteobacteria | 0.0000256 | 0.0001919 | -0.000166 | 0.0001663 | 0.032919    | 0.0348386 |
| 1280 | denovo288570 | p__Firmicutes     | 0.0000175 | 1.7885E-6 | 0.0000157 | -0.000016 | 0.041200    | 0.0419868 |
| 1281 | denovo288610 | p__Firmicutes     | 0.00006   | 0         | 0.00006   | -0.00006  | 0.000714    | 0.0047523 |
| 1282 | denovo288957 | p__Firmicutes     | 6.1638E-6 | 0         | 6.1638E-6 | -6.164E-6 | 0.032508    | 0.0344837 |
| 1283 | denovo288984 | p__Firmicutes     | 0.0292132 | 0.0061279 | 0.0230853 | -0.023085 | 0.002879    | 0.0108688 |
| 1284 | denovo288985 | p__Firmicutes     | 0.2122951 | 0.0107857 | 0.2015094 | -0.201509 | 0.000010825 | 0.000517  |
| 1285 | denovo288987 | p__Firmicutes     | 0.0020676 | 0.0147573 | -0.01269  | 0.0126897 | 0.001050    | 0.0062281 |



|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1286 | denovo289727 | p__Proteobacteria | 0         | 0.0000105 | -0.00001  | 0.0000105 | 0.003096 | 0.0108688 |
| 1287 | denovo289800 | p__Actinobacteria | 0.0000112 | 0         | 0.0000112 | -0.000011 | 0.032508 | 0.0344837 |
| 1288 | denovo289858 | p__Firmicutes     | 0         | 6.9242E-6 | -6.924E-6 | 6.9242E-6 | 0.032508 | 0.0344837 |
| 1289 | denovo290016 | p__Firmicutes     | 0.000022  | 0.0002349 | -0.000213 | 0.0002129 | 0.041200 | 0.0419868 |
| 1290 | denovo290273 | p__Proteobacteria | 0         | 0.0000118 | -0.000012 | 0.0000118 | 0.003096 | 0.0108688 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 1291   | denovo290683               | p__Firmicutes     | 0.0000212   | 2.8677E-6      | 0.0000183 | -0.000018 | 0.015004    | 0.0263616 |
| 1292   | denovo291602               | p__Firmicutes     | 0.000037    | 0              | 0.000037  | -0.000037 | 0.000714    | 0.0047523 |
| 1293   | denovo291702               | p__Actinobacteria | 0.000046    | 0              | 0.000046  | -0.000046 | 0.010836    | 0.0201715 |
| 1294   | denovo291798               | p__Firmicutes     | 0.0000237   | 2.8677E-6      | 0.0000209 | -0.000021 | 0.003691    | 0.0124301 |
| 1295   | denovo291857               | p__Proteobacteria | 9.376E-6    | 0.0000568      | -0.000047 | 0.0000475 | 0.004601    | 0.0147791 |
| 1296   | denovo292138               | p__Proteobacteria | 0           | 0.0000119      | -0.000012 | 0.0000119 | 0.010836    | 0.0201715 |
| 1297   | denovo292378               | p__Firmicutes     | 0.0001278   | 0.000012       | 0.0001158 | -0.000116 | 0.005651    | 0.0169802 |
| 1298   | denovo292462               | p__Firmicutes     | 7.7678E-6   | 4.71E-7        | 7.2968E-6 | -7.297E-6 | 0.032508    | 0.0344837 |
| 1299   | denovo292471               | p__Proteobacteria | 0           | 0.000083       | -0.000083 | 0.000083  | 0.003096    | 0.0108688 |
| 1300   | denovo292559               | p__Firmicutes     | 0.000019    | 0.0006082      | -0.000589 | 0.0005892 | 0.006939    | 0.0194653 |
| 1301   | denovo293013               | p__Firmicutes     | 0.0000739   | 0              | 0.0000739 | -0.000074 | 0.000010825 | 0.000517  |
| 1302   | denovo293178               | p__Firmicutes     | 0.0007554   | 0.0091637      | -0.008408 | 0.0084083 | 0.000206    | 0.0024559 |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1303 | denovo293882 | p__Firmicutes     | 0.0000119 | 0         | 0.0000119 | -0.000012 | 0.010836 | 0.0201715 |
| 1304 | denovo294138 | p__Firmicutes     | 0.0000713 | 6.7758E-7 | 0.0000707 | -0.000071 | 0.032508 | 0.0344837 |
| 1305 | denovo294374 | p__Proteobacteria | 8.257E-7  | 0.0000184 | -0.000018 | 0.0000176 | 0.003096 | 0.0108688 |
| 1306 | denovo294751 | p__Firmicutes     | 7.1381E-6 | 0         | 7.1381E-6 | -7.138E-6 | 0.032508 | 0.0344837 |
| 1307 | denovo294793 | p__Bacteroidetes  | 0.000021  | 0         | 0.000021  | -0.000021 | 0.032508 | 0.0344837 |
| 1308 | denovo295063 | p__Proteobacteria | 0         | 0.0000104 | -0.00001  | 0.0000104 | 0.003096 | 0.0108688 |
| 1309 | denovo295771 | p__Firmicutes     | 0.0000583 | 0         | 0.0000583 | -0.000058 | 0.010836 | 0.0201715 |
| 1310 | denovo295959 | p__Firmicutes     | 0.0000299 | 0         | 0.0000299 | -0.00003  | 0.032508 | 0.0344837 |
| 1311 | denovo296035 | p__TM7            | 0.0001665 | 0.0010183 | -0.000852 | 0.0008518 | 0.000693 | 0.0047523 |
| 1312 | denovo296151 | p__Proteobacteria | 0.0022369 | 0.012447  | -0.01021  | 0.0102101 | 0.002879 | 0.0108688 |
| 1313 | denovo296347 | p__Proteobacteria | 0         | 0.0000141 | -0.000014 | 0.0000141 | 0.032508 | 0.0344837 |
| 1314 | denovo296489 | p__Firmicutes     | 0.0000516 | 0         | 0.0000516 | -0.000052 | 0.032508 | 0.0344837 |
| 1315 | denovo296559 | p__Actinobacteria | 0.0000488 | 0         | 0.0000488 | -0.000049 | 0.032508 | 0.0344837 |
| 1316 | denovo296564 | p__Firmicutes     | 0.0000383 | 1.1486E-6 | 0.0000372 | -0.000037 | 0.006668 | 0.0190297 |
| 1317 | denovo296938 | p__Actinobacteria | 0.0000294 | 0         | 0.0000294 | -0.000029 | 0.032508 | 0.0344837 |
| 1318 | denovo298236 | p__Firmicutes     | 0.0000103 | 0         | 0.0000103 | -0.00001  | 0.032508 | 0.0344837 |
| 1319 | denovo298744 | p__Proteobacteria | 0         | 7.1901E-6 | -7.19E-6  | 7.1901E-6 | 0.032508 | 0.0344837 |
| 1320 | denovo298916 | p__Actinobacteria | 0.0000163 | 0         | 0.0000163 | -0.000016 | 0.032508 | 0.0344837 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample.

| SI No. | Operational Taxonomic Unit | Phylum | Oral Sample | Control Sample | O1-C1 | C1-O1 | P Value | FDR |
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|
|--------|----------------------------|--------|-------------|----------------|-------|-------|---------|-----|

|      |              |                   |           |           |           |           |             |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 1321 | denovo299302 | p__Proteobacteria | 2.5839E-6 | 0.0000136 | -0.000011 | 0.000011  | 0.034056    | 0.0354016 |
| 1322 | denovo299485 | p__Firmicutes     | 0.0000597 | 1.2422E-6 | 0.0000584 | -0.000058 | 0.007859    | 0.0201715 |
| 1323 | denovo299608 | p__Proteobacteria | 0.0000389 | 0.0007188 | -0.00068  | 0.0006799 | 0.000206    | 0.0024559 |
| 1324 | denovo299972 | p__Proteobacteria | 0         | 0.0000151 | -0.000015 | 0.0000151 | 0.010836    | 0.0201715 |
| 1325 | denovo300324 | p__Proteobacteria | 0         | 0.0000161 | -0.000016 | 0.0000161 | 0.032508    | 0.0344837 |
| 1326 | denovo300355 | p__Firmicutes     | 0.0000497 | 0         | 0.0000497 | -0.00005  | 0.003096    | 0.0108688 |
| 1327 | denovo300359 | p__Bacteroidetes  | 0.0000173 | 3.9927E-7 | 0.0000169 | -0.000017 | 0.032508    | 0.0344837 |
| 1328 | denovo300406 | p__Firmicutes     | 0.0000151 | 0         | 0.0000151 | -0.000015 | 0.032508    | 0.0344837 |
| 1329 | denovo300483 | p__Firmicutes     | 0         | 0.0001653 | -0.000165 | 0.0001653 | 0.032508    | 0.0344837 |
| 1330 | denovo300519 | p__Firmicutes     | 0.0000512 | 8.5346E-7 | 0.0000503 | -0.00005  | 0.000021650 | 0.0006237 |
| 1331 | denovo300730 | p__Actinobacteria | 0.0695125 | 0.0004074 | 0.0691051 | -0.069105 | 0.002879    | 0.0108688 |
| 1332 | denovo300861 | p__Firmicutes     | 0.0000117 | 1.3476E-6 | 0.0000104 | -0.00001  | 0.034056    | 0.0354016 |
| 1333 | denovo300959 | p__Firmicutes     | 0.0000319 | 0         | 0.0000319 | -0.000032 | 0.010836    | 0.0201715 |
| 1334 | denovo301101 | p__Firmicutes     | 0.0001463 | 0.0031558 | -0.003009 | 0.0030095 | 0.000877    | 0.0056635 |
| 1335 | denovo301157 | p__Firmicutes     | 0.0000161 | 0         | 0.0000161 | -0.000016 | 0.010836    | 0.0201715 |
| 1336 | denovo302044 | p__Firmicutes     | 0.000249  | 0.0000195 | 0.0002295 | -0.000229 | 0.003226    | 0.0112595 |
| 1337 | denovo302141 | p__Firmicutes     | 0.0000859 | 0         | 0.0000859 | -0.000086 | 0.032508    | 0.0344837 |
| 1338 | denovo302732 | p__Proteobacteria | 0.000656  | 0.0048044 | -0.004148 | 0.0041483 | 0.003832    | 0.0128089 |
| 1339 | denovo302950 | p__Actinobacteria | 0.0000191 | 0.0001738 | -0.000155 | 0.0001547 | 0.016313    | 0.0282797 |
| 1340 | denovo303187 | p__Proteobacteria | 0.0005236 | 0.0053786 | -0.004855 | 0.004855  | 0.000075776 | 0.0014477 |
| 1341 | denovo303215 | p__Bacteroidetes  | 0.0004458 | 0.0007947 | -0.000349 | 0.0003489 | 0.001277    | 0.0071392 |
| 1342 | denovo303250 | p__Firmicutes     | 0.000015  | 6.7758E-7 | 0.0000144 | -0.000014 | 0.032508    | 0.0344837 |
| 1343 | denovo303500 | p__Firmicutes     | 5.9484E-6 | 0         | 5.9484E-6 | -5.948E-6 | 0.032508    | 0.0344837 |
| 1344 | denovo303672 | p__Firmicutes     | 0.0000426 | 1.6974E-6 | 0.0000409 | -0.000041 | 0.026316    | 0.0344837 |
| 1345 | denovo303984 | p__Proteobacteria | 2.5839E-6 | 0.0000248 | -0.000022 | 0.0000222 | 0.034056    | 0.0354016 |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1346 | denovo304438 | p__Firmicutes     | 0.0000179 | 0         | 0.0000179 | -0.000018 | 0.032508 | 0.0344837 |
| 1347 | denovo304474 | p__Actinobacteria | 0.0009236 | 0.0000292 | 0.0008944 | -0.000894 | 0.012741 | 0.022761  |
| 1348 | denovo304659 | p__Firmicutes     | 0         | 0.0001116 | -0.000112 | 0.0001116 | 0.010836 | 0.0201715 |
| 1349 | denovo304881 | p__Firmicutes     | 0.0000147 | 0         | 0.0000147 | -0.000015 | 0.032508 | 0.0344837 |
| 1350 | denovo305386 | p__Firmicutes     | 0.0000224 | 3.9927E-7 | 0.000022  | -0.000022 | 0.010836 | 0.0201715 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 1351   | denovo305415               | p__Firmicutes     | 9.0351E-6   | 0              | 9.0351E-6 | -9.035E-6 | 0.032508    | 0.0344837 |
| 1352   | denovo305425               | p__Firmicutes     | 0.0000259   | 0              | 0.0000259 | -0.000026 | 0.032508    | 0.0344837 |
| 1353   | denovo305507               | p__Proteobacteria | 7.8735E-7   | 0.000028       | -0.000027 | 0.0000272 | 0.010836    | 0.0201715 |
| 1354   | denovo305695               | p__Proteobacteria | 0.0009404   | 0.0082294      | -0.007289 | 0.007289  | 0.000021650 | 0.0006237 |
| 1355   | denovo305900               | p__Firmicutes     | 0.0000359   | 2.5509E-6      | 0.0000334 | -0.000033 | 0.025125    | 0.0344837 |
| 1356   | denovo306143               | p__Firmicutes     | 8.0035E-6   | 0              | 8.0035E-6 | -8.003E-6 | 0.032508    | 0.0344837 |
| 1357   | denovo306794               | p__Actinobacteria | 0.0000964   | 1.6974E-6      | 0.0000947 | -0.000095 | 0.032508    | 0.0344837 |
| 1358   | denovo307404               | p__Firmicutes     | 0.0000572   | 7.0517E-6      | 0.0000501 | -0.00005  | 0.021975    | 0.0344837 |
| 1359   | denovo307461               | p__Firmicutes     | 0           | 6.6802E-6      | -6.68E-6  | 6.6802E-6 | 0.032508    | 0.0344837 |
| 1360   | denovo307710               | p__Proteobacteria | 2.5839E-6   | 0.0000278      | -0.000025 | 0.0000252 | 0.003096    | 0.0108688 |
| 1361   | denovo307749               | p__Firmicutes     | 0.0000381   | 8.7027E-7      | 0.0000372 | -0.000037 | 0.010836    | 0.0201715 |
| 1362   | denovo307858               | p__Proteobacteria | 6.5182E-6   | 0.0003491      | -0.000343 | 0.0003426 | 0.000054125 | 0.0012128 |
| 1363   | denovo307873               | p__Firmicutes     | 0.000106    | 1.7324E-6      | 0.0001043 | -0.000104 | 0.010836    | 0.0201715 |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1364 | denovo308184 | p__Firmicutes     | 5.6473E-6 | 0         | 5.6473E-6 | -5.647E-6 | 0.032508 | 0.0344837 |
| 1365 | denovo308199 | p__Proteobacteria | 0         | 0.0000533 | -0.000053 | 0.0000533 | 0.003096 | 0.0108688 |
| 1366 | denovo308278 | p__Actinobacteria | 0.0000203 | 0         | 0.0000203 | -0.00002  | 0.032508 | 0.0344837 |
| 1367 | denovo308578 | p__Firmicutes     | 9.1957E-6 | 0.0000231 | -0.000014 | 0.0000139 | 0.017385 | 0.0298806 |
| 1368 | denovo308628 | p__Firmicutes     | 0.0000149 | 6.7758E-7 | 0.0000143 | -0.000014 | 0.032508 | 0.0344837 |
| 1369 | denovo308718 | p__Proteobacteria | 0         | 0.0000142 | -0.000014 | 0.0000142 | 0.010836 | 0.0201715 |
| 1370 | denovo308743 | p__Firmicutes     | 0.0000353 | 1.6414E-6 | 0.0000336 | -0.000034 | 0.009050 | 0.0201715 |
| 1371 | denovo309479 | p__Firmicutes     | 0.0000114 | 0         | 0.0000114 | -0.000011 | 0.032508 | 0.0344837 |
| 1372 | denovo309927 | p__Firmicutes     | 1.84E-6   | 0.0002267 | -0.000225 | 0.0002249 | 0.032508 | 0.0344837 |
| 1373 | denovo310104 | p__Firmicutes     | 0.0000925 | 0         | 0.0000925 | -0.000093 | 0.000714 | 0.0047523 |
| 1374 | denovo310777 | p__Firmicutes     | 0.0000908 | 5.5795E-6 | 0.0000852 | -0.000085 | 0.001797 | 0.0092656 |
| 1375 | denovo310848 | p__Firmicutes     | 0.0001684 | 8.92E-6   | 0.0001595 | -0.00016  | 0.000292 | 0.0031957 |
| 1376 | denovo311174 | p__Firmicutes     | 0.0000398 | 6.7758E-7 | 0.0000391 | -0.000039 | 0.000714 | 0.0047523 |
| 1377 | denovo311443 | p__Bacteroidetes  | 0.0000762 | 0         | 0.0000762 | -0.000076 | 0.032508 | 0.0344837 |
| 1378 | denovo311516 | p__Firmicutes     | 0.0000141 | 0         | 0.0000141 | -0.000014 | 0.032508 | 0.0344837 |
| 1379 | denovo311621 | p__Actinobacteria | 0.0000415 | 0         | 0.0000415 | -0.000042 | 0.032508 | 0.0344837 |
| 1380 | denovo311889 | p__Proteobacteria | 1.6242E-6 | 7.0134E-6 | -5.389E-6 | 5.3891E-6 | 0.049536 | 0.0495356 |

The 2-sided p-value is presented.

|   |                            |                   |             |                |           |           | Page 47 of 61 |           |
|---|----------------------------|-------------------|-------------|----------------|-----------|-----------|---------------|-----------|
| Table S8  |                            |                   |             |                |           |           |               |           |
| Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample. |                            |                   |             |                |           |           |               |           |
| SI No.  | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value       | FDR       |
| 1381  | denovo311899               | p__Actinobacteria | 0.0000341   | 0              | 0.0000341 | -0.000034 | 0.032508      | 0.0344837 |

|      |              |                   |           |           |           |           |             |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 1382 | denovo312326 | p__Firmicutes     | 0.0000587 | 0.000674  | -0.000615 | 0.0006153 | 0.004601    | 0.0147791 |
| 1383 | denovo312347 | p__Firmicutes     | 0.0010777 | 0.0168572 | -0.015779 | 0.0157795 | 0.000021650 | 0.0006237 |
| 1384 | denovo312608 | p__Actinobacteria | 0         | 0.0001423 | -0.000142 | 0.0001423 | 0.010836    | 0.0201715 |
| 1385 | denovo313065 | p__Firmicutes     | 0.0000137 | 3.8004E-6 | 9.8982E-6 | -9.898E-6 | 0.026911    | 0.0344837 |
| 1386 | denovo313478 | p__Proteobacteria | 0         | 0.000019  | -0.000019 | 0.000019  | 0.003096    | 0.0108688 |
| 1387 | denovo314720 | p__Firmicutes     | 0.0000254 | 4.71E-7   | 0.0000249 | -0.000025 | 0.003096    | 0.0108688 |
| 1388 | denovo315094 | p__Firmicutes     | 0.000021  | 4.71E-7   | 0.0000205 | -0.000021 | 0.010836    | 0.0201715 |
| 1389 | denovo315400 | p__Firmicutes     | 0.0000645 | 3.3326E-6 | 0.0000612 | -0.000061 | 0.001905    | 0.0094999 |
| 1390 | denovo315460 | p__Firmicutes     | 0.0002663 | 0.0075054 | -0.007239 | 0.0072391 | 0.000206    | 0.0024559 |
| 1391 | denovo315518 | p__Firmicutes     | 0.0000522 | 6.0254E-6 | 0.0000462 | -0.000046 | 0.041200    | 0.0419868 |
| 1392 | denovo315669 | p__Proteobacteria | 0         | 0.0000157 | -0.000016 | 0.0000157 | 0.003096    | 0.0108688 |
| 1393 | denovo315712 | p__Firmicutes     | 0.0010824 | 0.0000175 | 0.0010648 | -0.001065 | 0.000097426 | 0.0018162 |
| 1394 | denovo315762 | p__Actinobacteria | 0.0000243 | 0         | 0.0000243 | -0.000024 | 0.032508    | 0.0344837 |
| 1395 | denovo315763 | p__Actinobacteria | 0.0000177 | 0         | 0.0000177 | -0.000018 | 0.032508    | 0.0344837 |
| 1396 | denovo315844 | p__Firmicutes     | 0.0000419 | 0         | 0.0000419 | -0.000042 | 0.010836    | 0.0201715 |
| 1397 | denovo316014 | p__Firmicutes     | 0.0000496 | 4.3207E-6 | 0.0000453 | -0.000045 | 0.001851    | 0.0093326 |
| 1398 | denovo316015 | p__Actinobacteria | 0.0000713 | 1.6974E-6 | 0.0000696 | -0.00007  | 0.032508    | 0.0344837 |
| 1399 | denovo316183 | p__Firmicutes     | 0.0004195 | 0.0024044 | -0.001985 | 0.0019848 | 0.032919    | 0.0348386 |
| 1400 | denovo316186 | p__Firmicutes     | 0.0002592 | 0.0031778 | -0.002919 | 0.0029186 | 0.001007    | 0.0062281 |
| 1401 | denovo316226 | p__Actinobacteria | 0.1645848 | 0.0040001 | 0.1605847 | -0.160585 | 0.000010825 | 0.000517  |
| 1402 | denovo316655 | p__Bacteroidetes  | 0.0006053 | 6.7898E-6 | 0.0005985 | -0.000599 | 0.000444    | 0.0043769 |
| 1403 | denovo316685 | p__Bacteroidetes  | 0.0022463 | 0.0000749 | 0.0021714 | -0.002171 | 0.001061    | 0.0062515 |
| 1404 | denovo316738 | p__Firmicutes     | 0.0000317 | 1.6974E-6 | 0.00003   | -0.00003  | 0.007859    | 0.0201715 |
| 1405 | denovo316809 | p__Proteobacteria | 7.089E-7  | 0.0000154 | -0.000015 | 0.0000147 | 0.032508    | 0.0344837 |
| 1406 | denovo316879 | p__Firmicutes     | 0.0000107 | 0         | 0.0000107 | -0.000011 | 0.032508    | 0.0344837 |
| 1407 | denovo317309 |                   | 6.0114E-6 |           |           |           |             |           |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|      |              | p__Proteobacteria |           | 0.0000862 | -0.00008  | 0.0000801 | 0.001851 | 0.0093326 |
| 1408 | denovo317314 | p__Firmicutes     | 0.0000121 | 0         | 0.0000121 | -0.000012 | 0.032508 | 0.0344837 |
| 1409 | denovo317480 | p__Firmicutes     | 7.3527E-6 | 0         | 7.3527E-6 | -7.353E-6 | 0.032508 | 0.0344837 |
| 1410 | denovo317823 | p__Firmicutes     | 0.0000237 | 0         | 0.0000237 | -0.000024 | 0.010836 | 0.0201715 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 1411   | denovo317928               | p__Firmicutes     | 0.0002208   | 0.0000176      | 0.0002032 | -0.000203 | 0.003908    | 0.0129194 |
| 1412   | denovo318298               | p__Proteobacteria | 0           | 0.0000329      | -0.000033 | 0.0000329 | 0.000714    | 0.0047523 |
| 1413   | denovo318447               | p__Firmicutes     | 0.0002246   | 0              | 0.0002246 | -0.000225 | 0.000119    | 0.0018162 |
| 1414   | denovo318766               | p__Proteobacteria | 0.0003476   | 0.0021733      | -0.001826 | 0.0018257 | 0.001494    | 0.007859  |
| 1415   | denovo318900               | p__Actinobacteria | 0.0000363   | 6.8058E-7      | 0.0000356 | -0.000036 | 0.010836    | 0.0201715 |
| 1416   | denovo319176               | p__Bacteroidetes  | 0.0001057   | 0.0010417      | -0.000936 | 0.0009359 | 0.034132    | 0.0354195 |
| 1417   | denovo319254               | p__Firmicutes     | 0.0000438   | 0              | 0.0000438 | -0.000044 | 0.000010825 | 0.000517  |
| 1418   | denovo319301               | p__Proteobacteria | 0.0001133   | 0.0011569      | -0.001044 | 0.0010437 | 0.000487    | 0.0043769 |
| 1419   | denovo319403               | p__Firmicutes     | 0.0000599   | 2.2004E-6      | 0.0000577 | -0.000058 | 0.032508    | 0.0344837 |
| 1420   | denovo319792               | p__Bacteroidetes  | 0.0000374   | 1.1327E-6      | 0.0000363 | -0.000036 | 0.000173    | 0.0022138 |
| 1421   | denovo319907               | p__Firmicutes     | 9.3899E-6   | 0              | 9.3899E-6 | -9.39E-6  | 0.032508    | 0.0344837 |
| 1422   | denovo319957               | p__Bacteroidetes  | 7.089E-7    | 0.0002783      | -0.000278 | 0.0002776 | 0.010836    | 0.0201715 |
| 1423   | denovo320289               | p__Actinobacteria | 0.0000291   | 0              | 0.0000291 | -0.000029 | 0.010836    | 0.0201715 |
| 1424   | denovo320295               |                   | 1.6514E-6   |                |           |           |             |           |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|      |              | p__Proteobacteria |           | 0.0000132 | -0.000012 | 0.0000115 | 0.026316 | 0.0344837 |
| 1425 | denovo320709 | p__Proteobacteria | 0         | 7.6624E-6 | -7.662E-6 | 7.6624E-6 | 0.032508 | 0.0344837 |
| 1426 | denovo320983 | p__Proteobacteria | 0.0002222 | 0.000472  | -0.00025  | 0.0002499 | 0.047403 | 0.0477186 |
| 1427 | denovo321475 | p__Firmicutes     | 0.0000404 | 7.3347E-7 | 0.0000397 | -0.00004  | 0.003096 | 0.0108688 |
| 1428 | denovo321847 | p__Firmicutes     | 0.0000382 | 0         | 0.0000382 | -0.000038 | 0.010836 | 0.0201715 |
| 1429 | denovo322255 | p__Firmicutes     | 0.0000388 | 0         | 0.0000388 | -0.000039 | 0.010836 | 0.0201715 |
| 1430 | denovo322461 | p__Firmicutes     | 0.0000177 | 0         | 0.0000177 | -0.000018 | 0.010836 | 0.0201715 |
| 1431 | denovo322472 | p__Firmicutes     | 0.000031  | 0         | 0.000031  | -0.000031 | 0.032508 | 0.0344837 |
| 1432 | denovo322551 | p__Bacteroidetes  | 0.0001293 | 0.000729  | -0.0006   | 0.0005997 | 0.021975 | 0.0344837 |
| 1433 | denovo322762 | p__Actinobacteria | 0.0000133 | 0         | 0.0000133 | -0.000013 | 0.032508 | 0.0344837 |
| 1434 | denovo322901 | p__Firmicutes     | 0.000017  | 8.7027E-7 | 0.0000162 | -0.000016 | 0.007859 | 0.0201715 |
| 1435 | denovo322903 | p__Firmicutes     | 0.000014  | 1.3552E-6 | 0.0000126 | -0.000013 | 0.018576 | 0.030734  |
| 1436 | denovo322975 | p__Firmicutes     | 0.000059  | 7.2138E-6 | 0.0000518 | -0.000052 | 0.027366 | 0.0344837 |
| 1437 | denovo323080 | p__Firmicutes     | 0.0000205 | 0         | 0.0000205 | -0.000021 | 0.032508 | 0.0344837 |
| 1438 | denovo323290 | p__Firmicutes     | 0.0002087 | 0.0005389 | -0.00033  | 0.0003301 | 0.033958 | 0.0354016 |
| 1439 | denovo323308 | p__Firmicutes     | 0.0000824 | 0.0007438 | -0.000661 | 0.0006615 | 0.000195 | 0.0024559 |
| 1440 | denovo323374 | p__Firmicutes     | 0.0002338 | 0.0019493 | -0.001715 | 0.0017155 | 0.019258 | 0.0317754 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum           | Oral Sample | Control Sample | O1-C1    | C1-O1     | P Value  | FDR       |
|--------|----------------------------|------------------|-------------|----------------|----------|-----------|----------|-----------|
| 1441   | denovo323491               | p__Bacteroidetes | 1.84E-6     | 0.0000215      | -0.00002 | 0.0000196 | 0.034056 | 0.0354016 |



|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1442 | denovo323984 | p__Bacteroidetes  | 0.0002227 | 0.0000205 | 0.0002021 | -0.000202 | 0.001028 | 0.0062281 |
| 1443 | denovo323991 | p__Actinobacteria | 0.0000467 | 0         | 0.0000467 | -0.000047 | 0.003096 | 0.0108688 |
| 1444 | denovo324569 | p__Firmicutes     | 0.000086  | 1.9094E-6 | 0.0000841 | -0.000084 | 0.000173 | 0.0022138 |
| 1445 | denovo324750 | p__Firmicutes     | 0         | 0.0000342 | -0.000034 | 0.0000342 | 0.010836 | 0.0201715 |
| 1446 | denovo324807 | p__Firmicutes     | 0.000053  | 2.0465E-6 | 0.0000509 | -0.000051 | 0.041200 | 0.0419868 |
| 1447 | denovo324845 | p__Firmicutes     | 0.0001958 | 0.0000228 | 0.000173  | -0.000173 | 0.006820 | 0.0192515 |
| 1448 | denovo324878 | p__Bacteroidetes  | 0.000074  | 0.0009286 | -0.000855 | 0.0008546 | 0.011420 | 0.0210866 |
| 1449 | denovo324942 |                   | 0.0000747 | 0         | 0.0000747 | -0.000075 | 0.003096 | 0.0108688 |
| 1450 | denovo325348 | p__Bacteroidetes  | 0.0001248 | 0.001918  | -0.001793 | 0.0017931 | 0.001472 | 0.007836  |
| 1451 | denovo325435 | p__Firmicutes     | 0.000024  | 1.1109E-6 | 0.0000229 | -0.000023 | 0.026316 | 0.0344837 |
| 1452 | denovo325951 | p__Firmicutes     | 0.0000192 | 0         | 0.0000192 | -0.000019 | 0.032508 | 0.0344837 |
| 1453 | denovo326364 | p__[Thermi]       | 0.0000233 | 0.0015666 | -0.001543 | 0.0015432 | 0.005889 | 0.0175794 |
| 1454 | denovo326604 | p__Proteobacteria | 0.0006508 | 0.0046417 | -0.003991 | 0.0039909 | 0.014571 | 0.0257253 |
| 1455 | denovo327032 | p__Proteobacteria | 0         | 7.792E-6  | -7.792E-6 | 7.792E-6  | 0.032508 | 0.0344837 |
| 1456 | denovo327033 | p__Proteobacteria | 0.0001476 | 0.0013606 | -0.001213 | 0.001213  | 0.003670 | 0.0124263 |
| 1457 | denovo327221 | p__Firmicutes     | 0.0000199 | 6.7758E-7 | 0.0000192 | -0.000019 | 0.003096 | 0.0108688 |
| 1458 | denovo327366 | p__Proteobacteria | 8.4355E-7 | 0.0000142 | -0.000013 | 0.0000133 | 0.018576 | 0.030734  |
| 1459 | denovo327542 | p__Firmicutes     | 0.0000334 | 0.0012096 | -0.001176 | 0.0011762 | 0.004980 | 0.0156907 |
| 1460 | denovo328222 | p__Firmicutes     | 0.0000379 | 8.5346E-7 | 0.0000371 | -0.000037 | 0.005477 | 0.0165144 |
| 1461 | denovo328699 | p__Firmicutes     | 0.0000173 | 0         | 0.0000173 | -0.000017 | 0.032508 | 0.0344837 |
| 1462 | denovo329028 | p__Proteobacteria | 1.84E-6   | 0.0000109 | -9.029E-6 | 9.0288E-6 | 0.026316 | 0.0344837 |
| 1463 | denovo329095 | p__Proteobacteria | 0.0000155 | 0.0001639 | -0.000148 | 0.0001484 | 0.000444 | 0.0043769 |
| 1464 | denovo329449 | p__Firmicutes     | 0.0000143 | 0         | 0.0000143 | -0.000014 | 0.032508 | 0.0344837 |
| 1465 | denovo329457 | p__Firmicutes     | 0.0002264 | 2.6714E-6 | 0.0002237 | -0.000224 | 0.001851 | 0.0093326 |
| 1466 | denovo329476 | p__Firmicutes     | 9.5351E-6 | 3.9927E-7 | 9.1359E-6 | -9.136E-6 | 0.032508 | 0.0344837 |
| 1467 | denovo329547 | p__Firmicutes     | 0.0000535 |           |           |           |          |           |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|      |              |                   |           | 3.3709E-6 | 0.0000502 | -0.00005  | 0.002457 | 0.0108688 |
| 1468 | denovo329630 | p__Bacteroidetes  | 0.0000615 | 0         | 0.0000615 | -0.000061 | 0.010836 | 0.0201715 |
| 1469 | denovo329885 | p__Actinobacteria | 0.0000338 | 1.7324E-6 | 0.0000321 | -0.000032 | 0.032508 | 0.0344837 |
| 1470 | denovo329923 | p__Firmicutes     | 0.0000381 | 0         | 0.0000381 | -0.000038 | 0.003096 | 0.0108688 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 1471   | denovo330106               | p__Proteobacteria | 0           | 0.0000181      | -0.000018 | 0.0000181 | 0.010836    | 0.0201715 |
| 1472   | denovo330134               | p__Bacteroidetes  | 0.0011923   | 0.0032838      | -0.002092 | 0.0020915 | 0.004980    | 0.0156907 |
| 1473   | denovo330478               | p__Proteobacteria | 1.0973E-6   | 0.0000371      | -0.000036 | 0.000036  | 0.032508    | 0.0344837 |
| 1474   | denovo330503               | p__Firmicutes     | 0           | 0.0000297      | -0.00003  | 0.0000297 | 0.032508    | 0.0344837 |
| 1475   | denovo330629               | p__Firmicutes     | 7.2579E-6   | 0              | 7.2579E-6 | -7.258E-6 | 0.032508    | 0.0344837 |
| 1476   | denovo330676               | p__Firmicutes     | 0.0000199   | 2.8302E-6      | 0.0000171 | -0.000017 | 0.020416    | 0.0335038 |
| 1477   | denovo330789               | p__Firmicutes     | 0           | 0.0000676      | -0.000068 | 0.0000676 | 0.032508    | 0.0344837 |
| 1478   | denovo330902               | p__Firmicutes     | 0.0000228   | 0              | 0.0000228 | -0.000023 | 0.032508    | 0.0344837 |
| 1479   | denovo330982               | p__Firmicutes     | 0.0000705   | 5.2906E-6      | 0.0000652 | -0.000065 | 0.001829    | 0.0093326 |
| 1480   | denovo331700               | p__Firmicutes     | 0.0001384   | 1.4669E-6      | 0.0001369 | -0.000137 | 0.000010825 | 0.000517  |
| 1481   | denovo333163               | p__Firmicutes     | 0.0000123   | 0              | 0.0000123 | -0.000012 | 0.032508    | 0.0344837 |
| 1482   | denovo333567               | p__Firmicutes     | 0.0000225   | 0              | 0.0000225 | -0.000022 | 0.032508    | 0.0344837 |
| 1483   | denovo334057               | p__Firmicutes     | 0.0000508   | 5.9755E-6      | 0.0000448 | -0.000045 | 0.032919    | 0.0348386 |
| 1484   | denovo334456               | p__Firmicutes     | 0           | 5.9298E-6      | -5.93E-6  | 5.9298E-6 | 0.032508    | 0.0344837 |
| 1485   | denovo334465               | p__Firmicutes     | 0.000033    |                |           |           |             |           |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|      |              |                   |           | 0         | 0.000033  | -0.000033 | 0.032508 | 0.0344837 |
| 1486 | denovo334496 | p__Proteobacteria | 2.5839E-6 | 0.0000247 | -0.000022 | 0.0000222 | 0.034056 | 0.0354016 |
| 1487 | denovo334729 | p__Proteobacteria | 0         | 0.0000123 | -0.000012 | 0.0000123 | 0.010836 | 0.0201715 |
| 1488 | denovo334862 | p__Firmicutes     | 0         | 0.0000654 | -0.000065 | 0.0000654 | 0.010836 | 0.0201715 |
| 1489 | denovo335086 | p__Firmicutes     | 0.0000752 | 0         | 0.0000752 | -0.000075 | 0.000119 | 0.0018162 |
| 1490 | denovo335607 | p__Actinobacteria | 0.0000135 | 6.7758E-7 | 0.0000128 | -0.000013 | 0.032508 | 0.0344837 |
| 1491 | denovo335792 | p__Firmicutes     | 0.000014  | 0         | 0.000014  | -0.000014 | 0.032508 | 0.0344837 |
| 1492 | denovo335880 | p__Firmicutes     | 0.0002436 | 0.0070343 | -0.006791 | 0.0067907 | 0.017764 | 0.0305029 |
| 1493 | denovo336340 | p__Proteobacteria | 0.0000551 | 0.0008217 | -0.000767 | 0.0007665 | 0.009234 | 0.0201715 |
| 1494 | denovo336777 | p__Bacteroidetes  | 0.000103  | 3.4349E-6 | 0.0000996 | -0.0001   | 0.021975 | 0.0344837 |
| 1495 | denovo337270 | p__Firmicutes     | 0.0000696 | 0.0006687 | -0.000599 | 0.0005991 | 0.000898 | 0.0057219 |
| 1496 | denovo337543 | p__Proteobacteria | 0         | 0.0000172 | -0.000017 | 0.0000172 | 0.010836 | 0.0201715 |
| 1497 | denovo337950 | p__Firmicutes     | 0.0000238 | 0         | 0.0000238 | -0.000024 | 0.032508 | 0.0344837 |
| 1498 | denovo338233 | p__Bacteroidetes  | 8.4355E-7 | 0.000186  | -0.000185 | 0.0001851 | 0.032508 | 0.0344837 |
| 1499 | denovo338517 | p__Proteobacteria | 0         | 7.5955E-6 | -7.596E-6 | 7.5955E-6 | 0.032508 | 0.0344837 |
| 1500 | denovo338615 | p__Firmicutes     | 0.0000375 | 1.6974E-6 | 0.0000358 | -0.000036 | 0.018576 | 0.030734  |

The 2-sided p-value is presented.

Table S7

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum           | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 1501   | denovo338843               | p__Bacteroidetes | 0.0001754   | 0.0000117      | 0.0001637 | -0.000164 | 0.001028 | 0.0062281 |
| 1502   | denovo339310               | p__Firmicutes    | 0.0000345   |                |           |           |          |           |

|      |              |                   |           |           |           |           |             |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
|      |              |                   |           | 0         | 0.0000345 | -0.000034 | 0.010836    | 0.0201715 |
| 1503 | denovo339571 | p__Firmicutes     | 0.0001085 | 0.0016057 | -0.001497 | 0.0014972 | 0.003908    | 0.0129194 |
| 1504 | denovo339587 | p__Firmicutes     | 0.0000525 | 3.9927E-7 | 0.0000521 | -0.000052 | 0.010836    | 0.0201715 |
| 1505 | denovo339593 | p__Firmicutes     | 0.0000154 | 0         | 0.0000154 | -0.000015 | 0.010836    | 0.0201715 |
| 1506 | denovo339656 | p__Bacteroidetes  | 0.0000139 | 0.0003182 | -0.000304 | 0.0003043 | 0.025125    | 0.0344837 |
| 1507 | denovo339754 | p__Firmicutes     | 9.4046E-7 | 0.0005171 | -0.000516 | 0.0005161 | 0.018576    | 0.030734  |
| 1508 | denovo340210 | p__Firmicutes     | 0.0089531 | 0.0000737 | 0.0088795 | -0.008879 | 0.000021650 | 0.0006237 |
| 1509 | denovo340560 | p__Bacteroidetes  | 0.0000392 | 0.0009908 | -0.000952 | 0.0009516 | 0.005185    | 0.0160388 |
| 1510 | denovo340568 | p__Firmicutes     | 0.0000214 | 0         | 0.0000214 | -0.000021 | 0.032508    | 0.0344837 |
| 1511 | denovo341067 | p__Proteobacteria | 0.0003134 | 0.0024613 | -0.002148 | 0.0021479 | 0.003865    | 0.01287   |
| 1512 | denovo341762 | p__Proteobacteria | 0         | 0.0000158 | -0.000016 | 0.0000158 | 0.010836    | 0.0201715 |
| 1513 | denovo342415 | p__Firmicutes     | 0.0000198 | 0         | 0.0000198 | -0.00002  | 0.032508    | 0.0344837 |
| 1514 | denovo342617 | p__Proteobacteria | 0         | 9.9083E-6 | -9.908E-6 | 9.9083E-6 | 0.010836    | 0.0201715 |
| 1515 | denovo342639 | p__Firmicutes     | 0.0000195 | 0         | 0.0000195 | -0.000019 | 0.032508    | 0.0344837 |
| 1516 | denovo342702 | p__Firmicutes     | 0.0002025 | 0.0002861 | -0.000084 | 0.0000836 | 0.033958    | 0.0354016 |
| 1517 | denovo342923 | p__Firmicutes     | 0.0000165 | 0         | 0.0000165 | -0.000016 | 0.010836    | 0.0201715 |
| 1518 | denovo343071 | p__Firmicutes     | 0.0021301 | 0.0052021 | -0.003072 | 0.0030721 | 0.014690    | 0.0259103 |
| 1519 | denovo343207 | p__Firmicutes     | 0.0000455 | 0         | 0.0000455 | -0.000045 | 0.010836    | 0.0201715 |
| 1520 | denovo343341 | p__Actinobacteria | 0.0000315 | 1.6974E-6 | 0.0000298 | -0.00003  | 0.034056    | 0.0354016 |
| 1521 | denovo343751 | p__Firmicutes     | 0.0004687 | 0.0000107 | 0.000458  | -0.000458 | 0.000693    | 0.0047523 |
| 1522 | denovo344009 | p__Bacteroidetes  | 0.0000181 | 0         | 0.0000181 | -0.000018 | 0.032508    | 0.0344837 |
| 1523 | denovo344250 | p__Bacteroidetes  | 0         | 0.0000382 | -0.000038 | 0.0000382 | 0.032508    | 0.0344837 |
| 1524 | denovo344417 | p__Firmicutes     | 0.0000627 | 0         | 0.0000627 | -0.000063 | 0.003096    | 0.0108688 |
| 1525 | denovo344942 | p__Proteobacteria | 0.0010962 | 0.0083816 | -0.007285 | 0.0072854 | 0.000021650 | 0.0006237 |
| 1526 | denovo345407 | p__Firmicutes     | 0.0001057 | 0.0021389 | -0.002033 | 0.0020332 | 0.000075776 | 0.0014477 |
| 1527 | denovo345855 | p__Actinobacteria | 0.0000158 | 0         | 0.0000158 | -0.000016 | 0.010836    | 0.0201715 |

|      |              |                   |          |           |           |           |          |           |
|------|--------------|-------------------|----------|-----------|-----------|-----------|----------|-----------|
| 1528 | denovo345954 | p__Firmicutes     | 0.000036 | 1.1109E-6 | 0.0000349 | -0.000035 | 0.010836 | 0.0201715 |
| 1529 | denovo345996 | p__Proteobacteria | 0        | 7.5394E-6 | -7.539E-6 | 7.5394E-6 | 0.032508 | 0.0344837 |
| 1530 | denovo346155 | p__Proteobacteria | 7.089E-7 | 0.0000145 | -0.000014 | 0.0000138 | 0.032508 | 0.0344837 |
|      |              |                   |          |           |           |           |          |           |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 1531   | denovo346317               | p__Firmicutes     | 0.0000225   | 0              | 0.0000225 | -0.000023 | 0.010836 | 0.0201715 |
| 1532   | denovo346349               | p__Actinobacteria | 0.0000297   | 2.4658E-6      | 0.0000272 | -0.000027 | 0.041200 | 0.0419868 |
| 1533   | denovo346360               | p__Firmicutes     | 0.0001211   | 0.0003039      | -0.000183 | 0.0001828 | 0.041200 | 0.0419868 |
| 1534   | denovo346673               | p__Firmicutes     | 0.0000149   | 3.9927E-7      | 0.0000145 | -0.000015 | 0.003096 | 0.0108688 |
| 1535   | denovo346858               | p__Proteobacteria | 0.000016    | 0.0000357      | -0.00002  | 0.0000197 | 0.005651 | 0.0169802 |
| 1536   | denovo346920               | p__Firmicutes     | 0.000509    | 0.0004449      | 0.0000641 | -0.000064 | 0.028903 | 0.0344837 |
| 1537   | denovo347005               | p__Firmicutes     | 6.6835E-6   | 0              | 6.6835E-6 | -6.684E-6 | 0.032508 | 0.0344837 |
| 1538   | denovo347299               | p__Proteobacteria | 1.784E-6    | 0.0000442      | -0.000042 | 0.0000424 | 0.001905 | 0.0094999 |
| 1539   | denovo347465               | p__Firmicutes     | 0.0000126   | 0              | 0.0000126 | -0.000013 | 0.032508 | 0.0344837 |
| 1540   | denovo347739               | p__Bacteroidetes  | 0.0000371   | 7.3347E-7      | 0.0000364 | -0.000036 | 0.032508 | 0.0344837 |
| 1541   | denovo348115               | p__Actinobacteria | 0.0001313   | 1.3552E-6      | 0.00013   | -0.00013  | 0.000714 | 0.0047523 |
| 1542   | denovo348223               | p__Bacteroidetes  | 0.0006825   | 0.0037231      | -0.003041 | 0.0030405 | 0.006722 | 0.0190941 |
| 1543   | denovo348353               | p__Firmicutes     | 0.0000533   | 0              | 0.0000533 | -0.000053 | 0.000119 | 0.0018162 |
| 1544   | denovo348494               | p__Firmicutes     | 0.0000377   | 0              | 0.0000377 | -0.000038 | 0.000714 | 0.0047523 |

|      |              |                   |           |           |           |           |             |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 1545 | denovo348520 | p__Actinobacteria | 0.0002552 | 0.0000579 | 0.0001973 | -0.000197 | 0.017385    | 0.0298806 |
| 1546 | denovo348732 | p__Firmicutes     | 3.2013E-6 | 0.0005314 | -0.000528 | 0.0005282 | 0.002934    | 0.0108688 |
| 1547 | denovo349084 | p__Firmicutes     | 8.8758E-6 | 6.7758E-7 | 8.1983E-6 | -8.198E-6 | 0.032508    | 0.0344837 |
| 1548 | denovo349121 | p__Firmicutes     | 0.0000109 | 0         | 0.0000109 | -0.000011 | 0.032508    | 0.0344837 |
| 1549 | denovo349811 | p__Proteobacteria | 0         | 4.8323E-6 | -4.832E-6 | 4.8323E-6 | 0.032508    | 0.0344837 |
| 1550 | denovo349885 | p__Firmicutes     | 0         | 0.00002   | -0.00002  | 0.00002   | 0.032508    | 0.0344837 |
| 1551 | denovo349902 | p__Bacteroidetes  | 0.0000251 | 0         | 0.0000251 | -0.000025 | 0.032508    | 0.0344837 |
| 1552 | denovo350007 | p__Firmicutes     | 0         | 0.0000209 | -0.000021 | 0.0000209 | 0.032508    | 0.0344837 |
| 1553 | denovo350798 | p__Firmicutes     | 1.84E-6   | 0.0000445 | -0.000043 | 0.0000426 | 0.018576    | 0.030734  |
| 1554 | denovo350941 | p__Firmicutes     | 0.0000551 | 0         | 0.0000551 | -0.000055 | 0.032508    | 0.0344837 |
| 1555 | denovo350952 | p__Actinobacteria | 0.0000483 | 0         | 0.0000483 | -0.000048 | 0.032508    | 0.0344837 |
| 1556 | denovo351190 | p__Firmicutes     | 0.0000185 | 0         | 0.0000185 | -0.000018 | 0.032508    | 0.0344837 |
| 1557 | denovo351311 | p__Firmicutes     | 0.0000105 | 0         | 0.0000105 | -0.000011 | 0.010836    | 0.0201715 |
| 1558 | denovo351415 | p__Firmicutes     | 0.0005108 | 0.0086435 | -0.008133 | 0.0081327 | 0.000043300 | 0.0009948 |
| 1559 | denovo351970 | p__Proteobacteria | 1.6242E-6 | 0.0000261 | -0.000025 | 0.0000245 | 0.001310    | 0.0071392 |
| 1560 | denovo352355 | p__Proteobacteria | 0.0014773 | 0.0014223 | 0.000055  | -0.000055 | 0.043257    | 0.0438367 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum        | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|---------------|-------------|----------------|-----------|-----------|----------|-----------|
| 1561   | denovo352628               | p__Firmicutes | 1.84E-6     | 0.0000612      | -0.000059 | 0.0000594 | 0.032508 | 0.0344837 |
| 1562   | denovo352782               |               | 0.0000188   |                |           |           |          |           |

|      |              |                   |           |           |           |           |             |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
|      |              | p__Actinobacteria |           | 0.0001489 | -0.00013  | 0.0001301 | 0.000173    | 0.0022138 |
| 1563 | denovo352954 | p__Proteobacteria | 0.0000446 | 0.0002273 | -0.000183 | 0.0001826 | 0.047403    | 0.0477186 |
| 1564 | denovo352963 | p__Proteobacteria | 0         | 3.4875E-6 | -3.488E-6 | 3.4875E-6 | 0.032508    | 0.0344837 |
| 1565 | denovo353154 | p__Firmicutes     | 0.0000617 | 0         | 0.0000617 | -0.000062 | 0.000714    | 0.0047523 |
| 1566 | denovo353335 | p__Firmicutes     | 0.000039  | 0         | 0.000039  | -0.000039 | 0.003096    | 0.0108688 |
| 1567 | denovo353584 | p__Proteobacteria | 0         | 0.0000131 | -0.000013 | 0.0000131 | 0.032508    | 0.0344837 |
| 1568 | denovo354014 | p__Firmicutes     | 0.0002905 | 0         | 0.0002905 | -0.000291 | 0.010836    | 0.0201715 |
| 1569 | denovo354536 | p__Actinobacteria | 0.0001084 | 0.0024458 | -0.002337 | 0.0023373 | 0.008996    | 0.0201715 |
| 1570 | denovo354852 | p__Bacteroidetes  | 0.0000266 | 0         | 0.0000266 | -0.000027 | 0.032508    | 0.0344837 |
| 1571 | denovo354987 | p__Firmicutes     | 0.0000119 | 0         | 0.0000119 | -0.000012 | 0.032508    | 0.0344837 |
| 1572 | denovo355607 | p__Bacteroidetes  | 0.0000434 | 0         | 0.0000434 | -0.000043 | 0.003096    | 0.0108688 |
| 1573 | denovo355671 | p__Actinobacteria | 0.0000424 | 0         | 0.0000424 | -0.000042 | 0.032508    | 0.0344837 |
| 1574 | denovo355784 | p__Proteobacteria | 0.0007847 | 0.0211436 | -0.020359 | 0.0203589 | 0.000043300 | 0.0009948 |
| 1575 | denovo356006 | p__Firmicutes     | 0.0000111 | 0         | 0.0000111 | -0.000011 | 0.032508    | 0.0344837 |
| 1576 | denovo356049 | p__Proteobacteria | 1.707E-6  | 0.0000274 | -0.000026 | 0.0000257 | 0.008887    | 0.0201715 |
| 1577 | denovo356174 | p__Firmicutes     | 0.0000567 | 0.0035618 | -0.003505 | 0.003505  | 0.000010825 | 0.000517  |
| 1578 | denovo356446 | p__Actinobacteria | 0.0000526 | 1.6974E-6 | 0.0000509 | -0.000051 | 0.032508    | 0.0344837 |
| 1579 | denovo356592 | p__Firmicutes     | 0.0000928 | 0.000016  | 0.0000769 | -0.000077 | 0.005185    | 0.0160388 |
| 1580 | denovo356788 | p__Firmicutes     | 0.0006821 | 0.0076016 | -0.006919 | 0.0069194 | 0.000487    | 0.0043769 |
| 1581 | denovo356813 | p__Proteobacteria | 0.0007269 | 0.0043566 | -0.00363  | 0.0036297 | 0.011496    | 0.0211619 |
| 1582 | denovo356910 | p__Firmicutes     | 0.0000147 | 0         | 0.0000147 | -0.000015 | 0.010836    | 0.0201715 |
| 1583 | denovo357126 | p__Firmicutes     | 0.000011  | 0         | 0.000011  | -0.000011 | 0.032508    | 0.0344837 |
| 1584 | denovo357154 | p__Firmicutes     | 0.0003154 | 0         | 0.0003154 | -0.000315 | 0.003096    | 0.0108688 |
| 1585 | denovo357429 | p__Firmicutes     | 0.0000467 | 1.5754E-6 | 0.0000451 | -0.000045 | 0.018576    | 0.030734  |
| 1586 | denovo357430 | p__Proteobacteria | 8.4355E-7 | 0.0000163 | -0.000015 | 0.0000154 | 0.001905    | 0.0094999 |
| 1587 | denovo357778 | p__Firmicutes     | 0.0000732 | 2.6089E-6 | 0.0000706 | -0.000071 | 0.001256    | 0.007078  |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1588 | denovo358597 | p__Proteobacteria | 0         | 6.3962E-6 | -6.396E-6 | 6.3962E-6 | 0.032508 | 0.0344837 |
| 1589 | denovo358949 | p__Firmicutes     | 0.0000109 | 0         | 0.0000109 | -0.000011 | 0.032508 | 0.0344837 |
| 1590 | denovo359287 | p__Firmicutes     | 0.0000133 | 0         | 0.0000133 | -0.000013 | 0.032508 | 0.0344837 |
|      |              |                   |           |           |           |           |          |           |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 1591   | denovo359328               | p__Actinobacteria | 0           | 0.0004619      | -0.000462 | 0.0004619 | 0.003096    | 0.0108688 |
| 1592   | denovo359405               | p__Firmicutes     | 0.0000403   | 3.08E-6        | 0.0000372 | -0.000037 | 0.001256    | 0.007078  |
| 1593   | denovo359623               | p__Actinobacteria | 0.000043    | 0              | 0.000043  | -0.000043 | 0.010836    | 0.0201715 |
| 1594   | denovo359800               | p__Firmicutes     | 0.0000234   | 0              | 0.0000234 | -0.000023 | 0.003096    | 0.0108688 |
| 1595   | denovo360202               | p__Proteobacteria | 0.0014537   | 0.0106898      | -0.009236 | 0.0092361 | 0.000021650 | 0.0006237 |
| 1596   | denovo360399               | p__Bacteroidetes  | 0.0000145   | 7.3347E-7      | 0.0000137 | -0.000014 | 0.032508    | 0.0344837 |
| 1597   | denovo360459               | p__Firmicutes     | 0.0000489   | 4.0285E-6      | 0.0000448 | -0.000045 | 0.002934    | 0.0108688 |
| 1598   | denovo360977               | p__Actinobacteria | 1.84E-6     | 0.0000578      | -0.000056 | 0.0000559 | 0.007859    | 0.0201715 |
| 1599   | denovo361253               | p__Firmicutes     | 0.0000182   | 6.7758E-7      | 0.0000175 | -0.000017 | 0.032508    | 0.0344837 |
| 1600   | denovo362175               | p__Actinobacteria | 0.0000869   | 0.0005215      | -0.000435 | 0.0004346 | 0.035376    | 0.0366067 |
| 1601   | denovo362472               | p__Firmicutes     | 0.000167    | 0.0000146      | 0.0001524 | -0.000152 | 0.006408    | 0.0189745 |
| 1602   | denovo362872               | p__Proteobacteria | 0.0000865   | 0.0005935      | -0.000507 | 0.0005071 | 0.038180    | 0.0394404 |
| 1603   | denovo362994               | p__Proteobacteria | 0.0000277   | 0.0004406      | -0.000413 | 0.0004129 | 0.040194    | 0.0414026 |
| 1604   | denovo363137               | p__Firmicutes     | 0.0000128   | 0              | 0.0000128 | -0.000013 | 0.032508    | 0.0344837 |
| 1605   | denovo363201               | p__Firmicutes     | 0.000052    | 3.9927E-7      | 0.0000516 | -0.000052 | 0.010836    | 0.0201715 |



|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1606 | denovo363259 | p__Proteobacteria | 1.6514E-6 | 0.00002   | -0.000018 | 0.0000183 | 0.018576 | 0.030734  |
| 1607 | denovo364458 | p__Proteobacteria | 0.0000279 | 0.0001734 | -0.000146 | 0.0001455 | 0.003334 | 0.0114828 |
| 1608 | denovo364538 | p__Firmicutes     | 0.0001032 | 1.7069E-6 | 0.0001015 | -0.000101 | 0.001310 | 0.0071392 |
| 1609 | denovo364718 | p__Firmicutes     | 0.0001461 | 8.5346E-7 | 0.0001453 | -0.000145 | 0.010836 | 0.0201715 |
| 1610 | denovo365991 | p__Firmicutes     | 0.0000102 | 0         | 0.0000102 | -0.00001  | 0.032508 | 0.0344837 |
| 1611 | denovo365997 | p__Firmicutes     | 0.0000314 | 0         | 0.0000314 | -0.000031 | 0.010836 | 0.0201715 |
| 1612 | denovo366010 | p__Firmicutes     | 0.0000176 | 0         | 0.0000176 | -0.000018 | 0.010836 | 0.0201715 |
| 1613 | denovo366613 | p__Proteobacteria | 0.0099549 | 0.0005011 | 0.0094539 | -0.009454 | 0.021542 | 0.0344837 |
| 1614 | denovo366762 | p__Firmicutes     | 1.6242E-6 | 0.0000538 | -0.000052 | 0.0000521 | 0.032508 | 0.0344837 |
| 1615 | denovo366981 | p__Proteobacteria | 0         | 4.7799E-6 | -4.78E-6  | 4.7799E-6 | 0.032508 | 0.0344837 |
| 1616 | denovo366985 | p__Bacteroidetes  | 0.003088  | 0.0200962 | -0.017008 | 0.0170082 | 0.000725 | 0.0047523 |
| 1617 | denovo367554 | p__Proteobacteria | 2.5647E-6 | 0.00004   | -0.000037 | 0.0000374 | 0.000487 | 0.0043769 |
| 1618 | denovo367790 | p__Proteobacteria | 0.0000561 | 0.0001961 | -0.00014  | 0.00014   | 0.016313 | 0.0282797 |
| 1619 | denovo368015 | p__Proteobacteria | 0         | 9.5377E-6 | -9.538E-6 | 9.5377E-6 | 0.032508 | 0.0344837 |
| 1620 | denovo368335 | p__Actinobacteria | 0.0000199 | 1.6974E-6 | 0.0000182 | -0.000018 | 0.034056 | 0.0354016 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 1621   | denovo368531               | p__Proteobacteria | 5.0795E-6   | 0.0000265      | -0.000021 | 0.0000215 | 0.006668 | 0.0190297 |
| 1622   | denovo368671               | p__Actinobacteria | 0.0000378   | 2.5604E-6      | 0.0000353 | -0.000035 | 0.032508 | 0.0344837 |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1623 | denovo368969 | p__Bacteroidetes  | 0.0000103 | 0.0005641 | -0.000554 | 0.0005538 | 0.027366 | 0.0344837 |
| 1624 | denovo369476 | p__Firmicutes     | 0.0000151 | 6.7758E-7 | 0.0000145 | -0.000014 | 0.010836 | 0.0201715 |
| 1625 | denovo370735 | p__Firmicutes     | 0.0000456 | 9.4201E-7 | 0.0000446 | -0.000045 | 0.003096 | 0.0108688 |
| 1626 | denovo371391 | p__Actinobacteria | 0.0001034 | 1.06E-6   | 0.0001023 | -0.000102 | 0.006668 | 0.0190297 |
| 1627 | denovo371896 | p__Firmicutes     | 0.0000225 | 0         | 0.0000225 | -0.000023 | 0.010836 | 0.0201715 |
| 1628 | denovo372222 | p__Firmicutes     | 0.0000131 | 1.1109E-6 | 0.000012  | -0.000012 | 0.034056 | 0.0354016 |
| 1629 | denovo372226 | p__Proteobacteria | 0         | 5.7689E-6 | -5.769E-6 | 5.7689E-6 | 0.032508 | 0.0344837 |
| 1630 | denovo372435 | p__Firmicutes     | 0.0000146 | 0         | 0.0000146 | -0.000015 | 0.032508 | 0.0344837 |
| 1631 | denovo372484 | p__Firmicutes     | 0.0001758 | 0         | 0.0001758 | -0.000176 | 0.000119 | 0.0018162 |
| 1632 | denovo372502 | p__Proteobacteria | 0         | 0.0000105 | -0.00001  | 0.0000105 | 0.032508 | 0.0344837 |
| 1633 | denovo372675 | p__Proteobacteria | 0         | 0.0000336 | -0.000034 | 0.0000336 | 0.003096 | 0.0108688 |
| 1634 | denovo372718 | p__Actinobacteria | 0.0000109 | 0         | 0.0000109 | -0.000011 | 0.032508 | 0.0344837 |
| 1635 | denovo373046 | p__Actinobacteria | 0.0000713 | 0         | 0.0000713 | -0.000071 | 0.010836 | 0.0201715 |
| 1636 | denovo373226 | p__Firmicutes     | 0.0000271 | 0         | 0.0000271 | -0.000027 | 0.010836 | 0.0201715 |
| 1637 | denovo373283 | p__Firmicutes     | 0.0000114 | 4.71E-7   | 0.000011  | -0.000011 | 0.032508 | 0.0344837 |
| 1638 | denovo373561 | p__Proteobacteria | 0         | 7.9838E-6 | -7.984E-6 | 7.9838E-6 | 0.032508 | 0.0344837 |
| 1639 | denovo373821 | p__Firmicutes     | 0.0000395 | 1.1109E-6 | 0.0000384 | -0.000038 | 0.026316 | 0.0344837 |
| 1640 | denovo373985 | p__Firmicutes     | 0.0000212 | 0         | 0.0000212 | -0.000021 | 0.010836 | 0.0201715 |
| 1641 | denovo374078 | p__Firmicutes     | 0.0000159 | 4.71E-7   | 0.0000154 | -0.000015 | 0.032508 | 0.0344837 |
| 1642 | denovo374465 | p__Firmicutes     | 0.0000625 | 1.9197E-6 | 0.0000606 | -0.000061 | 0.004016 | 0.0131338 |
| 1643 | denovo374574 | p__Firmicutes     | 0.0000544 | 1.1109E-6 | 0.0000533 | -0.000053 | 0.005477 | 0.0165144 |
| 1644 | denovo375848 | p__Bacteroidetes  | 0.0018219 | 0.0063674 | -0.004546 | 0.0045455 | 0.001039 | 0.0062281 |
| 1645 | denovo375951 | p__Firmicutes     | 0.0000129 | 0         | 0.0000129 | -0.000013 | 0.010836 | 0.0201715 |
| 1646 | denovo376013 | p__Proteobacteria | 0         | 9.602E-6  | -9.602E-6 | 9.602E-6  | 0.032508 | 0.0344837 |
| 1647 | denovo376592 | p__Firmicutes     | 0.0000142 | 0         | 0.0000142 | -0.000014 | 0.032508 | 0.0344837 |
| 1648 | denovo376909 | p__Firmicutes     | 0         |           |           |           |          |           |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|      |              |                   |           | 7.9967E-6 | -7.997E-6 | 7.9967E-6 | 0.032508 | 0.0344837 |
| 1649 | denovo377218 | p__Firmicutes     | 0.0000127 | 0         | 0.0000127 | -0.000013 | 0.010836 | 0.0201715 |
| 1650 | denovo377222 | p__Proteobacteria | 0         | 0.0000475 | -0.000047 | 0.0000475 | 0.010836 | 0.0201715 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 1651   | denovo377223               | p__Firmicutes     | 0.0000479   | 9.4201E-7      | 0.0000469 | -0.000047 | 0.005477 | 0.0165144 |
| 1652   | denovo377340               | p__Firmicutes     | 0.0000819   | 1.1109E-6      | 0.0000808 | -0.000081 | 0.010836 | 0.0201715 |
| 1653   | denovo377382               | p__Proteobacteria | 7.2621E-6   | 0.0000917      | -0.000084 | 0.0000844 | 0.001288 | 0.0071392 |
| 1654   | denovo377973               | p__Firmicutes     | 0           | 0.0000183      | -0.000018 | 0.0000183 | 0.032508 | 0.0344837 |
| 1655   | denovo378352               | p__Firmicutes     | 0.0000461   | 0              | 0.0000461 | -0.000046 | 0.010836 | 0.0201715 |
| 1656   | denovo378559               | p__Firmicutes     | 0.0000365   | 8.5346E-7      | 0.0000357 | -0.000036 | 0.003096 | 0.0108688 |
| 1657   | denovo378881               | p__Firmicutes     | 0.0000131   | 0              | 0.0000131 | -0.000013 | 0.010836 | 0.0201715 |
| 1658   | denovo378921               | p__Proteobacteria | 8.4355E-7   | 0.0000196      | -0.000019 | 0.0000188 | 0.007859 | 0.0201715 |
| 1659   | denovo378924               | p__Firmicutes     | 0.0000321   | 0              | 0.0000321 | -0.000032 | 0.010836 | 0.0201715 |
| 1660   | denovo379233               | p__Bacteroidetes  | 0.0004272   | 5.2191E-6      | 0.0004219 | -0.000422 | 0.026262 | 0.0344837 |
| 1661   | denovo379279               | p__Bacteroidetes  | 0.0000715   | 0.0022276      | -0.002156 | 0.0021562 | 0.001440 | 0.0077083 |
| 1662   | denovo379551               | p__[Thermi]       | 0           | 0.0000131      | -0.000013 | 0.0000131 | 0.032508 | 0.0344837 |
| 1663   | denovo379675               | p__Firmicutes     | 0.0000152   | 4.71E-7        | 0.0000148 | -0.000015 | 0.032508 | 0.0344837 |
| 1664   | denovo379677               | p__Firmicutes     | 0.0000361   | 0              | 0.0000361 | -0.000036 | 0.010836 | 0.0201715 |
| 1665   | denovo379725               | p__Firmicutes     | 1.6242E-6   |                |           |           |          |           |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|      |              |                   |           | 0.0000202 | -0.000019 | 0.0000186 | 0.032508 | 0.0344837 |
| 1666 | denovo379885 | p__Bacteroidetes  | 0.000032  | 0.0004686 | -0.000437 | 0.0004367 | 0.010544 | 0.0201715 |
| 1667 | denovo380005 | p__Firmicutes     | 0.0000222 | 0.0000302 | -7.988E-6 | 7.9884E-6 | 0.019767 | 0.0325557 |
| 1668 | denovo380110 | p__Firmicutes     | 0.0000122 | 0         | 0.0000122 | -0.000012 | 0.032508 | 0.0344837 |
| 1669 | denovo380135 | p__Firmicutes     | 0.0001152 | 1.2982E-6 | 0.0001139 | -0.000114 | 0.010836 | 0.0201715 |
| 1670 | denovo380201 | p__Bacteroidetes  | 0.0004743 | 0.0000642 | 0.0004101 | -0.00041  | 0.005153 | 0.0160388 |
| 1671 | denovo380372 | p__Firmicutes     | 0.000035  | 1.3245E-6 | 0.0000336 | -0.000034 | 0.000281 | 0.003096  |
| 1672 | denovo380402 | p__Firmicutes     | 0.0000161 | 0         | 0.0000161 | -0.000016 | 0.010836 | 0.0201715 |
| 1673 | denovo380540 | p__Firmicutes     | 0.0001341 | 0.000033  | 0.0001011 | -0.000101 | 0.003670 | 0.0124263 |
| 1674 | denovo380567 | p__Firmicutes     | 0.0000526 | 0.0012474 | -0.001195 | 0.0011949 | 0.012135 | 0.0221133 |
| 1675 | denovo381094 | p__Firmicutes     | 0         | 0.0000477 | -0.000048 | 0.0000477 | 0.032508 | 0.0344837 |
| 1676 | denovo381307 | p__Proteobacteria | 0.0000123 | 0.0000873 | -0.000075 | 0.000075  | 0.014571 | 0.0257253 |
| 1677 | denovo381957 | p__Firmicutes     | 0.0000177 | 0         | 0.0000177 | -0.000018 | 0.010836 | 0.0201715 |
| 1678 | denovo382377 | p__Firmicutes     | 0.0272502 | 0.0009108 | 0.0263395 | -0.026339 | 0.011496 | 0.0211619 |
| 1679 | denovo382894 | p__Firmicutes     | 0.0000448 | 4.5652E-6 | 0.0000402 | -0.00004  | 0.016194 | 0.0281809 |
| 1680 | denovo383148 | p__Firmicutes     | 0.0000294 | 1.3245E-6 | 0.0000281 | -0.000028 | 0.006668 | 0.0190297 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum        | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|---------------|-------------|----------------|-----------|-----------|----------|-----------|
| 1681   | denovo383303               | p__Firmicutes | 0.0000129   | 0              | 0.0000129 | -0.000013 | 0.032508 | 0.0344837 |
| 1682   | denovo383398               | p__Firmicutes | 7.5237E-6   | 0              | 7.5237E-6 | -7.524E-6 | 0.032508 | 0.0344837 |

|      |              |                   |           |           |           |           |             |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 1683 | denovo383448 | p__Firmicutes     | 0.0002764 | 0.0038307 | -0.003554 | 0.0035543 | 0.006408    | 0.0189745 |
| 1684 | denovo383574 | p__Bacteroidetes  | 0.0000499 | 0         | 0.0000499 | -0.00005  | 0.010836    | 0.0201715 |
| 1685 | denovo383743 | p__Proteobacteria | 0.0000123 | 0.0000495 | -0.000037 | 0.0000372 | 0.016974    | 0.0293403 |
| 1686 | denovo383945 | p__Firmicutes     | 0.0000105 | 0.0014755 | -0.001465 | 0.0014651 | 0.008509    | 0.0201715 |
| 1687 | denovo384163 | p__Firmicutes     | 0.0010497 | 0.0132221 | -0.012172 | 0.0121724 | 0.000325    | 0.0033875 |
| 1688 | denovo384165 | p__Firmicutes     | 0.0000418 | 0.0012652 | -0.001223 | 0.0012234 | 0.038840    | 0.0400542 |
| 1689 | denovo384409 | p__Firmicutes     | 0.0000226 | 0.001313  | -0.00129  | 0.0012904 | 0.000390    | 0.0039737 |
| 1690 | denovo384820 | p__Firmicutes     | 0.0000203 | 0         | 0.0000203 | -0.00002  | 0.003096    | 0.0108688 |
| 1691 | denovo385455 | p__Firmicutes     | 0.0007837 | 5.4413E-6 | 0.0007782 | -0.000778 | 0.026262    | 0.0344837 |
| 1692 | denovo385468 |                   | 0.000092  | 0         | 0.000092  | -0.000092 | 0.010836    | 0.0201715 |
| 1693 | denovo385726 | p__Firmicutes     | 0.0001101 | 5.5815E-6 | 0.0001045 | -0.000104 | 0.000010825 | 0.000517  |
| 1694 | denovo385750 | p__Actinobacteria | 0.0000167 | 0         | 0.0000167 | -0.000017 | 0.032508    | 0.0344837 |
| 1695 | denovo386315 | p__Firmicutes     | 0.0003072 | 7.3347E-7 | 0.0003065 | -0.000306 | 0.010836    | 0.0201715 |
| 1696 | denovo386364 | p__Firmicutes     | 0.0000107 | 8.5346E-7 | 9.8687E-6 | -9.869E-6 | 0.026316    | 0.0344837 |
| 1697 | denovo386418 | p__Firmicutes     | 0.000021  | 0         | 0.000021  | -0.000021 | 0.010836    | 0.0201715 |
| 1698 | denovo386568 | p__Firmicutes     | 0.0004432 | 0.0004663 | -0.000023 | 0.0000231 | 0.047403    | 0.0477186 |
| 1699 | denovo386570 | p__Firmicutes     | 0.0001124 | 0.0008081 | -0.000696 | 0.0006957 | 0.038840    | 0.0400542 |
| 1700 | denovo386587 | p__[Thermi]       | 0.0001861 | 0.0009668 | -0.000781 | 0.0007807 | 0.041731    | 0.0424031 |
| 1701 | denovo386607 | p__Firmicutes     | 0.0001148 | 2.2011E-6 | 0.0001126 | -0.000113 | 0.000173    | 0.0022138 |
| 1702 | denovo387184 | p__Firmicutes     | 0.0000587 | 0.000523  | -0.000464 | 0.0004644 | 0.007675    | 0.0201715 |
| 1703 | denovo387556 | p__Proteobacteria | 0.0000712 | 0.0003547 | -0.000283 | 0.0002835 | 0.004871    | 0.015484  |
| 1704 | denovo387652 | p__Proteobacteria | 1.0746E-6 | 0.0000293 | -0.000028 | 0.0000282 | 0.005477    | 0.0165144 |
| 1705 | denovo387791 | p__Firmicutes     | 0.0000167 | 0         | 0.0000167 | -0.000017 | 0.032508    | 0.0344837 |
| 1706 | denovo387914 | p__Firmicutes     | 0.00002   | 1.1109E-6 | 0.0000189 | -0.000019 | 0.032508    | 0.0344837 |
| 1707 | denovo388605 | p__Firmicutes     | 0.000024  | 0         | 0.000024  | -0.000024 | 0.032508    | 0.0344837 |
| 1708 | denovo388748 | p__Firmicutes     | 0.000032  |           |           |           |             |           |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|      |              |                   |           | 0         | 0.000032  | -0.000032 | 0.003096 | 0.0108688 |
| 1709 | denovo388879 | p__Proteobacteria | 0.0000209 | 0.000221  | -0.0002   | 0.0002    | 0.024963 | 0.0344837 |
| 1710 | denovo388946 | p__Actinobacteria | 0.0003731 | 0.0024375 | -0.002064 | 0.0020644 | 0.000487 | 0.0043769 |
|      |              |                   |           |           |           |           |          |           |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 1711   | denovo389061               | p__Firmicutes     | 0.0000429   | 0              | 0.0000429 | -0.000043 | 0.003096    | 0.0108688 |
| 1712   | denovo389119               | p__Cyanobacteria  | 0.0001357   | 0.0012633      | -0.001128 | 0.0011275 | 0.001039    | 0.0062281 |
| 1713   | denovo389192               | p__Firmicutes     | 0.0000115   | 4.71E-7        | 0.000011  | -0.000011 | 0.032508    | 0.0344837 |
| 1714   | denovo389489               | p__Actinobacteria | 0.0005537   | 8.6618E-6      | 0.000545  | -0.000545 | 0.000021650 | 0.0006237 |
| 1715   | denovo389553               | p__Bacteroidetes  | 1.0746E-6   | 0.000109       | -0.000108 | 0.0001079 | 0.010836    | 0.0201715 |
| 1716   | denovo389681               | p__Actinobacteria | 0.0000238   | 6.7758E-7      | 0.0000231 | -0.000023 | 0.032508    | 0.0344837 |
| 1717   | denovo390570               | p__Actinobacteria | 0.0000231   | 0              | 0.0000231 | -0.000023 | 0.032508    | 0.0344837 |
| 1718   | denovo390817               | p__Firmicutes     | 0.000073    | 5.5544E-6      | 0.0000675 | -0.000067 | 0.010241    | 0.0201715 |
| 1719   | denovo391590               | p__Proteobacteria | 1.4178E-6   | 0.000026       | -0.000025 | 0.0000246 | 0.034056    | 0.0354016 |
| 1720   | denovo392492               | p__Firmicutes     | 0.0000232   | 0              | 0.0000232 | -0.000023 | 0.010836    | 0.0201715 |
| 1721   | denovo392675               | p__Firmicutes     | 0.0000113   | 0              | 0.0000113 | -0.000011 | 0.010836    | 0.0201715 |
| 1722   | denovo393021               | p__Firmicutes     | 0.0000965   | 0.0000236      | 0.0000728 | -0.000073 | 0.001364    | 0.007346  |
| 1723   | denovo393762               | p__Firmicutes     | 0.0000335   | 0              | 0.0000335 | -0.000033 | 0.000714    | 0.0047523 |
| 1724   | denovo393773               | p__Firmicutes     | 0.0000189   | 4.71E-7        | 0.0000184 | -0.000018 | 0.032508    | 0.0344837 |
| 1725   | denovo393962               | p__Proteobacteria | 0.0000232   | 0.0001795      | -0.000156 | 0.0001563 | 0.022365    | 0.0344837 |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1726 | denovo394030 | p__Firmicutes     | 7.84E-6   | 0         | 7.84E-6   | -7.84E-6  | 0.010836 | 0.0201715 |
| 1727 | denovo394208 | p__Firmicutes     | 0.0000346 | 8.5346E-7 | 0.0000337 | -0.000034 | 0.018576 | 0.030734  |
| 1728 | denovo394847 | p__Firmicutes     | 0.0000718 | 2.3204E-6 | 0.0000695 | -0.000069 | 0.000281 | 0.003096  |
| 1729 | denovo395034 | p__Firmicutes     | 0.0000338 | 4.71E-7   | 0.0000333 | -0.000033 | 0.010836 | 0.0201715 |
| 1730 | denovo395780 | p__Firmicutes     | 0.0001469 | 5.1971E-6 | 0.0001417 | -0.000142 | 0.000714 | 0.0047523 |
| 1731 | denovo396148 | p__Firmicutes     | 0.0000534 | 2.5175E-6 | 0.0000509 | -0.000051 | 0.000281 | 0.003096  |
| 1732 | denovo396809 | p__Firmicutes     | 0.0000147 | 0         | 0.0000147 | -0.000015 | 0.032508 | 0.0344837 |
| 1733 | denovo397011 | p__Firmicutes     | 0.0000827 | 1.3245E-6 | 0.0000813 | -0.000081 | 0.000173 | 0.0022138 |
| 1734 | denovo397132 | p__Proteobacteria | 0.0001516 | 0.0009521 | -0.000801 | 0.0008006 | 0.027701 | 0.0344837 |
| 1735 | denovo397887 | p__Firmicutes     | 0.0000169 | 0         | 0.0000169 | -0.000017 | 0.032508 | 0.0344837 |
| 1736 | denovo398162 | p__Firmicutes     | 0.0000151 | 0         | 0.0000151 | -0.000015 | 0.010836 | 0.0201715 |
| 1737 | denovo399014 | p__Firmicutes     | 0         | 0.0004166 | -0.000417 | 0.0004166 | 0.010836 | 0.0201715 |
| 1738 | denovo399595 | p__Bacteroidetes  | 0.0000799 | 0.0010897 | -0.00101  | 0.0010098 | 0.000704 | 0.0047523 |
| 1739 | denovo399652 | p__Bacteroidetes  | 0.0002203 | 0.0000301 | 0.0001902 | -0.00019  | 0.002858 | 0.0108688 |
| 1740 | denovo399776 | p__Firmicutes     | 6.5267E-6 | 0         | 6.5267E-6 | -6.527E-6 | 0.032508 | 0.0344837 |

The 2-sided p-value is presented.

|  |                            |               |             |                |           |           |          | Page 59 of 61 |
|--|----------------------------|---------------|-------------|----------------|-----------|-----------|----------|---------------|
| Table S8   |                            |               |             |                |           |           |          |               |
| Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O)Sample. |                            |               |             |                |           |           |          |               |
| SI No.   | Operational Taxonomic Unit | Phylum        | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR           |
| 1741   | denovo399920               | p__Firmicutes | 0           | 0.0002112      | -0.000211 | 0.0002112 | 0.010836 | 0.0201715     |
| 1742   | denovo400697               | p__Firmicutes | 0.0002809   | 0.0009541      | -0.000673 | 0.0006732 | 0.008324 | 0.0201715     |
| 1743   | denovo401072               | p__Firmicutes | 0.0001608   | 0.0002775      | -0.000117 | 0.0001167 | 0.019767 | 0.0325557     |

|      |              |                   |           |           |           |           |             |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|-------------|-----------|
| 1744 | denovo401389 | p__Proteobacteria | 0         | 0.0000199 | -0.00002  | 0.0000199 | 0.000714    | 0.0047523 |
| 1745 | denovo402168 | p__Actinobacteria | 0.0000105 | 0         | 0.0000105 | -0.000011 | 0.032508    | 0.0344837 |
| 1746 | denovo402293 | p__Firmicutes     | 0.0000172 | 0.0023869 | -0.00237  | 0.0023698 | 0.000260    | 0.0029471 |
| 1747 | denovo402297 | p__Bacteroidetes  | 0.0008165 | 0.0069235 | -0.006107 | 0.0061069 | 0.000206    | 0.0024559 |
| 1748 | denovo402501 | p__Firmicutes     | 0.0001882 | 0.001603  | -0.001415 | 0.0014148 | 0.035203    | 0.0364691 |
| 1749 | denovo402529 | p__Actinobacteria | 0         | 7.8349E-6 | -7.835E-6 | 7.8349E-6 | 0.010836    | 0.0201715 |
| 1750 | denovo402605 | p__Firmicutes     | 0.0000472 | 0         | 0.0000472 | -0.000047 | 0.032508    | 0.0344837 |
| 1751 | denovo403714 | p__Firmicutes     | 0.0002922 | 0.0013145 | -0.001022 | 0.0010224 | 0.001007    | 0.0062281 |
| 1752 | denovo403764 | p__Bacteroidetes  | 3.5929E-6 | 0.0004078 | -0.000404 | 0.0004042 | 0.025125    | 0.0344837 |
| 1753 | denovo404289 | p__Proteobacteria | 0         | 0.0000138 | -0.000014 | 0.0000138 | 0.003096    | 0.0108688 |
| 1754 | denovo405116 | p__Proteobacteria | 1.0746E-6 | 0.0000682 | -0.000067 | 0.0000672 | 0.000119    | 0.0018162 |
| 1755 | denovo405445 | p__Firmicutes     | 0.0000147 | 0         | 0.0000147 | -0.000015 | 0.032508    | 0.0344837 |
| 1756 | denovo405531 | p__Firmicutes     | 0.0000157 | 0         | 0.0000157 | -0.000016 | 0.003096    | 0.0108688 |
| 1757 | denovo405750 | p__Proteobacteria | 0.00023   | 0.001877  | -0.001647 | 0.001647  | 0.000130    | 0.0018277 |
| 1758 | denovo405863 | p__Firmicutes     | 8.257E-7  | 0.000365  | -0.000364 | 0.0003642 | 0.001310    | 0.0071392 |
| 1759 | denovo406148 | p__Actinobacteria | 4.8727E-6 | 0.0000809 | -0.000076 | 0.000076  | 0.018576    | 0.030734  |
| 1760 | denovo406192 | p__Proteobacteria | 1.8238E-6 | 0.00003   | -0.000028 | 0.0000282 | 0.000010825 | 0.000517  |
| 1761 | denovo406365 | p__Bacteroidetes  | 0.0000124 | 7.3347E-7 | 0.0000117 | -0.000012 | 0.032508    | 0.0344837 |
| 1762 | denovo406509 | p__Proteobacteria | 0.0000167 | 0.0009252 | -0.000909 | 0.0009085 | 0.003572    | 0.0121645 |
| 1763 | denovo406587 | p__Bacteroidetes  | 0         | 0.0000569 | -0.000057 | 0.0000569 | 0.032508    | 0.0344837 |
| 1764 | denovo406615 | p__Proteobacteria | 0         | 0.0000157 | -0.000016 | 0.0000157 | 0.010836    | 0.0201715 |
| 1765 | denovo406924 | p__Firmicutes     | 0.0000267 | 3.1792E-6 | 0.0000235 | -0.000023 | 0.015870    | 0.0277756 |
| 1766 | denovo407008 | p__Actinobacteria | 0.0008112 | 6.9294E-6 | 0.0008043 | -0.000804 | 0.000043300 | 0.0009948 |
| 1767 | denovo407348 | p__Firmicutes     | 6.4969E-6 | 0.0000785 | -0.000072 | 0.000072  | 0.018576    | 0.030734  |
| 1768 | denovo407351 | p__Firmicutes     | 0.0000389 | 1.1109E-6 | 0.0000378 | -0.000038 | 0.005477    | 0.0165144 |
| 1769 | denovo407444 |                   | 0         |           |           |           |             |           |



|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
|      |              | p__Proteobacteria |           | 0.0000137 | -0.000014 | 0.0000137 | 0.010836 | 0.0201715 |
| 1770 | denovo408077 | p__Firmicutes     | 0.0000456 | 7.3347E-7 | 0.0000449 | -0.000045 | 0.010836 | 0.0201715 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls (C1), versus those present in the Oral (O) Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O-C1      | C1-O      | P Value     | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|-------------|-----------|
| 1771   | denovo408338               | p__Actinobacteria | 0           | 0.0000224      | -0.000022 | 0.0000224 | 0.032508    | 0.0344837 |
| 1772   | denovo408482               | p__Firmicutes     | 0.0000277   | 1.3552E-6      | 0.0000264 | -0.000026 | 0.010836    | 0.0201715 |
| 1773   | denovo409135               | p__Firmicutes     | 0.0001049   | 1.5754E-6      | 0.0001033 | -0.000103 | 0.000021650 | 0.0006237 |
| 1774   | denovo409169               | p__Firmicutes     | 0.0000227   | 4.71E-7        | 0.0000222 | -0.000022 | 0.010836    | 0.0201715 |
| 1775   | denovo409403               | p__Proteobacteria | 9.9809E-7   | 0.0000243      | -0.000023 | 0.0000233 | 0.032508    | 0.0344837 |
| 1776   | denovo409405               | p__Firmicutes     | 0.0000429   | 1.1486E-6      | 0.0000418 | -0.000042 | 0.006668    | 0.0190297 |
| 1777   | denovo409532               | p__Firmicutes     | 0.0003005   | 0.0000174      | 0.0002831 | -0.000283 | 0.003226    | 0.0112595 |
| 1778   | denovo409734               | p__Firmicutes     | 6.0367E-6   | 0              | 6.0367E-6 | -6.037E-6 | 0.032508    | 0.0344837 |
| 1779   | denovo409939               | p__Firmicutes     | 0.0001088   | 0.000494       | -0.000385 | 0.0003852 | 0.015004    | 0.0263616 |
| 1780   | denovo409965               | p__Firmicutes     | 0           | 0.0000107      | -0.000011 | 0.0000107 | 0.032508    | 0.0344837 |
| 1781   | denovo410298               | p__Firmicutes     | 0.0000144   | 0              | 0.0000144 | -0.000014 | 0.032508    | 0.0344837 |
| 1782   | denovo410318               | p__Firmicutes     | 0.0000144   | 6.7758E-7      | 0.0000137 | -0.000014 | 0.010836    | 0.0201715 |
| 1783   | denovo411305               | p__Firmicutes     | 0.0000287   | 0              | 0.0000287 | -0.000029 | 0.032508    | 0.0344837 |
| 1784   | denovo412195               | p__Firmicutes     | 0.0001342   | 0              | 0.0001342 | -0.000134 | 0.000714    | 0.0047523 |
| 1785   | denovo412603               | p__Firmicutes     | 0.0000215   | 0              | 0.0000215 | -0.000022 | 0.010836    | 0.0201715 |
| 1786   | denovo412731               | p__Firmicutes     | 0.0000405   | 1.0768E-6      | 0.0000394 | -0.000039 | 0.006668    | 0.0190297 |

|      |              |                     |           |           |           |           |          |           |
|------|--------------|---------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1787 | denovo412859 | p__Firmicutes       | 0.0000205 | 8.7027E-7 | 0.0000197 | -0.00002  | 0.000714 | 0.0047523 |
| 1788 | denovo412911 | p__Bacteroidetes    | 0.000023  | 0.0012545 | -0.001231 | 0.0012315 | 0.000173 | 0.0022138 |
| 1789 | denovo413418 | p__Firmicutes       | 0.0000862 | 3.9008E-6 | 0.0000823 | -0.000082 | 0.001851 | 0.0093326 |
| 1790 | denovo413706 | p__Proteobacteria   | 0         | 8.6217E-6 | -8.622E-6 | 8.6217E-6 | 0.032508 | 0.0344837 |
| 1791 | denovo413775 | p__Proteobacteria   | 0.0000288 | 0.0005356 | -0.000507 | 0.0005068 | 0.021553 | 0.0344837 |
| 1792 | denovo413929 | p__Firmicutes       | 0.0000366 | 9.4201E-7 | 0.0000357 | -0.000036 | 0.000714 | 0.0047523 |
| 1793 | denovo414490 | p__Firmicutes       | 0.000158  | 0.0024252 | -0.002267 | 0.0022672 | 0.001061 | 0.0062515 |
| 1794 | denovo414735 | p__Gemmatimonadetes | 0.0000466 | 0.0005209 | -0.000474 | 0.0004742 | 0.033958 | 0.0354016 |
| 1795 | denovo415029 | p__Firmicutes       | 0.0000145 | 0         | 0.0000145 | -0.000015 | 0.010836 | 0.0201715 |
| 1796 | denovo415054 | p__Firmicutes       | 0.0000213 | 0         | 0.0000213 | -0.000021 | 0.032508 | 0.0344837 |
| 1797 | denovo415197 | p__Firmicutes       | 0         | 0.0000551 | -0.000055 | 0.0000551 | 0.032508 | 0.0344837 |
| 1798 | denovo415400 | p__Firmicutes       | 0.0000104 | 0         | 0.0000104 | -0.00001  | 0.010836 | 0.0201715 |
| 1799 | denovo415539 | p__Firmicutes       | 4.8727E-6 | 0.0002455 | -0.000241 | 0.0002407 | 0.032508 | 0.0344837 |
| 1800 | denovo415677 | p__Firmicutes       | 0.000045  | 0.0005938 | -0.000549 | 0.0005488 | 0.026262 | 0.0344837 |

The 2-sided p-value is presented.

Table S8

Differences between microbiome signatures present in the Bronchoscope controls( C1), versus those present in the Oral Sample.

| SI No. | Operational Taxonomic Unit | Phylum            | Oral Sample | Control Sample | O1-C1     | C1-O1     | P Value  | FDR       |
|--------|----------------------------|-------------------|-------------|----------------|-----------|-----------|----------|-----------|
| 1801   | denovo416303               | p__Firmicutes     | 0.0000192   | 0              | 0.0000192 | -0.000019 | 0.003096 | 0.0108688 |
| 1802   | denovo416499               | p__Firmicutes     | 0.0000212   | 0              | 0.0000212 | -0.000021 | 0.010836 | 0.0201715 |
| 1803   | denovo416599               | p__Proteobacteria | 1.84E-6     | 0.0000704      | -0.000069 | 0.0000686 | 0.000714 | 0.0047523 |

|      |              |                   |           |           |           |           |          |           |
|------|--------------|-------------------|-----------|-----------|-----------|-----------|----------|-----------|
| 1804 | denovo416670 | p__Firmicutes     | 5.7598E-6 | 0         | 5.7598E-6 | -5.76E-6  | 0.032508 | 0.0344837 |
| 1805 | denovo416680 | p__Firmicutes     | 0.000012  | 0         | 0.000012  | -0.000012 | 0.032508 | 0.0344837 |
| 1806 | denovo416713 | p__Firmicutes     | 7.089E-7  | 0.000133  | -0.000132 | 0.0001322 | 0.018576 | 0.030734  |
| 1807 | denovo417191 | p__Firmicutes     | 0.00014   | 4.2813E-6 | 0.0001358 | -0.000136 | 0.000411 | 0.0041478 |
| 1808 | denovo417259 | p__Proteobacteria | 0.0018311 | 0.0121147 | -0.010284 | 0.0102835 | 0.000325 | 0.0033875 |
| 1809 | denovo417621 | p__Firmicutes     | 0.0003593 | 0.0000339 | 0.0003254 | -0.000325 | 0.041731 | 0.0424031 |
| 1810 | denovo419119 | p__Firmicutes     | 0         | 0.0002186 | -0.000219 | 0.0002186 | 0.032508 | 0.0344837 |
| 1811 | denovo419411 | p__Firmicutes     | 0.0000523 | 7.3347E-7 | 0.0000515 | -0.000052 | 0.032508 | 0.0344837 |
| 1812 | denovo419420 | p__Firmicutes     | 0.0000177 | 0         | 0.0000177 | -0.000018 | 0.032508 | 0.0344837 |
| 1813 | denovo419469 | p__Actinobacteria | 0.0000167 | 0         | 0.0000167 | -0.000017 | 0.032508 | 0.0344837 |
| 1814 | denovo419782 | p__Firmicutes     | 0.0000722 | 0         | 0.0000722 | -0.000072 | 0.010836 | 0.0201715 |
| 1815 | denovo419977 | p__Proteobacteria | 0.0000101 | 0.0002544 | -0.000244 | 0.0002444 | 0.013564 | 0.0241356 |

The 2-sided p-value is presented.

The above table details the significant operational taxonomic unit (OTU) differences between the oral and bronchoscope control samples (determined by Wilcoxon signed rank test). Difference in relative abundance of various OTU's in the oral and control samples have been shown under O-C1 and C1-O column. Multiple testing correction has been performed by calculating false discovery rate (FDR) for each test performed. Details provided under FDR column.

**Table S9. Correlation of MDSC subsets with bacterial phyla in the proximal and distal airway compartments**

| Phyla           | Correlation with MDSC subset | Significant correlation in proximal airway compartment | Significant correlation in distal airway compartment | Known metabolic pathways   |
|-----------------|------------------------------|--|--|--|
| Bacteroidetes   | <b>B</b>                     | <b>Positive</b>  | <b>Negative</b>                                      | Degrades high molecular polysaccharides<br>Activates T-cell mediated responses<br>Forms butyrate in GUT which has anti-neoplastic properties |
| Actinobacteria  | <b>B, C</b>                  | <b>Positive</b>  | <b>None</b>  | Ferrous (Fe <sup>2+</sup> ) Oxidation<br>Sulfur Oxidation<br>Peroxidase production   |
| Chlorobi        | <b>A</b>                     | <b>Positive</b>  | <b>None</b>  | Reduction of sulfide, hydrogen and ferrous ions  |
| TM7             | <b>B, C</b>                  | <b>Positive*</b>                                       | <b>Positive**</b>                                    | Suppresses TNF-alpha and thus reduces immune function  |
| Planctomycetes  | <b>C</b>                     | <b>Positive</b>  | <b>None</b>  | Anaerobic Ammonium oxidation   |
| Firmicutes      | <b>B</b>                     | <b>Positive</b>  | <b>Negative</b>                                      | Peroxidase breakdown<br>Amino acid metabolism<br>Fatty acid breakdown  |
| Proteobacteria  | <b>B</b>                     | <b>Negative</b>  | <b>Positive</b>                                      | Sulfur oxidation<br>Nitrite reduction<br>Oxidation of ammonia<br>Lipopolysaccharide induced inflammation                                     |
| Thermi          | <b>B</b>                     | <b>Negative</b>  | <b>Positive</b>                                      | Source of Taq polymerase enzyme<br>Suppression of Reactive oxygen species  |
| Acidobacteria   | <b>B</b>                     | <b>Negative</b>  | <b>None</b>  | Acidification<br>Sulfur reduction<br>Nitrite reduction<br>Iron redox reactions   |
| Verrucomicrobia | <b>C</b>                     | <b>Negative</b>  | <b>None</b>  | Oxidizes methane   |

Abbreviations: Subset (**A**), CD14<sup>+</sup>CD11b<sup>+</sup>CD16<sup>-</sup>HLA-DR<sup>-</sup> (monocytic), subset (**B**) CD66<sup>+</sup>CD16<sup>+</sup>CD14<sup>-</sup>HLA-DR<sup>-</sup> CD11b<sup>+</sup>(neutrophilic) and subset (**C**) CD163<sup>+</sup>HLA<sup>-</sup>DR<sup>+</sup>CD11b<sup>+</sup>CD66b<sup>-</sup>CD16<sup>-</sup> (macrophage), TNF- Tumor necrosis factor