

**Table S3.** Genus level comparison generated with the RDP library compare tool [1]. Values indicate the number of 16S rRNA pyrosequencing reads that map to the listed genus. Only significant differences are shown ( $P < 0.05$ ). A-F: patients;  $X_{\text{off}}$ : off-tumor tissue;  $X_{\text{on}}$ : on-tumor tissue.

| <b><math>A_{\text{off}}</math> vs <math>A_{\text{on}}</math></b> | <b><math>A_{\text{off}}</math></b> | <b><math>A_{\text{on}}</math></b> | <b>P value</b> |
|--|------------------------------------|-----------------------------------|----------------|
| <b>Megamonas</b>   | 406                                | 1                                 | <0.0001        |
| <b>Subdoligranulum</b>   | 5                                  | 179                               | <0.0001        |
| <b>Granulicatella</b>  | 59                                 | 2                                 | <0.0001        |
| <b>Coprobacillus</b>   | 54                                 | 4                                 | <0.0001        |
| <b>"Peptostreptococcaceae Incertae Sedis"</b>                    | 44                                 | 11390                             | <0.0001        |
| <b>Anaerobacter</b>  | 96                                 | 16                                | <0.0001        |
| <b>Bacteroides</b>   | 249                                | 4778                              | <0.0001        |
| <b>Clostridium</b>   | 2971                               | 980                               | <0.0001        |
| <b>Parabacteroides</b>   | 36                                 | 515                               | <0.0001        |
| <b>Sutterella</b>  | 6559                               | 13                                | <0.0001        |
| <b>"Ruminococcaceae Incertae Sedis"</b>                          | 9                                  | 143                               | <0.0001        |
| <b>Collinsella</b>   | 37                                 | 239                               | <0.0001        |
| <b>Faecalibacterium</b>  | 84                                 | 356                               | <0.0001        |
| <b>Eggerthella</b>   | 0                                  | 53                                | <0.0001        |
| <b>Veillonella</b>   | 1                                  | 49                                | <0.0001        |
| <b>"Lachnospiraceae Incertae Sedis"</b>                          | 171                                | 521                               | <0.0001        |
| <b>Bacillus c</b>  | 13                                 | 0                                 | <0.0001        |
| <b>Shigella</b>  | 27                                 | 16                                | <0.0001        |
| <b>Haemophilus</b>   | 8                                  | 0                                 | <0.0001        |
| <b>Propionibacterium</b>   | 8                                  | 0                                 | <0.0001        |
| <b>Gemella</b>   | 10                                 | 2                                 | 0.001          |
| <b>Peptostreptococcus</b>  | 0                                  | 17                                | 0.001          |
| <b>Anaerovorax</b>   | 4                                  | 0                                 | 0.010          |
| <b>Flavimonas</b>  | 4                                  | 0                                 | 0.010          |
| <b>Enterococcus</b>  | 3                                  | 0                                 | 0.029          |
| <b>Anaerotruncus</b>   | 0                                  | 9                                 | 0.029          |
| <b>Alistipes</b>   | 0                                  | 8                                 | 0.044          |

| <b>B<sub>off</sub> vs B<sub>on</sub></b>      | <b>B<sub>off</sub></b> | <b>B<sub>on</sub></b> | <b>P value</b> |
|---|------------------------|-----------------------|----------------|
| <b>Porphyromonas</b>                          | 950                    | 0                     | <0.0001        |
| <b>Moryella</b>                               | 166                    | 0                     | <0.0001        |
| <b>Dialister</b>                              | 153                    | 0                     | <0.0001        |
| <b>Rothia</b>                                 | 69                     | 0                     | <0.0001        |
| <b>Gemella</b>                                | 68                     | 0                     | <0.0001        |
| <b>Prevotella</b>                             | 1                      | 59                    | <0.0001        |
| <b>"Peptostreptococcaceae Incertae Sedis"</b> | 426                    | 165                   | <0.0001        |
| <b>Bacteroides</b>                            | 296                    | 1192                  | <0.0001        |
| <b>Escherichia</b>                            | 798                    | 52                    | <0.0001        |
| <b>Faecalibacterium</b>                       | 165                    | 988                   | <0.0001        |
| <b>Parvimonas</b>                             | 621                    | 101                   | <0.0001        |
| <b>Peptostreptococcus</b>                     | 2206                   | 6                     | <0.0001        |
| <b>Shigella</b>                               | 776                    | 2399                  | <0.0001        |
| <b>"Lachnospiraceae Incertae Sedis"</b>       | 20                     | 80                    | <0.0001        |
| <b>Anaerovorax</b>                            | 28                     | 0                     | <0.0001        |
| <b>Bulleidia</b>                              | 16                     | 0                     | <0.0001        |
| <b>Fusobacterium</b>                          | 0                      | 14                    | <0.0001        |
| <b>Paracoccus</b>                             | 0                      | 14                    | <0.0001        |
| <b>Collinsella</b>                            | 1                      | 13                    | 0.001          |
| <b>Coprobacillus</b>                          | 0                      | 10                    | 0.001          |
| <b>TM7_genera_incertae_sedis</b>              | 10                     | 0                     | 0.001          |
| <b>Propionibacterium</b>                      | 9                      | 0                     | 0.002          |
| <b>Actinomyces</b>                            | 10                     | 1                     | 0.007          |
| <b>Granulicatella</b>                         | 11                     | 2                     | 0.013          |
| <b>Staphylococcus</b>                         | 5                      | 0                     | 0.032          |

| <b>C<sub>off</sub> vs C<sub>on</sub></b> | <b>C<sub>off</sub></b> | <b>C<sub>on</sub></b> | <b>P value</b> |
|--|------------------------|-----------------------|----------------|
| "Peptostreptococcaceae Incertae Sedis"   | 0                      | 2892                  | <0.0001        |
| Rothia                                   | 0                      | 741                   | <0.0001        |
| Granulicatella                           | 0                      | 513                   | <0.0001        |
| Gemella                                  | 0                      | 336                   | <0.0001        |
| Sphingomonas                             | 466                    | 0                     | <0.0001        |
| Mogibacterium                            | 0                      | 238                   | <0.0001        |
| Veillonella                              | 0                      | 200                   | <0.0001        |
| Sutterella                               | 0                      | 127                   | <0.0001        |
| Peptostreptococcus                       | 0                      | 108                   | <0.0001        |
| Enhydrobacter                            | 169                    | 0                     | <0.0001        |
| Clostridium                              | 154                    | 0                     | <0.0001        |
| Parvimonas                               | 0                      | 58                    | <0.0001        |
| TM7_genera_incertae_sedis                | 0                      | 55                    | <0.0001        |
| Actinomyces                              | 0                      | 41                    | <0.0001        |
| Bacteroides                              | 2531                   | 35                    | <0.0001        |
| Haemophilus                              | 122                    | 1585                  | <0.0001        |
| Propionibacterium                        | 5856                   | 45                    | <0.0001        |
| Shigella                                 | 1062                   | 366                   | <0.0001        |
| Corynebacterium                          | 62                     | 0                     | <0.0001        |
| Subdoligranulum                          | 0                      | 27                    | <0.0001        |
| Staphylococcus                           | 296                    | 89                    | <0.0001        |
| Bulleidia                                | 0                      | 20                    | <0.0001        |
| Actinobacillus                           | 0                      | 17                    | <0.0001        |
| Nesterenkonia                            | 0                      | 17                    | <0.0001        |
| Prevotella                               | 0                      | 17                    | <0.0001        |
| Dialister                                | 0                      | 15                    | <0.0001        |
| Paenibacillus                            | 20                     | 0                     | <0.0001        |
| Phocoenobacter                           | 6                      | 18                    | <0.0001        |
| Porphyromonas                            | 51                     | 63                    | <0.0001        |
| "Lachnospiraceae Incertae Sedis"         | 0                      | 8                     | <0.0001        |
| Anaerobacter                             | 19                     | 1                     | 0.001          |
| Lactobacillus                            | 0                      | 6                     | 0.003          |
| Neisseria                                | 11                     | 20                    | 0.003          |
| Bacillus c                               | 24                     | 4                     | 0.006          |
| Jeotgalicoccus                           | 0                      | 5                     | 0.007          |
| Parabacteroides                          | 0                      | 5                     | 0.007          |
| Streptococcus                            | 5                      | 11                    | 0.016          |
| Moryella                                 | 0                      | 4                     | 0.018          |

| <b>D<sub>off</sub> vs D<sub>on</sub></b> | <b>D<sub>off</sub></b> | <b>D<sub>on</sub></b> | <b>P value</b> |
|--|------------------------|-----------------------|----------------|
| "Lachnospiraceae Incertae Sedis"         | 195                    | 572                   | <0.0001        |
| "Peptostreptococcaceae Incertae Sedis"   | 1015                   | 53                    | <0.0001        |
| Propionibacterium                        | 94                     | 0                     | <0.0001        |
| Anaerovorax                              | 50                     | 0                     | <0.0001        |
| Granulicatella                           | 44                     | 0                     | <0.0001        |
| Bacteroides                              | 802                    | 1379                  | <0.0001        |
| Faecalibacterium                         | 105                    | 359                   | <0.0001        |
| Subdoligranulum                          | 812                    | 155                   | <0.0001        |
| Eggerthella                              | 38                     | 0                     | <0.0001        |
| Sutterella                               | 38                     | 0                     | <0.0001        |
| Clostridium                              | 36                     | 0                     | <0.0001        |
| Haemophilus                              | 25                     | 0                     | <0.0001        |
| TM7_genera_incertae_sedis                | 24                     | 0                     | <0.0001        |
| Peptostreptococcus                       | 20                     | 0                     | <0.0001        |
| Dialister                                | 19                     | 0                     | <0.0001        |
| Enterococcus                             | 12                     | 45                    | <0.0001        |
| Shigella                                 | 1082                   | 1286                  | 0.001          |
| Desulfovibrio                            | 9                      | 0                     | 0.002          |
| Prevotella                               | 9                      | 0                     | 0.002          |
| Parabacteroides                          | 8                      | 0                     | 0.003          |
| Staphylococcus                           | 10                     | 1                     | 0.005          |
| Parvimonas                               | 7                      | 0                     | 0.007          |
| Escherichia                              | 11                     | 2                     | 0.011          |
| Enhydrobacter                            | 5                      | 0                     | 0.028          |

| <b>E<sub>off</sub> vs E<sub>on</sub></b> | <b>E<sub>off</sub></b> | <b>E<sub>on</sub></b> | <b>P value</b> |
|--|------------------------|-----------------------|----------------|
| Haemophilus                              | 0                      | 555                   | <0.0001        |
| Propionibacterium                        | 0                      | 464                   | <0.0001        |
| Sutterella                               | 0                      | 449                   | <0.0001        |
| Bradyrhizobium                           | 0                      | 334                   | <0.0001        |
| Rothia                                   | 1                      | 238                   | <0.0001        |
| Parabacteroides                          | 0                      | 152                   | <0.0001        |
| Acinetobacter                            | 0                      | 149                   | <0.0001        |
| Veillonella                              | 0                      | 149                   | <0.0001        |
| Capnocytophaga                           | 0                      | 124                   | <0.0001        |
| Alistipes                                | 1                      | 128                   | <0.0001        |
| Prevotella                               | 0                      | 113                   | <0.0001        |
| Paracoccus                               | 0                      | 92                    | <0.0001        |
| Campylobacter                            | 0                      | 75                    | <0.0001        |
| Staphylococcus                           | 0                      | 60                    | <0.0001        |
| Anaerococcus                             | 0                      | 48                    | <0.0001        |
| Phyllobacterium                          | 0                      | 46                    | <0.0001        |
| Granulicatella                           | 0                      | 40                    | <0.0001        |
| TM7_genera_incertae_sedis                | 0                      | 40                    | <0.0001        |
| Bulleidia                                | 0                      | 39                    | <0.0001        |
| Aggregatibacter                          | 0                      | 38                    | <0.0001        |
| "Lachnospiraceae Incertae Sedis"         | 692                    | 802                   | <0.0001        |
| "Peptostreptococcaceae Incertae Sedis"   | 75                     | 205                   | <0.0001        |
| Bacteroides                              | 4123                   | 547                   | <0.0001        |
| Collinsella                              | 18                     | 114                   | <0.0001        |
| Escherichia                              | 6                      | 495                   | <0.0001        |
| Mesorhizobium                            | 0                      | 34                    | <0.0001        |
| Fingoldia                                | 0                      | 30                    | <0.0001        |
| Flavimonas                               | 0                      | 29                    | <0.0001        |
| Fusobacterium                            | 0                      | 25                    | <0.0001        |
| Porphyromonas                            | 0                      | 25                    | <0.0001        |
| Gemella                                  | 0                      | 21                    | <0.0001        |
| Ruminococcus                             | 0                      | 21                    | <0.0001        |
| Subdoligranulum                          | 147                    | 39                    | <0.0001        |
| Roseburia                                | 5                      | 30                    | <0.0001        |
| Pseudomonas                              | 0                      | 17                    | <0.0001        |
| Dermacoccus                              | 0                      | 14                    | <0.0001        |
| Faecalibacterium                         | 823                    | 729                   | <0.0001        |
| Dialister                                | 0                      | 11                    | <0.0001        |
| Neisseria                                | 0                      | 11                    | <0.0001        |
| Actinomyces                              | 0                      | 10                    | <0.0001        |
| Modestobacter                            | 0                      | 8                     | 0.001          |
| Coprococcus                              | 12                     | 0                     | 0.002          |
| Enterococcus                             | 12                     | 0                     | 0.002          |
| Corynebacterium                          | 0                      | 6                     | 0.004          |
| Xylanibacter                             | 0                      | 4                     | 0.025          |

| <b>F<sub>off</sub> vs F<sub>on</sub></b>  | <b>F<sub>off</sub></b> | <b>F<sub>on</sub></b> | <b>P value</b> |
|---|------------------------|-----------------------|----------------|
| "Ruminococcaceae Incertae Sedis"          | 1260                   | 0                     | <0.0001        |
| <b>Butyrivibrio</b>                       | 752                    | 0                     | <0.0001        |
| <b>Prevotella</b>                         | 0                      | 134                   | <0.0001        |
| <b>Coprobacillus</b>                      | 0                      | 77                    | <0.0001        |
| <b>Collinsella</b>                        | 1                      | 63                    | <0.0001        |
| <b>Parvimonas</b>                         | 0                      | 37                    | <0.0001        |
| "Lachnospiraceae Incertae Sedis"          | 171                    | 340                   | <0.0001        |
| "Peptostreptococcaceae Incertae Sedis"    | 10                     | 413                   | <0.0001        |
| <b>Bacteroides</b>                        | 319                    | 3980                  | <0.0001        |
| <b>Coprococcus</b>                        | 7                      | 98                    | <0.0001        |
| <b>Faecalibacterium</b>                   | 111                    | 6055                  | <0.0001        |
| <b>Shigella</b>                           | 77                     | 1005                  | <0.0001        |
| <b>Streptococcus</b>                      | 55                     | 2                     | <0.0001        |
| <b>Erysipelotrichaceae Incertae Sedis</b> | 0                      | 22                    | <0.0001        |
| <b>Peptostreptococcus</b>                 | 0                      | 18                    | <0.0001        |
| <b>Alistipes</b>                          | 35                     | 0                     | <0.0001        |
| <b>Selenomonas</b>                        | 35                     | 0                     | <0.0001        |
| <b>Veillonella</b>                        | 8                      | 33                    | <0.0001        |
| <b>Dorea</b>                              | 1                      | 14                    | <0.0001        |
| <b>Sutterella</b>                         | 15                     | 32                    | <0.0001        |
| <b>Bradyrhizobium</b>                     | 12                     | 0                     | 0.003          |
| <b>Actinomyces</b>                        | 1                      | 6                     | 0.014          |
| <b>Anaerovorax</b>                        | 9                      | 0                     | 0.014          |
| <b>Xylanibacter</b>                       | 9                      | 0                     | 0.014          |
| <b>Rothia</b>                             | 11                     | 1                     | 0.031          |

1. Lane DJ *et al.* 16S/23S rRNA Sequencing. *Nucleic Acids Techniques in Bacterial Systematics*. Chichester: John Wiley & Sons, 1991:115-175.