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Supplemental Information

PPAR γ Cistrome Repression during Activation

of Lung Monocyte-Macrophages in Severe COVID-19

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Transparent Methods

Transcriptomes from public datasets

We obtained transcriptomes from COVID-19 lung biopsies from dataset GSE147507 in the Gene Expression Omnibus database (https://www.biorxiv.org/content/10.1101/2020.03.24.004655v1) and now published in Cell on 28th May 2020 (https://www.sciencedirect.com/science/article/pii/S009286742030489X?via%3Dihub) (Blanco-Melo et al., 2020, p.).

This dataset comprised human biological samples: lung biopsies from one male (age 72) and one female (age 60), used as biological replicates. Additionally, lung samples from a single male (COVID-19 deceased, age 74) patient were processed in technical replicates. These experiments had been performed with the approval of the institutional review board at the Icahn School of Medicine at Mount Sinai under protocol HS#12-00145. Samples were sequenced on NextSeq 500 technology (Illumina , CA) after the selection of a polyA RNA library using the TruSeq RNA Library Prep Kit v2 (Illumina, CA); the library was prepared from total RNA extracted using the RNeasy Mini Kit (Qiagen). Raw sequencing reads were aligned to the human genome (hg19) using the RNA-Seq Alignment App (v2.0.1). We then used the matrix of raw count data to perform the bioinformatics analyses described below.

The GSE150316 dataset had been prepared from distinct tissues from 5 COVID-19 patients and 5 healthy donors via RNAseq sequencing; samples from COVID-19 patients were processed in triplicate. Sequencing was performed on an Illumina NextSeq500 instrument after library preparation with the Smarter Stranded Total RNA-Seq kit v2 (634413, Illumina) starting from 10 ng of RNA (FFPE slides) extracted with the FormaPure Total nucleic acid extraction kit (C16675, Beckman Coulter).

Transcriptome of human tissues with immune cell sub-populations

Normalized transcriptomes from different human tissues were retrieved from the dataset GSE76340 on the GEO website. Samples in this dataset had been processed with different versions of the HumanHT-12 beadchip (Illumina, CA): versions V3 & V4 were annotated with the transcriptome platforms gpl6947 & gpl10558. These experiments comprised 166 human samples which were representative of hematopoietic and non-hematopoietic tissues present in the human body and were compatible with immune deconvolution analysis (Pont et al., 2016).

CHIP-sequencing from THP-1 cell line

Data from CHIP-sequencing experiments conducted using the THP-1 cell line were downloaded from the Cistrome Project website, in Bed and Bigwig format and aligned on version HG38 of the human genome. Promoter mapping was performed with BETA cistrome with a prediction +/-100 kb around transcription starting sites; promoter heatmaps were drawn with the deeptools application +/- 5 kb around transcription starting sites. CHIP-seq signals were visualized in the Integrative Genomics Viewer (IGV) standalone software after uploading the corresponding BigWig files.

Bioinformatics analyses

Bioinformatics analyses were performed in R software environment version 3.5.3. Functional network analysis was carried out using an immune gene-set enrichment analysis with the standalone software Cytoscape version 3.4.0. Raw counts of next-generation sequencing data were normalized with the algorithm 'variance stabilization transformation' (VST) from EdgeR. The cross-matrix between datasets, which comprised 170 transcriptome samples (Supplemental Table 3), was constructed by merging experiment sets based on their unique gene symbol identifiers. Cross-batch normalization was applied to the resulting matrix with the algorithm 'Combat' of the SVA R-package. Unsupervised principal component analyses were performed with FactoMineR. Transcriptome expression heatmaps were created with the Made4 and pheatmap R-packages, with default Pearson distances for small heatmaps and Euclidean distances for large ones. Immune landscape transcriptome analysis was performed with the xcell R-package and multi-testing linear model fit correction was applied to immune scores with the limma R-package. Gene-set enrichment analysis was performed on human lung biopsy samples with the standalone software GSEA version 4.0.3 using the MSigDB database, version 7.1.

Single-cell analysis of lung samples from healthy donors and patients with mild and severe COVID-19

In order to validate, at the single-cell level, the disruption observed in immune molecules in the transcriptome analysis of lung cells from COVID-19 patients, single-cell transcriptome (10x Genomics) data from bronchoalveolar lavage fluid samples were downloaded in H5 format from the dataset GSE145926. From this dataset, we created a merged matrix by aggregating a total of 90696 transcriptomes. This included six healthy donor samples—GSM4475048, GSM4475049, GSM4475050, GSM4475051, GSM4475052, GSM4475053—comprising 39900 transcriptomes, three mild COVID-19 samples—GSM4339769, GSM4339770, GSM4339772—comprising 9710 transcriptomes, and three severe COVID-19 samples—GSM4339771, GSM4339773, GSM4339774—comprising 41086 transcriptomes.

After canonical correlation and scaling, a total of 23742 features were analyzed, with 38738 anchors identified between samples. After variable feature selection with the VST algorithm, dimensionality reduction was carried out by principal component analysis on 2000 variable features (30 components) and UMAP dimensionality reduction of the 20 best components of the PCA. Single-cell analyses on the CD14+/CD16+ subset of cells were performed in Seurat and PPAR γ gamma-dependent trajectories were constructed for the CD14+/CD16+ subset with the monocle2 R-package. The transparent bioinformatics code for all single-cell analyses in R software is provided in the supplemental data (supplemental bioinformatics code).

References

- Blanco-Melo, D., Nilsson-Payant, B.E., Liu, W.-C., Uhl, S., Hoagland, D., Møller, R., Jordan, T.X., Oishi, K., Panis, M., Sachs, D., Wang, T.T., Schwartz, R.E., Lim, J.K., Albrecht, R.A., tenOever, B.R., 2020. Imbalanced Host Response to SARS-CoV-2 Drives Development of COVID-19. Cell 181, 1036-1045.e9. https://doi.org/10.1016/j.cell.2020.04.026
- Pont, M.J., Honders, M.W., Kremer, A.N., van Kooten, C., Out, C., Hiemstra, P.S., de Boer, H.C., Jager, M.J., Schmelzer, E., Vries, R.G., Al Hinai, A.S., Kroes, W.G., Monajemi, R., Goeman, J.J., Böhringer, S., Marijt, W. a. F., Falkenburg, J.H.F., Griffioen, M., 2016. Microarray Gene Expression Analysis to Evaluate Cell Type Specific Expression of Targets Relevant for

Immunotherapy of Hematological Malignancies. PloS One 11, e0155165. https://doi.org/10.1371/journal.pone.0155165

Supplemental figure legends

Supplemental Figure 1. Transcriptomic view of the immune response in lungs of COVID-19 patients compared to those of healthy donors, related to figure 1:

A. Genes highlighed by the gene-set enrichment analysis that are associated with the innate immune response; **B.** Genes highlighted by the gene-set enrichment analysis that are implicated both in the innate and adaptive immune responses; **C.** Genes highlighted by the gene-set enrichment analysis that are implicated in the adaptive immune response (for A to C: NES: normalized enrichment score, FDR: false discovery rate); **D.** Expression heatmap of immune-related genes that were upregulated in COVID-19 lung biopsy samples (Euclidean distances).

Supplemental Figure 2: Single cell expression of T and NK lymphocyte markers in lung of COVID-19 patients as compared to Healthy donors, related to figure 1:

UMAP projection of single cell expression split on lung from Healthy donors (control), from patient with COVID-19 mild and from patient with COVID-19 severe: respective expression of CD3E, CD8A (T lymphocyte) and NKG7 (Natural Killers)

Supplemental Figure 3. Single cell expression of B lymphocyte and epthelial markers in lung of COVID-19 patients as compared to Healthy donors, related to figure 1:

UMAP projection of single cell expression split on lung from Healthy donors (control), from patient with COVID-19 mild and from patient with COVID-19 severe: respective expression of MS4A1 alias CD20 (B lymphocyte) and KRT8 (epithelial cells)

Supplemental Figure 4. Immune score and immune characterization of COVID-19 lung samples, related to figure 2:

A. Volcanoplot of differentially expressed genes (DEG) in COVID-19 lung biopsies compared to healthy donor tissues; **B.** Expression heatmap of DEGs between COVID-19 lung biopsies and healthy tissues; **C.** Expression of the most upregulated marker, IFI6, in single cells from healthy donors, patients with mild COVID-19, and patients with severe COVID-19; **D.** Volcanoplot and heatmap of significant immune scores found in the immune infiltration of COVID-19 lung biopsies compared to those healthy donors; **E.** Immune deconvolution of the transcriptomes of COVID-19 and healthy donor lung biopsies via unsupervised principal component analysis (p-value: group stratification by Pearson correlation along the first principal axis)

Supplemental Figure 5: Repression of mitosis/cell cycle, stem cell and heme metabolism in COVID-19 lung biopsy as compared to healthy donor ones, related to figure 1:

(NES: normalized enrichment score, FDR: false discovery rate)

Supplemental Figure 6: Single cell expression of macrophages M1 and M2 markers in lung of COVID-19 patients as compared to Healthy donors, related to figure 3:

UMAP projection of single cell expression split on lung from Healthy donors (control), from patient with COVID-19 mild and from patient with COVID-19 severe: respective expression of CD68 for M1 macrophages and CD163 for M2 macrophages

Supplemental Figure 7: Workflow procedure of Batch cross normalization between transcriptome datasets used for immune deconvolution of COVID-19 lung biopsy, related to figure 3:

Cross transcriptome matrix from two datasets with three platforms was built on unique gene symbol, ComBat batch normalization was applied to the matrix to correct batch error

Supplemental Figure 8: Unsupervised principal component analysis performed with immune induced signature according to the batches used to build the transcriptome cross dataset matrix, related to figure 3

(respective batches merged during microarray analysis B1: batch1, B2: batch2, B3: batch3)

Supplemental Figure 9: Deregulation of inhibitory immune checkpoints in COVID-19 lung samples, related to figure 1:

A. Transcriptome expression heatmap of inhibitory immune checkpoints expressed in COVID-19 lung samples compared to those from healthy donors; **B-D.** Single-cell expression (bronchoalveolar lavage fluid) dotplots of inhibitory immune checkpoint markers by patient of origin: HD, mild COVID-19, and severe COVID-19 (percent: percent of cells expressing each marker, expression level: color intensity), **C**. UMAP representation of single-cell transcriptome (bronchoalveolar lavage fluid) expression data from HDs and patients with mild or severe COVID-19 for CD47 and **D**. LGALS9; **E**. Expression heatmap of stimulatory immune checkpoints expressed in COVID-19 lung samples compared to healthy donors; **F**. Single-cell expression (bronchoalveolar lavage fluid) dotplots of stimulatory immune checkpoints markers by patient of origin: HD, mild COVID-19, and severe COVID-19 (percent: percent of cells expressing each marker, expression level: color intensity), **G**. UMAP representation of single-cell transcriptome (bronchoalveolar lavage fluid) expression data for CD48 from HDs and patients with mild or severe COVID-19.

Supplemental Figure 10: Single cell expression of inhibitory immune checkpoints in lung of COVID-19 patients as compared to Healthy donors, related to figure 1:

UMAP projection of single cell expression split on lung from Healthy donors (control), from patient with COVID-19 mild and from patient with COVID-19 severe: respective expression of HAVCR2, IDO1, CD274

Supplemental Figure 11. Single cell expression of stimulatory immune checkpoints in lung of COVID-19 patients as compared to Healthy donors, related to figure 1:

UMAP projection of single cell expression split on lung from Healthy donors (control), from patient with COVID-19 mild and from patient with COVID-19 severe: respective expression of CD40.

Α









Supplemental Figure 3





















Three dataset expression matrix before batch normalization





Three dataset expression matrix after batch normalization











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Supplemental Tables:

Supplemental Table 1: list of differential expressed genes found to be up regulated in COVID-19 lung biopsy transcriptome as compared to healthy donor ones, related to figure 1

| gene symbol | logFC | AveExpr | t | P.Value | adj.P.Val | В |
|-------------|--------|---------|---------|---------|-----------|--------|
| IFI6 | 7.1776 | 13.6855 | 62.6608 | 0.0000 | 0.0416 | 2.8234 |
| DAPP1 | 5.3198 | 9.5271 | 40.7539 | 0.0001 | 0.0416 | 2.4574 |
| MX1 | 4.8482 | 12.2353 | 38.6539 | 0.0001 | 0.0416 | 2.3942 |
| CLEC4E | 7.4028 | 11.3749 | 37.9561 | 0.0001 | 0.0416 | 2.3713 |
| CASP5 | 5.0590 | 8.6360 | 37.1177 | 0.0001 | 0.0416 | 2.3426 |
| FFAR2 | 6.4971 | 10.1686 | 35.2980 | 0.0001 | 0.0416 | 2.2748 |
| RAC2 | 3.8602 | 11.8497 | 31.1533 | 0.0001 | 0.0416 | 2.0869 |
| TREM1 | 4.5248 | 11.1755 | 28.9204 | 0.0002 | 0.0416 | 1.9616 |
| TNFSF10 | 4.5746 | 12.1425 | 28.7743 | 0.0002 | 0.0416 | 1.9527 |
| TREML3P | 3.7333 | 7.7467 | 27.8337 | 0.0002 | 0.0416 | 1.8931 |
| LGALS9 | 3.5443 | 11.3215 | 26.9698 | 0.0002 | 0.0416 | 1.8346 |
| CXCL16 | 3.2593 | 11.6221 | 26.7020 | 0.0002 | 0.0416 | 1.8157 |
| CYP19A1 | 3.9088 | 7.3177 | 26.6198 | 0.0002 | 0.0416 | 1.8099 |
| ALOX5AP | 6.2144 | 12.7068 | 26.0076 | 0.0002 | 0.0416 | 1.7650 |
| PTK2B | 3.8377 | 11.0414 | 25.2922 | 0.0002 | 0.0416 | 1.7098 |
| НСК | 2.7985 | 10.7928 | 24.9444 | 0.0002 | 0.0416 | 1.6819 |
| ZC3HAV1 | 3.4884 | 11.5295 | 24.8897 | 0.0002 | 0.0416 | 1.6775 |
| PLAC8 | 3.8467 | 9.6419 | 24.1251 | 0.0003 | 0.0416 | 1.6132 |
| ST20 | 6.8379 | 9.7565 | 23.9457 | 0.0003 | 0.0416 | 1.5975 |
| FDCSP | 5.4337 | 8.0010 | 21.9213 | 0.0003 | 0.0416 | 1.4047 |
| TRIM21 | 3.0901 | 10.4027 | 21.6234 | 0.0004 | 0.0416 | 1.3736 |
| TLE4 | 2.6830 | 9.6468 | 21.1623 | 0.0004 | 0.0416 | 1.3240 |
| BASP1 | 4.0718 | 11.5338 | 20.1227 | 0.0004 | 0.0416 | 1.2048 |
| ZBP1 | 3.4269 | 7.9723 | 20.0985 | 0.0004 | 0.0416 | 1.2019 |
| KLK10 | 3.9032 | 8.8989 | 20.0770 | 0.0004 | 0.0416 | 1.1993 |
| WIPF1 | 2.3939 | 10.4371 | 19.7917 | 0.0005 | 0.0416 | 1.1646 |
| METTL7B | 2.3545 | 6.6711 | 19.6145 | 0.0005 | 0.0416 | 1.1426 |
| CERS6 | 2.4488 | 8.0154 | 19.2357 | 0.0005 | 0.0416 | 1.0945 |
| HSH2D | 4.2234 | 8.9230 | 19.0770 | 0.0005 | 0.0416 | 1.0739 |
| S100A11 | 4.4486 | 14.6746 | 18.8674 | 0.0005 | 0.0416 | 1.0462 |
| STAT2 | 2.3554 | 10.8830 | 18.7197 | 0.0005 | 0.0416 | 1.0264 |
| TAOK3 | 3.1629 | 10.2652 | 18.5327 | 0.0005 | 0.0416 | 1.0010 |
| TRIM38 | 4.2132 | 10.8972 | 18.4762 | 0.0005 | 0.0416 | 0.9932 |
| PLP2 | 2.4331 | 11.3802 | 18.4719 | 0.0005 | 0.0416 | 0.9926 |
| MSM01 | 2.1889 | 9.7341 | 18.1669 | 0.0006 | 0.0416 | 0.9500 |
| C19ORF66 | 3.8901 | 10.8223 | 17.9042 | 0.0006 | 0.0416 | 0.9123 |
| MXD1 | 4.9895 | 11.6460 | 17.9034 | 0.0006 | 0.0416 | 0.9122 |
| PADI2 | 4.2443 | 8.9215 | 17.8949 | 0.0006 | 0.0416 | 0.9109 |
| CD38 | 2.2730 | 7.4678 | 17.7960 | 0.0006 | 0.0416 | 0.8965 |

| TET22.31999.081917.65880.00060.04160.8763P2RV136.54919.586517.54380.00070.04160.7931FCER167.112514.99916.92340.00070.04160.7636SH3BGR132.949413.563716.71610.00070.04160.7635LCP14.145912.842416.2030.00080.04160.6525YIPF11.82408.954915.04960.00880.04160.5792LLRA65.49929.771515.7790.00080.04160.5500TNF5F82.27037.998215.54700.00090.04160.5300STAP15.03708.488015.34000.00090.04160.4363SP405.10119.368215.17100.00090.04160.4623GSK3A2.07679.925115.10700.00100.04160.3630SP1405.10119.368214.51700.00100.04160.3639SELL8.588812.305714.68700.00100.04160.3639SEL8.588812.305714.68700.00110.04160.3321DHRS92.08067.668814.5220.01110.04180.3324SIC9822.14029.398114.6430.0110.04200.3014DHRS92.08067.668814.5220.0110.04160.3619PLEK6.567512.610514.33700.00110.04200.30 | | | | | | | |
|---|----------|--------|---------|---------|--------|--------|---------|
| P2RY136.54919.586517.54380.00060.04160.8592TMEM713.8028.836317.11090.00070.04160.7931FCER107.112514.199916.02340.00070.04160.7636SH38GR132.949413.563716.71610.00080.04160.6512LCP14.145912.842416.04050.00080.04160.5795HP1.82227.690915.1710.00080.04160.5795LILRA65.49299.771515.7790.00090.04160.5706FIF2AK25.870110.536615.70270.00090.04160.5300STAF5.37078.488015.34000.00090.04160.4523SP1405.10119.362215.17100.00090.04160.4523SP1405.10119.152115.17100.00090.04160.4523SSL48.588812.305714.68700.01100.04160.3593SL50P22.14029.238114.6430.01010.04180.3324SL0922.08067.668814.5210.0110.04180.3324SL0929.208014.53920.00110.04180.3324SL0929.208014.5320.0110.04180.3324SL0929.208014.53920.0110.04180.3324SL1943.622112.643914.5390.0110.41800.3324SL1943.2829 <td>TET2</td> <td>2.3199</td> <td>9.0819</td> <td>17.6588</td> <td>0.0006</td> <td>0.0416</td> <td>0.8763</td> | TET2 | 2.3199 | 9.0819 | 17.6588 | 0.0006 | 0.0416 | 0.8763 |
| TMEM713.80528.836317.11090.00070.04160.7331FCER1G7.112514.199916.92340.00070.04160.7365SH3BGN32.949413.563716.71610.00070.04160.6452VIPF11.82408.954916.04960.00080.04160.65792LICRA5.49929.771515.77990.00080.04160.57926EIF2AK25.870110.539615.70270.00090.04160.5590TNFSF82.27037.998215.54070.00090.04160.4363FPGDS1.99208.210015.23780.00090.04160.4363SP1405.01119.368215.71070.00090.04160.4363SP1405.01119.368215.71070.00100.04160.4373SEL8.58812.305714.68700.00100.04160.3755SEL8.588812.305714.68700.00100.04160.3374S109P3.92229.906714.5020.00110.04160.3321PLEK6.567512.610514.33710.00110.04200.3031S10PB3.062113.643914.47070.0110.04200.3321S10PB3.92229.906714.5320.0110.04160.3325SEL8.58813.63914.6430.0110.04200.3321S10PB3.626113.643914.4200.0110.04230. | P2RY13 | 6.5491 | 9.5865 | 17.5438 | 0.0006 | 0.0416 | 0.8592 |
| FCER1G7.112514.199916.92340.00070.04160.7363SH3BGRL32.949413.563716.71610.00070.04160.7305LCP14.145912.842416.0030.00080.04160.6452YIPF11.82027.690915.81710.00080.04160.5726HP1.88227.690915.70270.00090.04160.5590TNFSF82.7037.982215.54070.00090.04160.4303FIP2AK25.87010.537015.37070.00090.04160.4303FMGDS1.99208.210015.2780.00090.04160.4623SP1405.10119.368215.17100.00090.04160.4623SP1405.01019.368215.17100.00100.04160.3619SEL8.58812.305114.51290.00100.04160.3619SLC9822.14029.238814.64330.00110.04160.3375SLC9822.14029.33814.64330.00110.04160.3321DHR592.08067.668814.50220.00110.04160.3321SLC9822.14029.35714.50120.00110.04160.3321DHR592.08067.668814.50220.00110.04160.3321SLC9822.140213.643214.6430.00110.04160.3321SLC9822.805614.50220.00110.04200.3321 </td <td>TMEM71</td> <td>3.8052</td> <td>8.8363</td> <td>17.1109</td> <td>0.0007</td> <td>0.0416</td> <td>0.7931</td> | TMEM71 | 3.8052 | 8.8363 | 17.1109 | 0.0007 | 0.0416 | 0.7931 |
| SH3BGRL32.949413.563716.71610.00070.04160.7305LCP14.145912.842416.20030.00080.04160.6452YIPF11.8207.690915.81710.00080.04160.5792LILRA65.4929.771515.70790.00090.04160.5790EIF2AK25.870110.539615.54070.00090.04160.5300STAP15.03708.488015.34000.00090.04160.4363HPGDS1.99208.210015.23780.00090.04160.4635STAP15.03719.368215.17100.00090.04160.4635SF1405.10119.368215.17100.00100.04160.4632GSK3A2.07679.925115.0170.00100.04160.3619SLC9B22.14029.239814.64870.00100.04160.3619SLC9B22.14029.239814.50220.00110.04180.3322MMP84.85088.435214.47070.01110.04180.3324SLC9B22.08067.668814.33710.0110.04160.3321SLC9B23.263314.64700.01110.04180.3324MMP84.85088.435214.47070.01110.04180.3324SLC9B23.93337.78414.28060.0110.04200.3014SLC9B23.93337.88414.28060.0110.04200.3324 </td <td>FCER1G</td> <td>7.1125</td> <td>14.1999</td> <td>16.9234</td> <td>0.0007</td> <td>0.0416</td> <td>0.7636</td> | FCER1G | 7.1125 | 14.1999 | 16.9234 | 0.0007 | 0.0416 | 0.7636 |
| LCP14.145912.842416.20030.00080.04160.6452YIPF11.82008.954916.04960.00080.04160.5792HP1.88227.690915.81710.00080.04160.5792LILRA65.49929.771515.77990.00090.04160.5500TNFSF82.27037.998215.54070.00090.04160.4936STAP15.03708.488015.34000.0090.04160.4633STAP15.03708.488015.17100.00090.04160.4633SP1405.10119.368215.17100.00090.04160.4321OAS15.20179.25115.01070.00100.04160.4321OAS16.261111.296614.71590.00100.04160.3593SLC9822.14029.239814.64530.00100.04160.3619PLEK6.567512.610514.53960.00110.04180.3322SLO9922.80607.688814.37210.00110.04180.3321SLO913.92229.906714.53260.00110.04180.3322SLO913.92337.78414.28060.0110.04200.3014RTP43.462313.647910.0110.04200.3014RTP43.426313.647913.09810.0120.04300.1717CLS7.002711.99414.02180.00120.04300.1717C | SH3BGRL3 | 2.9494 | 13.5637 | 16.7161 | 0.0007 | 0.0416 | 0.7305 |
| YIPF11.82408.954916.04960.00080.04160.6195HP1.88227.690915.81710.00080.04160.5726LILRA65.49229.771515.77990.00090.04160.5500FIF2AK25.870110.539615.50270.00090.04160.5300STAP15.03708.480015.34000.00090.04160.4936BCL2A16.366612.87115.17750.00090.04160.4721BCL2A15.10119.512115.17100.00100.04160.4321GSK3A2.07679.925115.10170.00100.04160.4321GSK3A2.07679.925115.10170.00100.04160.3699SLC9822.14029.239814.6430.00110.04160.3619PLEK6.567512.610514.53960.00110.04180.3321DMRS92.08067.668814.50220.00110.04180.3321SL0923.92229.906714.50120.0110.04180.3321SL0943.83937.78414.2070.0110.04200.3014SL0943.832314.47070.0110.04200.3014SL0943.3337.788414.32860.00110.04200.3034SL7943.432314.64310.0110.04200.3034SL7943.432413.54550.01310.04330.1515SL7943.4326 <t< td=""><td>LCP1</td><td>4.1459</td><td>12.8424</td><td>16.2003</td><td>0.0008</td><td>0.0416</td><td>0.6452</td></t<> | LCP1 | 4.1459 | 12.8424 | 16.2003 | 0.0008 | 0.0416 | 0.6452 |
| HP1.88227.690915.81710.00080.04160.5726LILRA65.49929.771515.77990.00090.04160.5706EIF2AK25.870110.539615.70270.00090.04160.5300TNFSF82.27037.998215.54070.00090.04160.4303STAP15.03708.488015.30700.04160.4371BCL2A16.364612.71115.1750.00090.04160.4632SP1405.10119.368215.17100.00100.04160.4623GSK3A2.07679.925115.1000.01010.41610.3575SELL8.589812.305714.68700.00100.04160.36161JCAS11.1.296614.51280.00100.04160.3619SLC9822.14029.239814.64630.00100.04160.3619JLK6.567512.610514.53020.0110.04180.3321MMPS4.85088.435214.47070.0110.4180.3321SL00P3.92229.06714.33710.0110.41200.3217SERPINA13.662113.63914.34200.0110.41200.3217SERPINA13.662113.63914.34200.0110.42200.3016CKNH73.8337.788414.30210.01210.42310.3216GEP1P13.083314.6431.00120.43330.1451GSERF3.011 <td>YIPF1</td> <td>1.8240</td> <td>8.9549</td> <td>16.0496</td> <td>0.0008</td> <td>0.0416</td> <td>0.6195</td> | YIPF1 | 1.8240 | 8.9549 | 16.0496 | 0.0008 | 0.0416 | 0.6195 |
| LILRA65.49929.771515.77990.00080.04160.5726EIF2AK25.870110.539615.70270.00090.04160.5590TNFSF82.27037.998215.54070.00090.04160.4936HPGDS1.99208.210015.23780.00090.04160.4936HPGDS1.99208.210015.23780.00090.04160.4623SP1405.10119.368215.17100.00090.04160.4623GSK3A2.07679.925115.01770.00100.04160.4321OAS16.261111.296614.71590.00100.04160.3619SELU8.589812.305714.68700.00110.04160.3619PLEK6.567512.610514.53960.00110.04180.3334S100P3.92229.906714.50120.00110.04180.3321SERPINA13.662113.643914.34240.00110.04200.3014RTP43.42628.775614.33710.00110.04200.3014RTP43.42628.775614.33710.00110.04200.3013KCNH73.89337.788414.28060.00110.04330.1171CASP43.431212.227713.85080.00130.04330.1581IFTM15.011113.749013.65250.00130.04330.1581IFTM15.011113.749013.6580.00130.0437 </td <td>HP</td> <td>1.8822</td> <td>7.6909</td> <td>15.8171</td> <td>0.0008</td> <td>0.0416</td> <td>0.5792</td> | HP | 1.8822 | 7.6909 | 15.8171 | 0.0008 | 0.0416 | 0.5792 |
| EIF2AK25.870110.539615.70270.00090.04160.5590TNFSF82.27037.998215.54070.00090.04160.4336HPGDS1.99208.210015.23780.00090.04160.4477BCL2A16.364612.871115.17750.00090.04160.4635SP1405.10119.368215.17100.00090.04160.4623GSK3A2.07679.925115.01070.00100.04160.4321OAS16.261111.296614.71590.00100.04160.3699SLC9B22.14029.239814.64630.00100.04160.3619PLEK6.567512.610514.53960.00110.04180.3334S100P3.92229.906714.50120.00110.04180.3321MMP84.85088.435214.47070.00110.04190.3271SERPINA13.662113.643914.32440.0110.04200.3003KCNH73.89337.788414.2060.0110.04200.3003KCNH73.89337.788414.2060.0110.04200.2371GSF43.431212.227713.85080.00120.04300.1173GSF43.431212.229713.85080.0130.04330.1581IFITM5.011113.74013.65750.0130.04320.1695GBP1P13.089812.259213.39530.00130.0437< | LILRA6 | 5.4992 | 9.7715 | 15.7799 | 0.0008 | 0.0416 | 0.5726 |
| TNFSF82.27037.992015.54070.00090.04160.5300STAP15.03708.488015.34000.00090.04160.4936HPGDS1.99208.210015.23780.00090.04160.4635SP1405.10119.368215.17100.00090.04160.4635SSK3A2.07679.925115.0100.0100.04160.4321OAS16.261111.296614.71590.00100.04160.3755SELL8.589812.305714.68700.00100.04160.3619PLEK6.567512.610514.53060.0110.04180.3321DMRS92.08067.668814.5020.0110.04180.3321SERPINA13.62219.906714.5020.0110.04180.3321SERPINA13.662113.64314.47070.0110.04180.3321SERPINA13.662113.64314.47070.0110.04180.3321SERPINA13.662113.64314.47070.0110.04180.3321SERPINA13.662113.64314.47070.0110.04200.3211SERPINA13.662113.64314.47070.0110.04200.3211SERPINA13.662113.64314.6400.0110.04200.3211SERPINA13.626317.6814.3710.0110.04200.2145SERPINA13.626317.6813.2320.0130.0431 <td>EIF2AK2</td> <td>5.8701</td> <td>10.5396</td> <td>15.7027</td> <td>0.0009</td> <td>0.0416</td> <td>0.5590</td> | EIF2AK2 | 5.8701 | 10.5396 | 15.7027 | 0.0009 | 0.0416 | 0.5590 |
| STAP15.03708.488015.34000.00990.04160.4936HPGDS1.99208.210015.23780.00990.04160.4747BCL2A16.364612.871115.17750.00990.04160.4635SP1405.10119.368215.17100.00100.04160.4623GSK3A2.07679.925115.01070.01000.04160.3755SELL8.589812.305714.68700.00100.04160.3699SLC9B22.14029.239814.6430.00100.04180.3340DHRS92.08067.668814.50220.00110.04180.3321MMP84.85088.435214.47070.00110.04180.3321SKRPINA13.662113.643914.34240.00110.04200.3014RTP43.42628.775614.33710.00110.04200.3031KCNH73.89337.788414.28060.00110.04210.2888CCL87.007211.99414.02180.00120.04330.15161IFTM15.011113.749013.65750.00130.04330.15161IFTM15.011113.749013.65750.00130.04370.0053GBP1P13.00898.528113.65750.00130.04370.0863FKR41.688210.820313.47060.01430.04330.1561IFTM15.011113.74913.80580.00130.0437 <td>TNFSF8</td> <td>2.2703</td> <td>7.9982</td> <td>15.5407</td> <td>0.0009</td> <td>0.0416</td> <td>0.5300</td> | TNFSF8 | 2.2703 | 7.9982 | 15.5407 | 0.0009 | 0.0416 | 0.5300 |
| HPGDS1.99208.210015.23780.00990.04160.4747BCL2A16.364612.871115.17750.00990.04160.4635SP1405.10119.368215.17100.00100.04160.4623GSK3A2.07679.925115.01070.00100.04160.4321OAS16.261111.296614.71590.00100.04160.3755SELL8.589812.305714.68700.00100.04160.3699SLC9B22.14029.239814.64630.00100.04180.3348DHRS92.08067.668814.50220.00110.04180.3321MMP84.85088.435214.47070.00110.04180.3321SERPINA13.662113.643914.34240.00110.04200.3014RTP43.42628.775614.33710.00110.04200.3031KCNH73.89337.788414.28060.00110.04200.3015UBE2L63.256311.761813.90810.00120.04300.2117CASP43.431212.229713.85080.00120.04300.1995GBP1P13.00898.528113.65750.0130.04330.1681IFITM15.011113.749013.65850.00130.04370.0833RNAS22.884512.659213.39360.00140.04420.0363FMA431.688210.259213.32660.01410.045 | STAP1 | 5.0370 | 8.4880 | 15.3400 | 0.0009 | 0.0416 | 0.4936 |
| BCL2A1 6.3646 12.8711 15.1775 0.0099 0.0416 0.4635 SP140 5.1011 9.3682 15.1710 0.0010 0.0416 0.4321 GSK3A 2.0767 9.9251 15.0107 0.0010 0.0416 0.3755 SELL 8.5898 12.3057 14.6870 0.0010 0.0416 0.3699 SLC9B2 2.1402 9.2398 14.6463 0.0011 0.0418 0.3344 DHRS9 2.0806 7.6688 14.5022 0.0011 0.0418 0.3334 S100P 3.9222 9.9067 14.5012 0.0011 0.0418 0.3322 MMP8 4.8508 8.4352 14.4707 0.0011 0.0419 0.3271 SERPINA1 3.6621 13.6439 14.3244 0.0011 0.0420 0.3014 RTP4 3.4262 8.7756 14.3371 0.011 0.0421 0.2888 CCL8 7.0072 11.994 14.0218 0.012 0.4333 0.1581< | HPGDS | 1.9920 | 8.2100 | 15.2378 | 0.0009 | 0.0416 | 0.4747 |
| SP140 5.1011 9.3682 15.1710 0.0009 0.0416 0.4623 GSK3A 2.0767 9.9251 15.0107 0.0010 0.0416 0.4321 OAS1 6.2611 11.2966 14.7159 0.0010 0.0416 0.3755 SELL 8.5898 12.3057 14.6870 0.0010 0.0416 0.3699 SLC9B2 2.1402 9.2398 14.6463 0.0011 0.0418 0.3344 DHRS9 2.0806 7.6688 14.5022 0.0011 0.0418 0.3334 S100P 3.9222 9.9067 14.5012 0.0011 0.0418 0.3334 S100P 3.9222 9.9067 14.5012 0.0011 0.0418 0.3324 MMP8 4.8508 8.4352 14.4707 0.0011 0.0420 0.3014 RTP4 3.6621 13.6439 14.3244 0.0011 0.0420 0.3003 KCNH7 3.8933 7.784 14.2806 0.0011 0.0420 0.3014 <td>BCL2A1</td> <td>6.3646</td> <td>12.8711</td> <td>15.1775</td> <td>0.0009</td> <td>0.0416</td> <td>0.4635</td> | BCL2A1 | 6.3646 | 12.8711 | 15.1775 | 0.0009 | 0.0416 | 0.4635 |
| GSK3A2.07679.925115.01070.00100.04160.4321OAS16.261111.296614.71590.00100.04160.3755SELL8.589812.305714.68700.00100.04160.3699SLC9B22.14029.239814.64630.00110.04180.3408DHRS92.08067.668814.50220.00110.04180.3334S100P3.92229.906714.50120.00110.04180.3322MMP84.85088.435214.47070.00110.04190.3271SERPINA13.662113.643914.34240.00110.04200.3014RTP43.42628.775614.33710.00110.04200.3003KCNH73.89337.788414.28060.00110.04210.2888CCL87.007211.994414.02180.00120.04300.2117CASP43.431212.229713.85080.00120.04300.1995GBP1P13.00898.528113.65750.00130.04330.1689IFITM15.011113.749013.60580.00130.04370.0066IFIT16.446011.536113.30420.00140.04220.0393RNASE24.84157.658313.30420.00140.04380.0803CXGF213.73547.920613.12320.00140.04450.0034PFN12.568614.743413.11210.0140.0445 </td <td>SP140</td> <td>5.1011</td> <td>9.3682</td> <td>15.1710</td> <td>0.0009</td> <td>0.0416</td> <td>0.4623</td> | SP140 | 5.1011 | 9.3682 | 15.1710 | 0.0009 | 0.0416 | 0.4623 |
| OAS1 6.2611 11.2966 14.7159 0.0010 0.0416 0.3755 SELL 8.5898 12.3057 14.6870 0.0010 0.0416 0.3699 SLC9B2 2.1402 9.2398 14.6463 0.0011 0.0418 0.3344 DHRS9 2.0806 7.6688 14.5022 0.0011 0.0418 0.3334 S100P 3.9222 9.9067 14.5012 0.0011 0.0418 0.3332 MMP8 4.8508 8.4352 14.4707 0.0011 0.0419 0.3271 SERPINA1 3.6621 13.6439 14.3424 0.0011 0.0420 0.3003 KCNH7 3.8933 7.7884 14.2806 0.0011 0.0421 0.2888 CCL8 7.0072 11.994 14.0218 0.0012 0.0430 0.2117 CASP4 3.4312 12.2297 13.8508 0.0012 0.0430 0.1995 GBP1P1 3.0089 8.5281 13.6575 0.0013 0.0433 0.16 | GSK3A | 2.0767 | 9.9251 | 15.0107 | 0.0010 | 0.0416 | 0.4321 |
| SELL 8.5898 12.3057 14.6870 0.0010 0.0416 0.3699 SLC9B2 2.1402 9.2398 14.6463 0.0010 0.0416 0.3619 PLEK 6.5675 12.6105 14.5396 0.0011 0.0418 0.3334 DHRS9 2.0806 7.6688 14.5022 0.0011 0.0418 0.3332 MMP8 4.8508 8.4352 14.4707 0.0011 0.0420 0.3014 RTP4 3.6621 13.6439 14.3242 0.0011 0.0420 0.3003 KCNH7 3.8933 7.7884 14.2806 0.0011 0.0420 0.3038 CCL8 7.0072 11.9994 14.0218 0.0012 0.0428 0.2355 UBE2L6 3.2563 11.7618 13.9081 0.0012 0.0430 0.1995 GBP1P1 3.0089 8.5281 13.6575 0.0013 0.0433 0.1469 ANXA3 1.6882 10.8230 13.4706 0.013 0.0437 0.1006 | OAS1 | 6.2611 | 11.2966 | 14.7159 | 0.0010 | 0.0416 | 0.3755 |
| SLC9B2 2.1402 9.2398 14.6463 0.0010 0.0416 0.3619 PLEK 6.5675 12.6105 14.5396 0.0011 0.0418 0.3334 S100P 3.9222 9.9067 14.5012 0.0011 0.0418 0.3332 MMP8 4.8508 8.4352 14.4707 0.0011 0.0419 0.3271 SERPINA1 3.6621 13.6439 14.3424 0.0011 0.0420 0.3014 RTP4 3.4262 8.7756 14.3371 0.0011 0.0420 0.3003 KCNH7 3.8933 7.7884 14.2806 0.0011 0.0420 0.2888 CCL8 7.0072 11.9994 14.0218 0.0012 0.0430 0.2117 CASP4 3.4312 12.2297 13.8508 0.0012 0.0430 0.1995 GBP1P1 3.0089 8.5281 13.6575 0.0013 0.0433 0.1469 ANXA3 1.6882 10.8230 13.4706 0.013 0.0437 0.10 | SELL | 8.5898 | 12.3057 | 14.6870 | 0.0010 | 0.0416 | 0.3699 |
| PLEK6.567512.610514.53960.00110.04180.3408DHRS92.08067.668814.50220.00110.04180.3334S100P3.92229.906714.50120.00110.04180.3321MMP84.85088.435214.47070.00110.04190.3271SERPINA13.662113.643914.34240.00110.04200.3014RTP43.42628.775614.33710.00110.04200.3003KCNH73.89337.788414.28060.00110.04210.2888CCL87.007211.999414.02180.00120.04300.2117CASP43.431212.229713.85080.00120.04300.1995GBP1P13.00898.528113.65750.00130.04330.1581IFITM15.011113.749013.60580.00130.04330.1469ANXA31.688210.823013.47060.00130.04370.1006IFIT16.446011.536113.32660.00130.04370.0853RNASE24.84157.658313.30420.00140.04420.0393PFN12.568614.743413.11210.00140.04450.0045POGLUT11.51878.446712.96730.00140.04450.0045POGLUT11.51878.446712.96730.00140.04450.0248ISG155.375312.673412.82550.00150.0 | SLC9B2 | 2.1402 | 9.2398 | 14.6463 | 0.0010 | 0.0416 | 0.3619 |
| DHRS92.08067.668814.50220.00110.04180.3334S100P3.92229.906714.50120.00110.04180.3322MMP84.85088.435214.47070.00110.04190.3271SERPINA13.662113.643914.34240.00110.04200.3014RTP43.42628.775614.33710.00110.04200.3003KCNH73.89337.788414.28060.00110.04210.2888CCL87.007211.999414.02180.00120.04300.2117CASP43.431212.229713.85080.00120.04300.1995GBP1P13.00898.528113.65750.00130.04330.1469ANXA31.688210.823013.47060.00130.04330.1469ANXA31.688210.823013.30420.00140.04380.0803CXORF213.73547.920613.12320.00140.04420.0393PFN12.568614.743413.11210.00140.04450.0080FAM49A1.81889.499912.97240.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CL116.088610.945412.84670.00150.0451-0.0228IFIT35.375312.673412.82550.00150.0451-0.0226CL1112.02506.965112.70170.00150.045 | PLEK | 6.5675 | 12.6105 | 14.5396 | 0.0011 | 0.0418 | 0.3408 |
| S100P 3.9222 9.9067 14.5012 0.0011 0.0418 0.3332 MMP8 4.8508 8.4352 14.4707 0.0011 0.0419 0.3271 SERPINA1 3.6621 13.6439 14.3424 0.0011 0.0420 0.3014 RTP4 3.4262 8.7756 14.3371 0.0011 0.0420 0.3003 KCNH7 3.8933 7.7884 14.2806 0.0011 0.0420 0.3003 KCNH7 3.8933 7.7884 14.2806 0.0011 0.0428 0.2355 UBE2L6 3.2563 11.7618 13.9081 0.0012 0.0430 0.2117 CASP4 3.4312 12.2297 13.8508 0.0012 0.0430 0.1995 GBP1P1 3.0089 8.5281 13.6575 0.0013 0.0433 0.1469 ANXA3 1.6882 10.8230 13.4706 0.0013 0.0437 0.0053 FIT1 6.4460 11.5361 13.3266 0.0013 0.0437 0. | DHRS9 | 2.0806 | 7.6688 | 14.5022 | 0.0011 | 0.0418 | 0.3334 |
| MMP84.85088.435214.47070.00110.04190.3271SERPINA13.662113.643914.34240.00110.04200.3003RTP43.42628.775614.33710.00110.04200.3003KCNH73.89337.788414.28060.00110.04200.2888CL87.007211.999414.02180.00120.04280.2355UBE2L63.256311.761813.90810.00120.04300.2117CASP43.431212.229713.85080.00120.04300.1995GBP1P13.00898.528113.65750.00130.04330.1581IFITM15.011113.749013.60580.00130.04330.1469ANXA31.688210.823013.47060.00130.04370.1006IFIT16.446011.536113.32660.00130.04370.0853RNASE24.84157.658313.30420.00140.04420.0393PFN12.568614.743413.11210.00140.04420.0367IFIT36.058412.493612.98750.00140.04450.0045POGLUT11.51878.446712.96730.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0248ISG155.375312.673412.84670.00150.0451-0.0248C10RF1942.02506.965112.70170.0016 <td< td=""><td>S100P</td><td>3.9222</td><td>9.9067</td><td>14.5012</td><td>0.0011</td><td>0.0418</td><td>0.3332</td></td<> | S100P | 3.9222 | 9.9067 | 14.5012 | 0.0011 | 0.0418 | 0.3332 |
| SERPINA13.662113.643914.34240.00110.04200.3014RTP43.42628.775614.33710.00110.04200.3003KCNH73.89337.788414.28060.00110.04210.2888CCL87.007211.999414.02180.00120.04280.2355UBE2L63.256311.761813.90810.00120.04300.2117CASP43.431212.229713.85080.00120.04300.1995GBP1P13.00898.528113.65750.00130.04330.1581IFITM15.011113.749013.60580.00130.04330.1469ANXA31.688210.823013.47060.00130.04370.1006IFIT16.446011.536113.32660.00130.04370.0853RNASE24.84157.658313.30420.00140.04420.0393PFN12.568614.743413.11210.00140.04450.0080FIT36.058412.493612.98750.00140.04450.0045POGLUT11.51878.446712.96730.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0248ISG155.375312.673412.84670.00150.0451-0.0248LYRM12.02506.965112.70170.00150.0457-0.0592 | MMP8 | 4.8508 | 8.4352 | 14.4707 | 0.0011 | 0.0419 | 0.3271 |
| RTP43.42628.775614.33710.00110.04200.3003KCNH73.89337.788414.28060.00110.04210.2888CCL87.007211.999414.02180.00120.04280.2355UBE2L63.256311.761813.90810.00120.04300.2117CASP43.431212.229713.85080.00120.04300.1995GBP1P13.00898.528113.65750.00130.04330.1581IFITM15.011113.749013.60580.00130.04330.1469ANXA31.688210.823013.47060.00130.04360.1173SERF22.884512.659213.39530.00130.04370.0853RNASE24.84157.658313.30420.00140.04380.0803CXORF213.73547.920613.12320.00140.04420.0393PFN12.568614.743413.11210.00140.04450.0080FAM49A1.81889.499912.97240.00140.04450.0045POGLUT11.51878.446712.96730.00140.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0451-0.0248LYRM12.02509.975312.52450.00160.0457-0.1019 | SERPINA1 | 3.6621 | 13.6439 | 14.3424 | 0.0011 | 0.0420 | 0.3014 |
| KCNH73.89337.788414.28060.00110.04210.2888CCL87.007211.999414.02180.00120.04280.2355UBE2L63.256311.761813.90810.00120.04300.2117CASP43.431212.229713.85080.00120.04300.1995GBP1P13.00898.528113.65750.00130.04330.1581IFITM15.011113.749013.60580.00130.04330.1469ANXA31.688210.823013.47060.00130.04360.1173SERF22.884512.659213.39530.00130.04370.0853RNAS24.84157.658313.30420.00140.04380.0803CXORF213.73547.920613.12320.00140.04420.0393PFN12.568614.743413.11210.00140.04450.0045POGLUT11.51878.446712.98750.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0282LYRM12.02506.965112.70170.00160.0457-0.0592 | RTP4 | 3.4262 | 8.7756 | 14.3371 | 0.0011 | 0.0420 | 0.3003 |
| CCL87.007211.999414.02180.00120.04280.2355UBE2L63.256311.761813.90810.00120.04300.2117CASP43.431212.229713.85080.00120.04300.1995GBP1P13.00898.528113.65750.00130.04330.1581IFITM15.011113.749013.60580.00130.04330.1469ANXA31.688210.823013.47060.00130.04360.1173SERF22.884512.659213.39530.00130.04370.0066IFIT16.446011.536113.32660.00140.04380.0803CXORF213.73547.920613.12320.00140.04420.0393PFN12.568614.743413.11210.00140.04450.0080FAM49A1.81889.499912.97240.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0457-0.0282LYRM12.02509.975312.52450.00160.0457-0.0109 | KCNH7 | 3.8933 | 7.7884 | 14.2806 | 0.0011 | 0.0421 | 0.2888 |
| UBE2L63.256311.761813.90810.00120.04300.2117CASP43.431212.229713.85080.00120.04300.1995GBP1P13.00898.528113.65750.00130.04330.1581IFITM15.011113.749013.60580.00130.04330.1469ANXA31.688210.823013.47060.00130.04360.1173SERF22.884512.659213.39530.00130.04370.1006IFIT16.446011.536113.32660.00130.04370.0853RNASE24.84157.658313.30420.00140.04380.0803CXORF213.73547.920613.12320.00140.04420.0393PFN12.568614.743413.11210.00140.04450.0045IFIT36.058412.493612.98750.00140.04450.0045POGLUT11.51878.446712.96730.00140.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0451-0.0282C10RF1942.02506.965112.70170.00160.0457-0.0109LYRM12.02509.975312.52450.00160.0457-0.1019 | CCL8 | 7.0072 | 11.9994 | 14.0218 | 0.0012 | 0.0428 | 0.2355 |
| CASP43.431212.229713.85080.00120.04300.1995GBP1P13.00898.528113.65750.00130.04330.1581IFITM15.011113.749013.60580.00130.04330.1469ANXA31.688210.823013.47060.00130.04360.1173SERF22.884512.659213.39530.00130.04370.1006IFIT16.446011.536113.32660.00130.04370.0853RNASE24.84157.658313.30420.00140.04380.0803CXORF213.73547.920613.12320.00140.04420.0393PFN12.568614.743413.11210.00140.04450.0045IFIT36.058412.493612.98750.00140.04450.0045POGLUT11.51878.446712.96730.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0282ISG155.375312.673412.83250.00150.0451-0.0282LYRM12.02509.975312.52450.00160.0457-0.0592 | UBE2L6 | 3.2563 | 11.7618 | 13.9081 | 0.0012 | 0.0430 | 0.2117 |
| GBP1P13.00898.528113.65750.00130.04330.1581IFITM15.011113.749013.60580.00130.04330.1469ANXA31.688210.823013.47060.00130.04360.1173SERF22.884512.659213.39530.00130.04370.1006IFIT6.446011.536113.32660.00130.04370.0853RNASE24.84157.658313.30420.00140.04380.0803CXORF213.73547.920613.12320.00140.04420.0393PFN12.568614.743413.11210.00140.04450.0080FAM49A1.81889.499912.97240.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0282ISG155.375312.673412.83250.00150.0457-0.0282LYRM12.02509.975312.52450.00160.0457-0.1019 | CASP4 | 3.4312 | 12.2297 | 13.8508 | 0.0012 | 0.0430 | 0.1995 |
| IFITM15.011113.749013.60580.00130.04330.1469ANXA31.688210.823013.47060.00130.04360.1173SERF22.884512.659213.39530.00130.04370.1006IFIT16.446011.536113.32660.00130.04370.0853RNASE24.84157.658313.30420.00140.04380.0803CXORF213.73547.920613.12320.00140.04420.0393PFN12.568614.743413.11210.00140.04450.0080FAM49A1.81889.499912.97240.00140.04450.0034POGLUT11.51878.446712.96730.00140.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0457-0.0592LYRM12.02509.975312.52450.00160.0457-0.1019 | GBP1P1 | 3.0089 | 8.5281 | 13.6575 | 0.0013 | 0.0433 | 0.1581 |
| ANXA31.688210.823013.47060.00130.04360.1173SERF22.884512.659213.39530.00130.04370.1006IFIT16.446011.536113.32660.00130.04370.0853RNASE24.84157.658313.30420.00140.04380.0803CXORF213.73547.920613.12320.00140.04420.0393PFN12.568614.743413.11210.00140.04420.0367IFIT36.058412.493612.98750.00140.04450.0080FAM49A1.81889.499912.97240.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0457-0.0592LYRM12.02509.975312.52450.00160.0457-0.1019 | IFITM1 | 5.0111 | 13.7490 | 13.6058 | 0.0013 | 0.0433 | 0.1469 |
| SERF22.884512.659213.39530.00130.04370.1006IFIT16.446011.536113.32660.00130.04370.0853RNASE24.84157.658313.30420.00140.04380.0803CXORF213.73547.920613.12320.00140.04420.0393PFN12.568614.743413.11210.00140.04420.0367IFIT36.058412.493612.98750.00140.04450.0080FAM49A1.81889.499912.97240.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0457-0.0592LYRM12.02509.975312.52450.00160.0457-0.1019 | ANXA3 | 1.6882 | 10.8230 | 13.4706 | 0.0013 | 0.0436 | 0.1173 |
| IFIT16.446011.536113.32660.00130.04370.0853RNASE24.84157.658313.30420.00140.04380.0803CXORF213.73547.920613.12320.00140.04420.0393PFN12.568614.743413.11210.00140.04420.0367IFIT36.058412.493612.98750.00140.04450.0080FAM49A1.81889.499912.97240.00140.04450.0045POGLUT11.51878.446712.96730.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0457-0.0592LYRM12.02509.975312.52450.00160.0457-0.1019 | SERF2 | 2.8845 | 12.6592 | 13.3953 | 0.0013 | 0.0437 | 0.1006 |
| RNASE24.84157.658313.30420.00140.04380.0803CXORF213.73547.920613.12320.00140.04420.0393PFN12.568614.743413.11210.00140.04420.0367IFIT36.058412.493612.98750.00140.04450.0080FAM49A1.81889.499912.97240.00140.04450.0045POGLUT11.51878.446712.96730.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0457-0.0592LYRM12.02509.975312.52450.00160.0457-0.1019 | IFIT1 | 6.4460 | 11.5361 | 13.3266 | 0.0013 | 0.0437 | 0.0853 |
| CXORF213.73547.920613.12320.00140.04420.0393PFN12.568614.743413.11210.00140.04420.0367IFIT36.058412.493612.98750.00140.04450.0080FAM49A1.81889.499912.97240.00140.04450.0045POGLUT11.51878.446712.96730.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0451-0.0282C10RF1942.02506.965112.70170.00150.0457-0.0592LYRM12.02509.975312.52450.00160.0457-0.1019 | RNASE2 | 4.8415 | 7.6583 | 13.3042 | 0.0014 | 0.0438 | 0.0803 |
| PFN12.568614.743413.11210.00140.04420.0367IFIT36.058412.493612.98750.00140.04450.0080FAM49A1.81889.499912.97240.00140.04450.0045POGLUT11.51878.446712.96730.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0451-0.0282C10RF1942.02506.965112.70170.00150.0457-0.0592LYRM12.02509.975312.52450.00160.0457-0.1019 | CXORF21 | 3.7354 | 7.9206 | 13.1232 | 0.0014 | 0.0442 | 0.0393 |
| IFIT36.058412.493612.98750.00140.04450.0080FAM49A1.81889.499912.97240.00140.04450.0045POGLUT11.51878.446712.96730.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0451-0.0282C10RF1942.02506.965112.70170.00150.0457-0.0592LYRM12.02509.975312.52450.00160.0457-0.1019 | PFN1 | 2.5686 | 14.7434 | 13.1121 | 0.0014 | 0.0442 | 0.0367 |
| FAM49A1.81889.499912.97240.00140.04450.0045POGLUT11.51878.446712.96730.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0451-0.0282C10RF1942.02506.965112.70170.00150.0457-0.0592LYRM12.02509.975312.52450.00160.0457-0.1019 | IFIT3 | 6.0584 | 12.4936 | 12.9875 | 0.0014 | 0.0445 | 0.0080 |
| POGLUT11.51878.446712.96730.00140.04450.0034DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0451-0.0282C10RF1942.02506.965112.70170.00150.0457-0.0592LYRM12.02509.975312.52450.00160.0457-0.1019 | FAM49A | 1.8188 | 9.4999 | 12.9724 | 0.0014 | 0.0445 | 0.0045 |
| DOK34.06279.571512.85630.00150.0451-0.0226CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0451-0.0282C10RF1942.02506.965112.70170.00150.0457-0.0592LYRM12.02509.975312.52450.00160.0457-0.1019 | POGLUT1 | 1.5187 | 8.4467 | 12.9673 | 0.0014 | 0.0445 | 0.0034 |
| CCL116.088610.945412.84670.00150.0451-0.0248ISG155.375312.673412.83250.00150.0451-0.0282C10RF1942.02506.965112.70170.00150.0457-0.0592LYRM12.02509.975312.52450.00160.0457-0.1019 | DOK3 | 4.0627 | 9.5715 | 12.8563 | 0.0015 | 0.0451 | -0.0226 |
| ISG15 5.3753 12.6734 12.8325 0.0015 0.0451 -0.0282 C10RF194 2.0250 6.9651 12.7017 0.0015 0.0457 -0.0592 LYRM1 2.0250 9.9753 12.5245 0.0016 0.0457 -0.1019 | CCL11 | 6.0886 | 10.9454 | 12.8467 | 0.0015 | 0.0451 | -0.0248 |
| C10RF194 2.0250 6.9651 12.7017 0.0015 0.0457 -0.0592 LYRM1 2.0250 9.9753 12.5245 0.0016 0.0457 -0.1019 | ISG15 | 5.3753 | 12.6734 | 12.8325 | 0.0015 | 0.0451 | -0.0282 |
| LYRM1 2.0250 9.9753 12.5245 0.0016 0.0457 -0.1019 | C1ORF194 | 2.0250 | 6.9651 | 12.7017 | 0.0015 | 0.0457 | -0.0592 |
| | LYRM1 | 2.0250 | 9.9753 | 12.5245 | 0.0016 | 0.0457 | -0.1019 |

| CPNE8 | 1.5333 | 9.2754 | 12.5214 | 0.0016 | 0.0457 | -0.1026 |
|---------|--------|---------|---------|--------|--------|---------|
| DDX60L | 5.1716 | 10.7959 | 12.5189 | 0.0016 | 0.0457 | -0.1032 |
| WAS | 4.7416 | 9.4159 | 12.5157 | 0.0016 | 0.0457 | -0.1040 |
| BCL2L14 | 3.4702 | 7.6795 | 12.4910 | 0.0016 | 0.0457 | -0.1100 |
| PSME3 | 2.5692 | 11.4849 | 12.4163 | 0.0016 | 0.0460 | -0.1283 |
| CCL19 | 4.1790 | 9.5531 | 12.4143 | 0.0016 | 0.0460 | -0.1288 |
| TIMM23 | 2.8022 | 10.1641 | 12.3870 | 0.0016 | 0.0461 | -0.1355 |
| CISD2 | 1.9337 | 8.6465 | 12.3203 | 0.0017 | 0.0464 | -0.1521 |
| NFKBID | 3.0303 | 9.3245 | 12.0344 | 0.0018 | 0.0479 | -0.2242 |
| CCL7 | 4.5305 | 8.3294 | 12.0065 | 0.0018 | 0.0479 | -0.2313 |
| GPR84 | 5.7629 | 10.1132 | 11.7846 | 0.0019 | 0.0486 | -0.2890 |
| CACNA1A | 4.3593 | 8.1171 | 11.7675 | 0.0019 | 0.0486 | -0.2936 |
| EIF1B | 2.5061 | 11.4329 | 11.5612 | 0.0020 | 0.0495 | -0.3485 |
| C2CD4B | 1.6818 | 9.4010 | 11.5384 | 0.0020 | 0.0495 | -0.3547 |
| NME1 | 2.4402 | 9.5301 | 11.5345 | 0.0020 | 0.0495 | -0.3557 |
| GAPT | 5.0651 | 8.6691 | 11.4180 | 0.0021 | 0.0496 | -0.3875 |
| MX2 | 5.8224 | 11.3090 | 11.4094 | 0.0021 | 0.0496 | -0.3898 |
| CYSTM1 | 3.2616 | 12.3467 | 11.4046 | 0.0021 | 0.0496 | -0.3911 |
| HESX1 | 3.3577 | 7.3091 | 11.3742 | 0.0021 | 0.0496 | -0.3995 |
| ABHD16A | 1.2973 | 9.4706 | 11.3154 | 0.0021 | 0.0496 | -0.4157 |
| NBN | 4.5922 | 10.9019 | 11.2639 | 0.0021 | 0.0497 | -0.4300 |
| RGL4 | 3.2771 | 8.8751 | 11.2201 | 0.0022 | 0.0498 | -0.4423 |
| U2AF2 | 1.3388 | 10.9096 | 11.2121 | 0.0022 | 0.0498 | -0.4445 |
| РАК2 | 1.4921 | 10.7463 | 11.1938 | 0.0022 | 0.0498 | -0.4496 |

Supplemental Table 2: limma score performed on immune score cell subpopulations of COVID-19 lung biopsy as compared to healthy donor ones, related to figure 3

| cell populations | logFC | AveExpr | t | P.Value | adj.P.Val | В |
|-----------------------|---------|---------|----------|---------|-----------|---------|
| Neutrophils | 0.1488 | 0.0744 | 41.9348 | 0.0002 | 0.0121 | 1.1275 |
| Monocytes | 0.2360 | 0.1180 | 24.2226 | 0.0007 | 0.0223 | -0.7054 |
| Osteoblast | -0.1505 | 0.0865 | -13.2767 | 0.0028 | 0.0475 | -2.7148 |
| aDC | 0.1128 | 0.0599 | 13.1170 | 0.0028 | 0.0475 | -2.7550 |
| ImmuneScore | 0.2760 | 0.1617 | 9.7578 | 0.0057 | 0.0761 | -3.7348 |
| DC | 0.0064 | 0.0032 | 8.1319 | 0.0087 | 0.0969 | -4.3321 |
| Macrophages | 0.0378 | 0.0213 | 6.9778 | 0.0123 | 0.1181 | -4.8279 |
| MicroenvironmentScore | 0.2182 | 0.2119 | 5.2521 | 0.0235 | 0.1966 | -5.7282 |
| MacrophagesM1 | 0.0243 | 0.0146 | 4.1635 | 0.0391 | 0.2911 | -6.4352 |
| Pericytes | -0.1096 | 0.0603 | -2.7570 | 0.0912 | 0.6108 | -7.5848 |
| Melanocytes | -0.0004 | 0.0002 | -2.0301 | 0.1588 | 0.7562 | -8.3090 |
| mv Endothelial cells | -0.0837 | 0.0491 | -1.7636 | 0.1994 | 0.7562 | -8.5945 |
| MSC | -0.0613 | 0.0307 | -1.5870 | 0.2336 | 0.7562 | -8.7872 |
| Endothelial cells | -0.0548 | 0.0383 | -1.4402 | 0.2675 | 0.7562 | -8.9479 |
| Plasma cells | 0.0209 | 0.0152 | 1.3946 | 0.2791 | 0.7562 | -8.9976 |
| Neurons | -0.0016 | 0.0012 | -1.2885 | 0.3086 | 0.7562 | -9.1127 |
| Smooth muscle | 0.0283 | 0.0142 | 1.0903 | 0.3736 | 0.7562 | -9.3223 |
| CD8+ T-cells | -0.0193 | 0.0097 | -1.0903 | 0.3736 | 0.7562 | -9.3224 |
| CD4+ T-cells | -0.0133 | 0.0067 | -1.0903 | 0.3736 | 0.7562 | -9.3224 |
| CD4+ Tcm | -0.0112 | 0.0056 | -1.0902 | 0.3737 | 0.7562 | -9.3225 |
| Basophils | 0.0080 | 0.0040 | 1.0900 | 0.3737 | 0.7562 | -9.3227 |
| Megakaryocytes | -0.0061 | 0.0030 | -1.0898 | 0.3738 | 0.7562 | -9.3229 |
| MacrophagesM2 | -0.0047 | 0.0024 | -1.0895 | 0.3739 | 0.7562 | -9.3233 |
| naive B-cells | -0.0033 | 0.0017 | -1.0885 | 0.3743 | 0.7562 | -9.3242 |
| Tgd cells | 0.0027 | 0.0014 | 1.0877 | 0.3746 | 0.7562 | -9.3251 |
| Keratinocytes | -0.0022 | 0.0011 | -1.0863 | 0.3751 | 0.7562 | -9.3265 |
| CD4+ memory T-cells | -0.0022 | 0.0011 | -1.0860 | 0.3752 | 0.7562 | -9.3269 |
| CD8+ Tem | -0.0016 | 0.0008 | -1.0821 | 0.3766 | 0.7562 | -9.3308 |
| Adipocytes | 0.0015 | 0.0007 | 1.0812 | 0.3770 | 0.7562 | -9.3318 |
| B-cells | 0.0114 | 0.0059 | 1.0679 | 0.3819 | 0.7562 | -9.3455 |
| Mesangial cells | 0.0009 | 0.0005 | 1.0677 | 0.3819 | 0.7562 | -9.3456 |
| Hepatocytes | 0.0007 | 0.0004 | 1.0540 | 0.3871 | 0.7562 | -9.3597 |
| CD8+ naive T-cells | -0.0187 | 0.0172 | -1.0419 | 0.3916 | 0.7562 | -9.3720 |
| Memory B-cells | 0.0006 | 0.0003 | 1.0350 | 0.3943 | 0.7562 | -9.3790 |
| Mast cells | 0.0063 | 0.0035 | 1.0331 | 0.3950 | 0.7562 | -9.3809 |
| Th2 cells | -0.0206 | 0.0120 | -1.0030 | 0.4068 | 0.7571 | -9.4112 |
| StromaScore | -0.0578 | 0.0502 | -0.9484 | 0.4291 | 0.7770 | -9.4653 |
| ly endothelial cells | -0.0113 | 0.0089 | -0.8289 | 0.4821 | 0.8295 | -9.5784 |

| Chondrocytes | -0.0177 | 0.0142 | -0.8273 | 0.4828 | 0.8295 | -9.5799 |
|-------------------------------|---------|--------|---------|--------|--------|----------|
| iDC | 0.0420 | 0.0531 | 0.7703 | 0.5103 | 0.8442 | -9.6308 |
| Myocytes | -0.0098 | 0.0088 | -0.7577 | 0.5166 | 0.8442 | -9.6418 |
| Fibroblasts | -0.0622 | 0.0614 | -0.7328 | 0.5292 | 0.8442 | -9.6632 |
| Platelets | -0.0002 | 0.0001 | -0.6848 | 0.5542 | 0.8583 | -9.7031 |
| Epithelial cells | -0.0144 | 0.0157 | -0.6670 | 0.5637 | 0.8583 | -9.7174 |
| Sebocytes | -0.0044 | 0.0053 | -0.6383 | 0.5793 | 0.8625 | -9.7400 |
| HSC | -0.1026 | 0.1514 | -0.5509 | 0.6291 | 0.8848 | -9.8042 |
| CD8+ Tcm | 0.0032 | 0.0079 | 0.5413 | 0.6348 | 0.8848 | -9.8108 |
| Tregs | -0.0114 | 0.0172 | -0.5206 | 0.6471 | 0.8848 | -9.8248 |
| CLP | -0.0023 | 0.0036 | -0.5048 | 0.6567 | 0.8848 | -9.8352 |
| GMP | 0.0198 | 0.0289 | 0.4988 | 0.6603 | 0.8848 | -9.8390 |
| Th1 cells | -0.0026 | 0.0091 | -0.3123 | 0.7801 | 1.0000 | -9.9392 |
| pDC | 0.0001 | 0.0003 | 0.2239 | 0.8406 | 1.0000 | -9.9719 |
| Class-switched memory B-cells | 0.0002 | 0.0009 | 0.2108 | 0.8498 | 1.0000 | -9.9758 |
| MEP | 0.0003 | 0.0027 | 0.0719 | 0.9483 | 1.0000 | -10.0034 |
| pro B-cells | 0.0000 | 0.0000 | -0.0107 | 0.9923 | 1.0000 | -10.0070 |
| Astrocytes | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | -10.0071 |
| CD4+ naive T-cells | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | -10.0071 |
| CD4+ Tem | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | -10.0071 |
| cDC | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | -10.0071 |
| СМР | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | -10.0071 |
| Eosinophils | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | -10.0071 |
| Erythrocytes | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | -10.0071 |
| MPP | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | -10.0071 |
| NK cells | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | -10.0071 |
| NKT | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | -10.0071 |
| Preadipocytes | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | -10.0071 |
| Skeletal muscle | 0.0000 | 0.0000 | 0.0000 | 1.0000 | 1.0000 | -10.0071 |

Supplemental Table 3: list of Gene expression omnibus (GEO) transcriptome samples included to performed integrative immune deconvolution of COVID-19 lung biopsy, related to figure 3: DOI: http://dx.doi.org/10.17632/3xnypzvcf7.1#file-39267130-458c-41d8-8bf7-26ae18b717d1

Supplemental Table 4: PPARγ **integrative repressed program in COVID-19 lung transcriptome, related to the figure 8:** DOI: http://dx.doi.org/10.17632/3xnypzvcf7.1#file-03b71cec-f317-439c-9176-170edd6ac7e0

Supplemental Table 5 : Human and SARS virus interactome connections in VirusHostNet database, related to figure 8: DOI: http://dx.doi.org/10.17632/3xnypzvcf7.1#file-71c195a0-6834-4a0a-8719-826bae172b31