Supplementary Materials for

Blood snoRNAs and miRNAs as predictors of COVID-19 Severity

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Figs. S1 to S2

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**Fig. S1. Spearman correlation matrix of clinical markers with uniquely DEMIs and snoRNAs in severe versus asymptomatic and severe versus mild comparisons.** Colour scale ranges from blue (r = −1) to white (r = 0) to red (r = 1).





**Fig. S2. Correlation between expression levels of common differentially expressed miRNAs and snoRNAs (in both severe versus asymptomatic, and severe versus mild comparisons) with albumin and hematocrit.** Scatter plots representation with x-axis as Log2 normalized transcript expression level and y-axis as the clinical variable measurements. Each dot represents a single miRNA/ snoRNAs transcript. Dots that are tagged with D letter represent a deceased patient measurement.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Probe ID** | **Probe Name** | **Transcript ID** | **log2 FC** | **FDR** | **Accession** |
| **Severe versus Asymptomatic COVID-19 patients** | | | | | |
| MIMAT0002816\_st | 20503803 | hsa-miR-494-3p | 2.61 | 0.15 | MIMAT0002816 |
| MIMAT0005898\_st | 20506837 | hsa-miR-1246 | 2.33 | 0.03 | MIMAT0005898 |
| ACA40\_x\_st | 20532669 | ACA40 | 2.15 | 0.03 | ACA40 |
| MIMAT0019071\_st | 20518933 | hsa-miR-4532 | 2.11 | 0.03 | MIMAT0019071 |
| ACA15\_s\_st | 20532624 | ACA15 | 1.93 | 0.15 | ACA15 |
| ENSG00000206785\_s\_st | 20532953 | ENSG00000206785 | 1.93 | 0.15 | ENSG00000206785 |
| ENSG00000207062\_s\_st | 20532982 | ENSG00000207062 | 1.93 | 0.15 | ENSG00000207062 |
| MIMAT0000437\_st | 20500755 | hsa-miR-145-5p | 1.82 | 0.01 | MIMAT000043 |
| MIMAT0031180\_st | 20529568 | hsa-miR-7977 | 1.76 | 0.06 | MIMAT0031180 |
| ACA18\_x\_st | 20532628 | ACA18 | 1.75 | 0.02 | ACA18 |
| ACA57\_st | 20532694 | ACA57 | 1.70 | 0.02 | ACA57 |
| HBII-135\_x\_st | 20534220 | HBII-135 | 1.66 | 0.13 | HBII-135 |
| U17b\_st | 20538140 | U17b | 1.66 | 0.02 | U17b |
| MI0012488\_st | 20536041 | hsa-mir-711 | 1.65 | 0.15 | MI0012488 |
| ENSG00000212378\_s\_st | 20533073 | ENSG00000212378 | 1.58 | 0.04 | ENSG00000212378 |
| U78\_s\_st | 20538252 | U78 | 1.58 | 0.04 | U78 |
| MIMAT0018071\_st | 20517902 | hsa-miR-3651 | 1.51 | 0.03 | MIMAT0018071 |
| MIMAT0018352\_st | 20518625 | hsa-miR-3937 | -1.75 | 0.11 | MIMAT0018352 |
| MIMAT0000072\_st | 20500132 | hsa-miR-18a-5p | -1.70 | 0.19 | MIMAT0000072 |
| MIMAT0000414\_st | 20500713 | hsa-let-7g5p | -1.66 | 0.19 | MIMAT0000414 |
| MIMAT0000415\_st | 20500715 | hsa-let-7i-5p | -1.60 | 0.02 | MIMAT0000415 |
| MIMAT0018994\_st | 20518852 | hsa-miR-4467 | -1.56 | 0.12 | MIMAT0018994 |
| MIMAT0015058\_st | 20515610 | hsa-miR-3180-3p | -1.55 | 0.01 | MIMAT0015058 |
| MIMAT0000067\_st | 20500123 | hsa-let-7f-5p | -1.55 | 0.19 | MIMAT0000067 |
| MIMAT0004948\_st | 20505790 | hsa-miR-885-3p | -1.51 | 0.14 | MIMAT0004948 |
| **Severe versus Mild COVID-19 patients** | | | | | |
| ACA40\_x\_st | 20532669 | ACA40 | 2.34 | 0.03 | ACA40 |
| MIMAT0017986\_st | 20517816 | hsa-miR-3609 | 2.26 | 0.02 | MIMAT0017986 |
| ENSG00000212378\_s\_st | 20533073 | ENSG00000212378 | 1.97 | 0.02 | ENSG00000212378 |
| U78\_s\_st | 20538252 | U78 | 1.97 | 0.02 | U78 |
| MIMAT0000231\_st | 20500399 | hsa-miR-199a-5p | 1.94 | 0.05 | MIMAT0000231 |
| MIMAT0000250\_st | 20500432 | hsa-miR-139-5p | 1.93 | 0.03 | MIMAT0000250 |
| MIMAT0031180\_st | 20529568 | hsa-miR-7977 | 1.92 | 0.07 | MIMAT0031180 |
| ACA18\_x\_st | 20532628 | ACA18 | 1.87 | 0.04 | ACA18 |
| U79\_st | 20538254 | U79 | 1.79 | 0.04 | U79 |
| MIMAT0019071\_st | 20518933 | hsa-miR-4532 | 1.76 | 0.08 | MIMAT0019071 |
| U78\_x\_st | 20538253 | U78 | 1.74 | 0.04 | U78 |
| ACA15\_s\_st | 20532624 | ACA15 | 1.72 | 0.09 | ACA15 |
| ENSG00000206785\_s\_st | 20532953 | ENSG00000206785 | 1.72 | 0.09 | ENSG00000206785 |
| ENSG00000207062\_s\_st | 20532982 | ENSG00000207062 | 1.72 | 0.09 | ENSG00000207062 |
| U29\_st | 20538158 | U29 | 1.70 | 0.05 | U29 |
| U17b\_st | 20538140 | U17b | 1.69 | 0.01 | U17b |
| MIMAT0000437\_st | 20500755 | hsa-miR-145-5p | 1.69 | 0.04 | MIMAT0000437 |
| MIMAT0016916\_st | 20517745 | hsa-miR-4286 | 1.68 | 0.11 | MIMAT0016916 |
| HBII-289\_st | 20534237 | HBII-289 | 1.67 | 0.06 | HBII-289 |
| MIMAT0018071\_st | 20517902 | hsa-miR-3651 | 1.61 | 0.01 | MIMAT0018071 |
| ACA20\_st | 20532631 | ACA20 | 1.59 | 0.02 | ACA20 |
| U59A\_st | 20538212 | U59A | 1.56 | 0.06 | U59A |
| MIMAT0030416\_st | 20529133 | hsa-miR-1273h-3p | 1.56 | 0.03 | MIMAT0030416 |
| MIMAT0000689\_st | 20501176 | hsa-miR-99b-5p | 1.54 | 0.07 | MIMAT0000689 |
| U76\_st | 20538249 | U76 | 1.52 | 0.10 | U76 |
| U44\_st | 20538182 | U44 | 1.51 | 0.05 | U44 |
| MIMAT0027480\_st | 20525541 | hsa-miR-6790-5p | -2.29 | 0.07 | MIMAT0027480 |
| MIMAT0000445\_st | 20500769 | hsa-miR-126-3p | -2.26 | 0.16 | MIMAT0000445 |
| MIMAT0004948\_st | 20505790 | hsa-miR-885-3p | -2.03 | 0.02 | MIMAT0004948 |
| MIMAT0000072\_st | 20500132 | hsa-miR-18a-5p | -2.01 | 0.18 | MIMAT0000072 |
| MIMAT0005586\_st | 20506779 | hsa-miR-1231 | -2.00 | 0.02 | MIMAT0005586 |
| MIMAT0018352\_st | 20518625 | hsa-miR-3937 | -1.96 | 0.07 | MIMAT0018352 |
| MIMAT0000415\_st | 20500715 | hsa-let-7i-5p | -1.94 | 0.02 | MIMAT0000415 |
| MIMAT0023700\_st | 20523007 | hsa-miR-6075 | -1.93 | 0.03 | MIMAT0023700 |
| MIMAT0019887\_st | 20519609 | hsa-miR-4750-5p | -1.83 | 0.02 | MIMAT0019887 |
| MIMAT0031000\_st | 20529783 | hsa-miR-8073 | -1.82 | 0.01 | MIMAT0031000 |
| MIMAT0018178\_st | 20518425 | hsa-miR-3180 | -1.81 | 0.02 | MIMAT0018178 |
| MIMAT0018994\_st | 20518852 | hsa-miR-4467 | -1.80 | 0.05 | MIMAT0018994 |
| MIMAT0019892\_st | 20519615 | hsa-miR-371b-5p | -1.79 | 0.02 | MIMAT0019892 |
| MIMAT0003237\_st | 20504295 | hsa-miR-572 | -1.79 | 0.02 | MIMAT0003237 |
| MIMAT0015065\_st | 20515617 | hsa-miR-3185 | -1.72 | 0.02 | MIMAT0015065 |
| MIMAT0000096\_st | 20500179 | hsa-miR-98-5p | -1.67 | 0.04 | MIMAT0000096 |
| MIMAT0000414\_st | 20500713 | hsa-let-7g-5p | -1.61 | 0.12 | MIMAT0000414 |
| MIMAT0027510\_st | 20525571 | hsa-miR-6805-5p | -1.59 | 0.04 | MIMAT0027510 |
| MIMAT0004792\_st | 20504273 | hsa-miR-92b-5p | -1.58 | 0.02 | MIMAT0004792 |
| MIMAT0021128\_st | 20520577 | hsa-miR-5196-5p | -1.57 | 0.02 | MIMAT0021128 |
| MIMAT0019871\_st | 20519592 | hsa-miR-4741 | -1.57 | 0.05 | MIMAT0019871 |
| MIMAT0027504\_st | 20525565 | hsa-miR-6802-5p | -1.55 | 0.02 | MIMAT0027504 |
| MIMAT0027623\_st | 20525684 | hsa-miR-6861-5p | -1.54 | 0.02 | MIMAT0027623 |
| MIMAT0022977\_st | 20519405 | hsa-miR-4632-5p | -1.53 | 0.04 | MIMAT0022977 |
| MIMAT0016873\_st | 20517701 | hsa-miR-4322 | -1.52 | 0.10 | MIMAT0016873 |

**Table. S1. Differentially expressed ncRNAs in severe versus asymptomatic and severe versus mild COVID-19 patients.** Probe ID and Name, Transcript ID and accession, Log2 fold change, and FDR values are shown.

|  |  |  |
| --- | --- | --- |
| **microRNA name** | **miRBase accession** | **microRNA mature sequence** |
| hsa-let-7f-5p | MIMAT0000067 | UGAGGUAGUAGAUUGUAUAGUU |
| hsa-let-7g-5p | MIMAT0000414 | UGAGGUAGUAGUUUGUACAGUU |
| hsa-let-7i-5p | MIMAT0000415 | UGAGGUAGUAGUUUGUGCUGUU |
| hsa-miR-1231 | MIMAT0005586 | GUGUCUGGGCGGACAGCUGC |
| hsa-miR-1246 | MIMAT0005898 | AAUGGAUUUUUGGAGCAGG |
| hsa-miR-126-3p | MIMAT0000445 | UCGUACCGUGAGUAAUAAUGCG |
| hsa-miR-1273h-3p | MIMAT0030416 | CUGCAGACUCGACCUCCCAGGC |
| hsa-miR-139-5p | MIMAT0000250 | UCUACAGUGCACGUGUCUCCAGU |
| hsa-miR-145-5p | MIMAT0000437 | GUCCAGUUUUCCCAGGAAUCCCU |
| hsa-miR-18a-5p | MIMAT0000072 | UAAGGUGCAUCUAGUGCAGAUAG |
| hsa-miR-199a-5p | MIMAT0000231 | CCCAGUGUUCAGACUACCUGUUC |
| hsa-miR-3180 | MIMAT0018178 | UGGGGCGGAGCUUCCGGAG |
| hsa-miR-3180-3p | MIMAT0015058 | UGGGGCGGAGCUUCCGGAGGCC |
| hsa-miR-3185 | MIMAT0015065 | AGAAGAAGGCGGUCGGUCUGCGG |
| hsa-miR-3609 | MIMAT0017986 | CAAAGUGAUGAGUAAUACUGGCUG |
| hsa-miR-3651 | MIMAT0018071 | CAUAGCCCGGUCGCUGGUACAUGA |
| hsa-miR-371b-5p | MIMAT0019892 | ACUCAAAAGAUGGCGGCACUUU |
| hsa-miR-3937 | MIMAT0018352 | ACAGGCGGCUGUAGCAAUGGGGG |
| hsa-miR-4286 | MIMAT0016916 | ACCCCACUCCUGGUACC |
| hsa-miR-4322 | MIMAT0016873 | CUGUGGGCUCAGCGCGUGGGG |
| hsa-miR-4467 | MIMAT0018994 | UGGCGGCGGUAGUUAUGGGCUU |
| hsa-miR-4632-5p | MIMAT0022977 | GAGGGCAGCGUGGGUGUGGCGGA |
| hsa-miR-4741 | MIMAT0019871 | CGGGCUGUCCGGAGGGGUCGGCU |
| hsa-miR-4750-5p | MIMAT0019887 | CUCGGGCGGAGGUGGUUGAGUG |
| hsa-miR-494-3p | MIMAT0002816 | UGAAACAUACACGGGAAACCUC |
| hsa-miR-5196-5p | MIMAT0021128 | AGGGAAGGGGACGAGGGUUGGG |
| hsa-miR-572 | MIMAT0003237 | GUCCGCUCGGCGGUGGCCCA |
| hsa-miR-6075 | MIMAT0023700 | ACGGCCCAGGCGGCAUUGGUG |
| hsa-miR-6790-5p | MIMAT0027480 | GUGAGUGUGGAUUUGGCGGGGUU |
| hsa-miR-6802-5p | MIMAT0027504 | CUAGGUGGGGGGCUUGAAGC |
| hsa-miR-6805-5p | MIMAT0027510 | UAGGGGGCGGCUUGUGGAGUGU |
| hsa-miR-6861-5p | MIMAT0027623 | ACUGGGUAGGUGGGGCUCCAGG |
| hsa-miR-7977 | MIMAT0031180 | UUCCCAGCCAACGCACCA |
| hsa-miR-8073 | MIMAT0031000 | ACCUGGCAGCAGGGAGCGUCGU |
| hsa-miR-885-3p | MIMAT0004948 | AGGCAGCGGGGUGUAGUGGAUA |
| hsa-miR-92b-5p | MIMAT0004792 | AGGGACGGGACGCGGUGCAGUG |
| hsa-miR-98-5p | MIMAT0000096 | UGAGGUAGUAAGUUGUAUUGUU |
| hsa-miR-99b-5p | MIMAT0000689 | CACCCGUAGAACCGACCUUGCG |
| hsa-mir-711 | MI0012488 | GGGACCCAGGGAGAGACGUAAG |
| hsa-let-7g-5p | MIMAT0000414 | UGAGGUAGUAGUUUGUACAGUU |

**Table. S2. Mature sequence of annotated differentially expressed miRNAs that are available in miRbase.** microRNA names, miRBase accession IDs, and microRNA mature sequences are shown. For hsa-mir-453, reads that map to the annotated mir-4532 locus (many with one mismatch) map exactly to annotated 28S rRNA sequences. The miRNA annotation is therefore likely to be false, and the miRNA was therefore removed from the database.

|  |  |
| --- | --- |
| **Transcript ID** | **Sequence** |
| ACA15 | GCATGGCCGAATACTGTGTTTTTATCAGTAGTTTACACAGCCAGACACCATGCAAAAGCAGTCTTCCCTTTAGAATGACTGATGGTATGCTAAGGTTTTTCATAGCATATCATTATTAAAGGTGAATACAAAT |
| ACA18 | GTTGAGGTCTATCCCGATGGGGCTTTTCCTGTAGCCTGCACATCGTTGGAAACGCCTCATAGAGTAACTCTGTGGTTTTACTTTACTCACAGGACTATTGTTAGATCTGTGGGAAGGAATTACAAGACAGTT |
| ACA20 | CTTCCCATTTATTTGCTGCTTGTAGTCTCACAGTGATACGAGCAGTTATACGCATGGGATAAAATAACATTGGGCCACTGTAAATTGAGATGAAGTAACCATTTTCATCTCTTCTGCAGGGACTAGACATTG |
| ACA40 | TGCACTTATGTATGTTTTTGTTTAACGTGGACAAAGACTTACAGATAGGTGCAAAAAATAAATCCTCTTTTGCAACCCAGAACTCATTGTTCAGTATGAGTTTTGATACATATAAGAAGGGATATTA |
| ACA57 | TTGTCCTGGCCTATTTTTCTGCTCCCCTGTGCTCAGTTCTAACAGGGTAGTCTGGCAGGACACACAGCAATTCCCTCTCAGTTTAGGAGGGCCGTCCTAAGAATAGGGCTGGCTCTTAAAGGCACGAGAGGACAATT |
| ENSG00000206785 | GCATGGCTGAATACTGTGTTCTTTTATCAGTAGTTTACACAGCCAGACACCATGCAAAAGCAGTCTTCCCTTTAGAATGACTGATGGTATGCTAAGGTTTTTCATAGCATATCATTATTAAAGGTGAATACAAAT |
| ENSG00000207062 | GCATGGCTGAATACTGTGTTCTTTTATCAGTAGTTTACACAGCCAGACACCATGCAAAAGCAGTCTTCCCTTTAGAATGACTGATGGTATGCTAAGGTTTTTCATAGCATATCATTATTAAAGGTGAATACAAAT |
| ENSG00000212378 | ATGTAATAATGTTCATCAAATGTCTGACCTGAAATGAGCATGTAGACAAGTTAATTTAACACTGAAGAA |
| HBII-135 | AAATGATGAAATCACCCAAAATAGCTGGAATTACCGGCAGATTGTGTAGTGGTGAACCTATGGTTTTCTGAAG |
| HBII-289 | ACTGAGGAATGATGACAAGAAAAGGCCGAATTGCAGTGTCTCCATCAGCAGTTTGCTCTCCATGGGCACACGATGACAAAATATCCTGAAGCGAACCACTAGTCTGACCTCAGT |
| U17b | TCCAACGTGGATACCCTGGGAGGTCACTCTCCCCAGGCTCTGTCCAAGTGGCATAGGGGAGCTTAGGGCTCTGCCCCATGATGTACAGTCCCTTTCCACAACGTTGAAGATGAAGCTGGGCCTCGTGTCTGCGCCTGCATATTCCTACAGCTTCCCAGAGTCCTGTGGACAATGACTGGGGAGACAAACCATGCAGGAAACATAT |
| U29 | TTTCTATGATGAATCAAACTAGCTCACTATGACCGACAGTGAAAATACATGAACACCTGAGAAAC |
| U44 | CCTGGATGATGATAAGCAAATGCTGACTGAACATGAAGGTCTTAATTAGCTCTAACTGACTAA |
| U59A | CCTTCTATGATGATTTTATCAAAATGACTTTCGTTCTTCTGAGTTTGCTGAAGCCACATTTAGGTACTGAGAAGG |
| U76 | GCCACAATGATGACAGTTTATTTGCTACTCTTGAGTGCTAGAATGATGAGGATCTTAACCACCATTATCTTAACTGAGGC |
| U78 | GTGTAATGATGTTGATCAAATGTCTGACCTGAAATGAGCATGTAGACAAAGGTAACACTGAAGAA |
| U79 | TACTGTTAGTGATGATTTTAAAATTAAAGCAGATGGGAATCTCTCTGAGAAAGAAAATGGAGATTAATCTTAAACTGAAACAGTA |

**Table. S3. Sequences of differentially expressed small nucleolar RNAs in severe cases of COVID-19.** Transcripts include snoRNA predicted using sequences from RFAM and miRbase. The following snoRNAs transcript IDs are not annotated in miRbase database:

|  |  |  |
| --- | --- | --- |
| **Hallmark gene set** | ***p*-value** | **q-value** |
| Hypoxia | 1.99E-23 | 9.93E-22 |
| TNF-alpha Signaling via NF-kB | 9.35E-23 | 1.56E-21 |
| G2-M Checkpoint | 9.35E-23 | 1.56E-21 |
| mTORC1 Signaling | 3.73E-20 | 4.66E-19 |
| Myc Targets V1 | 2.16E-15 | 2.16E-14 |
| UV Response Dn | 3.68E-15 | 3.07E-14 |
| E2F Targets | 2.70E-14 | 1.93E-13 |
| Apoptosis | 2.95E-13 | 1.72E-12 |
| p53 Pathway | 3.09E-13 | 1.72E-12 |
| UV Response Up | 1.58E-12 | 7.90E-12 |
| Inflammatory Response | 3.10E-11 | 1.41E-10 |
| TGF-beta Signaling | 2.38E-10 | 9.93E-10 |
| PI3K/AKT/mTOR  Signaling | 4.95E-10 | 1.90E-09 |
| Glycolysis | 7.75E-10 | 2.77E-09 |
| Epithelial Mesenchymal Transition | 2.16E-09 | 7.21E-09 |
| IL-2/STAT5 Signaling | 4.80E-09 | 1.50E-08 |
| Androgen Response | 2.06E-08 | 5.81E-08 |
| Unfolded Protein Response | 2.09E-08 | 5.81E-08 |
| Estrogen Response Early | 4.08E-08 | 1.07E-07 |
| Mitotic Spindle | 8.60E-08 | 2.15E-07 |
| Apical Junction | 2.56E-07 | 6.10E-07 |
| Interferon Gamma Response | 1.46E-06 | 3.32E-06 |
| Estrogen Response Late | 1.65E-05 | 3.43E-05 |
| KRAS Signaling Up | 1.65E-05 | 3.43E-05 |
| Protein Secretion | 2.51E-05 | 5.02E-05 |
| Allograft Rejection | 3.51E-05 | 6.74E-05 |
| Oxidative Phosphorylation | 7.28E-05 | 1.35E-04 |
| Complement | 1.47E-04 | 2.63E-04 |
| Pperoxisome | 3.09E-04 | 5.32E-04 |
| Myc Targets V2 | 5.77E-04 | 9.62E-04 |
| Myogenesis | 1.04E-03 | 1.67E-03 |
| DNA Repair | 1.11E-03 | 1.73E-03 |
| IL-6/JAK/STAT3 Signaling | 1.34E-03 | 2.02E-03 |
| Hedgehog Signaling | 2.37E-03 | 3.48E-03 |
| heme Metabolism | 3.34E-03 | 4.76E-03 |
| Angiogenesis | 7.46E-03 | 1.04E-02 |
| Notch Signaling | 8.89E-03 | 1.20E-02 |
| Cholesterol Homeostasis | 1.07E-02 | 1.40E-02 |
| Wnt-beta Catenin Signaling | 2.44E-02 | 3.13E-02 |
| Spermatogenesis | 2.92E-02 | 3.65E-02 |
| Reactive Oxygen Species Pathway | 3.17E-02 | 3.87E-02 |
| Adipogenesis | 3.79E-02 | 4.51E-02 |

**Table. S4. Gene Set Enrichment Analysis (GSEA) of differentially expressed miRNAs-targets via Enricher platform and Molecular Signatures Database (MSigDB).** Each hallmark gene set is a an expressed signature derived by aggregating many MSigDB gene sets to characterize reported biological states or processes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Gene Symbol\*** | ***p*-value** | **FDR** | **Odd ratio** | **Number of interactions** |
| CDKN1A | 8.0E-06 | 5.1E-03 | 3.1E-01 | 16 |
| IGF1R | 2.5E-03 | 6.9E-02 | 3.7E-01 | 10 |
| SOCS7 | 2.7E-04 | 3.3E-02 | 2.5E-01 | 9 |
| MIDN | 4.0E-03 | 9.0E-02 | 3.6E-01 | 9 |
| LMNB2 | 5.8E-03 | 1.1E-01 | 3.9E-01 | 9 |
| GPAT4 | 7.2E-05 | 2.3E-02 | 1.8E-01 | 8 |
| POTEM | 3.8E-04 | 3.4E-02 | 2.3E-01 | 8 |
| POTEG | 4.0E-04 | 3.4E-02 | 2.3E-01 | 8 |
| GLO1 | 6.1E-04 | 3.7E-02 | 2.5E-01 | 8 |
| PLAGL2 | 5.8E-03 | 1.1E-01 | 3.5E-01 | 8 |
| CCND1 | 3.0E-02 | 2.3E-01 | 4.7E-01 | 8 |
| LRIG3 | 2.1E-06 | 2.7E-03 | 9.2E-02 | 7 |
| ERO1A | 6.1E-06 | 4.7E-03 | 1.1E-01 | 7 |
| POLL | 1.6E-04 | 2.8E-02 | 1.8E-01 | 7 |
| AHCYL2 | 2.2E-04 | 3.1E-02 | 1.8E-01 | 7 |
| ZNF556 | 1.2E-03 | 4.8E-02 | 2.4E-01 | 7 |
| CBX5 | 4.1E-03 | 9.1E-02 | 3.0E-01 | 7 |
| SAR1A | 5.0E-03 | 1.0E-01 | 3.1E-01 | 7 |
| PMAIP1 | 5.3E-03 | 1.1E-01 | 3.2E-01 | 7 |
| HMGA1 | 8.5E-03 | 1.4E-01 | 3.4E-01 | 7 |
| GABPB1 | 9.1E-03 | 1.4E-01 | 3.5E-01 | 7 |
| STK4 | 9.1E-03 | 1.4E-01 | 3.5E-01 | 7 |
| PPP1R15B | 1.2E-02 | 1.6E-01 | 3.6E-01 | 7 |
| TUBB2A | 2.2E-02 | 2.1E-01 | 4.1E-01 | 7 |
| SKI | 3.4E-02 | 2.6E-01 | 4.5E-01 | 7 |
| YWHAZ | 3.5E-02 | 2.6E-01 | 4.5E-01 | 7 |
| ZNF264 | 5.7E-02 | 3.3E-01 | 5.0E-01 | 7 |
| SOD2 | 8.4E-02 | 3.9E-01 | 5.5E-01 | 7 |
| SLC7A5 | 1.0E-01 | 4.2E-01 | 5.7E-01 | 7 |

**Table. S5. Candidate genes that connect with more than 6 miRNA-target interactions using miRTarBase. \***CDKN1A: Cyclin Dependent Kinase Inhibitor 1A, IGF1R: Insulin Like Growth Factor 1 Receptor, SOCS7: Suppressor Of Cytokine Signaling 7, MIDN: Midnolin, LMNB2: Lamin B2, GPAT4: Glycerol-3-Phosphate Acyltransferase 4, POTEM: POTE Ankyrin Domain Family Member M, POTEG: POTE Ankyrin Domain Family Member G, GLO1: Glyoxalase I, PLAGL2: PLAG1 Like Zinc Finger 2, CCND1: Cyclin D1, LRIG3: Leucine Rich Repeats And Immunoglobulin Like Domains 3, ERO1A: Endoplasmic Reticulum Oxidoreductase 1 Alpha, POLL: DNA Polymerase Lambda, AHCYL2: Adenosylhomocysteinase Like 2, ZNF556: Zinc Finger Protein 556, CBX5: Chromobox 5, SAR1A: Secretion Associated Ras Related GTPase 1A, PMAIP1: Phorbol-12-Myristate-13-Acetate-Induced Protein 1, HMGA1: High Mobility Group AT-Hook 1, GABPB1: GA Binding Protein Transcription Factor Subunit Beta 1, STK4: Serine/Threonine Kinase 4, PPP1R15B: Protein Phosphatase 1 Regulatory Subunit 15B, TUBB2A: Tubulin Beta 2A Class IIa, SKI: SKI Proto-Oncogene, YWHAZ: Tyrosine 3-Monooxygenase/Tryptophan 5-Monooxygenase Activation Protein Zeta, ZNF264: Zinc Finger Protein 264, SOD2: Superoxide Dismutase 2, SLC7A5: Solute Carrier Family 7 Member 5.

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| **Characteristic\*** | **N** | **Asymptomatic** | **Mild** | **Severe** | ***p*-value** |
| Age [years] | 29 | 54 (52-56) | 49 (45-56) | 63 (57-64) | 0.078 |
| Survival Rate [%] | 29 | 10 (38%) | 10 (38%) | 6 (23%) | 0.023 |
| COVID-19 Average CT | 21 | 22.9 (21.5-29.2) | 26.7 (23.4-29.4) | 33.8 (26.8-34.1) | 0.3 |
| Diabetes Mellitus | 29 | 6 (33%) | 6 (33%) | 6 (33%) | >0.9 |
| Glucose [mmol/L] | 20 | 7.00 (6.25-14.40) | 6.80 (6.27-8.12) | 6.60 (6.40-10.60) | 0.9 |
| WBC [x103/μL] | 27 | 6.3 (6.2-7.8) | 5.5 (5.1-6.4) | 11.9 (8.0-15.4) | 0.014 |
| Lymphocyte count [x103/μL] | 27 | 2.10 (1.20-2.50) | 1.30 (1.20-1.61) | 1.10 (0.90-1.40) | 0.2 |
| Lymphocyte [%] | 27 | 29 (24-33) | 24 (21-31) | 9 (5-14) | 0.004 |
| ANC [x103/μL] | 27 | 3.6 (2.9-6.1) | 3.6 (2.7-4.7) | 7.7 (6.7-13.1) | 0.005 |
| Neutrophil [%] | 21 | 56 (51-62) | 66 (58-69) | 83 (80-86) | 0.012 |
| Eosinophil count [x103/μL] | 27 | 0.10 (0.00-0.27) | 0.00 (0.00-0.00) | 0.00 (0.00-0.10) | 0.2 |
| Eosinophil [%] | 27 | 2.50 (0.90-3.40) | 0.10 (0.00-0.80) | 0.10 (0.00-0.80) | 0.029 |
| Monocyte count [x103/μL] | 27 | 0.60 (0.60-0.70) | 0.47 (0.40-0.50) | 0.90 (0.80-1.00) | 0.11 |
| Monocyte [%] | 27 | 8.70 (6.80-10.90) | 9.00 (5.10-9.40) | 5.60 (4.80-6.60) | 0.14 |
| Basophil count [x103/μL] | 27 | 0.030 (0.030-0.040) | 0.020 (0.020-0.050) | 0.030 (0.010-0.040) | 0.6 |
| Basophil [%] | 27 | 0.50 (0.40-0.80) | 0.40 (0.20-0.50) | 0.20 (0.10-0.40) | 0.026 |
| RBC [x106/uL] | 27 | 5.10 (4.90-5.30) | 5.00 (4.70-5.70) | 3.80 (3.50-4.20) | 0.011 |
| Hgb [g/dL] | 27 | 13.60 (13.50-15.20) | 14.20 (13.60-16.00) | 11.20 (9.90-12.60) | 0.036 |
| HbA1C [%] | 18 | 8.70 (6.05-11.80) | 7.00 (6.40-7.50) | 6.00 (5.90-6.40) | 0.4 |
| Hct [%] | 27 | 42 (40-43) | 42 (40-47) | 33 (30-38) | 0.03 |
| MCV [fL] | 27 | 81.9 (81.0-87.0) | 85.4 (82.2-91.2) | 90.6 (86.4-91.2) | 0.031 |
| MCH [pg] | 27 | 27.30 (26.50-29.50) | 28.10 (27.90-30.50) | 30.00 (29.40-30.30) | 0.11 |
| MCHC [g/dL] | 27 | 33.30 (32.40-34.00) | 33.60 (32.90-34.10) | 33.50 (32.50-34.10) | 0.8 |
| RDW-CV [%] | 27 | 13.00 (11.90-14.30) | 14.20 (12.70-14.90) | 13.90 (12.50-16.20) | 0.3 |
| MPV [fl] | 27 | 10.20 (9.60-11.30) | 10.80 (9.90-12.00) | 10.40 (9.80-11.50) | 0.8 |
| Platelet [× 109/L] | 27 | 226 (200-251) | 187 (161-324) | 342 (223-363) | 0.2 |
| Ferritin [μg/L] | 18 | 574 (574-574) | 449 (210-804) | 1,131 (700-1,856) | 0.079 |
| PDW [fl] | 19 | 15.10 (15.10-15.10) | 13.90 (12.00-15.80) | 11.70 (11.00-14.20) | 0.5 |
| Fibrinogen [g/L] | 11 | 6.80 (6.80-6.80) | 4.60 (4.60-4.60) | 5.10 (3.30-5.60) | 0.5 |
| D-Dimer [mg/L FEU] | 16 | 1.55 (1.55-1.55) | 0.40 (0.32-0.60) | 2.65 (2.15-5.16) | 0.036 |
| APTT [second] | 15 | 26 (26-26) | 32 (29-35) | 31 (31-36) | 0.4 |
| PT [second] | 15 | 12.60 (12.60-12.60) | 11.30 (11.10-11.50) | 13.10 (12.60-13.50) | 0.047 |
| INR | 15 | 1.10 (1.10-1.10) | 1.00 (1.00-1.00) | 1.10 (1.10-1.10) | 0.057 |
| CRP [mg/L] | 27 | 3 (2-6) | 21 (5-56) | 26 (5-78) | 0.063 |
| IL-6 [pg/mL] | 9 | - | 32 (20-34) | 306 (137-476) | 0.2 |
| Total Protein [g/L] | 24 | 76 (66-77) | 73 (69-75) | 71 (68-72) | 0.8 |
| Albumin [g/L] | 26 | 40 (36-42) | 37 (35-39) | 26 (24-29) | 0.001 |
| Chloride [mmol/L] | 25 | 100.0 (97.5-101.5) | 100.7 (98.0-103.0) | 104.0 (102.0-107.0) | 0.079 |
| Magnesium [mmol/L] | 14 | 0.85 (0.85-0.85) | 0.79 (0.76-1.00) | 0.94 (0.89-1.09) | 0.4 |
| Potassium [mmol/L] | 26 | 4.80 (4.55-5.05) | 4.10 (3.80-4.40) | 4.20 (3.60-4.60) | 0.11 |
| Sodium [mmol/L] | 27 | 136 (134-138) | 138 (136-140) | 139 (137-148) | 0.2 |
| Bicarbonate [mmol/L] | 23 | 25.0 (24.0-26.0) | 26.0 (21.5-27.0) | 23.0 (22.0-28.0) | >0.9 |
| Calcium [mmol/L] | 26 | 2.32 (2.25-2.37) | 2.38 (2.34-2.44) | 2.19 (2.14-2.30) | 0.093 |
| Adjusted calcium [mmol/L] | 26 | 2.29 (2.24-2.39) | 2.46 (2.35-2.46) | 2.46 (2.45-2.52) | 0.039 |
| Vitamin D [ng/mL] | 14 | 23 (20-24) | 23 (14-32) | 32 (23-39) | 0.6 |
| Procalcitonin [ng/mL] | 13 | 0.25 (0.25-0.25) | 0.38 (0.22-0.38) | 0.26 (0.10-0.72) | >0.9 |
| Bilirubin [mg/dL] | 25 | 5 (5-16) | 9 (5-12) | 10 (7-30) | 0.4 |
| Urea [mmol/L] | 27 | 4 (4-6) | 4 (4-5) | 16 (10-20) | <0.001 |
| Uric acid [µmol/L] | 19 | 295 (282-311) | 229 (210-270) | 355 (337-374) | 0.2 |
| Creatinine [µmol/L] | 27 | 85 (73-99) | 78 (69-100) | 115 (83-168) | 0.3 |
| ALT [U/L] | 23 | 18 (17-25) | 34 (20-55) | 59 (20-134) | 0.2 |
| AST [U/L] | 20 | 23 (18-33) | 27 (24-34) | 34 (28-110) | 0.2 |
| CK [U/L] | 14 | 129 (129-129) | 97 (62-173) | 103 (62-239) | 0.8 |
| ALP [U/L] | 25 | 79 (66-115) | 66 (61-93) | 78 (45-143) | 0.9 |
| LDH [U/L] | 14 | 183 (183-183) | 337 (226-343) | 332 (294-375) | 0.3 |

**Table. S6. Clinical characterization of asymptomatic, mild, and severe COVID-19 patients.** Patients were grouped as severe based on oxygen support need and ICU admission, whereas mild cases were categorized based on clinical symptoms and positive radiographic findings suggestive of pulmonary involvement. \*ALP: Alkaline phosphatase, ALT: Alanine aminotransferase, ANC: Absolute neutrophil count, APTT: Partial thromboplastin time, AST: Aspartate aminotransferase, CK: Creatine kinase, CRP: C-reactive protein, Hct: Hematocrit, Hgb: Hemoglobin, IL-6: Interleukin-6, INR: International Normalized Ratio, LDH: Lactate dehydrogenase, MCH: Mean cell hemoglobin, MCHC: Mean corpuscular hemoglobin concentration, MCV: Mean corpuscular volume, MPV: Mean platelet volume, PDW: Platelet distribution width, PT: Prothrombin time, RBC: Red blood cell count, RDW-CV: Red blood cell distribution width, WBC: White blood cell count. n (%); Median (25%-75%), Fisher's exact test; Kruskal-Wallis rank sum test.