

## Supplementary Data

### Proteomics Investigation of Diverse Serological Patterns in COVID-19

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Supplementary materials provided as separate files

## Supplementary figure legends

**Figure S1 Serological characteristics in COVID-19 patients.** A) IgM and IgG plateau expression labelled with different groups. The triangle labels denote the selected patients for proteomics analysis. B) Summary of patient and serology test number from different groups. C-D) Scatterplots of NAbs expression titers and their correlations with IgG and IgM expression titers, respectively.

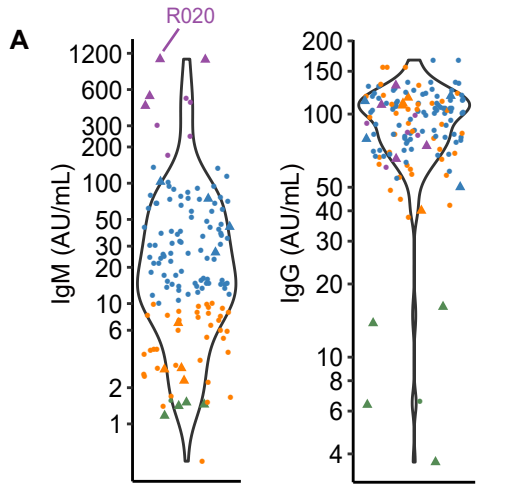
**Figure S2 Proteomic experiment for the serum samples from the selected patients.** A) Temporal IgM and IgG expression of the 16 selected patients. B) Principal component analysis (PCA) of the patient cohort, based on the on-admission expression of nine highlighted clinical indicators in Figure 2B and stratified by the patient groups. The triangle labels denote the 16 selected patients. The ellipse probability for each group is set as 0.95. C) PCA of the serum samples in the patient cohort, based on the temporal expression of ten highlighted clinical indicators across weeks 1-10 in Figure 2C and stratified by the patient groups. Clinical indicators with multiple samplings within a week were averaged in expression and the serum samples with a missing value ratio of over 0.5 were excluded. The triangle labels denote serum samples from the 16 selected patients. The ellipse probability for each group is set as 0.95. D) Experimental workflow for serum proteomics analysis. E) Coefficient of variation for the proteins in the pooled samples across eight batches.

**Figure S3 Serum protein characteristics that are associated with leukocyte mediated immunity and lipid metabolic process.** A) Relative expression of the serum proteins in pathway Leukocyte mediated immunity (GO: 0002443). The protein expression was quantile normalized. B) Comparison of the top eight enriched pathways by IPA from proteins in Cluster 1 and Cluster 2. C) Relative expression of the serum proteins in pathway Lipid metabolic process (GO: 0006629). The protein expression was quantile normalized. D) Enriched pathway networks by IPA from proteins in Cluster 3.

**Figure S4 Serum protein differential analyses of the patient groups.** A) Summary of differentially expressed protein (DEP) counts at each week interval. B) PCA of the serum samples from the selected patients at weeks 4-10, based on the DEPs at weeks 4-10 and stratified by each patient. C) PCA of the serum samples from the selected patients at weeks 4-10, based on the DEPs at weeks 4-10 and stratified by each week interval. D) Spearman correlation of the DEPs for the

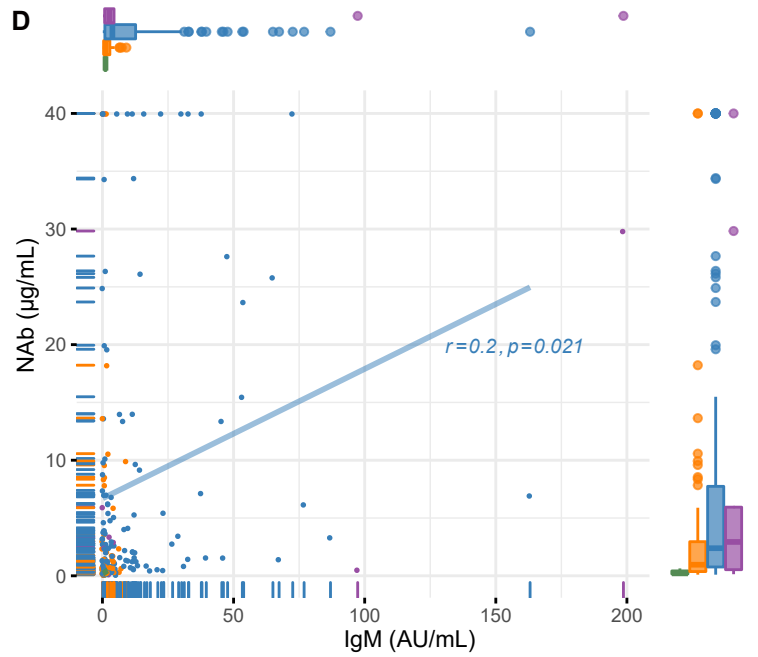
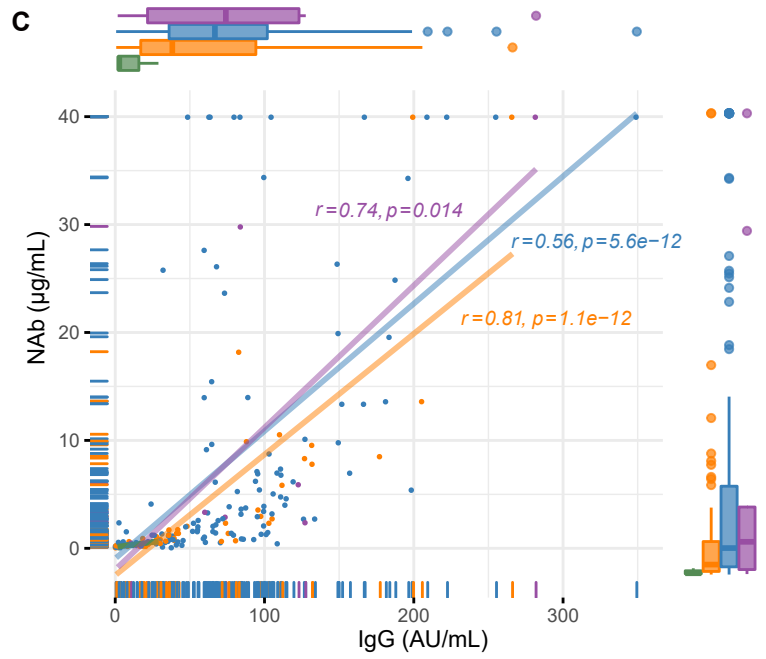
selected patients at weeks 1-2 and weeks 4-10, respectively. E) Heatmap of top 20 enriched functions between our study and other studies from DEPs at weeks 1-2 and weeks 4-10, respectively. The pathways enriched in our study were shown in bold font and the table describes details of other studies. This analysis was generated by CoronaScape.

**Figure S1**



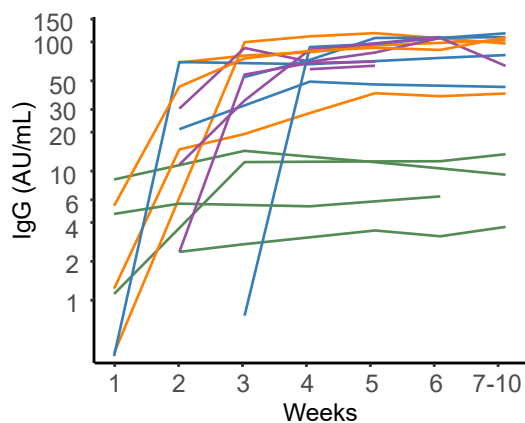
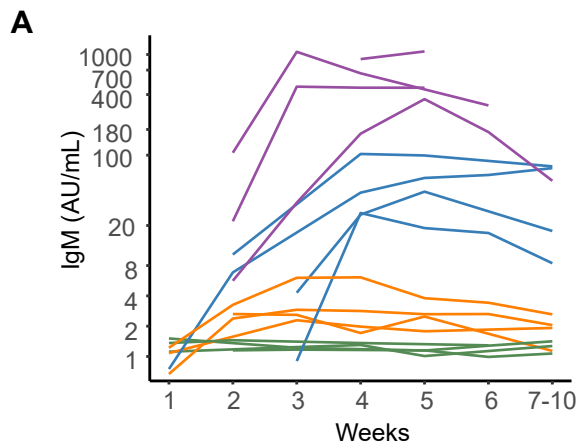
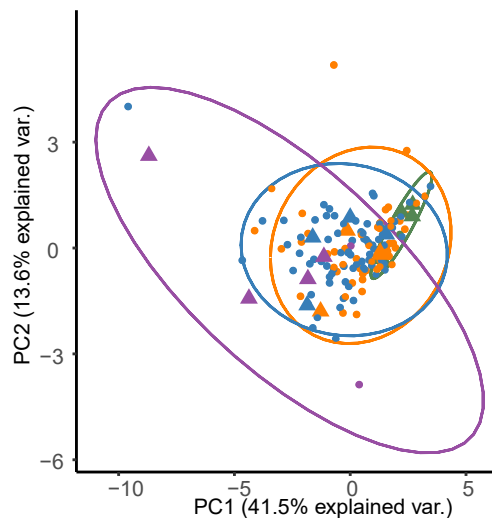
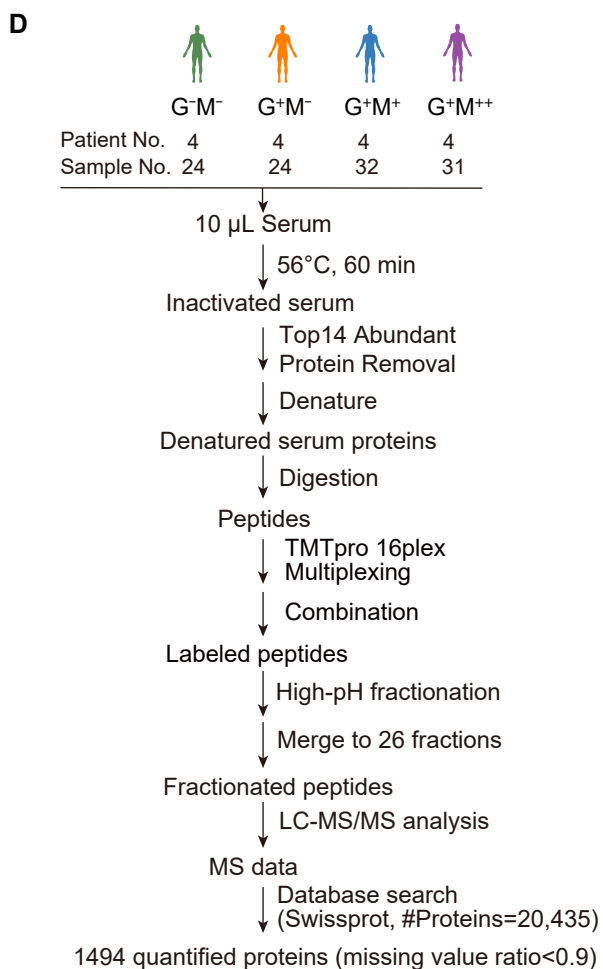
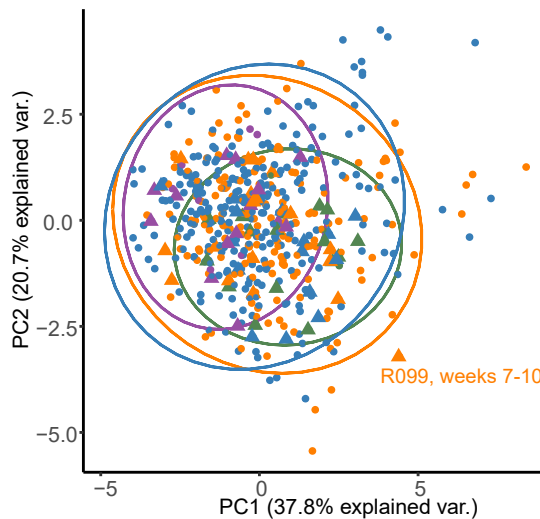
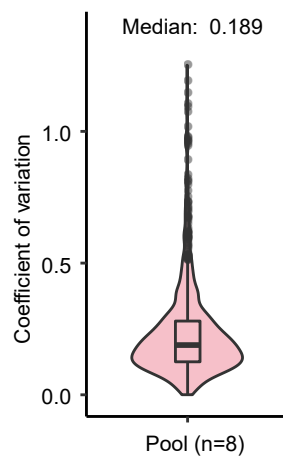
**B**

Group	G-M <sup>-</sup>	G <sup>+</sup> M <sup>-</sup>	G <sup>+</sup> M <sup>+</sup>	G <sup>+</sup> M <sup>++</sup>
Patient No.	5	42	88	9
Serology test No.	29	231	589	71



**Figure S2**

■ G-M<sup>-</sup>   ■ G-M<sup>-</sup>   ■ G-M<sup>+</sup>   ■ G-M<sup>++</sup>

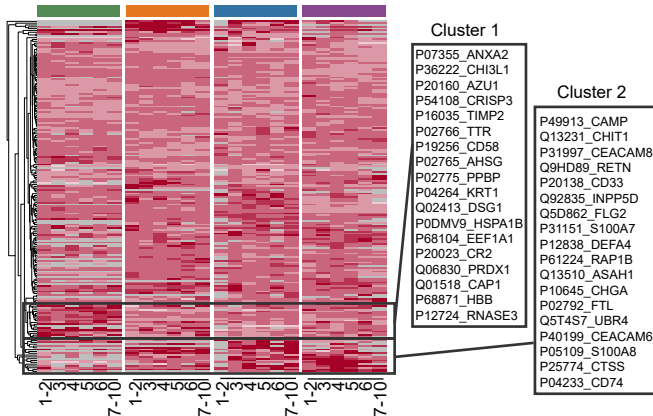
**B** **PCA based on the 9 on-admission clinical indexes****C** **PCA based on the 10 clinical indexes at weeks 1-10****E**

**Figure S3**

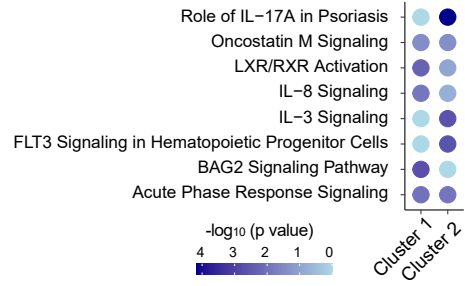
■ G<sup>-</sup>M<sup>-</sup> ■ G<sup>+</sup>M<sup>-</sup> ■ G<sup>+</sup>M<sup>+</sup> ■ G<sup>+</sup>M<sup>++</sup>

**A**

Leukocyte mediated immunity (GO:0002443)

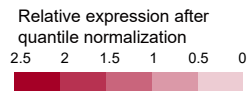
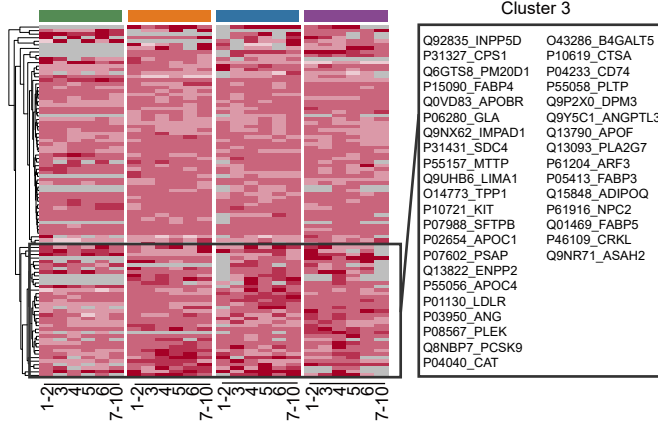


**B**

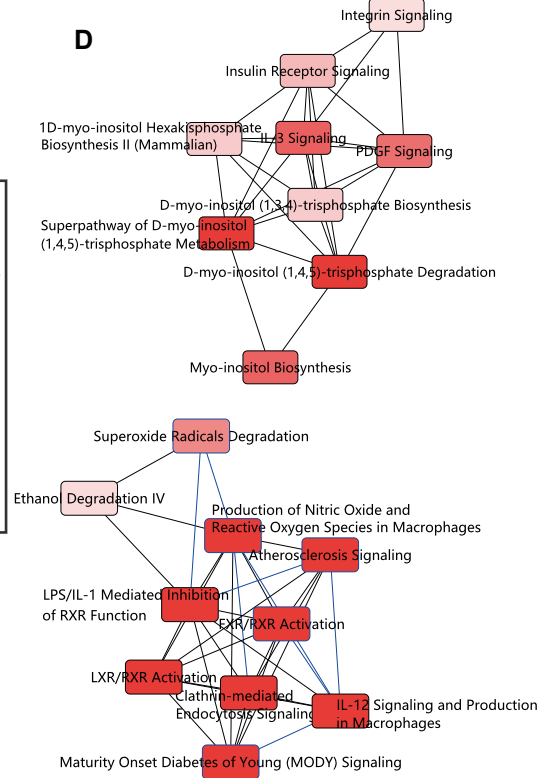


**C**

Lipid metabolic process (GO:0006629)



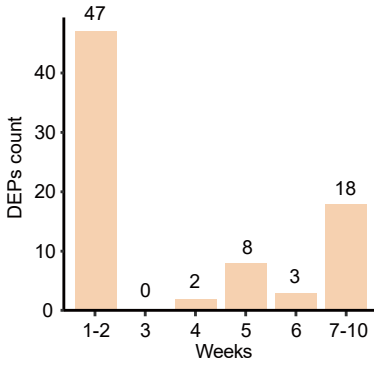
**D**



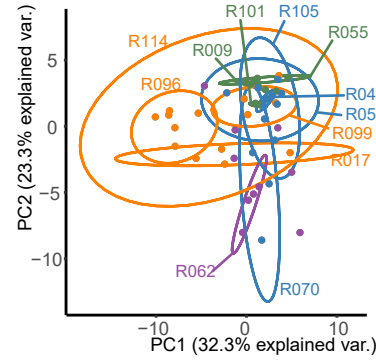
**Figure S4**

■ G<sup>-</sup>M<sup>-</sup> ■ G<sup>+</sup>M<sup>-</sup> ■ G<sup>+</sup>M<sup>+</sup> ■ G<sup>+</sup>M<sup>++</sup>

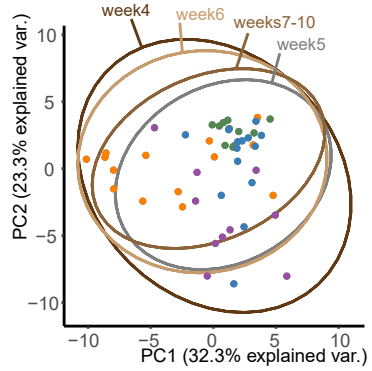
**A**



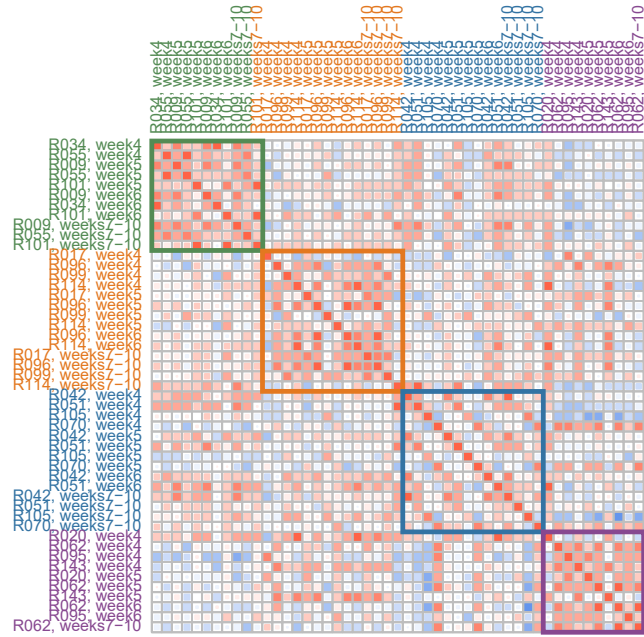
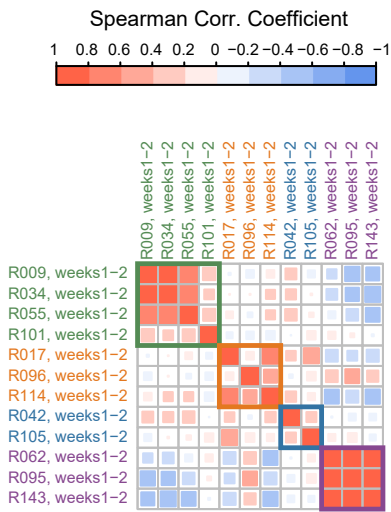
**B**



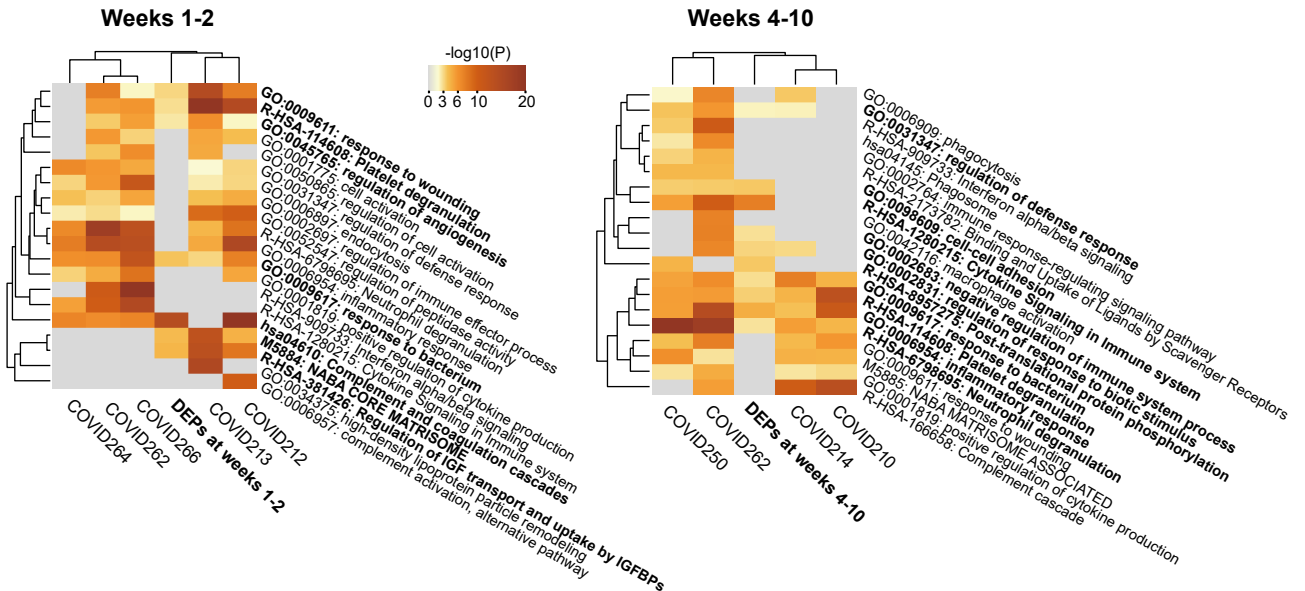
**C**



**D**



**E**



Label	List Name	Technology	Source	Treatment	Reference	Timepoints
COVID264	RNA_Wilk_CD16+Monocytes_patient-C3_Up	scRNA-seq	CD16+ Monocytes	SARS-CoV-2	Healthy	9d post onset
COVID262	RNA_Wilk_CD16+Monocytes_patient-C1B-severe_Up	scRNA-seq	CD16+ Monocytes	SARS-CoV-2	Healthy	11d post onset
COVID266	RNA_Wilk_CD16+Monocytes_patient-C4_Up	scRNA-seq	CD16+ Monocytes	SARS-CoV-2	Healthy	9d post onset
COVID213	Proteome_Shen_Serum-severe-vs-healthy_Down	Proteome	Serum	SARS-CoV-2 (severe)	Healthy	
COVID212	Proteome_Shen_Serum-severe-vs-healthy_Up	Proteome	Serum	SARS-CoV-2 (severe)	Healthy	
COVID250	RNA_Wilk_CD14+Monocytes_patient-C3_Up	scRNA-seq	CD14+ Monocytes	SARS-CoV-2	Healthy	9d post onset
COVID214	Proteome_Shen_Serum-nonCovid-vs-healthy_Up	Proteome	Serum	Non-SARS-CoV-2 patient	Healthy	
COVID210	Proteome_Shen_Serum-severe-vs-nonsevere_Up	Proteome	Serum	SARS-CoV-2 (severe)	SARS-CoV-2 (mild)	