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Supplemental Information

Enhanced expression of immune checkpoint receptors during SARS-CoV-2 viral infection

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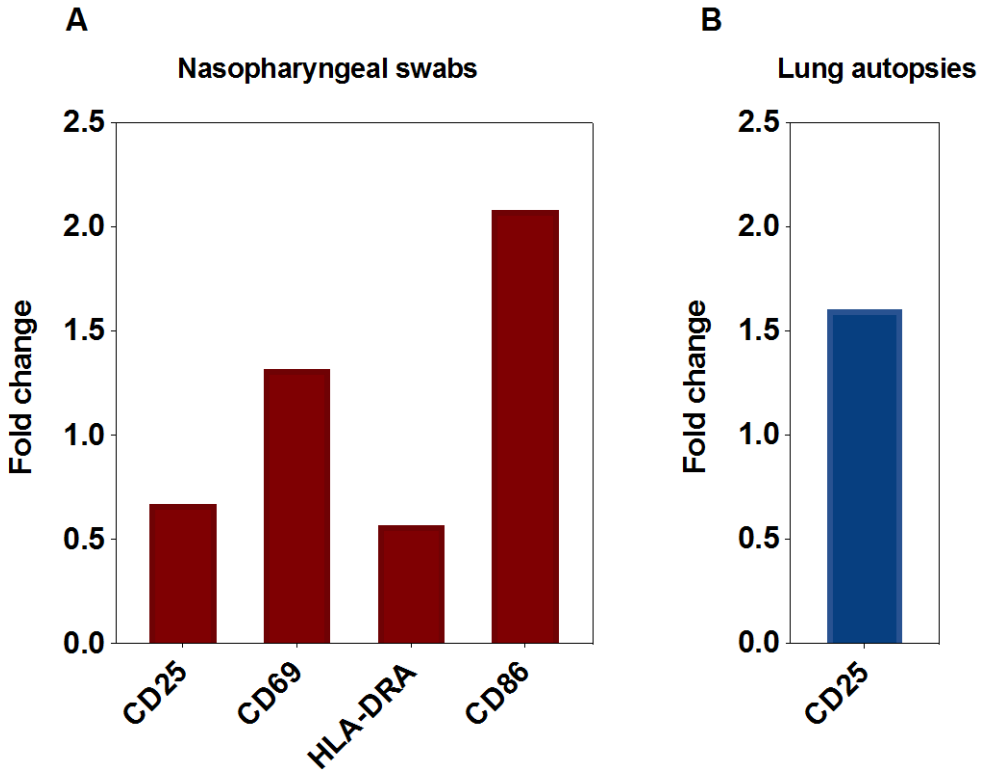

Figure S1. Immune stimulatory gene expression in the nasopharyngeal swabs and lung autopsies. (A) Nasopharyngeal swabs showed upregulation of 4 immune stimulatory genes, (n=431 COVID-19 vs n=54 controls, GSE152075). (B) Lung autopsies revealed upregulation of one out of four stimulatory genes (n=16 COVID-19 vs n=5 controls lung autopsies, GSE150316). For all analyses, $p < 0.05$ was considered significant.

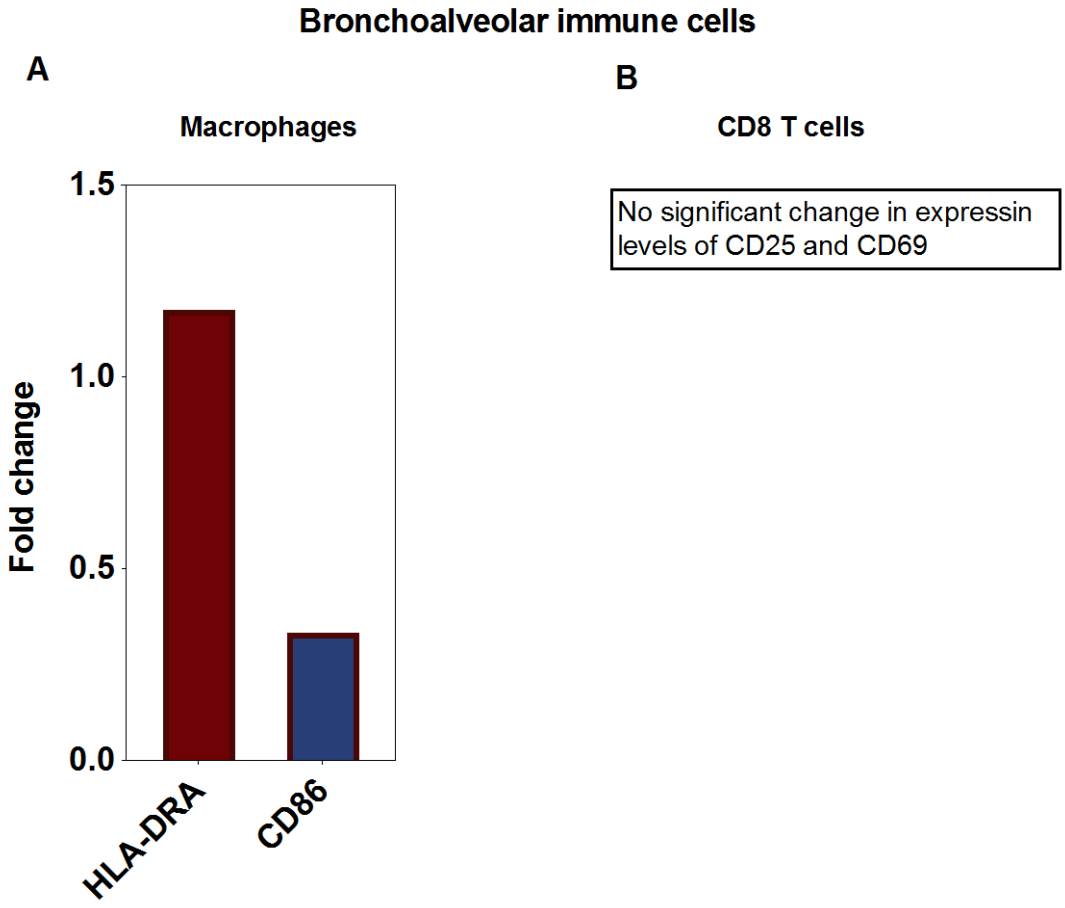

Figure S2. Single-cell expression of bronchoalveolar immune cells in patients with COVID-19 (GSE145926) Single-cell RNA sequencing was performed on bronchoalveolar lavage fluid (BALF) from 6 severe and 3 moderate COVID-19 patients and 3 healthy control. (A) Expression of immune stimulatory gene HLA-DRA was upregulated in the macrophage cluster enriched more in the healthy and less severe COVID-19 patients, while CD86 markers was slightly upregulated in the M2 like macrophage cluster enriched more in severe COVID-19 patients. (B) There was no significant change in expression levels of CD25 and CD69 in COVID-19 CD8+ T cells. For all analyses, $p < 0.05$ was considered significant.

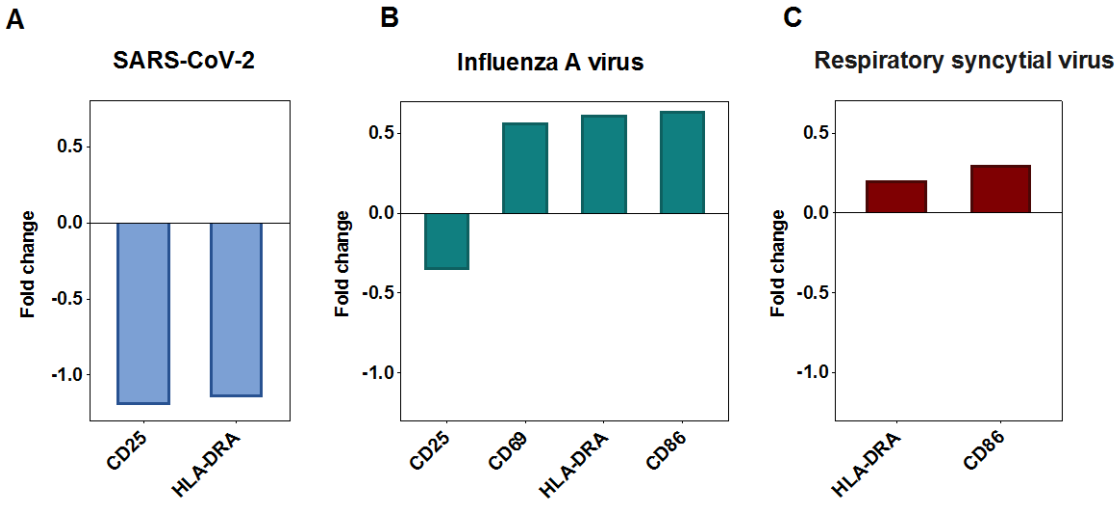

Figure S3. The expression levels of four immune stimulatory genes during different respiratory infections. Fold change was obtained from comparison between the condition and controls provided within the same study. (A) In the whole blood of COVID-19 there was no change in expression levels of CD69 and CD86, however CD25 and HLA-DRA were significantly down regulated. (B) In IAV infection CD69, HLA-DRA, and CD86 were slightly upregulated, while CD25 was slightly down regulated. (C) In RSV infection, HLA-DRA and CD86 were slightly increased. The following datasets were used; GSE17156 (n=17 IAV vs n=17 controls), GSE17156 (n=20 RSV vs n=20 controls), GSE1739 (n=10 SARS-CoV-1 vs n=4 controls), and EGAS00001004503 (n=39 COVID-19 vs n=10 controls). For all analyses, $p < 0.05$ was considered significant. IAV, influenza A virus; RSV, Respiratory syncytial virus.