

**Figure S1:** Mechanistic networks showing the interactions between up-stream regulators (TNF, IL1A, F2) and their target genes identified in the SARS-CoV-2 bulk RNA-seq signature. The IPA upstream regulator analysis is based on the expected causal effects between upstream regulators and targets;

**Figure S2:** The standard curves of genes GJA1, IRF9, OAS1 and CXCL10. The experiment was conducted using a 2-fold serial dilution on a cDNA pool (in triplicate). Data is presented as mean +/- SD;

**Figure S3:** Comparison of relative gene expression using RTqPCR in non-infected iALI samples (mock) at day 0 (n=3) and day 4 (n=1), as a control of Figure 4D. There is no significant change between day 0 and day 4.

**Table S1:** Primer pairs used for validation by RT-qPCR. When existing, the reference of the paper from which the sequence was found is cited;

**Table S2:** List of the 515 genes specific to the SARS-CoV-2 bulk RNA-seq signature (transcriptome analysis by Blanco-Melo, D et al. [18]);

**Table S3:** List of the top GO categories identified by Ingenuity Pathway Analysis using the 515 genes listed in Table S2;

**Table S4:** List of the 146 enriched canonical pathways identified in the SARS-CoV-2 bulk RNA-seq signature;

**Table S5:** Lists of genes targeted by the upstream regulator's TNF, IL1A and F2 identified using IPA Upstream Regulator Analysis;

**Table S6:** Exhaustive lists of miRNAs that are putative regulators of genes implicated in interferon and inflammatory responses upon SARS-CoV-2 infection of ALI cultures retrieved by GenGo Metacore.