

Supplementary Table 1: Candidate COVID-19 related disease genes

Gene Symbol	Gene ID	Gene expression on NHBE cells after SARS-CoV-2 infection (GSE147507)		Gene expression on Calu-3 cell line after SARS-CoV-2 infection (GSE147507)		Relevance of COVID-19 related proteins based on additional data sources: molecular profiling data of human lung tissues infected by SARS-CoV-2 or other respiratory viruses, deep-immunophenotyping/ cytokine profiling data in the blood or lungs of patients with severe COVID-19
		Log Fc	pValue	Log Fc	pValue	
Cytokine Release Syndrome (CRS)						
C5	727	NS	NS	NS	NS	<ul style="list-style-type: none"> - Elevated levels of C5a in bronchoalveolar liquid fluid (BALF) of COVID-19 patients with acute respiratory distress syndrome (ARDS) (Carvelli et al.)¹ - High plasma levels of soluble C5b9 in COVID-19 patients (Peffault de Latour et al.)² - Interest of targeting proinflammatory C5a in COVID-19 (Merad et al.)³
C5aR1	728	NS	NS	NS	NS	C5aR1+ cells detected in neutrophils and monocytes from lung samples of COVID-19 patients with ARDS (Carvelli et al.) ¹
CCL2 (MCP-1)	6347	NA	NA	2,27199792	0,00033869	<ul style="list-style-type: none"> - CCL2 gene expression detected in BALF of COVID-19 patients with ARDS (Carvelli et al.)¹ - High expression of CCL2 in single-cell RNA sequenced BALF macrophages from COVID-19 patients (Liao et al.)⁴ - Elevated levels of circulating CCL2 associated with COVID-19 severity (Hadjadj et al.)⁵
CCL20	6364	2,80512267	0,00644687	3,72792364	0,0014312	Upregulated gene expression in SARS-CoV infected in human peripheral blood mononuclear cells (PBMCs) (Ng et al.) ⁶
CCL5	6352	NS	NS	4,0079621	0,00071506	
CCL7 (MCP-3)	6354	NS	NS	NS	NS	<ul style="list-style-type: none"> - Increased plasma levels of CCL7 in COVID-19 patients associated with disease severity (Vabret et al.)⁷ - High expression of CCL7 in single-cell RNA sequenced BALF macrophages from COVID-19 patients (Liao et al.)⁴
CSF2 (GM-CSF)	1437	1,12015328	0,00070066	4,43508382	7,3065E-17	Increased frequency of GM-CSF+IFN- γ + T cells and CD14+CD16+GM-CSF+ monocytes in blood from COVID-19 patients (Vabret et al.) ⁷
CXCL10 (IP10)	3627	NS	NS	4,6211212	0,00072944	<ul style="list-style-type: none"> - Increased plasma levels of CXCL10 in COVID-19 patients associated with disease severity (Vabret et al., Laing et al.)^{7,8} - High expression of CXCL10 in single-cell RNA sequenced BALF macrophages from COVID-19 patients (Liao et al.)⁴ - Increased CXCL10 gene expression in lung biopsies from COVID-19 patients (Ackermann et al.)⁹
CXCL11	6373	NS	NS	4,53540857	0,0007608	High expression of CXCL11 on single-cell RNA sequenced BALF macrophages from COVID-19 patients (Liao et al.) ⁴
CXCL5	6374	1,79511867	3,0178E-6	1,03717803	0,00855694	<ul style="list-style-type: none"> - CXCL5 contributes to SARS-CoV-2 induced lung inflammation in a hACE2 transgenic mouse model (Laing et al.)⁸ - Implication of CXCL5-mediated neutrophil recruitment in viral-induced asthma exacerbation (Sokulsky et al.)¹⁰ - Top hub gene from transcriptome network analysis of SARS-CoV-2 infected human cell (Fagone et al.)¹¹
CXCL8 (IL8)	3576	NA	NA	NA	NA	<ul style="list-style-type: none"> - Increased plasma levels of CXCL8 in COVID-19 patients associated with disease severity (Vabret et al., Laing et al.)^{7,8} - CXCL8 detected in BALF of COVID-19 patients with ARDS (Carvelli et al.)¹ - Increased CXCL8 gene expression in lung biopsies from COVID-19 patients (Ackermann et al.)⁹ - Top hub gene from transcriptome network analysis of SARS-CoV-2 infected human cell (Fagone et al.)¹¹
IFNγ	3458	NA	NA	NA	NA	<ul style="list-style-type: none"> - Increased plasma levels of IFNγ in COVID-19 patients (Vabret et al.)⁷ - Interest of targeting IFNγ in COVID-19 (Merad et al., Ye et al.)^{3,12} - IFNγ implication in coronavirus recognition and immune response, in relationship with obesity, age, and risk of severe COVID-19 (Brodin)¹³
IL12A	3592	NS	NS	2,06155735	7,6616E-06	IL12A implication in coronavirus recognition and immune response, in relationship with obesity, age, and risk of severe COVID-19 (Brodin) ¹³
IL15	3600	NS	NS	1,37007695	0,00492881	

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		Log Fc	pValue	Log Fc	pValue	
IL15RA	3601	NS	NS	1,9033827	0,00013765	
IL1β	3553	1,03550935	0,00911132	3,91985098	4,991E-12	<ul style="list-style-type: none"> - IL1β detected in BALF of COVID-19 patients with ARDS (Carvelli et al.)¹ - High expression of IL1β in single-cell RNA sequenced BALF macrophages from COVID-19 patients (Liao et al.)⁴ - Increased blood levels of CD14+ IL1β+ monocytes in COVID-19 patients (Wen et al.)¹⁴ - Top hub gene from transcriptome network analysis of SARS-CoV-2 infected human cell (Fagone et al.)¹¹ - IL1β implication in coronavirus recognition and immune response, in relationship with obesity, age, and risk of severe COVID-19 (Brodin)¹³
IL2	3558	NA	NA	NA	NA	Increased plasma levels of IL2 in COVID-19 patients (Vabret et al.) ⁷
IL23A	51561	NS	NS	1,21854059	0,00120562	
IL32	9235	1,73869606	0,00014965	1,20922853	0,0134375	
IL36G	56300	2,16695495	5,883E-05	NS	NS	
IL6	3569	2,00320976	0,00194694	5,11939899	1,5515E-09	<ul style="list-style-type: none"> - Increased plasma levels of IL6 in COVID-19 patients associated with disease severity (Vabret et al., Laing et al., Hadjadj et al.)^{5,7,8} - IL6 detected in BALF of COVID-19 patients with ARDS (Carvelli et al.)¹ - High expression of IL6 in single-cell RNA sequenced BALF macrophages from COVID-19 patients (Liao et al.)⁴ - Increased IL6 gene expression in lung biopsies from COVID-19 patients (Ackermann et al.)⁹ - Top hub gene from transcriptome network analysis of SARS-CoV-2 infected human cell (Fagone et al.)¹¹ - Interest of targeting IL6 in COVID-19 (Merad et al., Ye et al., Moore et al., Rica et al.)^{3,12,15,16}
JAK1		0,56164939	0,00984357	NS	NS	Interest of targeting JAK-STAT pathway in COVID-19 (Luo et al.) ¹⁷
JAK2		NS	NS	1,45997096	0,00011929	Interest of targeting JAK-STAT pathway in COVID-19 (Luo et al.) ¹⁷
TNFα	7124	NS	NS	4,77158416	1,827E-07	<ul style="list-style-type: none"> - TNFα detected in BALF of COVID-19 patients with ARDS (Carvelli et al.)¹ - High expression of TNFα in single-cell RNA sequenced BALF macrophages from COVID-19 patients (Liao et al.)⁴ - Elevated TNFα serum concentration associated with critical COVID-19 (Leisman et al., Hadjadj et al.)^{5,18} - TNFα implication in coronavirus recognition and immune response, in relationship with obesity, age, and risk of severe COVID-19 (Brodin)¹³ - Interest of targeting TNFα in COVID-19 (Ye et al.)¹²
IL17RA	23765	NS	NS	NS	NS	Increased blood levels of IL17 in COVID-19 patients associated with lung injury (Pacha et al.) ¹⁹
Alarmins						
AGER (RAGE)	177	NS	NS	NS	NS	Low sRAGE levels in elderly patients with lung involvement (Yalcine Kehribar et al.) ²⁰
CAMP	820	NS	NS	NS	NS	Role of Vitamin D in the regulation of CAMP gene expression in the course of COVID-19 disease (Roth et al.) ²¹
Defensin α	Group ID 502	NA	NA	NA	NA	Downregulation of α-Defensin gene expression following SARS-CoV-2 infection (Idris et al.) ²²
Defensin β	Group ID 503	NA	NA	NA	NA	Downregulation of β-Defensin gene expression following SARS-CoV-2 infection (Idris et al.) ²²
EDN1	1906	NS	NS	1,86633662	0,00981865	
EDN2	1907	NS	NS	2,01436393	1,389E-05	
FN1		1,25633714	0,00806437	NS	NS	Increased FN1 gene expression in lung biopsies from COVID-19 patients (Ackermann et al.) ⁹
GPLY	10578	NS	NS	NS	NS	Elevated CD4+ and CD8+ effector T cells expressing GPLY are associated with convalescence in moderate COVID-19 patients (Zhang et al.) ²³
HMGB1	3146	NS	NS	-0,7123577	0,00335352	Elevated serum levels of HMGB1 correlates with inferior clinical outcomes in COVID-19 patients (Chen et al.) ²⁴
IL1A	3552	NS	NS	4,95457015	2,0084E-12	Top hub gene from transcriptome network analysis of SARS-CoV-2 infected human cell (Fagone et al.) ¹¹
IL1R1	3554	0,50439323	0,05023721	NS	NS	Elevated serum levels of IL1R1 in COVID-19 patients (Choreño-Parra et al.) ²⁵

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		Log Fc	pValue	Log Fc	pValue	
IL25	64806	NA	NA	NA	NA	- Increased production of IL25 during lung inflammation associated with allergic asthma (Atamas et al.) ²⁶ - Interest of targeting IL25 in COVID-19 (Rica et al.) ¹⁶
IL33	90865	NS	NS	NS	NS	- High serum IL33 levels correlates with adverse COVID-19 outcome (Burke et al., Ye et al., Zizzo et al.) ^{12,27,28} - Increased production of IL33 during lung inflammation associated with allergic asthma (Atamas et al.) ²⁶ - Interest of targeting IL33 in COVID-19 (Rica et al.) ¹⁶
S100A4	6275	NS	NS	NS	NS	S100A4+ T cells detected in the blood of COVID-19 patients (Zhang et al.) ²³
S100A7	6278	NS	NS	NS	NS	Top hub gene from transcriptome network analysis of SARS-CoV-2 infected human cell (Fagone et al.) ¹¹
S100A7A	338324	0,62524042	2,019E-07	NS	NS	
S100A8	6279	NS	NS	NS	NS	- Elevated gene expression levels of S100A8 mRNA and protein level in lung samples from fatal COVID-19 cases (Wu et al.) ²⁹ - Elevated serum levels of S100A8/A9 are correlated with inferior clinical outcomes in COVID-19 patients (Chen et al.) ²⁴ - Single-cell landscape of bronchoalveolar immune cells (Liao et al.) ⁴ - Elevated plasma levels in severe COVID-19 patients (Silvin et al.) ³⁰ - Top hub gene from transcriptome network analysis of SARS-CoV-2 infected human cell (Fagone et al.) ¹¹
S100A9	6280	NS	NS	NS	NS	- Elevated gene expression levels of S100A9 mRNA and protein level in lung samples from fatal cases of COVID-19 (Wu et al.) ²⁹ - Elevated serum levels of S100A8/A9 are correlated with inferior clinical outcomes in COVID-19 patients (Chen et al.) ²⁴ - Elevated plasma levels in severe COVID-19 patients (Silvin et al.) ³⁰ - Top hub gene from transcriptome network analysis of SARS-CoV-2 infected human cell (Fagone et al.) ¹¹
S100A10	6281	NS	NS	-0,4801333	0,08343353	Elevated anti- Annexin A2 antibodies associated with high mortality in COVID-19 patients (Zuniga et al.) ³¹
S100A11	6282	0,4543227	0,0858988	NS	NS	Elevated gene expression levels of S100A11 mRNA and protein level in lung samples in fatal COVID-19 cases (Wu et al.) ²⁹
S100A12	6283	0,43317817	0,06620747	NS	NS	- Increased gene expression levels of S100A12 mRNA and protein level in lung samples in fatal COVID-19 cases (Wu et al.) ²⁹ - Single-cell RNASeq detects S100A12+ neutrophils in the blood of patients with severe COVID-19 (Combes et al.) ³² - Plasma levels of S100A12 elevated in severe COVID-19 patients (Arunachalam et al.) ³³ - Top hub gene from transcriptome network analysis of SARS-CoV-2 infected human cell (Fagone et al.) ¹¹
S100B	6285	NA	NA	NA	NA	Detection of serum S100B associated with disease severity (Aceti et al.) ³⁴
S100P	6286	NS	NS	1,47488119	0,02103115	Elevated gene expression of S100P mRNA and protein in lung samples in fatal cases (Wu et al.) ²⁹
ST2	9173	NA	NA	NA	NA	- Elevated serum levels of ST2 in patients with COVID-19 (Zeng et al.) ³⁵ - Interest of targeting ST2 based on increased expression in COVID-19 (Zizzo et al.) ²⁸
TSLP	85480	NS	NS	NS	NS	- Elevated serum levels of TSLP in COVID-19 patients (Choreño-Parra et al.) ²⁵ - Increased production of TSLP during lung inflammation associated with allergic asthma (Atamas et al.) ²⁶
CRLF2 (TSLPR)	14281	NA	NA	NA	NA	Elevated serum levels in COVID-19 patients (Choreño-Parra et al.) ²⁵

NA: Not available; NS: Not significant

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