

Supplementary Table 1: Drugs involved in COVID-19 therapy and their associated genes						
Drug	DrugBank ID	Category	Target	Enzyme	Transporters	Carriers
<b>Anti-Cytokine/Anti-Inflammatory</b>						
Tocilizumab	DB06273	Interleukin Inhibitor	IL6R	CYP3A4		
Sarilumab	DB11767	Interleukin Inhibitor	IL6R, FCGR1A,	CYP3A4		
Anakinra	DB00026	Interleukin Inhibitor	IL1R1			
Siltuximab	DB09036	Interleukin Inhibitor	IL6	CYP3A4		
Leflunomide	DB01097	Immunosuppressants	<b>DHODH, AHR, PTK2B</b>	<b>CYP2C9, CYP1A2</b>	ABCG2	
Clazakizumab	DB12849	Immunoglobulins				
Prazosin	DB00457	Cardiovascular Agents	<b>ADRA1A, ADRA1B, ADRA1D, KCNH2, ADRA2A, ADRA2B,</b>		<b>SLC22A1, SLC22A3, ABCB1, ABCG2</b>	ORM1
Canakinumab	DB06168	Immunosuppressants	IL1B			
Naltrexone	DB00704	Analgesics	OPRD1, OPRM1, OPRK1, SIGMAR1	UGT1A1		
Ketamine	DB01221	Anesthetics	<b>GRIN3A, TACR1, DRD2, OPRD1, SLC6A2, OPRK1, OPRM1, HTR3A, CHRNA7, BCHE, NOS1</b>	<b>CYP2C9, CYP3A4, CYP2B6, PTGS1, CYP2C8</b>		
Sirukumab	DB11803	Immunosuppressants				
Fluoxetine	DB00472	Antidepressants	SLC6A4,	CYP2C19,	ABCB1	ALB, ORM1
Astegolimab						
Ulinastatin	DB12038	Hemostatics				
Mavrilimumab	DB12534	Immunoglobulins				
Axatilimab						

Lenzilumab	DB15148					
Sargramostim	DB00020	Immunostimulants	CSF2RA, IL3RA,			
Tofacitinib	DB08895	Immunosuppressants	JAK1, JAK2, JAK3, <b>TYK2</b>	CYP3A4, CYP2C19		ALB
Leronlimab	DB05941	Anti-Retroviral Agents	CCR5			
Eculizumab	DB01257	Immunosuppressants	C5			
Dexamethasone	DB01234	Corticosteroids	<b>NR3C1, NR0B1, ANXA1, NOS2, NR1I2</b>	HSD11B2, CYP3A4, HSD11B1, CYP3A5, CYP3A7, CYP17A1, <b>CYP1A1, CYP2A6,</b> CYP2B6, CYP2C19, <b>CYP2C8,</b> CYP2E1, <b>CYP3A43,</b> CYP4A11, CYP11B1	ABCB1, SLC22A8, ABCB11, ABCC2, ABCG2, <b>SLCO1A2</b>	ALB
Apremilast	DB05676	Immunosuppressants	PDE4	CYP3A4, <b>CYP2A6,</b> CYP1A2	ABCB1	
Cenicriviroc	DB11758	Anti-Retroviral Agents				
Icatibant	DB06196	Analgesics	BDKRB2, <b>ANPEP</b>			
Razuprotafib						
Naproxen	DB00788	Analgesics	PTGS1, PTGS2	<b>CYP2C9, CYP1A2, CYP2C8, UGT2B7, UGT1A3, UGT1A6, UGT1A7, UGT1A8, UGT1A9, UGT1A10</b>	<b>SLCO1A2, SLC22A6, ABCB11, ABCB1, SLC22A8</b>	ALB

Baricitinib	DB11817	Immunosuppressants	JAK1, JAK2, PTK2B, JAK3	CYP3A4	SLC22A8, ABCG2, <b>SLC47A2</b> , SLC22A6, SLC22A2, <b>SLCO1B3</b> , ABCB1	
Nicotine	DB00184	Nervous system drugs	CHRNA4, <b>CHRNA7</b> , CHRN2, CHRNA2, <b>CHRNA3</b> , <b>CHRNA5</b> , CHRNA6, <b>CHRNA9</b> , <b>CHRNA10</b> , <b>CHRN3</b> , CHRN4, CYP19A1, CHAT	<b>CYP2A6</b> , <b>CYP2E1</b> , <b>CYP2A13</b> , <b>CYP2B6</b> , <b>CYP1A1</b> , <b>CYP1A2</b> , <b>CYP2C19</b> , <b>CYP2C8</b> , <b>CYP2C9</b> , <b>CYP2D6</b> , <b>CYP3A4</b> , <b>MAOA</b> , <b>MAOB</b>	SLC22A2, <b>SLC22A1</b> , SLC22A3, <b>SLC22A5</b> , <b>SLC22A4</b>	
Disulfiram	DB00822	Nervous system drugs	ALDH2, DBH	CYP2E1, CYP3A4, CYP3A5	ABCB11	
<b>Inhibit viral entry</b>						
Hydroxychloroquine	DB01611	Antiprotozoals	TLR7, TLR9, ACE2	CYP3A4, <b>CYP2D6</b> , <b>CYP2C8</b>	ABCB1, <b>SLCO1A2</b>	ALB
Chloroquine	DB00608	Antiprotozoals	GSTA2, TNF, TLR9, HMGB1, GSTM1, ACE2	<b>CYP2C8</b> , <b>CYP3A4</b> , <b>CYP3A5</b> , <b>CYP2D6</b> , <b>CYP1A1</b>	ABCB1	ALB
Camostat Mesylate (Camostat)	DB13729	Hemostatics	PRSS1, <b>TMPS2</b> , ST14, CCK			

Umifenovir	DB13609	Antiviral		CYP3A4, FMO3, FMO1, CYP2E1, CYP1A2, <b>CYP2D6</b> , <b>CYP2C9</b> , CYP3A5, <b>UGT1A9</b> , UGT2B7		
DAS181	DB15313	Recombinant Proteins				
Losartan	DB00678	Cardiovascular System drugs	AGTR1	<b>CYP2C9</b> , <b>CYP3A4</b> , <b>CYP2C19</b> , <b>UGT1A1</b> , <b>UGT1A3</b> , <b>UGT1A10</b> , <b>UGT2B7</b> , <b>UGT2B17</b> , <b>CYP2C8</b>	ABCB1, SLC22A6, SLC22A12, <b>SLC2A9</b> , ABCB11	ALB
Isotretinoin	DB00982	Dermatologicals	RARA, RARG	CYP3A4		ALB
Telmisartan	DB00966	Cardiovascular System drugs	AGTR1, PPARG	CYP2C19, <b>UGT1A3</b>	ABCB1, ABCC2, ABCG2, ABCB11	
Ramipril	DB00178	Cardiovascular System drugs	ACE, BDKRB1	BCHE	SLC15A1, <b>SLC15A2</b>	
Nicotine	DB00184	Nervous system drugs	CHRNA4, <b>CHRNA7</b> , CHRNB2, CHRNA2, <b>CHRNA3</b> , <b>CHRNA5</b> , CHRNA6, <b>CHRNA9</b> , <b>CHRNA10</b> , <b>CHRNB3</b> , CHRNB4, CYP19A1, CHAT	<b>CYP2A6</b> , <b>CYP2E1</b> , <b>CYP2A13</b> , <b>CYP2B6</b> , <b>CYP1A1</b> , <b>CYP1A2</b> , <b>CYP2C19</b> , <b>CYP2C8</b> , <b>CYP2C9</b> , <b>CYP2D6</b> , <b>CYP3A4</b> , <b>MAOA</b> , <b>MAOB</b>	SLC22A2, <b>SLC22A1</b> , SLC22A3, <b>SLC22A5</b> , <b>SLC22A4</b>	

**Inhibit viral replication**

Remdesivir	DB14761	Antiviral Agents	rep (Organism: SARS-CoV2)	<b>CYP2C8,</b> <b>CYP2D6,</b> <b>CYP3A4</b>	<b>SLCO1B1,</b> <b>ABCB1,</b> <b>SLCO1B3,</b> <b>ABCB11,</b> <b>ABCC4,</b> <b>SLC10A1</b>	
Favipiravir	DB12466	Antiviral Agents		AOX1, XDH, <b>CYP2C8,</b> CYP2E1	ABCB1, SLC22A6, SLC22A8, SLC22A12	ALB
Ribavirin	DB00811	Antiviral Agents	IMPDH1, IMPDH2	ADK, NT5C2	SLC29A1, SLC28A3	
Darunavir	DB01264	Antiviral Agents		<b>CYP3A4,</b> <b>CYP2D6</b>	<b>SLCO1B1,</b> <b>ABCB1</b>	ALB, ORM1
Clevudine	DB06683	Antiviral Agents				
Lopinavir	DB01601	Antiviral Agents		CYP3A4, <b>CYP2D6,</b> CYP1A2, CYP2C19, CYP2B6, <b>CYP2C9</b>	ABCB1, <b>SLCO1B1,</b> <b>SLCO1B3,</b> ABCB11	ORM1, ALB
Ritonavir	DB00503	Antiviral Agents	NR1I2	CYP3A4, <b>CYP2D6,</b> <b>CYP2C9,</b> CYP2C19, CYP2B6, <b>CYP2C8,</b> CYP1A2, CYP3A5, CYP3A7	ABCB1, <b>ABCC1,</b> <b>SLCO1A2,</b> ABCC2, ABCG2, <b>SLCO1B1,</b> <b>SLCO2B1,</b> ABCB11, <b>SLCO1B3</b>	ALB, ORM1
Interferon alfa-2b, recombinant	DB00105	Immunostimulants	IFNAR2, IFNAR1	CYP1A2		
Famotidine	DB00927	Gastrointestinal Agents	HRH2	CYP1A2	SLC22A6, SLC22A8, SLC22A2, SLC47A1	
Rintatolimod						
EIDD-2801	DB15661	Experimental Unapproved treatment for COVID-19				

Peginterferon lambda-1a	DB14767					
AT-527						
Merimepodib	DB04862	Benzene Derivatives				
Disulfiram	DB00822	Nervous system drugs	ALDH2, DBH	CYP2E1, CYP3A4, CYP3A5	ABCB11	
<b>Others</b>						
Deferoxamine	DB00746	Antagonist	APP	XDH		
Tranexamic Acid	DB00302	Hemostatics	PLG		<b>SLC15A2</b>	
Ruxolitinib	DB08877	Antineoplastic and Immunomodulating Agents	JAK1, JAK2	CYP3A4		
Sirolimus	DB00877	Immunosuppressants	MTOR, FKBP1A, FGF2	CYP3A4, CYP3A5, CYP3A7	ABCB1, <b>SLCO1B1</b> , SLC47A1	
Enoxaparin	DB01225	Cardiovasucular Agents	<b>SERPINC1, F10</b>	MPO,		
Fluvoxamine	DB00176	Antidepressants	SLC6A4, KCNH2	<b>CYP2D6,</b> <b>CYP1A2,</b> <b>CYP1A1,</b> <b>CYP3A4,</b> <b>CYP2C9,</b> <b>CYP2C19,</b> <b>CYP2B6</b>	ABCB1, ABCB11	
Chlorhexidine	DB00878	Anti Infective Agents				ALB
Acalabrutinib	DB11703	Antineoplastic and Immunomodulating Agents	BTK	CYP3A4, CYP3A5		ALB
AT-001	DB15121					
Dapagliflozin	DB06292	Blood Glucose lowering Agents	SLC5A2	<b>CYP1A1,</b> <b>CYP1A2,</b> <b>CYP2A6,</b> <b>CYP2C9,</b> <b>CYP2D6,</b> <b>CYP3A4,</b> <b>UGT1A9,</b> <b>UGT2B4,</b> <b>UGT2B7</b>	ABCB1	

Progesterone	DB00396	Neurology Drugs	PGR, ESR1, NR3C2, CYP17A1, OPRK1, ORM1, NR3C1, AR, SHBG, ESR2	CYP3A5, CYP2C9, CYP3A7, CYP2C19, CYP3A4, CYP17A1, CYP1A1, CYP1B1, CYP2A6, CYP2D6	ABCB1, SLC22A2, SLC22A1, SLC22A3, ABCB11, ABCC1, SLC10A1, SLC01B1, ABCG2, SLC01B3	
Acetylcysteine	DB06151	Anti-Infective Agents	GSS, SLC7A11, ACY1, IKBKB, CHUK, GRIN2B, GRIN1, GRIN2A, GRIN2D, GRIN3A		SLC01B1, SLC22A6	
Heparin	DB01109	Cardiovascular Agents	SERPINC1, F10, SELP, FGFR4, FGF4, FGF19, FGFR1, FGF1, FGFR2, FGF2, PF4, HGF	HPSE		SERPINA7
Dornase Alfa	DB00003	Respiratory System Drugs				
Nitric Oxide	DB00435	Respiratory System Drugs	GUCY1A2, MT1A, IDO1	ALDH2, CYP1A2, CYP2B6, CYP3A4		
Galidesivir	DB11676	Experimental Unapproved Treatment for COVID-19				
Human interferon beta	DB14999	Anti-Infective Agents	IFNAR1	CYP1A2		ALB
Triazavirin	DB15622	Antiviral Agents				
TMC-310911	DB15623	Antiviral Agents				
AZD1222	DB15656	Experimental Unapproved Treatment for COVID-19				

Fingolimod	DB08868	Immunosuppressants	<b>S1PR5, HDAC1, S1PR1, S1PR4, S1PR3</b>	SPHK1, CYP2E1, <b>CYP4F2</b>	SLC1A2, SLC1A3, ABCB1, <b>ABCC1</b>	
Methylprednisolone	DB00959	Corticosteroids	<b>NR3C1, ANXA1</b>	CYP3A4, <b>CYP2A6</b> , CYP1B1, CYP2B6, <b>CYP2C8</b> , CYP2C19, <b>CYP2C9</b>	ABCB1	ALB
Bevacizumab	DB00112	Antineoplastic and Immunomodulating Agents	VEGFA, C1QA, C1QB, C1QC, FCGR3A, FCGR1A, <b>FCGR2A</b> , FCGR2B, FCGR2C			
Azithromycin	DB00207	Anti-Bacterial Agents	PADI4	CYP3A4	ABCB1, ABCC2	
N4-Hydroxycytidine	DB15660	Experimental Unapproved Treatment for COVID-19				
Elbasvir	DB11574	Antiviral Agents		CYP3A4, CYP3A5, CYP3A7, <b>CYP3A43</b>	ABCB1	
GS-441524	DB15686	Antiviral Agents	rep (SARS COV-2)			
Tridecactide	DB15687	Experimental Unapproved Treatment for COVID-19				
Metenkefalin	DB12668	Experimental Unapproved Treatment for COVID-19	OPRD1, <b>OPRM1</b>	<b>CPA6</b>		
Vazegepant	DB15688	Experimental Unapproved Treatment for COVID-19	CALCRL			



Ibuprofen	DB01050	Analgesics	PTGS2, PTGS1, BCL2, THBD, FABP2, PPARG, CFTR, PPARA, GP1BA, S100A7	CYP2C9, CYP2C8, CYP2C19, UGT1A3, UGT1A9, UGT2B4, UGT2B7, UGT2B7, CYP3A4	SLCO2B1, ABCB1, ABCC4, ABCC1, SLCO1A2, SLC22A6, SLC22A8, SLC22A11	ALB
Anti-SARS-CoV-2 REGN-COV2	DB15691	Experimental Unapproved Treatment for COVID-19				
COVID-19 convalescent plasma	DB15692	Experimental Unapproved Treatment for COVID-19				
INO-4800	DB15693	Experimental Unapproved Treatment for COVID-19				
Colchicine	DB01394	Musculoskeletal System	TUBB	CYP3A4, CYP2B6, CYP2C8, CYP2E1	ABCB1	ALB
LY-CoV555	DB15718	Experimental Unapproved Treatment for COVID-19				