

Immunomodulatory therapies for COVID-19 from the rheumatology perspective: a systematic literature review to inform EULAR points to consider

Online Supplementary Material

Table of Contents

	Page
Online Supplementary Text S1: Search strategy for pathophysiology of COVID-19	2
Online Supplementary Text S2: Search strategy for COVID-19 treatment	13
Online Supplementary Text S3: Search strategy for COVID-19 and rheumatic and musculoskeletal diseases.	27
Online Supplementary Text S4: Research questions and PICOs	35
Online Supplementary Text S5: Eligibility criteria	44

On line supplementary Text S6: Risk of bias tools	45
On line supplementary Table S1: Flowchart of the 3 searches (Part 1)	63
On line supplementary Table S2: Flowchart of the 3 searches (Part 2)	65
On line supplementary Table S3: Design of studies retrieved by the SLR.	67
On line supplementary Table S4: Characteristics of randomized controlled trials retrieved by the SLR.	69
On line supplementary Table S5: Effect of immunomodulatory drugs assessed by prospective studies on mortality, invasive and non-invasive ventilation and on oxygen support in severe COVID-19	79
Online supplementary Text S7: List of abbreviations	80

Online Supplementary Text S1: Search strategy for pathophysiology of COVID-19**Medline**

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily <2016 to November 2, 2020>

Search Strategy: Covid & Pathophysiology

-
- 1 exp T-Lymphocytes/ (45024)
 - 2 ((T adj2 lymphocyte*) or (T adj2 cell*) or Thymus Dependent Lymphocyte*).mp(106985)
 - 3 exp B-Lymphocytes/ (10564)
 - 4 ((b adj2 cell*) or (b adj2 lymphocyte*)).mp(50718)
 - 5 B10.mp(463)
 - 6 exp Biomarkers/ (176995)
 - 7 (((biological or biochemical or biologic or immune or immunologic* or laboratory or surrogate or viral) adj3 marker*) or biomarker*).mp(250594)
 - 8 exp Biopsy/ (40157)
 - 9 (biopsy or biopsies).mp(114651)
 - 10 B-Lymphocytes, Regulatory/ (374)
 - 11 (breg* or "regulatory b cell*" or "regulatory b lymphocyte*").mp(1099)
 - 12 exp Bronchoalveolar Lavage/ (3837)
 - 13 ((Bronchoalveolar or bronchial or bronchopulmonary or Bronchioalveolar or lung or pulmonary) adj2 (lavage or wash*)).mp(8720)
 - 14 (CD16 or FCgammaRIII or (IgG adj receptor*)).mp(1978)
 - 15 Receptors, IgG/ (1403)
 - 16 Antigens, CD19/ (882)
 - 17 CD19.mp(3752)
 - 18 CD4 Antigens/ (930)
 - 19 CD4.mp(38856)
 - 20 CD8 Antigens/ (525)
 - 21 CD8.mp(24487)
 - 22 exp Chemokines/ (13572)
 - 23 (chemokine* or chemotactic* or intercrine*).mp(30771)
 - 24 exp Complement System Proteins/ (4896)
 - 25 complement.mp(31082)
 - 26 exp Cytokines/ (120609)
 - 27 (cytokine* or interleukin*).mp(171683)
 - 28 exp Dendritic Cells/ (8077)
 - 29 (((dendritic or interdigitating) adj2 cell*) or DC).mp(34118)
 - 30 exp Endothelial Cells/ (18959)
 - 31 ((endothelial or endothelium) adj2 cell*).mp(45902)
 - 32 ((endothelial or endothelium) adj3 microparticle*).mp(291)
 - 33 exp Endothelium/ (9505)
 - 34 endothelium.mp(18957)
 - 35 Eosinophils/ (2610)
 - 36 eosinophil*.mp(17889)
 - 37 exp T-Lymphocytes, Helper-Inducer/ (8679)
 - 38 "T helper cell*".mp(2113)
 - 39 exp Fibroblasts/ (27166)
 - 40 fibroblast*.mp(53774)
 - 41 exp Genes/ (100804)
 - 42 (gene or genes).mp(755066)
 - 43 exp Genome/ (155426)

44 genome*.mp(188459)
45 Genome-Wide Association Study/ (13155)
46 (GWAS or "GWA stud*" or "genome wide association stud*").mp(21707)
47 exp Hemostasis/ (9820)
48 (hemostasis or haemostasis).mp(10313)
49 exp Histology/ (33687)
50 (histology or histologic*).mp(167555)
51 ((immune or immunocompetent or immunocompetent) adj2 cell*).mp(40241)
52 exp Immune System/ (138423)
53 "immune system*".mp(44449)
54 exp Immunoglobulins/ (106188)
55 (Immunoglobulin* or "gamma-globulin*" or gammaglobulin* or tegeline or veinoglobulin*
or venoglobulin*).mp(50150)
56 Immunosenescence/ (275)
57 (Immunosenescence or immunosenescence or immunosenescence).mp(1099)
58 exp Interferon Type I/ (6119)
59 Interferon-gamma/ (7582)
60 exp Interferons/ (15621)
61 interferon*.mp(40965)
62 exp Lymphocytes/ (63730)
63 lymphocyte*.mp(97245)
64 exp Macrophages/ (32803)
65 (macrophage* or histiocyte*).mp(71015)
66 Mast Cells/ (2767)
67 ("mast cell*" or mastocyte*).mp(7573)
68 exp MicroRNAs/ (41135)
69 (microRNA* or "micro RNA*" or miRNA* or mi-RNA* or miRs).mp(71821)
70 exp Monocytes/ (8102)
71 monocyte*.mp(27872)
72 exp Nasal Lavage/ (237)
73 ((nasal or nasopharyngeal or nasopharyngeal or nose or nasopharynx) adj3 (lavage or irrigation
or aspirate* or swab* or wash* or smear* or mucosa)).mp(7261)
74 exp Killer Cells, Natural/ (5220)
75 ("natural killer*" or "NK cell*" or NK).mp(16729)
76 Neutrophils/ (10439)
77 (neutrophil* or granulocyte*).mp(47471)
78 (oropharyngeal adj3 swab*).mp(438)
79 exp Leukocytes, Mononuclear/ (74463)
80 ("peripheral blood mononuclear cell*" or PBMC or (mononuclear adj2
leukocyte*).mp(15035)
81 exp Plasma/ (4915)
82 (plasma or plasm).mp(193969)
83 Blood Platelets/ (7226)
84 (platelet* or thrombocyte*).mp(55469)
85 B-Lymphocytes, Regulatory/ (374)
86 T-Lymphocytes, Regulatory/ (6849)
87 Saliva/ (6472)
88 (saliva or spittle).mp(15463)
89 exp Serum/ (3019)
90 serum.mp(232308)
91 Sputum/ (2801)

- 92 (sputum or expectorate).mp(8692)
 93 exp Feces/ (16049)
 94 (stool* or faeces or feces).mp(32801)
 95 exp Superantigens/ (258)
 96 Superantigen*.mp(670)
 97 exp T-Lymphocytes, Helper-Inducer/ (8679)
 98 ("t helper*" or "helper cell*").mp(7829)
 99 Th1 Cells/ (2976)
 100 Th1.mp(11045)
 101 Th17 Cells/ (3538)
 102 Th17.mp(8665)
 103 Th2 Cells/ (2677)
 104 Th2.mp(9688)
 105 Th22.mp(356)
 106 Th9.mp(429)
 107 exp Thrombosis/ (15110)
 108 (thrombosis or thrombus or "blood clot*" or thrombotic).mp(54227)
 109 T-Lymphocytes, Regulatory/ (6849)
 110 (Treg or "t reg*" or (regulatory adj3 (lymphocyte* or cell*))).mp(20216)
 111 Urine/ (2116)
 112 urine.mp(55328)
 113 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75 or 76 or 77 or 78 or 79 or 80 or 81 or 82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90 or 91 or 92 or 93 or 94 or 95 or 96 or 97 or 98 or 99 or 100 or 101 or 102 or 103 or 104 or 105 or 106 or 107 or 108 or 109 or 110 or 111 or 112 (2075821)
 114 exp Coronavirus/ (19595)
 115 exp Coronavirus Infections/ (20991)
 116 ("2019-nCoV*" or 2019nCoV* or "19-nCoV*" or 19nCoV* or nCoV2019* or "nCoV-2019*" or nCoV19* or "nCoV-19*" or "COVID-19*" or COVID19* or "COVID-2019*" or COVID2019* or "HCoV-19*" or HCoV19* or "HCoV-2019*" or HCoV2019* or "2019 novel*" or Ncov* or "n-cov" or "SARS-CoV-2*" or "SARSCoV-2*" or "SARSCoV2*" or "SARS-CoV2*" or SARSCov19* or "SARS-Cov19*" or "SARSCov-19*" or "SARS-Cov-19*" or SARSCov2019* or "SARS-Cov2019*" or "SARSCov-2019*" or "SARS-Cov-2019*" or SARS2* or "SARS-2*" or SARSCoronavirus2* or "SARS-coronavirus-2*" or "SARSCoronavirus 2*" or "SARS coronavirus2*" or SARSCoronavirus2* or "SARS-coronavirus-2*" or "SARSCoronavirus 2*" or "SARS coronavirus2*" or covid).ti,ab,kw,kf. (38713)
 117 "severe acute respiratory syndrome*".ti,ab,kw,kf. (6855)
 118 ((corona* or corono*) adj1 (virus* or viral* or virinae*)).ti,ab,kw,kf. (1388)
 119 (coronavirus* or coronovirus* or coronavirinae* or CoV).ti,ab,kw,kf. (28750)
 120 114 or 115 or 116 or 117 or 118 or 119 (51103)
 121 113 and 120 (12309)
 122 limit 121 to yr="2019 -Current" (7539)

Embase

Database: Embase <1996 to November 2, 2020>

Search Strategy: Covid & Pathogenesis

1 exp t lymphocyte/ (456309)

- 2 ((T adj2 lymphocyte* or (T adj2 cell* or Thymus Dependent Lymphocyte*).mp. (591269)
- 3 exp b lymphocyte/ (147673)
- 4 ((b adj2 cell* or (b adj2 lymphocyte*).mp. (249121)
- 5 B10.mp. (2059)
- 6 biological marker/ (307140)
- 7 (((biological or biochemical or biologic or immune or immunologic* or laboratory or surrogate or viral) adj3 marker*) or biomarker*).mp. (578923)
- 8 exp biopsy/ (669360)
- 9 (biopsy or biopsies).mp. (771743)
- 10 regulatory b lymphocyte/ (960)
- 11 (breg* or "regulatory b cell*" or "regulatory b lymphocyte").mp. (3888)
- 12 lung lavage/ (45132)
- 13 ((Bronchoalveolar or bronchial or bronchopulmonary or Bronchioalveolar or lung or pulmonary) adj2 (lavage or wash*).mp. (58261)
- 14 CD16 antigen/ (8740)
- 15 (CD16 or FCgammaRIII or (IgG adj receptor*).mp. (15723)
- 16 CD19 antigen/ (15516)
- 17 CD19.mp. (28635)
- 18 CD4 antigen/ (112927)
- 19 CD4.mp. (254302)
- 20 CD8.mp. (153758)
- 21 CD8 antigen/ (67128)
- 22 exp chemokine/ (215856)
- 23 (chemokine* or chemotactic* or intercrine*).mp. (193870)
- 24 exp complement/ (45769)
- 25 complement.mp. (140206)
- 26 exp cytokine/ (1380226)
- 27 (cytokine* or interleukin*).mp. (919536)
- 28 exp dendritic cell/ (100167)
- 29 (((dendritic or interdigitating) adj2 cell*) or DC).mp. (173804)
- 30 exp endothelium cell/ (170061)
- 31 ((endothelial or endothelium) adj2 cell*).mp. (238200)
- 32 endothelial microparticle/ (1283)
- 33 ((endothelial or endothelium) adj3 microparticle*).mp. (1755)
- 34 endothelial progenitor cell/ (9075)
- 35 exp endothelium/ (110181)
- 36 endothelium.mp. (243355)
- 37 eosinophil/ (40827)
- 38 Eosinophil*.mp. (104859)
- 39 exp helper cell/ (90736)
- 40 "T helper cell".mp. (10123)
- 41 exp fibroblast/ (123146)
- 42 fibroblast*.mp. (266122)
- 43 exp gene/ (961112)
- 44 (gene or genes).mp. (3400074)
- 45 exp genome/ (273762)
- 46 genome*.mp. (548669)
- 47 genome-wide association study/ (24143)
- 48 (GWAS or "GWA stud*" or "genome wide association stud").mp. (52611)
- 49 hemostasis/ (63878)
- 50 (hemostasis or haemostasis).mp. (80520)

- 51 exp histology/ (886402)
52 (histology or histologic*).mp. (771484)
53 immunocompetent cell/ (66110)
54 ((immune or immunocompetent or immunocompetent) adj2 cell*).mp. (148896)
55 exp immune system/ (1684358)
56 "immune system".mp. (165426)
57 exp immunoglobulin/ (373027)
58 (Immunoglobulin* or "gamma-globulin*" or gammaglobulin* or tegeline or veinoglobulin* or venoglobulin*).mp. (568468)
59 immunosenescence/ (1384)
60 (Immunosenescence or immunosenescence or immunosenescence).mp. (3342)
61 exp interferon/ (499113)
62 interferon*.mp. (339214)
63 exp lymphocyte/ (674815)
64 lymphocyte*.mp. (753344)
65 exp macrophage/ (224069)
66 (macrophage* or histiocyte*).mp. (362232)
67 exp mast cell/ (33055)
68 ("mast cell*" or mastocyte*).mp. (44865)
69 exp microRNA/ (160021)
70 (microRNA* or "micro RNA*" or miRNA* or mi-RNA* or miRs).mp. (170200)
71 exp monocyte/ (96637)
72 monocyte*.mp. (177960)
73 nose smear/ (6102)
74 ((nasal or nasopharyngeal or nasopharyngeal or nose or nasopharynx) adj3 (lavage or irrigation or aspirate* or swab* or wash* or smear* or mucosa)).mp. (29983)
75 natural killer cell/ (63740)
76 ("natural killer*" or "NK cell*" or NK).mp. (98324)
77 neutrophil/ (109021)
78 (neutrophil* or granulocyte*).mp. (328852)
79 (oropharyngeal adj3 swab*).mp. (1038)
80 peripheral blood mononuclear cell/ (67396)
81 ("peripheral blood mononuclear cell*" or PBMC or (mononuclear adj2 leukocyte*)).mp. (87892)
82 exp plasma/ (142187)
83 (plasma or plasm).mp. (893214)
84 platelet microparticle/ (1568)
85 exp thrombocyte/ (79775)
86 (platelet* or thrombocyte*).mp. (331188)
87 regulatory b lymphocyte/ (960)
88 regulatory t lymphocyte/ (65724)
89 saliva/ (25032)
90 (saliva or spittle).mp. (55943)
91 exp serum/ (158337)
92 serum.mp. (1046723)
93 sputum/ (19808)
94 (sputum or expectorate).mp. (53160)
95 feces/ (43635)
96 (stool* or faeces or feces).mp. (154107)
97 superantigen/ (3561)
98 superantigen*.mp. (5363)

- 99 exp helper cell/ (90736)
 100 ("t helper*" or "helper cell*").mp. (46692)
 101 Th1.mp. (68879)
 102 Th17.mp. (34832)
 103 Th2.mp. (61592)
 104 Th22.mp. (1216)
 105 Th9.mp. (1345)
 106 exp thrombosis/ (276774)
 107 (thrombosis or thrombus or "blood clot*" or thrombotic).mp. (482680)
 108 regulatory t lymphocyte/ (65724)
 109 (Treg or "t reg*" or (regulatory adj3 (lymphocyte* or cell*))).mp. (92424)
 110 urine/ (65124)
 111 urine.mp. (352699)
 112 nasal lavage/ (1514)
 113 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75 or 76 or 77 or 78 or 79 or 80 or 81 or 82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90 or 91 or 92 or 93 or 94 or 95 or 96 or 97 or 98 or 99 or 100 or 101 or 102 or 103 or 104 or 105 or 106 or 107 or 108 or 109 or 110 or 111 or 112 (9203624)
 114 exp Coronavirinae/ (16754)
 115 exp Coronavirus infection/ (17958)
 116 ("coronavirus disease 2019" or "severe acute respiratory syndrome coronavirus 2").sh,dj. (35694)
 117 ((corona* or corono*) adj1 (virus* or viral* or virinae*)).ti,ab,kw. (1168)
 118 ("2019-nCoV*" or 2019nCoV* or "19-nCoV*" or 19nCoV* or nCoV2019* or "nCoV-2019*" or nCoV19* or "nCoV-19*" or "COVID-19*" or COVID19* or "COVID-2019*" or COVID2019* or "HCoV-19*" or HCoV19* or "HCoV-2019*" or HCoV2019* or "2019 novel*" or Ncov* or "n-cov" or "SARS-CoV-2*" or "SARSCoV-2*" or "SARSCoV2*" or "SARS-CoV2*" or SARSCov19* or "SARS-Cov19*" or "SARSCov-19*" or "SARS-Cov-19*" or SARSCov2019* or "SARS-Cov2019*" or "SARSCov-2019*" or "SARS-Cov-2019*" or SARS2* or "SARS-2*" or SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus 2*" or "SARS coronavirus2*" or SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus 2*" or "SARS coronavirus2*" or covid).ti,ab,kw. (37658)
 119 "severe acute respiratory syndrome*".ti,ab,kw. (9296)
 120 (coronavirus* or coronavirus* or coronavirinae* or CoV).ti,ab,kw. (33830)
 121 114 or 115 or 116 or 117 or 118 or 119 or 120 (64189)
 122 113 and 121 (20125)
 123 limit 122 to yr="2019 -Current" (10224)

CINAHL

8/10/2020

S106 S96 AND S104 S105 S96 AND S104 S104 S103 S97 OR S98 OR S99 OR S100 OR S101 OR S102 OR S103 (MH "Coronavirus+") S102 S101 "severe acute respiratory syndrome*" ("2019nCoV*" or 2019nCoV* or "19nCoV*" or 19nCoV* or nCoV2019* or "nCoV2019*" or nCoV19* or "nCoV-19*" or "COVID19*" or COVID19* or "COVID-2019*" or COVID2019* or "HCoV19*" or HCoV19* or "HCoV-2019*" or HCoV2019* or "2019 novel*" or Ncov* or "ncov" or "SARS-CoV-2*" or "SARSCoV-2*" or "SARSCoV2*" or "SARSCoV2*" or SARSCov19* or "SARS-Cov19*" or "SARSCov-19*" or "SARS-Cov-19*" or SARSCov2019* or "SARSCov2019*" or "SARSCov-2019*" or "SARS-Cov-2019*" or SARS2* or "SARS-2*" or

SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus 2*" or "SARScoronavirus2*" or SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus2*" or "SARS coronavirus2*" or covid)
S100 (coronavirus* or coronovirus* or coronavirinae* or CoV)
S99 ((corona* or corono*) N1 (virus* or viral* or virinae*)).
S98 ("coronavirus disease 2019" or "severe acute respiratory syndrome coronavirus 2").
S97 (MH "Coronavirus Infections+")
S96 S1 OR S12 OR S23 OR S34 OR S45 OR S56 OR S67 OR S78 OR S89 OR S12 OR S23 OR S34 OR S45 OR S56 OR S67 OR S78 OR S89 OR S10 OR S11 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S46 OR S47 OR S48 OR S49 OR S50 OR S51 OR S52 OR S53 OR S54 OR S55 OR S57 OR S58 OR S59 OR S60 OR S61 OR S62 OR S63 OR S64 OR S65 OR S66 OR S68 OR S69 OR S70 OR S71 OR S72 OR S73 OR S74 OR S75 OR S76 OR S77 OR S79 OR S80 OR S81 OR S82 OR S83 OR S84 OR S85 OR S86 OR S87 OR S88 OR S90 OR S91 OR S92 OR S93 OR S94 OR S95
S95 neutrophil* or granulocyte*
S94 urine
S93 TH9
S92 sputum or expectorate
S91 "mast cell*" or mastocyte"
S90 macrophage* or histiocyte*
S89 (MH "Eosinophils")
S88 ((dendritic or interdigitating) N2 cell*) or DC
S87 (MH "Chemokines+")
S86 (MH "Urine")
S85 Treg or "t reg*" or (regulatory N3 (lymphocyte* or cell*))
S84 thrombosis or thrombus or "blood clot*" or thrombotic
S83 (MH "Thrombosis+")
S82 Th22
S81 Th17
S80 Th2
S79 Th1
S78 (MH "Bronchoalveolar Lavage")
S77 "t helper*" or "helper cell*"
S76 (MH "Dendritic Cells")
S75 Superantigen*
S74 CD8
S73 (stool* or faeces or feces)
S72 (MH "Feces")
S71 (MH "Sputum")
S70 serum
S69 (MH "Serum")
S68 saliva or spittle
S67 endothelium
S66 (MH "Saliva")
S65 platelet* or thrombocyte*
S64 cytokine* or interleukin*
S63 (MH "Blood Platelets")
S62 plasma or plasm
S61 CD4

S60 (MH "Plasma")
S59 "peripheral blood mononuclear cell*" or PBMC or (mononuclear N2 leukocyte*)
S58 (MH "Leukocytes, Mononuclear+")
S57 oropharyngeal N3 swab*
S56 (MH "Endothelium")
S55 (MH "Neutrophils")
S54 "natural killer*" or "NK cell*" or NK
S53 (MH "Killer Cells, Natural")
S52 (MH "Cytokines")
S51 (nasal or nasopharyngeal or nasopharyngeal or nose or nasopharynx) N3 (lavage or irrigation or aspirate* or swab* or wash* or smear* or mucosa)
S50 (MH "Nasal Lavage")
S49 monocyte*
S48 CD19
S47 (MH "Monocytes")
S46 microRNA* or "micro RNA*" or miRNA* or mi-RNA* or miRs
S45 (endothelial or endothelium) N3 microparticle*
S44 (MH "MicroRNA")
S43 (MH "Mast Cells")
S42 (MH "Macrophages+")
S41 lymphocyte*
S40 complement
S39 (MH "Lymphocytes+")
S38 Interferon*
S37 (MH "Interferons")
S36 Immunosenescence or immunosenescence or immunosenescence
S35 CD16 or FCgammaRIII or (IgG N receptor*)
S34 chemokine* or chemotactic* or intercrine*
S33 Immunoglobulin* or "gamma-globulin*" or gammaglobulin* or tegeline or veinoglobulin* or venoglobulin*
S32 (MH "Immunoglobulins+")
S31 "immune system*"
S30 (MH "Immune System+")
S29 (immune or immunocompetent or immunocompetent) N2 cell*
S28 breg* or "regulatory b cell*" or "regulatory b lymphocyte*"
S27 histology or histologic*
S26 (MH "Histology")
S25 hemostasis or haemostasis
S24 (MH "Hemostasis+")
S23 (endothelial or endothelium) N2 cell*
S22 GWAS or "GWA stud*" or "genome wide association stud*"
S21 (Bronchoalveolar or bronchial or bronchopulmonary or Bronchioalveolar or lung or pulmonary)
N2 (lavage or wash*)
S20 (MH "Genome Wide Association Study")
S19 genome*
S18 (MH "Genome+")
S17 gene or genes
S16 (MH "Complement")
S15 (MH "Genes+")
S14 fibroblast*

S13 (MH "Fibroblasts+")
 S12 (MH "Endothelial Cells")
 S11 "T helper cell*"
 S10 eosinophil*
 S9 biopsy or biopsies
 S8 (MH "Biopsy")
 S7 ((biological or biochemical or biologic or immune or immunologic* or laboratory or surrogate or viral) N3 marker*) or biomarker*
 S6 (MH "Biological Markers+")
 S5 B10
 S4 (b N2 cell*) or (b N2 lymphocyte*)
 S3 (MH "B Lymphocytes")
 S2 (T N2 lymphocyte*) or (T N2 cell*) or (Thymus Dependent Lymphocyte*)
 S1 (MH "T Lymphocytes+")

The Cochrane Library

November 2, 2020

ID	Search Hits	
#1	MeSH descriptor: [T-Lymphocytes] explode all trees	3317
#2	((T near/2 lymphocyte*) or (T near/2 cell*) or (Thymus Dependent Lymphocyte*)):ti,ab,kw	13935
#3	MeSH descriptor: [B-Lymphocytes] explode all trees	491
#4	((b near/2 cell*) or (b near/2 lymphocyte*)):ti,ab,kw	6336
#5	(B10):ti,ab,kw	56
#6	MeSH descriptor: [Biomarkers] explode all trees	19928
#7	((((biological or biochemical or biologic or immune or immunologic or laboratory or surrogate or viral) near/3 marker*) or biomarker*)):ti,ab,kw	43143
#8	MeSH descriptor: [Biopsy] explode all trees	5629
#9	(biopsy or biopsies):ti,ab,kw	28898
#10	MeSH descriptor: [B-Lymphocytes, Regulatory] explode all trees	3
#11	(breg* or "regulatory b cell*" or "regulatory b lymphocyte*"):ti,ab,kw	63
#12	MeSH descriptor: [Bronchoalveolar Lavage] explode all trees	543
#13	((Bronchoalveolar or bronchial or bronchopulmonary or Bronchioalveolar or lung or pulmonary) near/2 (lavage or wash*)):ti,ab,kw	1429
#14	(CD16 or FCgammaRIII or (IgG adj receptor*)):ti,ab,kw	510
#15	MeSH descriptor: [Receptors, IgG] explode all trees	101
#16	(CD19):ti,ab,kw	766
#17	MeSH descriptor: [Antigens, CD19] explode all trees	34
#18	MeSH descriptor: [CD4 Antigens] explode all trees	169
#19	(CD4):ti,ab,kw	10970
#20	MeSH descriptor: [CD8 Antigens] explode all trees	69
#21	(CD8):ti,ab,kw	4437
#22	MeSH descriptor: [Chemokines] explode all trees	1598
#23	(chemokine* or chemotactic* or intercrine*):ti,ab,kw	2610
#24	MeSH descriptor: [Complement System Proteins] explode all trees	699
#25	(complement):ti,ab,kw	4639
#26	MeSH descriptor: [Cytokines] explode all trees	20089
#27	(cytokine* or interleukin*):ti,ab,kw	29474
#28	MeSH descriptor: [Dendritic Cells] explode all trees	268

#29	(((dendritic or interdigitating) near/2 cell*) or DC):ti,ab,kw	4416
#30	MeSH descriptor: [Endothelial Cells] explode all trees	379
#31	((endothelial or endothelium) near/2 cell*):ti,ab,kw	3779
#32	((endothelial or endothelium) near/3 microparticle*):ti,ab,kw	105
#33	MeSH descriptor: [Endothelial Progenitor Cells] explode all trees	78
#34	MeSH descriptor: [Endothelium] explode all trees	3109
#35	(endothelium):ti,ab,kw	6396
#36	MeSH descriptor: [Eosinophils] explode all trees	783
#37	(Eosinophil*):ti,ab,kw	4818
#38	MeSH descriptor: [T-Lymphocytes, Helper-Inducer] explode all trees	468
#39	("T helper cell*"):ti,ab,kw	129
#40	MeSH descriptor: [Fibroblasts] explode all trees	253
#41	(fibroblast*):ti,ab,kw	2526
#42	MeSH descriptor: [Genes] explode all trees	1581
#43	(gene*):ti,ab,kw	212810
#44	MeSH descriptor: [Genome] explode all trees	1944
#45	(genome*):ti,ab,kw	2427
#46	MeSH descriptor: [Genome-Wide Association Study] explode all trees	129
#47	(GWAS or "GWA stud*" or "genome wide association stud*"):ti,ab,kw	313
#48	MeSH descriptor: [Hemostasis] explode all trees	4848
#49	(hemostasis or haemostasis):ti,ab,kw	5675
#50	MeSH descriptor: [Histology] explode all trees	1337
#51	(histology or histologic*):ti,ab,kw	28746
#52	((immune or immunocompetent) near/2 cell*):ti,ab,kw	3654
#53	MeSH descriptor: [Immune System] explode all trees	11878
#54	("immune system*"):ti,ab,kw	5140
#55	MeSH descriptor: [Immunoglobulins] explode all trees	25489
#56	(Immunoglobulin* or "gamma-globulin*" or gammaglobulin* or tegeline or veinoglobulin* or venoglobulin*):ti,ab,kw	13773
#57	MeSH descriptor: [Immunosenescence] explode all trees	2
#58	(Immunosenescence or immunosenescense or immunosenesence):ti,ab,kw	104
#59	MeSH descriptor: [Interferon Type I] explode all trees	4393
#60	MeSH descriptor: [Interferon-gamma] explode all trees	1074
#61	MeSH descriptor: [Interferons] explode all trees	5775
#62	(interferon*):ti,ab,kw	15371
#63	MeSH descriptor: [Lymphocytes] explode all trees	5186
#64	(Lymphocyte*):ti,ab,kw	19255
#65	MeSH descriptor: [Macrophages] explode all trees	492
#66	(macrophage* or histiocyte*):ti,ab,kw	4190
#67	MeSH descriptor: [Mast Cells] explode all trees	207
#68	("mast cell*" or mastocyte*):ti,ab,kw	809
#69	MeSH descriptor: [MicroRNAs] explode all trees	153
#70	(microRNA* or "micro RNA*" or miRNA* or mi-RNA* or miRs):ti,ab,kw	972
#71	MeSH descriptor: [Monocytes] explode all trees	748
#72	(monocyte*):ti,ab,kw	4118
#73	MeSH descriptor: [Nasal Lavage] explode all trees	255
#74	((nasal or nasopharyngeal or nasopharyngeal or nose or nasopharynx) near/3 (lavage or irrigation or aspirate* or swab* or wash* or smear* or mucosa)):ti,ab,kw	3181
#75	MeSH descriptor: [Killer Cells, Natural] explode all trees	764
#76	("natural killer*" or "NK cell*" or NK):ti,ab,kw	3035
#77	MeSH descriptor: [Neutrophils] explode all trees	1367

- #78 (neutrophil* or granulocyte*):ti,ab,kw 15333
- #79 (oropharyngeal near/3 swab*):ti,ab,kw 80
- #80 MeSH descriptor: [Leukocytes, Mononuclear] explode all trees 6605
- #81 ("peripheral blood mononuclear cell*" or PBMC or (mononuclear near/2 leukocyte*)):ti,ab,kw 2901
- #82 MeSH descriptor: [Plasma] explode all trees 972
- #83 (plasma or plasm):ti,ab,kw 96931
- #84 MeSH descriptor: [Blood Platelets] explode all trees 1961
- #85 (platelet* or thrombocyte*):ti,ab,kw 28701
- #86 MeSH descriptor: [B-Lymphocytes, Regulatory] explode all trees 3
- #87 MeSH descriptor: [T-Lymphocytes, Regulatory] explode all trees 274
- #88 MeSH descriptor: [Saliva] explode all trees 2652
- #89 (saliva or spittle):ti,ab,kw 7069
- #90 MeSH descriptor: [Serum] explode all trees 868
- #91 (serum):ti,ab,kw 98631
- #92 MeSH descriptor: [Sputum] explode all trees 1262
- #93 (sputum or expectorate):ti,ab,kw 5882
- #94 MeSH descriptor: [Feces] explode all trees 2833
- #95 ((stool* or faeces or feces)):ti,ab,kw 13931
- #96 MeSH descriptor: [Superantigens] explode all trees 11
- #97 (Superantigen*):ti,ab,kw 41
- #98 ("t helper*" or "helper cell*"):ti,ab,kw 902
- #99 (Th1):ti,ab,kw 1310
- #100 (Th17):ti,ab,kw 486
- #101 (Th2):ti,ab,kw 1353
- #102 (Th22):ti,ab,kw 50
- #103 (Th9):ti,ab,kw 23
- #104 MeSH descriptor: [Thrombosis] explode all trees 4754
- #105 (thrombosis or thrombus or "blood clot*" or thrombotic):ti,ab,kw 21776
- #106 MeSH descriptor: [T-Lymphocytes, Regulatory] explode all trees 274
- #107 (Treg or "t reg*" or (regulatory near/3 (lymphocyte* or cell*))) :ti,ab,kw 1663
- #108 MeSH descriptor: [Urine] explode all trees 641
- #109 (Urine):ti,ab,kw 40231
- #110 {or #1-#109} 549437
- #111 MeSH descriptor: [Coronavirus] explode all trees 35
- #112 MeSH descriptor: [Coronavirus Infections] explode all trees 297
- #113 (((corona* or corono*) near/1 (virus* or viral* or virinae*))) :ti,ab,kw 52
- #114 ((coronavirus* or coronavirus* or coronavirinae* or CoV):ti,ab,kw 727
- #115 (("2019 nCoV" or 2019nCoV* or "19 nCoV" or 19nCoV* or nCoV2019* or "nCoV 2019" or nCoV19* or "nCoV 19" or "COVID 19" or COVID19* or "COVID 2019" or COVID2019* or "HCoV 19" or HCoV19* or "HCoV 2019" or HCoV2019* or "2019 novel" or Ncov* or "n cov" or "SARS CoV 2" or "SARSCoV 2" or "SARSCoV2" or "SARS CoV2" or SARSCov19* or "SARS Cov19" or "SARSCov 19" or "SARS Cov 19" or SARSCov2019* or "SARS Cov2019" or "SARSCov 2019" or "SARS Cov 2019" or SARS2* or "SARS 2" or SARScoronavirus2* or "SARS coronavirus 2" or "SARScoronavirus 2" or "SARS coronavirus2" or SARScoronavirus2* or "SARS coronavirus 2" or "SARScoronavirus 2" or "SARS coronavirus2" or covid)):ti,ab,kw 1106
- #116 ("severe acute respiratory syndrome" or "severe acute respiratory syndromes") 373
- #117 {or #111-#116} 1345
- #118 #110 and #117 619
- #119 #118 with Publication Year from 2019 to present, in Trials 499

Online Supplementary Text S2: Search strategy for COVID-19 treatment**Medline**

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily <2016 to week 50, 2020>

Search Strategy: Covid & Therapy

-
- 1 Abatacept/ (579)
 - 2 (Abatacept or "CTLA4 Ig" or "CTLA4 immunoglobulin" or orenicia).mp. (1197)
 - 3 ABX464.mp. dentifier, synonyms] (7)
 - 4 Adalimumab/ (2026)
 - 5 (Adalimumab or adaly or amgevita or amjevita or humira or imraldi or trudexa).mp. dentifier, synonyms] (4179)
 - 6 Interleukin 1 Receptor Antagonist Protein/ (863)
 - 7 (Anakinra or kineret or "recombinant interleukin 1 receptor antagonist" or "recombinant interleukin 1 receptor blocker" or "recombinant interleukin 1 receptor blocking agent").mp. dentifier, synonyms] (882)
 - 8 ARGX-117.mp. dentifier, synonyms] (0)
 - 9 avdoralimab.mp. dentifier, synonyms] (0)
 - 10 Azathioprine/ (1087)
 - 11 (Azathioprine or arathioprin or arathioprine or immurel or imurel).mp. dentifier, synonyms] (3327)
 - 12 (Baricitinib or olumiant).mp. dentifier, synonyms] (356)
 - 13 BDB-001.mp. dentifier, synonyms] (0)
 - 14 Bevacizumab/ (3553)
 - 15 (Bevacizumab or avastin).mp. dentifier, synonyms] (7906)
 - 16 Brensocatib.mp. dentifier, synonyms] (0)
 - 17 (Canakinumab or ilaris).mp. dentifier, synonyms] (492)
 - 18 exp "Cell- and Tissue-Based Therapy"/ (42360)
 - 19 ("cell based therapy" or "cell based therapies" or "cell therapy" or "cell therapies" or "cellular therapy" or "cellular therapies").mp. dentifier, synonyms] (17559)
 - 20 Certolizumab.mp. dentifier, synonyms] (714)
 - 21 exp Chloroquine/ (2273)
 - 22 Chloroquin*.mp. dentifier, synonyms] (4346)
 - 23 CIGB-258.mp. dentifier, synonyms] (0)
 - 24 CMAB806.mp. dentifier, synonyms] (0)
 - 25 exp Colchicine/ (886)
 - 26 Colchicine.mp. dentifier, synonyms] (2730)
 - 27 exp Adrenal Cortex Hormones/ (38366)
 - 28 (corticosteroid* or "adrenal cortex hormone*" or "cortical steroid*" or "cortico steroid*" or corticoid* or "corticosteroid agent*").mp. dentifier, synonyms] (29383)
 - 29 exp Cyclosporins/ (2310)
 - 30 Cyclosporin*.mp. dentifier, synonyms] (6643)
 - 31 CYT-107.mp. dentifier, synonyms] (0)
 - 32 exp Dexamethasone/ (5326)
 - 33 Dexamethasone.mp. dentifier, synonyms] (12801)
 - 34 DFV890.mp. dentifier, synonyms] (0)
 - 35 Ebastine.mp. dentifier, synonyms] (72)
 - 36 Eculizumab.mp. dentifier, synonyms] (1052)
 - 37 Etanercept/ (1273)
 - 38 (Etanercept or benepali or embrel or enbrel or "tumor necrosis factor receptor Fc fusion protein" or "tumour necrosis factor receptor Fc fusion protein").mp. dentifier, synonyms] (2787)

- 39 Fedratinib.mp. dentifier, synonyms] (61)
40 Filgotinib.mp. dentifier, synonyms] (87)
41 Fingolimod Hydrochloride/ (720)
42 (Fingolimod or gilenia or gilenya).mp. dentifier, synonyms] (1398)
43 (Golimumab or simponi).mp. dentifier, synonyms] (805)
44 (Guselkumab or tremfya).mp. dentifier, synonyms] (234)
45 exp Glucocorticoids/ (21083)
46 glucocorticoid*.mp. dentifier, synonyms] (22665)
47 HCR040.mp. dentifier, synonyms] (0)
48 Hydroxychloroquine/ (1171)
49 (Hydroxychloroquine or plaquenil).mp. dentifier, synonyms] (3003)
50 IFX-1.mp. dentifier, synonyms] (14)
51 Imatinib Mesylate/ (1814)
52 (Imatinib or gleevac or gleevec or glivec).mp. dentifier, synonyms] (4620)
53 exp Immunoglobulins/ (106188)
54 (Immunoglobulin* or "gamma-globulin*" or gammaglobulin* or tegeline or veinoglobulin* or venoglobulin*).mp. dentifier, synonyms] (50150)
55 exp Immunotherapy/ (44172)
56 (Immunotherap* or "biologic response modifier therap*" or "biological response modifier therap*" or "BRM therap*" or "immune therap*" or "immunoglobulin therap*" or "immunological therap*" or "immunological treatment*" or "immunomodulatory intervention*").mp. dentifier, synonyms] (48544)
57 IMU-838.mp. dentifier, synonyms] (2)
58 Infliximab/ (2440)
59 (Infliximab or flixabi or inflectra or remicade or remsima or renflexis).mp. dentifier, synonyms] (5286)
60 exp Interferons/ (15621)
61 Interferon*.mp. dentifier, synonyms] (40965)
62 Itolizumab.mp. dentifier, synonyms] (28)
63 Immunoglobulins, Intravenous/ (2436)
64 IVIG.mp. dentifier, synonyms] (2567)
65 (Ixekizumab or taltz).mp. dentifier, synonyms] (510)
66 Jakotinib.mp. dentifier, synonyms] (0)
67 Leflunomide/ (240)
68 (Leflunomide or arava).mp. dentifier, synonyms] (695)
69 Masitinib.mp. dentifier, synonyms] (63)
70 Mast Cells/ (2767)
71 ((mast adj cell*) or mastocyte*).mp. dentifier, synonyms] (7573)
72 Mavrilimumab.mp. dentifier, synonyms] (19)
73 Methotrexate/ (4535)
74 (Methotrexate or metoject or nordimet or novatrex).mp. dentifier, synonyms] (10851)
75 exp Methylprednisolone/ (2121)
76 Methylprednisolone.mp. dentifier, synonyms] (4915)
77 Mycophenolic Acid/ (1248)
78 (Mycophenolate or (mycophenolic adj acid) or myfortic or (mycophenolate adj mofetil)).mp. dentifier, synonyms] (3724)
79 (Nintedanib or intedanib).mp. dentifier, synonyms] (766)
80 exp Anti-Inflammatory Agents, Non-Steroidal/ (24544)
81 (NSAID* or "non steroid anti inflammatory agent*" or "non steroid anti inflammatory drug*" or "non steroidal anti inflammatory agent*" or "non steroidal anti inflammatory drug*" or "nonsteroid antiinflammatory agent*" or "nonsteroid antiinflammatory drug*" or "nonsteroidal

antiinflammatory agent*" or "nonsteroidal antiinflammatory drug*" or "non steroid antiinflammatory agent*" or "non steroid antiinflammatory drug*" or "non steroidal antiinflammatory agent*" or "non steroidal antiinflammatory drug*" or "nonsteroid anti inflammatory agent*" or "nonsteroid anti inflammatory drug*" or "nonsteroidal anti inflammatory agent*" or "nonsteroidal anti inflammatory drug*").mp. dentifier, synonyms] (12245)

82 (Ocrelizumab or ocrevus).mp. dentifier, synonyms] (285)

83 Otilimab.mp. dentifier, synonyms] (2)

84 Programmed Cell Death 1 Receptor/ (4857)

85 (PD-1 or Gilvetmab or "programmed cell death 1 receptor").mp. dentifier, synonyms] (13078)

86 (Pembrolizumab or keytruda or lambrolizumab).mp. dentifier, synonyms] (4063)

87 exp Prednisolone/ (4716)

88 Prednisolone.mp. dentifier, synonyms] (7040)

89 Prednisone/ (3337)

90 Prednisone.mp. dentifier, synonyms] (7442)

91 (Ravulizumab or ultomiris).mp. dentifier, synonyms] (29)

92 ((recombinant adj2 "interleukin 2") or lymphocult).mp. dentifier, synonyms] (92)

93 (recombinant adj2 "interleukin 7").mp. dentifier, synonyms] (18)

94 Rituximab/ (4433)

95 (Rituximab or mabthera or truxima).mp. dentifier, synonyms] (10152)

96 (Ruxolitinib or jakafi or jakavi).mp. dentifier, synonyms] (1043)

97 (Sarilumab or kevzara).mp. dentifier, synonyms] (133)

98 (Secukinumab or cosentyx).mp. dentifier, synonyms] (1013)

99 Selinexor.mp. dentifier, synonyms] (163)

100 Siltuximab.mp. dentifier, synonyms] (88)

101 exp Stem Cells/ (56740)

102 "stem cell*".mp. dentifier, synonyms] (126152)

103 Sulfasalazine/ (376)

104 (Sulphasalazine or salazopyrine or sulfasalazine or salazosulfapyridine).mp. dentifier, synonyms] (1086)

105 TD-0903.mp. dentifier, synonyms] (0)

106 (Tocilizumab or roactemra).mp. dentifier, synonyms] (2307)

107 (Tranilast or rizaben).mp. dentifier, synonyms] (144)

108 ("tumor necrosis factor alpha inhibitor*" or "tumour necrosis factor alpha inhibitor*").mp. dentifier, synonyms] (517)

109 ("anti TNF agent*" or "anti TNF alpha agent*").mp. dentifier, synonyms] (834)

110 ("anti tumor necrosis factor agent*" or "anti tumour necrosis factor agent*").mp. dentifier, synonyms] (181)

111 ("TNF alpha inhibitor*" or "TNF inhibitor*").mp. dentifier, synonyms] (1775)

112 ("tumor necrosis factor inhibitor*" or "tumour necrosis factor inhibitor*").mp. dentifier, synonyms] (257)

113 (Upadacitinib or rinvoq).mp. dentifier, synonyms] (116)

114 (Ustekinumab or stelara).mp. dentifier, synonyms] (1401)

115 Ustekinumab/ (605)

116 Vafidemstat.mp. dentifier, synonyms] (1)

117 vMIP.mp. dentifier, synonyms] (20)

118 zilucoplan.mp. dentifier, synonyms] (4)

119 (acalabrutinib or "acp 196" or acp196 or calquence).mp. dentifier, synonyms] (141)

120 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or

- 70 or 71 or 72 or 73 or 74 or 75 or 76 or 77 or 78 or 79 or 80 or 81 or 82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90 or 91 or 92 or 93 or 94 or 95 or 96 or 97 or 98 or 99 or 100 or 101 or 102 or 103 or 104 or 105 or 106 or 107 or 108 or 109 or 110 or 111 or 112 or 113 or 114 or 115 or 116 or 117 or 118 or 119 (506357)
- 121 exp Coronavirus/ (19595)
- 122 exp Coronavirus Infections/ (20991)
- 123 ("2019-nCoV*" or 2019nCoV* or "19-nCoV*" or 19nCoV* or nCoV2019* or "nCoV-2019*" or nCoV19* or "nCoV-19*" or "COVID-19*" or COVID19* or "COVID-2019*" or COVID2019* or "HCoV-19*" or HCoV19* or "HCoV-2019*" or HCoV2019* or "2019 novel*" or Ncov* or "n-cov" or "SARS-CoV-2*" or "SARSCoV-2*" or "SARSCoV2*" or "SARS-CoV2*" or SARSCov19* or "SARS-Cov19*" or "SARSCov-19*" or "SARS-Cov-19*" or SARSCov2019* or "SARS-Cov2019*" or "SARSCov-2019*" or "SARS-Cov-2019*" or SARS2* or "SARS-2*" or SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus 2*" or "SARS coronavirus2*" or SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus 2*" or "SARS coronavirus2*" or covid).ti,ab,kw,kf. (38713)
- 124 "severe acute respiratory syndrome".ti,ab,kw,kf. (6855)
- 125 ((corona* or coronov*) adj1 (virus* or viral* or virinae*).ti,ab,kw,kf. (1388)
- 126 (coronavirus* or coronovirus* or coronavirinae* or CoV).ti,ab,kw,kf. (28750)
- 127 121 or 122 or 123 or 124 or 125 or 126 (51103)
- 128 120 and 127 (5416)
- 129 limit 128 to yr="2019 -Current" (3615)

Embase

Database: Embase <1996 to week 50, 2020>

Search Strategy: Covid & Therapy

-
- 1 abatacept/ (9193)
- 2 (Abatacept or "CTLA4 Ig" or "CTLA4 immunoglobulin" or orenicia).mp. (9964)
- 3 ABX464.mp. (17)
- 4 acalabrutinib/ (534)
- 5 (Acalabrutinib or "acp 196" or acp196 or calquence).mp. (569)
- 6 adalimumab/ (33496)
- 7 (Adalimumab or adaly or amgevita or amjevita or humira or imraldi or trudexa).mp. (34253)
- 8 anakinra/ (2412)
- 9 (Anakinra or kineret or "recombinant interleukin 1 receptor antagonist" or "recombinant interleukin 1 receptor blocker" or "recombinant interleukin 1 receptor blocking agent").mp. (8661)
- 10 ARGX-117.mp. (1)
- 11 avdoralimab.mp. (1)
- 12 azathioprine/ (71856)
- 13 (Azathioprine or arathioprin or arathioprine or immurel or imurel).mp. (73616)
- 14 baricitinib/ (1171)
- 15 (Baricitinib or olumiant).mp. (1215)
- 16 BDB-001.mp. (1)
- 17 bevacizumab/ (58063)
- 18 (Bevacizumab or avastin).mp. (59931)
- 19 brensocatib/ (2)
- 20 Brensocatib.mp. (2)
- 21 canakinumab/ (3040)
- 22 (Canakinumab or ilaris).mp. (3139)
- 23 exp cell therapy/ (202065)

- 24 ("cell based therapy" or "cell based therapies" or "cell therapy" or "cell therapies" or "cellular therapy" or "cellular therapies").mp. (68705)
- 25 Certolizumab.mp. (7209)
- 26 chloroquine/ (24968)
- 27 Chloroquin*.mp. (28360)
- 28 CIGB-258.mp. (0)
- 29 CMAB806.mp. (0)
- 30 exp colchicine/ (20097)
- 31 Colchicine.mp. (21834)
- 32 exp corticosteroid/ (713138)
- 33 (corticosteroid* or "adrenal cortex hormone*" or "cortical steroid*" or "cortico steroid*" or corticoid* or "corticosteroid agent*").mp. (254142)
- 34 cyclosporine/ (12119)
- 35 Cyclosporin*.mp. (128632)
- 36 CYT-107.mp. (25)
- 37 dexamethasone/ (116542)
- 38 Dexamethasone.mp. (125934)
- 39 DFV890.mp. (0)
- 40 ebastine/ (1148)
- 41 Ebastine.mp. (1181)
- 42 eculizumab/ (5141)
- 43 Eculizumab.mp. (5371)
- 44 etanercept/ (31276)
- 45 (Etanercept or benepali or embrel or enbrel or "tumor necrosis factor receptor Fc fusion protein" or "tumour necrosis factor receptor Fc fusion protein").mp. (32234)
- 46 fedratinib/ (398)
- 47 Fedratinib.mp. (413)
- 48 filgotinib/ (383)
- 49 Filgotinib.mp. (389)
- 50 fingolimod/ (9700)
- 51 (Fingolimod or gilenia or gilenya).mp. (9947)
- 52 golimumab/ (6880)
- 53 (Golimumab or simponi).mp. (7051)
- 54 guselkumab/ (692)
- 55 (Guselkumab or tremfya).mp. (720)
- 56 exp glucocorticoid/ (547889)
- 57 glucocorticoid*.mp. (109216)
- 58 HCR040.mp. (0)
- 59 hydroxychloroquine/ (23249)
- 60 (Hydroxychloroquine or plaquenil).mp. (24266)
- 61 IFX-1.mp. (95)
- 62 imatinib/ (41910)
- 63 (Imatinib or gleevac or gleevec or glivec).mp. (43723)
- 64 exp immunoglobulin/ (373027)
- 65 (Immunoglobulin* or "gamma-globulin*" or gammaglobulin* or tegeline or veinoglobulin* or venoglobulin*).mp. (568468)
- 66 exp immunotherapy/ (191127)
- 67 (Immunotherap* or "biologic response modifier therap*" or "biological response modifier therap*" or "BRM therap*" or "immune therap*" or "immunoglobulin therap*" or "immunological therap*" or "immunological treatment*" or "immunomodulatory intervention*").mp. (182967)
- 68 IMU-838.mp. (8)

- 69 infliximab/ (50638)
- 70 (Infliximab or flixabi or inflectra or remicade or remsima or renflexis).mp. (51789)
- 71 exp interferon/ (499113)
- 72 Interferon*.mp. (339214)
- 73 itolizumab/ (77)
- 74 IVIG.mp. (16952)
- 75 ixekizumab/ (1706)
- 76 (Ixekizumab or taltz).mp. (1763)
- 77 Jakotinib.mp. (0)
- 78 leflunomide/ (11660)
- 79 (Leflunomide or arava).mp. (11973)
- 80 masitinib/ (507)
- 81 Masitinib.mp. (537)
- 82 mast cell/ (32134)
- 83 ((mast adj cell*) or mastocyte*).mp. (44865)
- 84 mavrilimumab/ (110)
- 85 Mavrilimumab.mp. (110)
- 86 methotrexate/ (138928)
- 87 (Methotrexate or metoject or nordimet or novatrex).mp. (142684)
- 88 methylprednisolone/ (78064)
- 89 Methylprednisolone.mp. (85801)
- 90 mycophenolic acid/ (17362)
- 91 (Mycophenolate or (mycophenolic adj acid) or myfortic or (mycophenolate adj mofetil)).mp. (68499)
- 92 nintedanib/ (3037)
- 93 (Nintedanib or intedanib).mp. (3252)
- 94 exp nonsteroid antiinflammatory agent/ (580879)
- 95 (NSAID* or "non steroid anti inflammatory agent*" or "non steroid anti inflammatory drug*" or "non steroidal anti inflammatory agent*" or "non steroidal anti inflammatory drug*" or "nonsteroid antiinflammatory agent*" or "nonsteroid antiinflammatory drug*" or "nonsteroidal antiinflammatory agent*" or "nonsteroidal antiinflammatory drug*" or "non steroid antiinflammatory agent*" or "non steroid antiinflammatory drug*" or "non steroidal antiinflammatory agent*" or "non steroidal antiinflammatory drug*" or "nonsteroid anti inflammatory agent*" or "nonsteroid anti inflammatory drug*" or "nonsteroidal anti inflammatory agent*" or "nonsteroidal anti inflammatory drug*").mp. (131423)
- 96 ocrelizumab/ (1735)
- 97 (Ocrelizumab or ocrevus).mp. (1805)
- 98 otilimab/ (17)
- 99 Otilimab.mp. (17)
- 100 gilvetmab/ (251)
- 101 (PD-1 or Gilvetmab).mp. (31251)
- 102 programmed cell death 1 receptor.mp. (221)
- 103 pembrolizumab/ (15300)
- 104 (Pembrolizumab or keytruda or lambrolizumab).mp. (16207)
- 105 prednisolone/ (97691)
- 106 Prednisolone.mp. (108112)
- 107 prednisone/ (127911)
- 108 Prednisone.mp. (132005)
- 109 ravulizumab/ (93)
- 110 (Ravulizumab or ultomiris).mp. (96)
- 111 exp recombinant interleukin 2/ (5784)

- 112 ((recombinant adj2 "interleukin 2") or lymphocult).mp. (4146)
113 exp recombinant interleukin 7/ (339)
114 (recombinant adj2 "interleukin 7").mp. (363)
115 rituximab/ (79475)
116 (Rituximab or mabthera or truxima).mp. (83435)
117 ruxolitinib/ (4756)
118 (Ruxolitinib or jakafi or jakavi).mp. (4910)
119 sarilumab/ (594)
120 (Sarilumab or kevzara).mp. (615)
121 secukinumab/ (3533)
122 (Secukinumab or cosentyx).mp. (3646)
123 selinexor/ (664)
124 Selinexor.mp. (699)
125 siltuximab/ (687)
126 Siltuximab.mp. (706)
127 exp stem cell/ (362533)
128 (Stem adj cell*).mp. (538786)
129 salazosulfapyridine/ (19864)
130 (Sulphasalazine or salazopyrine or sulfasalazine or salazosulfapyridine).mp. (20375)
131 TD-0903.mp. (1)
132 tocilizumab/ (12168)
133 (Tocilizumab or roactemra).mp. (12676)
134 tranilast/ (1181)
135 (Tranilast or rizaben).mp. (1222)
136 exp tumor necrosis factor inhibitor/ (90671)
137 ("tumor necrosis factor alpha inhibitor*" or "tumour necrosis factor alpha inhibitor*").mp. (6793)
138 ("anti TNF agent*" or "anti TNF alpha agent*").mp. (4699)
139 ("anti tumour necrosis factor agent*" or "anti tumor necrosis factor agent*").mp. (582)
140 ("TNF alpha inhibitor*" or "TNF inhibitor*").mp. (7426)
141 ("tumour necrosis factor inhibitor*" or "tumor necrosis factor inhibitor*").mp. (14939)
142 upadacitinib/ (408)
143 (Upadacitinib or rinvoq).mp. (417)
144 ustekinumab/ (7049)
145 (Ustekinumab or stelara).mp. (7247)
146 vafidemstat/ (6)
147 Vafidemstat.mp. (6)
148 vMIP.mp. (139)
149 zilucoplan/ (25)
150 zilucoplan.mp. (25)
151 itolizumab.mp. (81)
152 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75 or 76 or 77 or 78 or 79 or 80 or 81 or 82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90 or 91 or 92 or 93 or 94 or 95 or 96 or 97 or 98 or 99 or 100 or 101 or 102 or 103 or 104 or 105 or 106 or 107 or 108 or 109 or 110 or 111 or 112 or 113 or 114 or 115 or 116 or 117 or 118 or 119 or 120 or 121 or 122 or 123 or 124 or 125 or 126 or 127 or 128 or 129 or 130 or 131 or 132 or 133 or 134 or 135 or 136 or 137 or 138 or 139 or 140 or 141 or 142 or 143 or 144 or 145 or 146 or 147 or 148 or 149 or 150 or 151 (3020762)

- 153 exp Coronavirinae/ (16754)
 154 exp Coronavirus infection/ (17958)
 155 ("coronavirus disease 2019" or "severe acute respiratory syndrome coronavirus 2").sh,dj. (35694)
 156 ((corona* or corono*) adj1 (virus* or viral* or virinae*)).ti,ab,kw. (1168)
 157 ("2019-nCoV*" or 2019nCoV* or "19-nCoV*" or 19nCoV* or nCoV2019* or "nCoV-2019*" or nCoV19* or "nCoV-19*" or "COVID-19*" or COVID19* or "COVID-2019*" or COVID2019* or "HCoV-19*" or HCoV19* or "HCoV-2019*" or HCoV2019* or "2019 novel*" or Ncov* or "n-cov" or "SARS-CoV-2*" or "SARSCoV-2*" or "SARSCoV2*" or "SARS-CoV2*" or SARSCov19* or "SARS-Cov19*" or "SARSCov-19*" or "SARS-Cov-19*" or SARSCov2019* or "SARS-Cov2019*" or "SARSCov-2019*" or "SARS-Cov-2019*" or SARS2* or "SARS-2*" or SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus 2*" or "SARS coronavirus2*" or SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus 2*" or "SARS coronavirus2*" or covid).ti,ab,kw. (37658)
 158 "severe acute respiratory syndrome".ti,ab,kw. (9296)
 159 (coronavirus* or coronovirus* or coronavirinae* or CoV).ti,ab,kw. (33830)
 160 153 or 154 or 155 or 156 or 157 or 158 or 159 (64189)
 161 152 and 160 (9143)
 162 limit 161 to yr="2019 -Current" (5942)

CINAHL

09/12/2020

S125 S115 AND S123

S124 S115 AND S123

S123 S116 OR S117 OR S118 OR S119 OR S120 OR S121 OR S122

S122 (MH "Coronavirus+")

S121 "severe acute respiratory syndrome"

S120 ("2019-nCoV*" or 2019nCoV* or "19-nCoV*" or 19nCoV* or nCoV2019* or "nCoV-2019*" or nCoV19* or "nCoV-19*" or "COVID-19*" or COVID19* or "COVID-2019*" or COVID2019* or "HCoV-19*" or HCoV19* or "HCoV-2019*" or HCoV2019* or "2019 novel*" or Ncov* or "n-cov" or "SARS-CoV-2*" or "SARSCoV-2*" or "SARSCoV2*" or "SARSCoV2*" or SARSCov19* or "SARS-Cov19*" or "SARSCov-19*" or "SARS-Cov-19*" or SARSCov2019* or "SARS-Cov2019*" or "SARSCov-2019*" or "SARS-Cov-2019*" or SARS2* or "SARS-2*" or SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus 2*" or "SARS coronavirus2*" or SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus 2*" or "SARS coronavirus2*" or covid)

S119 (coronavirus* or coronovirus* or coronavirinae* or CoV)

S118 ((corona* or corono*) N1 (virus* or viral* or virinae*)).

S117 ("coronavirus disease 2019" or "severe acute respiratory syndrome coronavirus 2").S116 (MH "Coronavirus Infections+")

S115 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR

S11 OR S12 OR S13 OR

S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR

S20 OR S21 OR S22 OR

S23 OR S24 OR S25 OR

S26 OR S27 OR S28 OR

S29 OR S30 OR S31 OR

S32 OR S33 OR S34 OR

S35 OR S36 OR S37 OR

S38 OR S39 OR S40 OR
S41 OR S42 OR S43 OR
S44 OR S45 OR S46 OR
S47 OR S48 OR S49 OR
S50 OR S51 OR S52 OR
S53 OR S54 OR S55 OR
S56 OR S57 OR S58 OR
S59 OR S60 OR S61 OR
S62 OR S63 OR S64 OR
S65 OR S66 OR S67 OR
S68 OR S69 OR S70 OR
S71 OR S72 OR S73 OR
S74 OR S75 OR S76 OR
S77 OR S78 OR S79 OR
S80 OR S81 OR S82 OR
S83 OR S84 OR S85 OR
S86 OR S87 OR S88 OR
S89 OR S90 OR S91 OR
S92 OR S93 OR S94 OR
S95 OR S96 OR S97 OR
S98 OR S99 OR S100
OR S101 OR S102 OR
S103 OR S104 OR S105
OR S106 OR S107 OR
S108 OR S109 OR S110 OR S111 OR S112 OR S113 OR S114

S114 vafidemstat
S113 secukinumab or cosentyx
S112 ustekinumab or stelara
S111 (MH "Stem Cells+")
S110 upadacitinib or rinvoq
S109 selinexor
S108 "anti tumor necrosis factor agent*" or "anti tumour necrosis factor agent*" or "TNF inhibitor*" or "tumor necrosis factor inhibitor*" or "tumour necrosis factor inhibitor*"
S107 "tumor necrosis factor alpha inhibitor*" or "tumour necrosis factor alpha inhibitor*" or "antiTNF Agent*" or "anti tnf alpha agent*"
S106 tranilast or rizaben
S105 siltuximab
S104 sulphasalazine or salazopyrine or sulfasalazine or salazosulfapyridine
S103 tocilizumab or roactemra
S102 (MH "Tocilizumab")
S101 zilucoplan
S100 vMIP
S99 "stem cell*"
S98 (MH "Azathioprine")
S97 sarilumab or kevzara
S96 ruxolitinib or jakafi or jakavi
S95 rituximab or mabthera or truxima
S94 (MH "Rituximab")
S93 (recombinant N2 "interleukin 7")
S92 (recombinant N2 "interleukin 2") or lymphocult

S91 ravulizumab or ultomiris
S90 prednisone
S89 (MH "Prednisone")
S88 prednisolone
S87 (MH "Prednisolone")
S86 pembrolizumab or keytruda or lambrolizumab
S85 PD-1 or gilvetmab or "programmed cell death 1 receptor"
S84 (MH "Programmed Cell Death Protein 1 Receptor")
S83 otilimab
S82 ocrelizumab or ocrevus
S81 ((nonsteroid* or "non steroid*") adj (antiinflammatory or "anti inflammatory") adj (drug* or agent*)) or NSAID*)
S80 (MH "Antiinflammatory Agents, Non-Steroidal")
S79 nintedanib or intedanib
S78 mycophenolate or "mycophenolic acid" or "mycophenolate mofetil" or myfortic
S77 (MH "Mycophenolic Acid") OR (MH "Mycophenolate Mofetil")
S76 methylprednisolone
S75 (MH "Methylprednisolone")
S74 methotrexate or metoject or nordimet or novatrex
S73 (MH "Methotrexate")
S72 mavrilimumab
S71 (MH "Mast Cells")
S70 "mast cell*" or mastocyte*
S69 mastinib
S68 leflunomide or arava
S67 (MH "Leflunomide")
S66 jakotinib
S65 ixekizumab or taltz
S64 IVIG
S63 (MH "Immunoglobulins intravenous")
S62 itolizumab
S61 Interferon*
S60 (MH "Interferons")
S59 "infliximab or flixabi or inflectra or remicade or remsima or renflexis
S58 (MH "Infliximab")
S57 IMU-838
S56 immunotherap* or "biologic response modifier therap*" or "biological response modifier therap*" or BRM therap*" or "immune therap*" or "immunoglobulin therap*" or "immunological therap*" or "immunological treatment*" or "immunological intervention*"
S55 (MH "Immunotherapy")
S54 immunoglobulin* or "gamma-globulin*" or gammaglobulin* or tegeline or veinoglobulin* or venoglobulin*
S53 (MH "Immunoglobulins")
S52 imatinib or gleevac or gleevec or glivec
S51 (MH "Imatinib")
S50 IFX-1
S49 hydroxychloroquine or plaquenil
S48 (MH "Hydroxychloroquine")
S47 HCR040
S46 glucocorticoid*
S45 (MH "Glucocorticoids+")

S44 guselkumab or tremfya
S43 golimumab or simponi
S42 (MH "Golimumab")
S41 fingolimod or gilenia or gilenya
S40 filgotinib
S39 fedratinib
S38 etanercept or benepali or embrel or enbrel or "tumor necrosis factor receptor fc fusion protein" or "tumour necrosis factor receptor fc fusion protein"
S37 (MH "Etanercept")
S36 eculizumab
S35 ebastine
S34 DFV890
S33 dexamethasone
S32 (MH "Dexamethasone")
S31 CYT-107
S30 cyclosporin
S29 (MH "Cyclosporine")
S28 corticosteroid* or "adrenal cortex hormone*" or "cortical steroid*" or "corticosteroid*" or corticoid* or "corticosteroid agent*"
S27 (MH "Adrenal Cortex Hormones+")
S26 colchicine
S25 (MH "Colchicine")
S24 CMAB806
S23 CIGB-258
S22 chloroquin*
S21 (MH "Chloroquine+")
S20 certolizumab
S19 (MH "Cell Therapy")
S18 "cell based therap*" or "cell therap*" or "cellular therapy**"
S17 canakinumab or ilaris
S16 brensocatic
S15 bevacizumab or avastin
S14 (MH "Bevacizumab")
S13 BDB-001
S12 baricitinib or olumiant
S11 azathioprine or arathioprin or arathioprine or immurel or imurel
S10 TD-0903
S9 advoralimab
S8 ARGX-117
S7 anakinra or kineret of "recombinant interleukin 1 receptor antagonist" or "recombinant interleukin 1 receptor blocker" or recombinant interleukin 1 receptor blocking agent"
S6 adalimumab or adaly or amgevita or amjevita or humira or imraldi or trudexaS5 (MH "Adalimumab")
S4 acalabrutinib or "acp196" or acp196 or calquence
S3 (ABX464
S2 (MH "Abatacept")
S1 abatacept or "CTLA4 Ig" or "CTLA4 immunoglobulin" or orenicia

The Cochrane Library

Search Name: Covid & Therapy

Date Run: December 9, 2020

Comment: Cochrane - CENTRAL

ID	Search Hits
#1	MeSH descriptor: [Abatacept] explode all trees 273
#2	(Abatacept or "CTLA4 Ig" or "CTLA4 immunoglobulin" or orenicia):ti,ab,kw 755
#3	(ABX464):ti,ab,kw 20
#4	(Acalabrutinib or "acp 196" or acp196 or calquence):ti,ab,kw 74
#5	MeSH descriptor: [Adalimumab] explode all trees 737
#6	(Adalimumab or adaly or amgevita or amjevita or humira or imraldi or trudexa):ti,ab,kw 2977
#7	MeSH descriptor: [Interleukin 1 Receptor Antagonist Protein] explode all trees 305
#8	(Anakinra or kineret or "recombinant interleukin 1 receptor antagonist" or "recombinant interleukin 1 receptor blocker" or "recombinant interleukin 1 receptor blocking agent"):ti,ab,kw 360
#9	(ARGX-117):ti,ab,kw 0
#10	(avdoralimab):ti,ab,kw 1
#11	MeSH descriptor: [Azathioprine] explode all trees 1215
#12	(Azathioprine or arathioprin or arathioprine or immurel or imurel):ti,ab,kw 3186
#13	(Baricitinib or olumiant):ti,ab,kw 355
#14	(BDB-001):ti,ab,kw 1
#15	MeSH descriptor: [Bevacizumab] explode all trees 1896
#16	(Bevacizumab or avastin):ti,ab,kw 6112
#17	(Brensocatib):ti,ab,kw 0
#18	(Canakinumab or ilaris):ti,ab,kw 280
#19	MeSH descriptor: [Cell- and Tissue-Based Therapy] explode all trees 6100
#20	("cell based therapy" or "cell based therapies" or "cell therapy" or "cell therapies" or "cellular therapy" or "cellular therapies"):ti,ab,kw 1713
#21	(Certolizumab):ti,ab,kw 650
#22	MeSH descriptor: [Chloroquine] explode all trees 1160
#23	(Chloroquin*):ti,ab,kw 1503
#24	(CIGB-258):ti,ab,kw 0
#25	(CMAB806):ti,ab,kw 0
#26	MeSH descriptor: [Colchicine] explode all trees 335
#27	(Colchicine):ti,ab,kw 826
#28	MeSH descriptor: [Adrenal Cortex Hormones] explode all trees 14272
#29	(corticosteroid* or "adrenal cortex hormone*" or "cortical steroid*" or "cortico steroid*" or corticoid* or "corticosteroid agent*"):ti,ab,kw 21772
#30	MeSH descriptor: [Cyclosporins] explode all trees 3157
#31	(Cyclosporin*):ti,ab,kw 7107
#32	(CYT-107):ti,ab,kw 4
#33	MeSH descriptor: [Dexamethasone] explode all trees 4489
#34	(Dexamethasone):ti,ab,kw 11427
#35	(DFV890):ti,ab,kw 1
#36	(Ebastine):ti,ab,kw 142
#37	(Eculizumab):ti,ab,kw 221
#38	MeSH descriptor: [Etanercept] explode all trees 754
#39	(Etanercept or benepali or embrel or enbrel or "tumor necrosis factor receptor Fc fusion protein" or "tumour necrosis factor receptor Fc fusion protein"):ti,ab,kw 2197
#40	(Fedratinib):ti,ab,kw 15

- #41 (Filgotinib):ti,ab,kw 132
- #42 MeSH descriptor: [Fingolimod Hydrochloride] explode all trees 146
- #43 (Fingolimod or gilenia or gilenya):ti,ab,kw 548
- #44 (Golimumab or simponi):ti,ab,kw 662
- #45 (Guselkumab or tremfya):ti,ab,kw 186
- #46 MeSH descriptor: [Glucocorticoids] explode all trees 4492
- #47 (glucocorticoid*):ti,ab,kw 8445
- #48 (HCR040):ti,ab,kw 1
- #49 MeSH descriptor: [Hydroxychloroquine] explode all trees 463
- #50 (Hydroxychloroquine or plaquenil):ti,ab,kw 1168
- #51 (IFX-1):ti,ab,kw 17
- #52 MeSH descriptor: [Imatinib Mesylate] explode all trees 399
- #53 (Imatinib or gleevac or gleevec or glivec):ti,ab,kw 1396
- #54 MeSH descriptor: [Immunoglobulins] explode all trees 25489
- #55 (Immunoglobulin* or "gamma-globulin*" or gammaglobulin* or tegeline or veinoglobulin* or venoglobulin*):ti,ab,kw 13773
- #56 MeSH descriptor: [Immunotherapy] explode all trees 7883
- #57 (Immunotherap* or "biologic response modifier therap*" or "biological response modifier therap*" or "BRM therap*" or "immune therap*" or "immunoglobulin therap*" or "immunological therap*" or "immunological treatment*" or "immunomodulatory intervention*"):ti,ab,kw 9839
- #58 (IMU-838):ti,ab,kw 4
- #59 MeSH descriptor: [Infliximab] explode all trees 720
- #60 (Infliximab or flixabi or inflectra or remicade or remsima or renflexis):ti,ab,kw 2290
- #61 MeSH descriptor: [Interferons] explode all trees 5775
- #62 (Interferon*):ti,ab,kw 15371
- #63 (Itolizumab):ti,ab,kw 18
- #64 MeSH descriptor: [Immunoglobulins, Intravenous] explode all trees 837
- #65 (IVIG):ti,ab,kw 1322
- #66 (Ixezumab or taltz):ti,ab,kw 407
- #67 (Jakotinib):ti,ab,kw 0
- #68 MeSH descriptor: [Leflunomide] explode all trees 149
- #69 (Leflunomide or arava):ti,ab,kw 625
- #70 (Masitinib):ti,ab,kw 88
- #71 MeSH descriptor: [Mast Cells] explode all trees 207
- #72 ("mast cell*" or mastocyte*):ti,ab,kw 809
- #73 (Mavrilimumab):ti,ab,kw 43
- #74 MeSH descriptor: [Methotrexate] explode all trees 4127
- #75 (Methotrexate or metoject or nordimet or novatrex):ti,ab,kw 11173
- #76 (Methylprednisolone):ti,ab,kw 5203
- #77 MeSH descriptor: [Methylprednisolone] explode all trees 2708
- #78 MeSH descriptor: [Mycophenolic Acid] explode all trees 1356
- #79 (Mycophenolate or (mycophenolic near acid) or myfortic or (mycophenolate near mofetil)):ti,ab,kw 4180
- #80 (Nintedanib or intedanib):ti,ab,kw 465
- #81 MeSH descriptor: [Anti-Inflammatory Agents, Non-Steroidal] explode all trees 7595
- #82 ((NSAID* or "non steroid anti inflammatory agent*" or "non steroid anti inflammatory drug*" or "non steroidal anti inflammatory agent*" or "non steroidal anti inflammatory drug*" or "nonsteroid antiinflammatory agent*" or "nonsteroid antiinflammatory drug*" or "nonsteroidal antiinflammatory agent*" or "nonsteroidal antiinflammatory drug*" or "non steroid

- antiinflammatory agent*" or "non steroid antiinflammatory drug*" or "non steroidal antiinflammatory agent*" or "non steroidal antiinflammatory drug*" or "nonsteroid anti inflammatory agent*" or "nonsteroid anti inflammatory drug*" or "nonsteroidal anti inflammatory agent*" or "nonsteroidal anti inflammatory drug*")):ti,ab,kw 8525
- #83 (Ocrelizumab or ocrevus):ti,ab,kw 196
- #84 (Otilimab):ti,ab,kw 6
- #85 MeSH descriptor: [Programmed Cell Death 1 Receptor] explode all trees 56
- #86 (PD-1 or Gilvetmab or "programmed cell death 1 receptor"):ti,ab,kw 1714
- #87 (Pembrolizumab or keytruda or lambrolizumab):ti,ab,kw 1417
- #88 MeSH descriptor: [Prednisolone] explode all trees 4851
- #89 (Prednisolone):ti,ab,kw 6988
- #90 MeSH descriptor: [Prednisone] explode all trees 3951
- #91 (Prednisone):ti,ab,kw 9425
- #92 (Ravulizumab or ultomiris):ti,ab,kw 24
- #93 ((recombinant near/2 "interleukin 2") or lymphocult):ti,ab,kw 195
- #94 (recombinant near/2 "interleukin 7"):ti,ab,kw 17
- #95 (recombinant near/2"interleukin 7"):ti,ab,kw 17
- #96 MeSH descriptor: [Rituximab] explode all trees 1243
- #97 (Rituximab or mabthera or truxima):ti,ab,kw 4625
- #98 (Ruxolitinib or jakafi or jakavi):ti,ab,kw 378
- #99 (Sarilumab or kevezara):ti,ab,kw 215
- #100 (Secukinumab or cosentyx):ti,ab,kw 786
- #101 (Selinexor):ti,ab,kw 69
- #102 (Siltuximab):ti,ab,kw 59
- #103 MeSH descriptor: [Stem Cells] explode all trees 775
- #104 ("Stem cell*"):ti,ab,kw 10459
- #105 MeSH descriptor: [Sulfasalazine] explode all trees 476
- #106 (Sulphasalazine or salazopyrine or sulfasalazine or salazosulfapyridine):ti,ab,kw 1400
- #107 (TD-0903):ti,ab,kw 2
- #108 (Tocilizumab or roactemra):ti,ab,kw 1047
- #109 (Tranilast or rizaben):ti,ab,kw 78
- #110 ("tumor necrosis factor alpha inhibitor*" or "anti TNF agent*" or "anti TNF alpha agent*" or "anti tumor necrosis factor agent*" or "anti tumour necrosis factor agent*" or "TNF alpha inhibitor*" or "TNF inhibitor*" or "tumor necrosis factor inhibitor*" or "tumour necrosis factor alpha inhibitor*" or "tumour necrosis factor inhibitor*"):ti,ab,kw 864
- #111 (Upadacitinib or rinvoq):ti,ab,kw 196
- #112 (Ustekinumab or stelara):ti,ab,kw 759
- #113 (Vafidemstat):ti,ab,kw 0
- #114 (vMIP):ti,ab,kw 1
- #115 (zilucoplan):ti,ab,kw 10
- #116 {or #1-#115} 162188
- #117 MeSH descriptor: [Coronavirus] explode all trees 35
- #118 MeSH descriptor: [Coronavirus Infections] explode all trees 297
- #119 (((corona* or corono*) near/1 (virus* or viral* or virinae*))) :ti,ab,kw 52
- #120 ((coronavirus* or coronovirus* or coronavirinae* or CoV)):ti,ab,kw 727
- #121 ("2019 nCoV" or 2019nCoV* or "19 nCoV" or 19nCoV* or nCoV2019* or "nCoV 2019" or nCoV19* or "nCoV 19" or "COVID 19" or COVID19* or "COVID 2019" or COVID2019* or "HCoV 19" or HCoV19* or "HCoV 2019" or HCoV2019* or "2019 novel" or Ncov* or "n cov" or "SARS CoV 2" or "SARSCoV 2" or "SARSCoV2" or "SARS CoV2" or SARSCov19* or "SARS Cov19" or "SARSCov 19" or "SARS Cov 19" or SARSCov2019* or "SARS Cov2019" or "SARSCov 2019" or "SARS Cov 2019" or SARS2* or "SARS 2" or SARScoronavirus2* or "SARS

coronavirus 2" or "SARScoronavirus 2" or "SARS coronavirus2" or SARScoronavirus2* or "SARS coronavirus 2" or "SARScoronavirus 2" or "SARS coronavirus2" or covid)):ti,ab,kw 1106
 #122 ("severe acute respiratory syndrome" or "severe acute respiratory syndromes") 373
 #123 {or #117-#122} 1345
 #124 #116 and #123 444
 #125 #124 with Publication Year from 2019 to present, in Trials 401

Online Supplementary Text S3: Search strategy for COVID-19 and rheumatic and musculoskeletal diseases.

Medline

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily <2016 to November 2, 2020>

Search Strategy: Covid & RMD

- 1 exp Musculoskeletal Diseases/ (147749)
- 2 (musculoskeletal adj2 (disease* or disorder*)).mp. (6163)
- 3 exp Osteoarthritis/ (14140)
- 4 (degenerative adj2 arthritis).mp. dentifier, synonyms] (276)
- 5 osteoarthritis.mp. dentifier, synonyms] (29910)
- 6 exp Connective Tissue Diseases/ (38287)
- 7 (connective adj tissue adj2 (disease* or disorder*)).mp. dentifier, synonyms] (4407)
- 8 Rheumatic Diseases/ (1920)
- 9 (rheumatic adj2 (disease* or disorder*)).mp. dentifier, synonyms] (6738)
- 10 exp Lupus Erythematosus, Systemic/ (7514)
- 11 lupus.mp. dentifier, synonyms] (18771)
- 12 exp Antiphospholipid Syndrome/ (1225)
- 13 antiphospholipid.mp. dentifier, synonyms] (3162)
- 14 Sjogren's Syndrome/ (1816)
- 15 (sjogren* or sjoegren*).mp. dentifier, synonyms] (4095)
- 16 exp Scleroderma, Systemic/ (2839)
- 17 "systemic sclerosis".mp. dentifier, synonyms] (4615)
- 18 scleroderma.mp. dentifier, synonyms] (4808)
- 19 Scleroderma, Localized/ (461)
- 20 exp Arthritis, Rheumatoid/ (14699)
- 21 (rheumatoid adj2 arthritis).mp. dentifier, synonyms] (28128)
- 22 Arthritis, Psoriatic/ (1779)
- 23 (psoriatic adj2 arthritis).mp. dentifier, synonyms] (3993)
- 24 (psoriatic adj2 arthropathy).mp. dentifier, synonyms] (35)
- 25 Spondylitis, Ankylosing/ (2096)
- 26 (ankylosing adj2 spondylitis).mp. dentifier, synonyms] (4581)
- 27 (scleroderma adj2 (localised or localized)).mp. dentifier, synonyms] (606)
- 28 morphea.mp. dentifier, synonyms] (448)
- 29 Arthritis, Juvenile/ (1503)
- 30 (juvenile adj2 arthritis).mp. dentifier, synonyms] (2949)
- 31 exp Polymyositis/ (1237)
- 32 polymyositis.mp. dentifier, synonyms] (1163)
- 33 Dermatomyositis/ (1104)
- 34 dermatomyositis.mp. dentifier, synonyms] (2528)
- 35 dermatomyositides.mp. dentifier, synonyms] (0)
- 36 exp Spondylarthritis/ (4930)

- 37 (Spondyloarthritis or spondylarthritis or spondarthritits or (spinal adj2 arthritis)).mp. dentifier, synonyms] (2736)
- 38 Fibromyalgia/ (1486)
- 39 fibromyalgia.mp. dentifier, synonyms] (3589)
- 40 Gout/ (1564)
- 41 gout.mp. dentifier, synonyms] (4338)
- 42 exp Chondrocalcinosis/ (263)
- 43 chondrocalcinosis.mp. dentifier, synonyms] (325)
- 44 (calcium adj pyrophosphate adj2 disease*).mp. dentifier, synonyms] (107)
- 45 (calcium adj pyrophosphate adj2 deposition).mp. dentifier, synonyms] (184)
- 46 pseudogout.mp. dentifier, synonyms] (158)
- 47 exp Vasculitis/ (9001)
- 48 vasculitis.mp. dentifier, synonyms] (10442)
- 49 Angiitis.mp. dentifier, synonyms] (342)
- 50 Angiitides.mp. dentifier, synonyms] (0)
- 51 angitis.mp. dentifier, synonyms] (18)
- 52 (vascular adj2 inflammation).mp. dentifier, synonyms] (2473)
- 53 (vasculitic adj2 lesion*).mp. dentifier, synonyms] (43)
- 54 Angioitis.mp. dentifier, synonyms] (0)
- 55 exp Sarcoidosis/ (2191)
- 56 Sarcoid.mp. dentifier, synonyms] (739)
- 57 Sarcoidosis.mp. dentifier, synonyms] (5162)
- 58 ("Besnier Boeck" adj2 (disease or syndrome)).mp. dentifier, synonyms] (1)
- 59 ("Besnier Boeck Schaumann" adj2 (disease or syndrome)).mp. dentifier, synonyms] (1)
- 60 Sarcoidoses.mp. dentifier, synonyms] (1)
- 61 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 (238373)
- 62 exp Coronavirus/ (19595)
- 63 exp Coronavirus Infections/ (20991)
- 64 ("2019-nCoV*" or 2019nCoV* or "19-nCoV*" or 19nCoV* or nCoV2019* or "nCoV-2019*" or nCoV19* or "nCoV-19*" or "COVID-19*" or COVID19* or "COVID-2019*" or COVID2019* or "HCoV-19*" or HCoV19* or "HCoV-2019*" or HCoV2019* or "2019 novel*" or Ncov* or "n-cov" or "SARS-CoV-2*" or "SARSCoV-2*" or "SARSCoV2*" or "SARS-CoV2*" or SARSCov19* or "SARS-Cov19*" or "SARSCov-19*" or "SARS-Cov-19*" or SARSCov2019* or "SARS-Cov2019*" or "SARSCov-2019*" or "SARS-Cov-2019*" or SARS2* or "SARS-2*" or SARSCoronavirus2* or "SARS-coronavirus-2*" or "SARSCoronavirus 2*" or "SARS coronavirus2*" or SARSCoronavirus2* or "SARS-coronavirus-2*" or "SARSCoronavirus 2*" or "SARS coronavirus2*" or covid).ti,ab,kw,kf. (38713)
- 65 "severe acute respiratory syndrome*".ti,ab,kw,kf. (6855)
- 66 ((corona* or corono*) adj1 (virus* or viral* or virinae*)).ti,ab,kw,kf. (1388)
- 67 (coronavirus* or coronovirus* or coronavirinae* or CoV).ti,ab,kw,kf. (28750)
- 68 62 or 63 or 64 or 65 or 66 or 67 (51103)
- 69 61 and 68 (685)
- 70 limit 69 to yr="2019 -Current" (615)

Embase

Database: Embase <1996 to November 2, 2020>

Search Strategy: Covid & RMD

- 1 exp musculoskeletal disease/ (1805492)
- 2 (musculoskeletal adj2 (disease* or disorder*)),mp. (39744)
- 3 exp osteoarthritis/ (112778)
- 4 osteoarthritis.mp. (125888)
- 5 (degenerative adj2 arthritis).mp. (1182)
- 6 exp connective tissue disease/ (342785)
- 7 (connective adj tissue adj2 (disease* or disorder*)),mp. (25810)
- 8 exp rheumatic disease/ (191065)
- 9 (rheumatic adj2 (disease* or disorder*)),mp. (51642)
- 10 exp systemic lupus erythematosus/ (71140)
- 11 lupus.mp. (107596)
- 12 antiphospholipid syndrome/ (15875)
- 13 antiphospholipid.mp. (21828)
- 14 Sjogren syndrome/ (17933)
- 15 (sjogren* or sjogren*).mp. (24026)
- 16 exp systemic sclerosis/ (25333)
- 17 "systemic sclerosis".mp. (26622)
- 18 scleroderma.mp. (20606)
- 19 exp localized scleroderma/ (2942)
- 20 exp rheumatoid arthritis/ (158914)
- 21 (rheumatoid adj2 arthritis).mp. (173099)
- 22 psoriatic arthritis/ (21021)
- 23 (psoriatic adj2 arthritis).mp. (22500)
- 24 (psoriatic adj2 arthropathy).mp. (278)
- 25 ankylosing spondylitis/ (21379)
- 26 (ankylosing adj2 spondylitis).mp. (25741)
- 27 (scleroderma adj2 (localised or localized)),mp. (1585)
- 28 morphea/ (1922)
- 29 morphea.mp. (2328)
- 30 exp juvenile rheumatoid arthritis/ (17280)
- 31 (juvenile adj2 arthritis).mp. (18619)
- 32 polymyositis/ (6533)
- 33 polymyositis.mp. (8219)
- 34 exp dermatomyositis/ (12670)
- 35 dermatomyositis.mp. (13758)
- 36 dermatomyositides.mp. (1)
- 37 spondylarthritis/ (7587)
- 38 spondylarthritis.mp. (7862)
- 39 fibromyalgia/ (19185)
- 40 fibromyalgia.mp. (20622)
- 41 gout/ (16602)
- 42 gout.mp. (18924)
- 43 chondrocalcinosis/ (1061)
- 44 chondrocalcinosis.mp. (1276)
- 45 (calcium adj pyrophosphate adj2 disease*).mp. (296)
- 46 (calcium adj pyrophosphate adj2 deposition).mp. (565)
- 47 pseudogout.mp. (1055)
- 48 exp vasculitis/ (86672)
- 49 vasculitis.mp. (63781)
- 50 Angiitis.mp. (1563)
- 51 Angiitides.mp. (4)

- 52 angitis.mp. (184)
 53 (vascular adj2 inflammation).mp. (9818)
 54 (vasculitic adj2 lesion*).mp. (341)
 55 Angioitis.mp. (1)
 56 exp sarcoidosis/ (26462)
 57 Sarcoid.mp. (3644)
 58 Sarcoidosis.mp. (31208)
 59 ("Besnier Boeck" adj2 (disease or syndrome)).mp. (3)
 60 ("Besnier Boeck Schaumann" adj2 (disease or syndrome)).mp. (4)
 61 Sarcoidoses.mp. (21)
 62 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 (2075430)
 63 exp Coronavirinae/ (16754)
 64 exp Coronavirus infection/ (17958)
 65 ("coronavirus disease 2019" or "severe acute respiratory syndrome coronavirus 2").sh,dj. (35694)
 66 ((corona* or corono*) adj1 (virus* or viral* or virinae*)).ti,ab,kw. (1168)
 67 ("2019-nCoV*" or 2019nCoV* or "19-nCoV*" or 19nCoV* or nCoV2019* or "nCoV-2019*" or nCoV19* or "nCoV-19*" or "COVID-19*" or COVID19* or "COVID-2019*" or COVID2019* or "HCoV-19*" or HCoV19* or "HCoV-2019*" or HCoV2019* or "2019 novel*" or Ncov* or "n-cov" or "SARS-CoV-2*" or "SARSCoV-2*" or "SARSCoV2*" or "SARS-CoV2*" or SARSCov19* or "SARS-Cov19*" or "SARSCov-19*" or "SARS-Cov-19*" or SARSCov2019* or "SARS-Cov2019*" or "SARSCov-2019*" or "SARS-Cov-2019*" or SARS2* or "SARS-2*" or SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus 2*" or "SARS coronavirus2*" or SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus 2*" or "SARS coronavirus2*" or covid).ti,ab,kw. (37658)
 68 "severe acute respiratory syndrome*".ti,ab,kw. (9296)
 69 (coronavirus* or coronovirus* or coronavirinae* or CoV).ti,ab,kw. (33830)
 70 63 or 64 or 65 or 66 or 67 or 68 or 69 (64189)
 71 62 and 70 (2467)
 72 limit 71 to yr="2019 -Current" (1776)

CINAHL to be added

November 2, 2020

S71 S61 AND S69

S70 S61 AND S69

S69 S62 OR S63 OR S64 OR S65 OR S66 OR S67 OR S68

S68 (MH "Coronavirus+")

S67 "severe acute respiratory syndrome"

S66 ("2019-nCoV*" or 2019nCoV* or "19-nCoV*" or 19nCoV* or nCoV2019* or "nCoV- 2019*" or nCoV19* or "nCoV-19*" or "COVID-19*" or COVID19* or "COVID-2019*" or COVID2019* or "HCoV-19*" or HCoV19* or "HCoV-2019*" or HCoV2019* or "2019 novel*" or Ncov* or "n-cov" or "SARS-CoV-2*" or "SARSCoV-2*" or "SARSCoV2*" or "SARSCoV2*" or SARSCov19* or "SARS-Cov19*" or "SARSCov-19*" or "SARS-Cov-19*" or SARSCov2019* or "SARS-Cov2019*" or "SARSCov-2019*" or "SARS-Cov-2019*" or SARS2* or "SARS-2*" or SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus 2*" or "SARS coronavirus2*" or SARScoronavirus2* or "SARS-coronavirus-2*" or "SARScoronavirus 2*" or "SARS coronavirus2*" or covid)

S65 (coronavirus* or coronovirus* or coronavirinae* or CoV)
S64 ((corona* or corono*) N1 (virus* or viral* or virinae*)).
S63 ("coronavirus disease 2019" or "severe acute respiratory syndrome coronavirus 2").S116 (MH "Coronavirus Infections+")
S62 (MH "Coronavirus Infections+")
S61 S1 OR S2 OR S3 OR S4
OR S5 OR S6 OR S7 OR
S8 OR S9 OR S10 OR
S11 OR S12 OR S13 OR
S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR
S20 OR S21 OR S22 OR
S23 OR S24 OR S25 OR
S26 OR S27 OR S28 OR
S29 OR S30 OR S31 OR
S32 OR S33 OR S34 OR
S35 OR S36 OR S37 OR
S38 OR S39 OR S40 OR
S41 OR S42 OR S43 OR
S44 OR S45 OR S46 OR
S47 OR S48 OR S49 OR
S50 OR S51 OR S52 OR
S53 OR S54 OR S55 OR
S56 OR S57 OR S58 OR
S59 OR S60
S60 (MH "Spondylarthritis+")
S59 scleroderma
S58 (MH "Scleroderma, Systemic+")
S57 sjogren* or sjoegren*
S56 (MH "Sjogren's Syndrome")
S55 sarcoidoses
S54 sarcoidosis
S53 "besnier boeck schaumann" N2 (disease or syndrome)
S52 "besnier boeck" N2 (disease or syndrome)
S51 (MH "Sarcoidosis")
S50 sarcoid
S49 angioitis
S48 vasculitic N2 lesion*
S47 vascular N2 inflammation
S46 angitis
S45 antiphospholipid
S44 angiitides
S43 angiitis
S42 vasculitis
S41 (MH "Vasculitis+")
S40 pseudogout
S39 "calcium pyrophosphate" N2 deposition
S38 "calcium pyrophosphate" N2 disease*
S37 chondrocalcinosis
S36 (MH "Chondrocalcinosis")
S35 gout
S34 (MH "Antiphospholipid Syndrome")

S33 (MH "Gout")
 S32 fibromyalgia
 S31 (MH "Fibromyalgia")
 S30 Spondyloarthritis or spondylarthritis or spondarthritis or (spinal adj2 arthritis)
 S29 dermatomyositides
 S28 dermatomyositis
 S27 (MH "Dermatomyositis")
 S26 polymyositis
 S25 (MH "Polymyositis+")
 S24 juvenile N2 arthritis
 S23 lupus
 S22 (MH "Arthritis, Juvenile Rheumatoid")
 S21 "morphea"
 S20 scleroderma N2 (localised or localized)
 S19 ankylosing N2 spondylitis
 S18 (MH "Spondylitis, Ankylosing")
 S17 psoriatic N2 arthropathy
 S16 psoriatic N2 arthritis
 S15 (MH "Arthritis, Psoriatic")
 S14 rheumatoid N2 arthritis
 S13 (MH "Arthritis, Rheumatoid+")
 S12 (MH "Lupus Erythematosus, Systemic+")
 S11 (MH "Scleroderma, Circumscribed")
 S10 "systemic sclerosis"
 S9 rheumatic N2 (disease* or disorder*)
 S8 (MH "Rheumatic Diseases+")
 S7 "connective tissue" N2 (disease* or disorder*)
 S6 (MH "Connective Tissue Diseases+")
 S5 degenerative N2 arthritis
 S4 osteoarthritis
 S3 (MH "Osteoarthritis+")
 S2 (musculoskeletal N2 (disease* or disorder*))
 S1 (MH "Musculoskeletal Diseases+")

The Cochrane Library

November 2, 2020

ID	Search Hits
#1	MeSH descriptor: [Musculoskeletal Diseases] explode all trees 40204
#2	(musculoskeletal near/2 (disease* or disorder*)):ti,ab,kw 4971
#3	MeSH descriptor: [Osteoarthritis] explode all trees 7366
#4	(Osteoarthritis):ti,ab,kw 17270
#5	(degenerative near/2 arthritis):ti,ab,kw 78
#6	MeSH descriptor: [Connective Tissue Diseases] explode all trees 9484
#7	("connective tissue" near/2 disease*):ti,ab,kw 1697
#8	("connective tissue" near/2 disorder*):ti,ab,kw 608
#9	MeSH descriptor: [Rheumatic Diseases] explode all trees 15387
#10	(rheumatic near/2 (disease* or disorder*)):ti,ab,kw 2842
#11	MeSH descriptor: [Lupus Erythematosus, Systemic] explode all trees 1025

#12	(lupus):ti,ab,kw	3035	
#13	MeSH descriptor: [Antiphospholipid Syndrome] explode all trees	90	
#14	(antiphospholipid):ti,ab,kw	452	
#15	MeSH descriptor: [Sjogren's Syndrome] explode all trees	283	
#16	(sjogren* or Sjoegren*):ti,ab,kw	764	
#17	MeSH descriptor: [Scleroderma, Systemic] explode all trees	541	
#18	("systemic sclerosis"):ti,ab,kw	1099	
#19	(scleroderma):ti,ab,kw	1117	
#20	MeSH descriptor: [Scleroderma, Localized] explode all trees	82	
#21	MeSH descriptor: [Arthritis, Rheumatoid] explode all trees	6056	
#22	(rheumatoid near/2 arthritis):ti,ab,kw	15306	
#23	MeSH descriptor: [Arthritis, Psoriatic] explode all trees	431	
#24	(psoriatic near/2 arthritis):ti,ab,kw	1946	
#25	psoriatic near/2 arthropathy	29	
#26	MeSH descriptor: [Spondylitis, Ankylosing] explode all trees	677	
#27	(ankylosing near/2 spondylitis):ti,ab,kw	1982	
#28	(scleroderma near/2 (localised or localized)):ti,ab,kw	108	
#29	(morphea):ti,ab,kw	35	
#30	MeSH descriptor: [Arthritis, Juvenile] explode all trees	294	
#31	(juvenile near/2 arthritis):ti,ab,kw	849	
#32	MeSH descriptor: [Polymyositis] explode all trees	93	
#33	(polymyositis):ti,ab,kw	177	
#34	MeSH descriptor: [Dermatomyositis] explode all trees	87	
#35	(dermatomyositis):ti,ab,kw	295	
#36	(dermatomyositides):ti,ab,kw0		
#37	MeSH descriptor: [Spondylarthritis] explode all trees	1289	
#38	(Spondyloarthritis or spondylarthritis or spondarthritis or (spinal near/2 arthritis)):ti,ab,kw	893	
#39	MeSH descriptor: [Fibromyalgia] explode all trees	1363	
#40	(fibromyalgia):ti,ab,kw	2935	
#41	MeSH descriptor: [Gout] explode all trees	360	
#42	(gout):ti,ab,kw	1391	
#43	MeSH descriptor: [Chondrocalcinosis] explode all trees	15	
#44	(chondrocalcinosis):ti,ab,kw	19	
#45	("calcium pyrophosphate" near/2 disease*):ti,ab,kw	8	
#46	("calcium pyrophosphate" near/2 deposition):ti,ab,kw	10	
#47	(pseudogout):ti,ab,kw	13	
#48	MeSH descriptor: [Vasculitis] explode all trees	1978	
#49	(vasculitis):ti,ab,kw	1240	
#50	(Angiitis):ti,ab,kw	19	
#51	(Angiitides):ti,ab,kw	0	
#52	(angitis):ti,ab,kw	2	
#53	(vascular near/2 inflammation):ti,ab,kw	609	
#54	(vasculitic near/2 lesion*):ti,ab,kw	3	
#55	(Angioitis):ti,ab,kw	0	
#56	(Sarcoid):ti,ab,kw	40	
#57	(Sarcoidosis):ti,ab,kw	611	
#58	MeSH descriptor: [Sarcoidosis] explode all trees	214	
#59	("Besnier Boeck" near/2 (disease or syndrome)):ti,ab,kw	0	
#60	("Besnier Boeck Schaumann" near/2 (disease or syndrome)):ti,ab,kw	0	
#61	(Sarcoidoses):ti,ab,kw	0	

- #62 {or #1-#61} 76539
- #63 MeSH descriptor: [Coronavirus] explode all trees 35
- #64 MeSH descriptor: [Coronavirus Infections] explode all trees 297
- #65 (((corona* or corono*) near/1 (virus* or viral* or virinae*))) :ti,ab,kw 52
- #66 ((coronavirus* or coronovirus* or coronavirinae* or CoV)) :ti,ab,kw 727
- #67 (("2019 nCoV" or 2019nCoV* or "19 nCoV" or 19nCoV* or nCoV2019* or "nCoV 2019" or nCoV19* or "nCoV 19" or "COVID 19" or COVID19* or "COVID 2019" or COVID2019* or "HCoV 19" or HCoV19* or "HCoV 2019" or HCoV2019* or "2019 novel" or Ncov* or "n cov" or "SARS CoV 2" or "SARSCoV 2" or "SARSCoV2" or "SARS CoV2" or SARSCov19* or "SARS Cov19" or "SARSCov 19" or "SARS Cov 19" or SARSCov2019* or "SARS Cov2019" or "SARSCov 2019" or "SARS Cov 2019" or SARS2* or "SARS 2" or SARScoronavirus2* or "SARS coronavirus 2" or "SARScoronavirus 2" or "SARS coronavirus2" or SARScoronavirus2* or "SARS coronavirus 2" or "SARScoronavirus 2" or "SARS coronavirus2" or covid)) :ti,ab,kw 1106
- #68 ("severe acute respiratory syndrome" or "severe acute respiratory syndromes") 373
- #69 {or #63-#68} 1345
- #70 #62 and #69 38
- #71 #70 with Publication Year from 2019 to present, in Trials 32

Online supplemental Text S4: Research questions and PICOs**Research Questions-Pathogenesis (I)**

1	Is pathophysiology of COVID-19 at some phase immune mediated?
2	What pro-inflammatory cytokines and chemokines are predominant at different stages of COVID infection? Which are primary and which are downstream?
5	What is the role of type 1, type 2 and type 3 interferon and IFN-inducible genes?
6	What are the lymphocyte subset abnormalities at different stages of COVID-19 infection?
12	What is the role of mast cell abnormalities at different stages of COVID-19 infection?
13	What is the role of neutrophils at different stages of COVID-19 infection?
14	Is there any relationship between viral replication/load and the immune response?
15	Is the immunoprotection against COVID-19 antibody dependent or cellular dependent?
16	Is there a role of antibody dependent enhancement and detrimental effect of anti-SARS-CoV2 antibodies (e.g. by stimulation of macrophages)?
17	What is the time to anti-COVID-19 immunoglobulin generation and relation (if any) with clinical outcomes?
20	Does SARS-CoV2 exert a superantigen effect?
21	Does immunosenescence play a role in the response to SARS-CoV2?

In vivo

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	No intervention SOC Any immunomodulatory intervention (<i>see Appendix 1 for compounds</i>)
C	Comparator	No comparator Baseline SOC Same immunomodulatory agent at different dose/interval/way of administration Other immunomodulatory agent
O	Outcome	Total and partial WBC count, WBC % (L, N, Mo, N), CD4/CD8 ratio, % of CD3+ T cells, Th1, Th2, Th17, Treg, Thf, % of CD19 cells, % Breg, % of CD16+ cells, % Mo subsets, % N subsets, N/L ratio, % mast cells, platelet count, SARS-CoV2 specific T cells, B cells and Ig, concentration of cytokines, concentration of chemokines
S	Sample	Any biologic sample (<i>see Appendix 2</i>)

In vitro

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	Any technique assessing phenotype and function of immune and non-immune cells Any analysis of the concentration of soluble mediators Any technique assessing SARS-CoV2 structure and physiopathological mechanisms
C	Comparator	No comparator Baseline Any stage of the disease evolution Before/After any treatment-immunomodulatory agent
O	Outcome	Monocytes/Macrophages activation, function and polarization; T cells (Th1, Th2, Th17, Treg, Thf, NK, GammaDelta T cells) activation, function and differentiation; B cells and plasmocytes activation, function, differentiation and Ig production, PNN, Mast cells, dendritic cells activation and function, endothelial cells activation and function, fibroblasts activation and function, Interferon production, cytokines/chemokines production, underlying molecular pathways (NFkB, JAK/STAT...), complement activation, SARS-CoV2 structure, replication and mechanisms of action, SARS-CoV2 interactions with any cell type, senescent cells, T cell exhaustion.
T	Time	Cross sectional, longitudinal and retrospective studies
S	Sample	Any biologic sample

Research questions-pathogenesis (II)

3	Is it possible to clearly demarcate distinct stages of the disease, with specific biomarkers for each stage?
22	Are there immune profiles/signatures associated with disease severity or phenotypes?

In vivo

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	No intervention SOC Any immunomodulatory intervention (<i>see Appendix 1 for compounds</i>)
C	Comparator	No comparator Baseline SOC Same immunomodulatory agent at different dose/interval/way of administration Other immunomodulatory agent
O	Outcome	Total and partial WBC count, WBC % (L, N, Mo, N), CD4/CD8 ratio, % of CD3+ T cells, Th1, Th2, Th17, Treg, Thf, % of CD19 cells, % Breg, % of

		CD16+ cells, % Mo subsets, % N subsets, N/L ratio, % mast cells, SARS-CoV2 specific T cells, B cells and Ig, concentration of cytokines, concentration of chemokines, concentration of: ferritin, D dimer, LDH, SAA, CRP, ESR, platelet count, creatinine, urea, cardiac troponin. Any other measurement related to clinical and radiological outcomes
T	Time	Cross sectional, longitudinal and retrospective studies
S	Sample	Any biologic sample

In vitro

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	Any analysis of the concentration of soluble mediators
C	Comparator	No comparator Baseline Any stage of the disease evolution Before/After any treatment-immunomodulatory agent
O	Outcome	Immunotypes, cellular signatures, molecular signatures, Interferon production, cytokines/chemokines production, complement activation, underlying molecular pathways (NFkB, JAK/STAT...), by any cell type (<i>See Appendix 3</i>)
S	Sample	Any biologic sample (<i>see Appendix 2</i>)

Research questions-pathogenesis (III)

4	Are there endotypic variants that predispose to more severe COVID-19 outcomes?
10	Which genetically determined differences in individual immune response and concomitant diseases may contribute to the development of cytokine release syndrome?
18	Do blood groups (Rhesus and AB0) or HLA genes play any role in the susceptibility to develop severe COVID-19?

In vivo

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	No intervention Any intervention
C	Comparator	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection AND with different HLA haplotypes/blood groups/other known genotypes
O	Outcome	Total and partial WBC count, WBC % (L, N, Mo, N), CD4/CD8 ratio, % of CD3+ T cells, Th1, Th2, Th17, Treg, Thf, % of CD19 cells, % Breg, % of CD16+ cells, % Mo subsets, % N subsets, N/L ratio, % mast cells, SARS-CoV2 specific T cells, B cells and Ig, concentration of cytokines, concentration of chemokines, concentration of: ferritin, D dimer, LDH, SAA, CRP, ESR, platelet count, creatinine, urea, cardiac troponin. Any other measurement related to clinical and radiological outcomes
T	Time	Cross sectional, longitudinal and retrospective studies
S	Sample	Any biologic sample (<i>see Appendix 2</i>)

In vitro

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	Any study assessing gene expression of immune and non-immune cells
C	Comparator	No comparator Any other comparator (other disease, different populations...)
O	Outcome	GWAS Polymorphisms (SNPs) Bulk RNA sequencing Single cell RNA sequencing miRs arrays
S	Sample	Any biologic sample (<i>see Appendix 2</i>)

Research questions-pathogenesis (IV)

7	What is the mechanism of endothelial dysfunction and thrombosis?
8	What is the role of complement in endothelial dysfunction?

In vivo

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	No intervention SOC Any immunomodulatory intervention
C	Comparator	No comparator Baseline SOC Same immunomodulatory agent at different dose/interval/way of administration Other immunomodulatory agent
O	Outcome	D-dimer, fibrinogen, vWf, platelet count, markers of platelet activation (e.g. P-selectin), ICAM, VCAM, circulating endothelial cell count, anti-phospholipid antibodies, endothelial microparticles, complement fractions
T	Time	Cross sectional, longitudinal and retrospective studies
S	Sample	Any biologic sample (<i>see Appendix 2</i>)

In vitro

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	Any study assessing endothelial dysfunction
C	Comparator	No comparator Baseline Any stage of the disease evolution

		Before/After any treatment-immunomodulatory agent
O	Outcome	Endothelial cells activation and function, Complement activation, Platelets function and activation, platelets microparticles release, Interaction of Endothelial cells and platelets with any other cells (<i>see Appendix 3</i>) or with the SARS-CoV2 virus, adhesion molecules (ICAM, VCAM...) expression
S	Sample	Any biologic sample (<i>see Appendix 2</i>)

Research questions-pathogenesis (V)

9	Which is the spectrum of histological abnormalities in COVID-19 pneumonia and their correlations with the clinical picture?	
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P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	No intervention SOC Any immunomodulatory intervention (<i>see Appendix 1 for compounds</i>)
C	Comparator	No comparator Baseline SOC Same immunomodulatory agent at different dose/interval/way of administration Other immunomodulatory agent
O	Outcome	Any histological finding (e.g. inflammatory infiltrate and its features, cytokine expression...)
T	Time	Cross sectional, longitudinal and retrospective studies
S	Sample	Bronchial endothelial cells from BAL Ante-mortem lung/airway biopsies Post-mortem lung/airway tissue

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	Any study assessing bronchial endothelial cells function
C	Comparator	No comparator Baseline Any stage of the disease evolution Before/After any treatment-immunomodulatory agent
O	Outcome	Bronchial endothelial cells function, activation and chemokines/cytokines secretion, Bronchial endothelial cells interactions with any other cell type (<i>see Appendix 3</i>)
S	Sample	Bronchial endothelial cells from BAL

Research questions-pathogenesis (VI)

11	Which are the differences in COVID-19 pathogenesis in the adult and pediatric populations?
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In vivo

P	Patients	Adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	No intervention Any intervention
C	Comparator	Pediatric patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
O	Outcome	Any clinical and laboratory variable as per other PICOs
T	Time	Cross sectional, longitudinal and retrospective studies
S	Sample	Any biologic sample (<i>see Appendix 2</i>)

In vitro

P	Patients	Adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	Any technique assessing phenotype and function of immune and non-immune cells Any study assessing endothelial dysfunction Any study assessing gene expression of immune and non-immune cells Any analysis of the concentration of soluble mediators
C	Comparator	Pediatric patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
O	Outcome	Any cell function, activation, interaction with SARS-Cov2 as per other PICOs
S	Sample	Any biologic sample (<i>see Appendix 2</i>)

Research questions-pathogenesis (VII)

19	Does the gut play any role (e.g. increased IgA permeability) in COVID-19 pathogenesis
22	Do comorbidities (e.g. obesity) affect the immune response against SARS-COV2?

In vivo

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	No intervention SOC Any immunomodulatory intervention (<i>see Appendix 1 for compounds</i>)
C	Comparator	No comparator Baseline SOC Same immunomodulatory agent at different dose/interval/way of administration Other immunomodulatory agent
O	Outcome	BMI, abdominal fat evaluation, bowel biopsy, endoscopic findings
T	Time	Cross sectional, longitudinal and retrospective studies
S	Sample	Any biologic sample (<i>see Appendix 2</i>)

In vitro

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	Any technique assessing phenotype and function of immune and non-immune cells Any study assessing gut epithelia dysfunction
C	Comparator	Baseline Any stage of the disease evolution Before/After any treatment-immunomodulatory agent Other intestinal diseases such as IBDs
O	Outcome	Gut epithelial cells function and activation, Gut epithelial cells interactions with other immune cells (T cells, B cells, DCs, macrophages, PNN, Mast cells) or SARS-CoV2, gut permeability to IGs, complement activation, effects of systemic inflammation caused by comorbidities on any cells described in <i>Appendix 3</i> .
S	Sample	Any biologic sample (<i>see Appendix 2</i>)

Research questions-Immunomodulatory treatment

1	What is the efficacy and safety of immune-modulatory drugs (hydroxychloroquine, glucocorticoids, tocilizumab, sarilumab, siltuximab, anakinra, colchicine, JAKi, mavrilimumab, anti GM-CSFR Mab, inhalatory IFN etc.) in COVID-19?
2	What are the consequences of immune-modulatory drugs on viral load and host anti-viral immune response?
3	What is the risk of secondary infections?
4	Is it possible to clearly demarcate distinct stages of the disease with stratified interventions for each stage?
5	Can Dexamethasone be considered as the standard of care after the RECOVERY study?
6	Can Dexamethasone be combined with other anti-cytokines and if so at which disease stage?
7	Should anti-cytokine agents be combined with dexamethasone or used as an alternative (e.g. steroid sparing)?
8	Is there a room for an association of anti-viral drugs or interferon and immunomodulators (Dexamethasone +/- anti-cytokines)?
9	Can any corticosteroid be used with the same efficacy in COVID-19 or is dexamethasone more effective than others?
10	Is combined immunotherapy more effective and safe than sequential immunotherapy?

In vivo

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	Any immunomodulatory intervention
C	Comparator	No comparator Baseline SOC Same immunomodulatory agent at different dose/interval/way of administration Same immunomodulatory agent in severe vs mild/moderate COVID-19 Other immunomodulatory agent (same or different mechanism of action)
O	Outcome	<u>Efficacy outcomes:</u> Admission to ICU, death, discharge, disease state (composite scores), recovery (no symptoms/signs and/or negative diagnostic test), viral load, imaging features of involved sites (e.g. lungs) <u>Safety outcomes:</u> AEs, SAEs (including among others QT elevation and secondary infections)
T	Time	Longitudinal observational, retrospective, RCTs
S	Sample	No biologic sample (for studies with only clinical/imaging outcomes) Any biologic sample for SARS-CoV2 detection before and after treatment

In vitro

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without a RMDs prior SARS-CoV2 infection (RMD treated with any compound)
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I	Intervention	Any technique assessing phenotype and function of immune and non-immune cells Any study assessing gene expression of immune and non immune cells Any analysis of the concentration of soluble mediators
C	Comparator	No comparator Baseline Any stage of the disease evolution Before/During/After any treatment-immunomodulatory agent
O	Outcome	Effect of any immunomodulatory drug alone or in combination (<i>see Appendix 1</i>) on Monocytes/Macrophages activation, function and polarization; T cells (Th1, Th2, Th17, Treg, Thf, NK, GammaDelta T cells) activation, function and differentiation; B cells and plasmocytes activation, function, differentiation and Ig production, PNN, Mast cells, dendritic cells activation and function, endothelial cells activation and function, fibroblasts activation and function, Interferon production, cytokines/chemokines production, underlying molecular pathways (NFkB, JAK/STAT...), complement activation, SARS-CoV2 structure, replication and mechanisms of action, SARS-CoV2 interactions with any cell type
S	Sample	Any biologic sample

Research questions-COVID-19 and RMDs

	Is SARS-CoV2 a trigger for autoimmune diseases?
--	---

In vivo

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND without an RMDs prior SARS-CoV2 infection
I	Intervention	No intervention Any intervention
C	Comparator	No comparator Any comparator
O	Outcome	New onset autoimmune disease (fulfilling corresponding classification criteria) OR new onset of isolated symptoms/signs associated with laboratory abnormalities (e.g. ANA+ Raynaud's phenomenon)
T	Time	Longitudinal observational, RCTs and retrospective studies
S	Sample	Any biologic sample (<i>see Appendix 2</i>)

In vitro

P	Patients	Pediatric and adult patients with proven SARS-CoV2 infection AND with clinical features of COVID-19 OR with asymptomatic/paucisymptomatic infection AND WITHOUT RMDs prior SARS-CoV2 infection (RMD treated with any compound)
I	Intervention	Any technique assessing phenotype and function of immune and non-immune cells

		Any analysis of the concentration of soluble mediators
C	Comparator	No comparator Baseline Any stage of the disease evolution
O	Outcome	Monocytes/Macrophages activation, function and polarization; T cells (Th1, Th2, Th17, Treg, Thf, NK, GammaDelta T cells) activation, function and differentiation; B cells and plasmocytes activation, function, differentiation and Ig production, PNN, Mast cells, dendritic cells activation and function, endothelial cells activation and function, fibroblasts activation and function, Interferon production, cytokines/chemokines production, underlying molecular pathways (NFkB, JAK/STAT...), complement activation, SARS-CoV2 structure, replication and mechanisms of action, SARS-CoV2 interactions with any cell type (<i>See appendix 3</i>).GWAS, Polymorphisms (SNPs), Bulk RNA sequencing, Single cell RNA sequencing (Any cell, <i>see Appendix 3</i>), miRs arrays.
S	Sample	Any biologic sample (<i>see Appendix 2</i>)

Online Supplemental Text S5: Eligibility criteria for studies on COVID-19 and therapy

- Original research articles
- Published in peer-reviewed journals
- English language
- Adults
- Proven SARS-CoV2 infection according to the reference standard (nucleic acid amplification tests such as RT-qPCR)
- Signs/symptoms of COVID-19 or asymptomatic SARS-CoV2 infection
- Intervention: any immunomodulatory drug investigated or under investigation in SARS-CoV-2 infection according to the WHO International Clinical Trials Registry Platform as of 9 July 2020
- Any comparator or no comparator
- Any study design
- No diagnosis of RMDs prior SARS-CoV2 infection

On line supplementary Text S6: Risk of Bias evaluation tools.**Randomized Controlled Trials: Revised Cochrane risk-of-bias tool for randomized trials (RoB2)****Version of 22 August 2019**

Study details	
Reference	<input type="text"/>
Study design	
<input checked="" type="checkbox"/>	Individually-randomized parallel-group trial
<input type="checkbox"/>	Cluster-randomized parallel-group trial
<input type="checkbox"/>	Individually randomized cross-over (or other matched) trial
For the purposes of this assessment, the interventions being compared are defined as	
Experimental:	<input type="text"/> Comparator: <input type="text"/>
Specify which outcome is being assessed for risk of bias	<input type="text"/>
Specify the numerical result being assessed. In case of multiple alternative analyses being presented, specify the numeric result (e.g. RR = 1.52 (95% CI 0.83 to 2.77) and/or a reference (e.g. to a table, figure or paragraph) that uniquely defines the result being assessed.	<input type="text"/>
Is the review team's aim for this result...?	
<input type="checkbox"/>	to assess the effect of <i>assignment to intervention</i> (the 'intention-to-treat' effect)
<input type="checkbox"/>	to assess the effect of <i>adhering to intervention</i> (the 'per-protocol' effect)
If the aim is to assess the effect of <i>adhering to intervention</i>, select the deviations from intended intervention that should be addressed (at least one must be checked):	
<input type="checkbox"/>	occurrence of non-protocol interventions
<input type="checkbox"/>	failures in implementing the intervention that could have affected the outcome
<input type="checkbox"/>	non-adherence to their assigned intervention by trial participants
Which of the following sources were <u>obtained</u> to help inform the risk-of-bias assessment? (tick as many as apply)	
<input type="checkbox"/>	Journal article(s) with results of the trial
<input type="checkbox"/>	Trial protocol
<input type="checkbox"/>	Statistical analysis plan (SAP)
<input type="checkbox"/>	Non-commercial trial registry record (e.g. ClinicalTrials.gov record)
<input type="checkbox"/>	Company-owned trial registry record (e.g. GSK Clinical Study Register record)
<input type="checkbox"/>	"Grey literature" (e.g. unpublished thesis)
<input type="checkbox"/>	Conference abstract(s) about the trial
<input type="checkbox"/>	Regulatory document (e.g. Clinical Study Report, Drug Approval Package)
<input type="checkbox"/>	Research ethics application
<input type="checkbox"/>	Grant database summary (e.g. NIH RePORTER or Research Councils UK Gateway to Research)
<input type="checkbox"/>	Personal communication with trialist
<input type="checkbox"/>	Personal communication with the sponsor

Risk of bias assessment

Responses underlined in green are potential markers for low risk of bias, and responses in **red** are potential markers for a risk of bias. Where questions relate only to sign posts to other questions, no formatting is used.

Domain 1: Risk of bias arising from the randomization process

Signalling questions	Comments	Response options
1.1 Was the allocation sequence random?		<u>Y</u> / PY / PN / N / NI
1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?		<u>Y</u> / PY / PN / N / NI
1.3 Did baseline differences between intervention groups suggest a problem with the randomization process?		Y / PY / <u>PN</u> / N / NI
Risk-of-bias judgement		Low / High / Some concerns
Optional: What is the predicted direction of bias arising from the randomization process?		NA / Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

Domain 2: Risk of bias due to deviations from the intended interventions (*effect of assignment to intervention*)

Signalling questions	Comments	Response options
2.1. Were participants aware of their assigned intervention during the trial?		Y / PY / PN / N / NI
2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?		Y / PY / PN / N / NI
2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the trial context?		NA / Y / PY / PN / N / NI
2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?		NA / Y / PY / PN / N / NI
2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?		NA / Y / PY / PN / N / NI
2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?		Y / PY / PN / N / NI
2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?		NA / Y / PY / PN / N / NI
Risk-of-bias judgement		Low / High / Some concerns
Optional: What is the predicted direction of bias due to deviations from intended interventions?		NA / Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

Domain 2: Risk of bias due to deviations from the intended interventions (*effect of adhering to intervention*)

Signalling questions	Comments	Response options
2.1. Were participants aware of their assigned intervention during the trial?		Y / PY / <u>PN</u> / <u>N</u> / NI
2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?		Y / PY / <u>PN</u> / <u>N</u> / NI
2.3. [If applicable:] <u>If Y/PY/NI to 2.1 or 2.2:</u> Were important non-protocol interventions balanced across intervention groups?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
2.4. [If applicable:] Were there failures in implementing the intervention that could have affected the outcome?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
2.5. [If applicable:] Was there non-adherence to the assigned intervention regimen that could have affected participants' outcomes?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
2.6. <u>If N/PN/NI to 2.3, or Y/PY/NI to 2.4 or 2.5:</u> Was an appropriate analysis used to estimate the effect of adhering to the intervention?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
Risk-of-bias judgement		Low / High / Some concerns
Optional: What is the predicted direction of bias due to deviations from intended interventions?		NA / Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

Domain 3: Missing outcome data

Signalling questions	Comments	Response options
3.1 Were data for this outcome available for all, or nearly all, participants randomized?		<u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
3.2 If <u>N/PN/NI</u> to 3.1: Is there evidence that the result was not biased by missing outcome data?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u>
3.3 If <u>N/PN</u> to 3.2: Could missingness in the outcome depend on its true value?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
3.4 If <u>Y/PY/NI</u> to 3.3: Is it likely that missingness in the outcome depended on its true value?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
Risk-of-bias judgement		Low / High / Some concerns
Optional: What is the predicted direction of bias due to missing outcome data?		NA / Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

Domain 4: Risk of bias in measurement of the outcome

Signalling questions	Comments	Response options
4.1 Was the method of measuring the outcome inappropriate?		Y / PY / <u>PN</u> / <u>N</u> / NI
4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?		Y / PY / <u>PN</u> / <u>N</u> / NI
4.3 If <u>NP/N/NI</u> to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants?		NA / Y / PY / <u>PN</u> / <u>N</u> / NI
4.4 If <u>Y/PY/NI</u> to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?		NA / Y / PY / <u>PN</u> / <u>N</u> / NI
4.5 If <u>Y/PY/NI</u> to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?		NA / Y / PY / <u>PN</u> / <u>N</u> / NI
Risk-of-bias judgement		Low / High / Some concerns
Optional: What is the predicted direction of bias in measurement of the outcome?		NA / Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

Domain 5: Risk of bias in selection of the reported result

Signalling questions	Comments	Response options
5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?		<u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
Is the numerical result being assessed likely to have been selected, on the basis of the results, from...		
5.2. ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?		<u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
5.3 ... multiple eligible analyses of the data?		<u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
Risk-of-bias judgement		Low / High / Some concerns
Optional: What is the predicted direction of bias due to selection of the reported result?		NA / Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

Overall risk of bias

Risk-of-bias judgement		Low / High / Some concerns
Optional: What is the overall predicted direction of bias for this outcome?		NA / Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

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s of interventions: The Risk Of Bias In Non-randomized Studies – of Interventions (ROBINS-I) assessment tool

Version 19 September 2016

ROBINS-I tool (Stage I): At protocol stage

Specify the review question

Participants	
Experimental intervention	
Comparator	
Outcomes	

List the confounding domains relevant to all or most studies

--

List co-interventions that could be different between intervention groups and that could impact on outcomes

--

ROBINS-I tool (Stage II): For each study

Specify a target randomized trial specific to the study

Design	Individually randomized / Cluster randomized / Matched (e.g. cross-over)
Participants	
Experimental intervention	
Comparator	

Is your aim for this study...?

- to assess the effect of *assignment* to intervention
- to assess the effect of *starting and adhering* to intervention

Specify the outcome

Specify which outcome is being assessed for risk of bias (typically from among those earmarked for the Summary of Findings table). Specify whether this is a proposed benefit or harm of intervention.

Specify the numerical result being assessed

In case of multiple alternative analyses being presented, specify the numeric result (e.g. RR = 1.52 (95% CI 0.83 to 2.77) and/or a reference (e.g. to a table, figure or paragraph) that uniquely defines the result being assessed.

Preliminary consideration of confounders

Complete a row for each important confounding domain (i) listed in the review protocol; and (ii) relevant to the setting of this particular study, or which the study authors identified as potentially important.

“Important” confounding domains are those for which, in the context of this study, adjustment is expected to lead to a clinically important change in the estimated effect of the intervention. “Validity” refers to whether the confounding variable or variables fully measure the domain, while “reliability” refers to the precision of the measurement (more measurement error means less reliability).

(i) Confounding domains listed in the review protocol				
Confounding domain	Measured variable(s)	Is there evidence that controlling for this variable was unnecessary?*	Is the confounding domain measured validly and reliably by this variable (or these variables)?	OPTIONAL: Is failure to adjust for this variable (alone) expected to favour the experimental intervention or the comparator?
			Yes / No / No information	Favour experimental / Favour comparator / No information

(ii) Additional confounding domains relevant to the setting of this particular study, or which the study authors identified as important				
Confounding domain	Measured variable(s)	Is there evidence that controlling for this variable was unnecessary?*	Is the confounding domain measured validly and reliably by this variable (or these variables)?	OPTIONAL: Is failure to adjust for this variable (alone) expected to favour the experimental intervention or the comparator?

			Yes / No / No information	Favour experimental / Favour comparator / No information

* In the context of a particular study, variables can be demonstrated not to be confounders and so not included in the analysis: (a) if they are not predictive of the outcome; (b) if they are not predictive of intervention; or (c) because adjustment makes no or minimal difference to the estimated effect of the primary parameter. Note that “no statistically significant association” is not the same as “not predictive”.

Preliminary consideration of co-interventions

Complete a row for each important co-intervention (i) listed in the review protocol; and (ii) relevant to the setting of this particular study, or which the study authors identified as important.

“Important” co-interventions are those for which, in the context of this study, adjustment is expected to lead to a clinically important change in the estimated effect of the intervention.

(i) Co-interventions listed in the review protocol		
Co-intervention	Is there evidence that controlling for this co-intervention was unnecessary (e.g. because it was not administered)?	Is presence of this co-intervention likely to favour outcomes in the experimental intervention or the comparator
		Favour experimental / Favour comparator / No information
		Favour experimental / Favour comparator / No information
		Favour experimental / Favour comparator / No information
		Favour experimental / Favour comparator / No information

(ii) Additional co-interventions relevant to the setting of this particular study, or which the study authors identified as important		
Co-intervention	Is there evidence that controlling for this co-intervention was unnecessary (e.g. because it was not administered)?	Is presence of this co-intervention likely to favour outcomes in the experimental intervention or the comparator
		Favour experimental / Favour comparator / No information
		Favour experimental / Favour comparator / No information
		Favour experimental / Favour comparator / No information
		Favour experimental / Favour comparator / No information

Risk of bias assessment

Responses underlined in green are potential markers for low risk of bias, and responses in **red** are potential markers for a risk of bias. Where questions relate only to sign posts to other questions, no formatting is used.

Signalling questions	Description	Response options
Bias due to confounding		
1.1 Is there potential for confounding of the effect of intervention in this study? If <u>N/PN</u> to 1.1: the study can be considered to be at low risk of bias due to confounding and no further signalling questions need be considered		Y / PY / <u>PN / N</u>
If Y/PY to 1.1: determine whether there is a need to assess time-varying confounding:		
1.2. Was the analysis based on splitting participants' follow up time according to intervention received? If N/PN, answer questions relating to baseline confounding (1.4 to 1.6) If Y/PY, go to question 1.3.		NA / Y / PY / PN / N / NI
1.3. Were intervention discontinuations or switches likely to be related to factors that are prognostic for the outcome? If N/PN, answer questions relating to baseline confounding (1.4 to 1.6) If Y/PY, answer questions relating to both baseline and time-varying confounding (1.7 and 1.8)		NA / Y / PY / PN / N / NI

Questions relating to baseline confounding only		
1.4. Did the authors use an appropriate analysis method that controlled for all the important confounding domains?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
1.5. If <u>Y/PY</u> to 1.4: Were confounding domains that were controlled for measured validly and reliably by the variables available in this study?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
1.6. Did the authors control for any post-intervention variables that could have been affected by the intervention?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
Questions relating to baseline and time-varying confounding		
1.7. Did the authors use an appropriate analysis method that controlled for all the important confounding domains and for time-varying confounding?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
1.8. If <u>Y/PY</u> to 1.7: Were confounding domains that were controlled for measured validly and reliably by the variables available in this study?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
Risk of bias judgement		Low / Moderate / Serious / Critical / NI
Optional: What is the predicted direction of bias due to confounding?		Favours experimental / Favours comparator / Unpredictable

Bias in selection of participants into the study		
<p>2.1. Was selection of participants into the study (or into the analysis) based on participant characteristics observed after the start of intervention?</p> <p>If N/PN to 2.1: go to 2.4</p> <p>2.2. If Y/PY to 2.1: Were the post-intervention variables that influenced selection likely to be associated with intervention?</p> <p>2.3 If Y/PY to 2.2: Were the post-intervention variables that influenced selection likely to be influenced by the outcome or a cause of the outcome?</p>		<p>Y / PY / <u>PN / N</u> / NI</p> <p>NA / Y / PY / <u>PN / N</u> / NI</p> <p>NA / Y / PY / <u>PN / N</u> / NI</p>
2.4. Do start of follow-up and start of intervention coincide for most participants?		Y / PY / <u>PN / N</u> / NI
2.5. If Y/PY to 2.2 and 2.3, or N/PN to 2.4: Were adjustment techniques used that are likely to correct for the presence of selection biases?		NA / <u>Y / PY</u> / <u>PN / N</u> / NI
Risk of bias judgement		Low / Moderate / Serious / Critical / NI
Optional: What is the predicted direction of bias due to selection of participants into the study?		Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

Bias in classification of interventions		
3.1 Were intervention groups clearly defined?		<u>Y / PY</u> / <u>PN / N</u> / NI
3.2 Was the information used to define intervention groups recorded at the start of the intervention?		<u>Y / PY</u> / <u>PN / N</u> / NI
3.3 Could classification of intervention status have been affected by knowledge of the outcome or risk of the outcome?		Y / PY / <u>PN / N</u> / NI
Risk of bias judgement		Low / Moderate / Serious / Critical / NI
Optional: What is the predicted direction of bias due to classification of interventions?		Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

Bias due to deviations from intended interventions		
If your aim for this study is to assess the effect of assignment to intervention, answer questions 4.1 and 4.2		
4.1. Were there deviations from the intended intervention beyond what would be expected in usual practice?		Y / PY / <u>PN / N</u> / NI
4.2. If Y/PY to 4.1: Were these deviations from intended intervention unbalanced between groups <i>and</i> likely to have affected the outcome?		NA / Y / PY / <u>PN / N</u> / NI
If your aim for this study is to assess the effect of starting and adhering to intervention, answer questions 4.3 to 4.6		
4.3. Were important co-interventions balanced across intervention groups?		<u>Y / PY</u> / PN / N / NI
4.4. Was the intervention implemented successfully for most participants?		<u>Y / PY</u> / PN / N / NI
4.5. Did study participants adhere to the assigned intervention regimen?		<u>Y / PY</u> / PN / N / NI
4.6. If N/PN to 4.3, 4.4 or 4.5: Was an appropriate analysis used to estimate the effect of starting and adhering to the intervention?		NA / <u>Y / PY</u> / PN / N / NI
Risk of bias judgement		Low / Moderate / Serious / Critical / NI
Optional: What is the predicted direction of bias due to deviations from the intended interventions?		Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

Bias due to missing data		
5.1 Were outcome data available for all, or nearly all, participants?		<u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
5.2 Were participants excluded due to missing data on intervention status?		<u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
5.3 Were participants excluded due to missing data on other variables needed for the analysis?		<u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
5.4 If PN/N to 5.1, or Y/PY to 5.2 or 5.3: Are the proportion of participants and reasons for missing data similar across interventions?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
5.5 If PN/N to 5.1, or Y/PY to 5.2 or 5.3: Is there evidence that results were robust to the presence of missing data?		NA / <u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
Risk of bias judgement		Low / Moderate / Serious / Critical / NI
Optional: What is the predicted direction of bias due to missing data?		Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

Bias in measurement of outcomes		
6.1 Could the outcome measure have been influenced by knowledge of the intervention received?		<u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
6.2 Were outcome assessors aware of the intervention received by study participants?		<u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
6.3 Were the methods of outcome assessment comparable across intervention groups?		<u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
6.4 Were any systematic errors in measurement of the outcome related to intervention received?		<u>Y</u> / <u>PY</u> / <u>PN</u> / <u>N</u> / NI
Risk of bias judgement		Low / Moderate / Serious / Critical / NI
Optional: What is the predicted direction of bias due to measurement of outcomes?		Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

Bias in selection of the reported result		
Is the reported effect estimate likely to be selected, on the basis of the results, from...		
7.1 ... multiple outcome <i>measurements</i> within the outcome domain?		Y / PY / <u>PN / N</u> / NI
7.2 ... multiple <i>analyses</i> of the intervention-outcome relationship?		Y / PY / <u>PN / N</u> / NI
7.3 ... different <i>subgroups</i> ?		Y / PY / <u>PN / N</u> / NI
Risk of bias judgement		Low / Moderate / Serious / Critical / NI
Optional: What is the predicted direction of bias due to selection of the reported result?		Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

Overall bias		
Risk of bias judgement		Low / Moderate / Serious / Critical / NI
Optional: What is the overall predicted direction of bias for this outcome?		Favours experimental / Favours comparator / Towards null / Away from null / Unpredictable

On line supplementary Table S1: Flowchart of the 3 searches (Part 1)

	TOTAL	COVID-19 AND pathogenesis	COVID-19 AND therapy	COVID-19 AND RMDs
Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily	18465	10847	6746	872
Embase	34843	16321	15508	3014
Cumulative Index to Nursing and Allied Health Literature (CINAHL)	4604	1643	2709	252
The Cochrane Central Register of Controlled Trials (CENTRAL)	2460	732	1680	48
TOTAL	60372	29543	26643	4186
DUPLICATES (within groups + between groups)	32458	11548	18337	2573
TITLES AND ABSTRACTS SCREENED	27914	17995	8306	1613
EXCLUDED:	26213	17144	7708	1361
<i>Other topic (no COVID-19)</i>	1562	1342	181	39
<i>Other topic (COVID-19)</i>	9330	6182	2621	527
<i>Other therapies for COVID-19 (e.g. antivirals)</i>	586	469	112	5
<i>Narrative reviews, commentaries, viewpoints, editorials</i>	9205	6259	2378	568
<i>Systematic literature reviews</i>	647	350	255	42
<i>Case reports unless on immunomodulatory treatments</i>	1339	692	602	75
<i>Study protocols</i>	2373	1137	1181	55
<i>Other language</i>	238	121	95	22

<i>Recommendations/guidelines/position papers</i>	245	79	142	24
<i>Conference abstracts</i>	71	8	63	0
<i>Erratum/Corrections/Retractions</i>	112	70	41	1
<i>Animal studies</i>	119	104	15	0
<i>Preprints</i>	386	331	52	3

INCLUDED FOR FULL TEXT ASSESSMENT	1710	860	568	252
PATHOGENESIS	586	423	140	23
THERAPY	700	298	398	4
RMDs	394	139	30	225

On line supplementary Table S2: Flowchart of the 3 searches (Part 2)

	TOTAL	COVID-19 AND pathogenesis	COVID-19 AND therapy	COVID-19 AND RMDs	Handsearch
FULL TEXTS EVALUATED	707	298	398	4	7

EXCLUDED	306	151	151	4	0
Narrative reviews, commentaries, viewpoints, editorials	103	53	48	2	0
Systematic literature reviews	15	9	6	0	0
Wrong population	31	18	11	2	0
Study protocols	18	10	8	0	0
Conference abstracts	10	9	1	0	0
Other language	15	8	7	0	0
Other topic related to COVID	70	24	46	0	0
Wrong intervention	12	6	6	0	0
Duplicates	32	14	18	0	0

INCLUDED IN THE SLR	401	147	247	0	7
Tocilizumab	138	28	110	0	0
Corticosteroids	65	21	44	0	0
Hydroxychloroquine	53	13	40	0	0
Convalescent plasma	42	37	5	0	0
Anakinra	19	12	7	0	0
Mesenchymal stem cells	13	7	6	0	0
Intravenous immunoglobulins	12	5	7	0	0
Baricitinib	6	3	3	0	1
Tocilizumab + glucocorticoids	6	2	4	0	0
Ruxolitinib	7	3	4	0	1
Interferon beta 2a	6	4	2	0	0
Colchicine	4	4	0	0	0
Sarilumab	3	2	1	0	0
Eculizumab	3	0	1	0	2
Leflunomide	2	2	0	0	0
Baricitinib + glucocorticoids	3	0	1	0	0

Mavrilimumab	1	1	0	0	0
Vilobelimumab	1	0	1	0	0
Ruxolitinib + eculizumab	1	1	0	0	0
rhIL-7	2	1	1	0	0
Interferon alpha 2b	1	0	1	0	0
Interferon kappa	1	0	1	0	0
Infliximab	1	1	0	0	0
Canakinumab	2	0	2	0	0
Imatinib	1	0	1	0	0
Ruxolitinib+glucocorticoids	1	0	1	0	0
Anakinra + glucocorticoids	1	0	1	0	0
Cyclosporin + glucocorticoids	1	0	1	0	0
Lenzilumab	1	0	1	0	0
Itolizumab	1	0	1	0	0
AMY-101	1	0	0	0	1
Tesidolumab	1	0	0	0	1
Treg cells	1	0	0	0	1

On line supplementary Table S3: Design of studies retrieved by the SLR.

	RCTs	Prospective		Retrospective		Case Reports
		Controlled	Non controlled	Controlled	Non controlled	
Tocilizumab	4	18	13	36	39	28
Corticosteroids	6	14	0	24	10	11
Hydroxychloroquine	12	8	4	16	9	4
Convalescent plasma	3	6	5	4	10	14
Anakinra	1	0	0	4	4	10
Mesenchymal stem cells	0	1	3	0	1	8
Intravenous immunoglobulins	2	0	0	4	3	3
Baricitinib	1	3	0	1	1	0
Tocilizumab + glucocorticoids	0	3	1	0	1	1
Ruxolitinib	1	0	1	0	2	2
Interferon beta 2a	3	1	1	0	1	0
Colchicine	1	1	0	1	0	1
Sarilumab	0	1	2	0	0	0
Eculizumab	0	1	0	0	0	2
Leflunomide	2	0	0	0	0	0
Baricitinib + glucocorticoids	0	1	0	0	1	1
Mavrilimumab	0	1	0	0	0	0
Vilobelimab	1	0	0	0	0	0
Ruxolitinib + eculizumab	0	1	0	0	0	0
rhIL-7	0	1	0	0	0	1
Interferon alpha 2b	0	1	0	0	0	0
Interferon kappa	1	0	0	0	0	0
Infliximab	0	0	0	1	0	0
Canakinumab	0	0	0	0	1	1
Imatinib	0	0	0	0	0	1

Ruxolitinib+glucocorticoids	0	1	0	0	0	0
Anakinra + glucocorticoids	0	0	0	1	0	0
Cyclosporin + glucocorticoids	0	1	0	0	0	0
Lenzilumab	0	1	0	0	0	0
Itolizumab	0	0	1	0	0	0
AMY-101	0	0	0	0	0	1
Tesidolumab	0	0	0	0	1	0
Treg cells	0	0	0	0	0	1

The full list of references pertaining to articles included in the SLR but now shown in the main manuscript since better evidence was published is available upon request.

Online Supplementary Table S4. Characteristics of the randomized controlled trials included in the SLR.

Author	Drug, dosage and administration, N	Comparator N	Patient characteristics		
			Patients hospitalized, oxygen therapy N(%)	NIV, N(%)	IMV, N(%)
RECOVERY collaborative group	Dexamethasone 6 mg/d per os or iv N=2104	SOC N=4321	DEX 1279 (61%) SOC: 2604 (60%)	NA	DEX: 324 (15%) SOC: 683 (16%)
Prado Jeronimo et al	Methylprednisolone 0.5 mg/kg bid iv for 5d N=194	SOC+PBO N=199	88/393 (47.8)		133/393 (33.8)
Tomazini et al (CoDex)	Dexamethasone 20 mg/d iv for 5 d and then 10 mg/d iv for 5 d N=151	SOC ³ N=148	0	0	100%
Edalatifard et al	Methylprednisolone 250 mg/d ⁻¹ iv pulse for 3 d	SOC	MTP: 21 (61.8%) SOC: 17 (64.3%)	MTP: 13 (38.2%) SOC: 10 (35.7%)	0
Angus et al (REMAP-CAP)	Hydrocortisone 50 mg iv every 6 h for 7 d	SOC+PBO	0	HCT: 122 (45.6%) SOC: 48 (44.4%)	HCT: 173 (54.4%) SOC: 60 (63.6%)
Dequin et al (CAPE-COVID)	Hydrocortisone 200 mg/d for 4 d or 7 d; 100 mg/d for 2 d or 4 d; 50mg/d for 2 d or 3 d. Continuous iv infusion for 8 d or 14 d	SOC+PBO	0	HCT: 14 (18.4%) SOC: 14 (19.2%)	HCT: 62 (81.6%) SOC: 59 (80.8%)
Abd-Elsalam et al	HCQ 400 mg twice daily (in day 1) followed by 200 mg tablets twice daily	SOC ⁷ N=97	NR	NR	NR

	N=97				
Lyngbakken et al.	HCQ 400 mg twice daily for 7 days N=26	SOC ⁸ N=25	HCQ: 8 (29.6) SOC: 12 (46.2)	NR	NR
RECOVERY collaborative group	HCQ sulfate (in the form of a 200-mg tablet containing a 155-mg base equivalent) 800mg at baseline and at 6 hours, then 400 mg starting at 12 hours after the initial dose and then every 12 hours for the next 9 days or until discharge N=1561	SOC ⁹ N=3155	HCQ: 938 (60.1) SOC: 1873 (59.3)		HCQ: 261 (16.7) SOC: 532 (16.9)
Cavalcanti et al.	HCQ 400 mg twice a day 7 days N=221	SOC ¹⁰ N=227 SOC ¹⁰ + azithromycin 500mg N=217	HCQ+AZT: 92 (42.4) HCQ: 89 (40.3) SOC: 97 (42.7)	0 (exclusion criteria)	0 (exclusion criteria)
Huang et al.	Chloroquine 500 mg orally twice daily for 10 days; N=10	SOC ¹¹ N=12	NA	NA	NA
Tang et al.	HCQ 1200 mg daily for three days followed by a maintenance dose of	SOC ¹² N=75	NA	NA	NA

	800 mg daily (total treatment duration: two or three weeks N=75)				
Mirja et al.	HCQ (800 mg on day 1, followed by 400 mg once daily for 6 days N=136)	SOC ¹³ N=157	0	0	0
Skipper et al.	HCQ 800mg (4 tablets) once, then 600 mg (3 tablets) 6 to 8 hours later, then 600 mg (3 tablets) once daily for 4 more days (5 days in total). N=212	SOC ¹⁴ +PBO N=211	0	0	0
Omrani et al.	Oral HCQ (600 mg daily for one week), or oral HC plus oral AZ (500 mg day one, 250 mg daily on days two through five) N=152	SOC ¹⁵ + PBO (NA) N=152 SOC + AZT N=152	NA	0	0
Chen et al.	HCQ 400 mg twice for 1 day OR HCQ 200 mg twice daily for 6 days. N=21	SOC ¹⁶ N=12	0	0 (Exclusion criteria)	(Exclusion criteria)
Self et al.	HCQ 400 mg twice daily for 2 doses, then 200 mg twice daily for	SOC ¹⁷ + PBO N=237	46.8%	11.5%	6.7%

	8 doses N=242				
Ulrich et al.	HCQ 400 mg (2 tablets) by mouth 2 times per day (day 1) and 200 mg (1 tablet) by mouth 2 times per day (days 2–5) N=67	SOC ¹⁸ + PBO N=61	1%	1%	0 (exclusion criteria)
Hermine et al. (CORIMUNO-19-TOCI1)	TCZ, 8 mg/kg, IV plus usual care on day 1 and on day 3 if clinically indicated N=64	SOC ¹⁹ N=67	131 (100%) (>3L <15L)	0 (exclusion criteria)	0 (exclusion criteria)
Stone et al	TCZ 8mg/kg IV single dose N=161	SOC ²⁰ N=81	NA	0 (exclusion criteria)	0 (exclusion criteria)
Salvarani et al.	TCZ 8mg/kg IV within 8 hours from randomization followed by a second dose after 12 hours. N=60	SOC ²¹ N=66	NA	0 (exclusion criteria)	0 (exclusion criteria)
Zhao et al.	TCZ IV 4–8 mg/kg (recommended 400 mg) N=5	SOC ²² + Favipiracvir N=7 SOC + Favipiracvir + TCZ N=14	NA	NA	NA
Mariette et al (CORIMUNO-19-ANA1)	Anakinra 200mg IV bid at day 1, 2 and 3, then 100mg bid at day4 and 100mg/day at day 5	SOC ²³ N=55	114 (100%) (>3L <15L)	0 (exclusion criteria)	0 (exclusion criteria)

	In case of absence of improvement at D4: 400mg/day at day 4, 5, and 6, 200mg/day at day 7 and 100mg/day at day 8 N=59				
Cao et al.	Ruxolitinib 5mg bid N=22	SOC ²⁴ +PBO N=21	RUXO: 18 (86) SOC: 18 (90)	RUXO: 3 (14) SOC: 2 (10)	0 (exclusion criteria)
Davoudi-Monfared et al Rahmani et al.	Interferon beta 250 mcg sc eod for 2w N=46	SOC ²⁵ N=46	IFN: 26 (56) SOC: 22 (48)	IFN: 1 (2) SOC: 0 (0)	IFN 15 (36) SOC 17 (44)
Monk et al.	Interferon beta (SNG001) 6 MIU delivered via nebulizer once daily for up to 14 days N=50	SOC ²⁶ +PBO N=51	IFN= 28 (56%) SOC= 36 (75%)	IFN= 1 (2%) SOC= 1 (2%)	IFN=0 SOC=0
Gharebaghi et al	IVIg 5 gm5/d for 3d N=30	SOC ²⁷ , ²⁸ +PBO N=29	NA	NA	NA
Tabarsi et al.	IGIV 400 mg/kg, IV, daily for three days N=52	SOC ²⁹ +PBO N=32	N=84	NA	NA
Vlaar et al	Vilobelimab 800mg/d iv up to seven doses N=15	SOC ³⁰ N=15	VILO: N=7 (47) SOC= N=8 (53)		VILO: N= 5 (25) SOC: N=10 (75)
Wang et al.	Leflunomide 50 mg, q12h three consecutive times, after	SOC ³¹ N=24	NA	NA	NA

	20 mg/d for 10d N=24				
Hu et al.	Leflunomide 50 mg, q12h three consecutive times, after 20 mg/d for 10d N=5	SOC ³² N=5	NA	0 (exclusion criteria)	0 (exclusion criteria)
Deftereos et al.	Colchicine Loading dose 1.5 mg followed by 0.5 mg 60min later. Maintenance 0.5mg bid for a maximum of 21 d N=50	SOC ³³ N=55	COL: N= 36 (65) SOC: N=30 (60)	COL: N=0 SOC: N=3 (6)	COL N=0 SOC N=0
WHO Solidarity Trial Consortium	HCQ four tablets at hour 0, four tablets at hour 6, and, starting at hour 12, two tablets twice daily for 10 days N=954 INTERFERON Beta 1 mainly SC 3 doses over a period of 6 days (the day of randomization and days 3 and 6) of 44 µg N=2063	SOC ³⁴ N=4088	N=3200 HCQ=345 IFN=482	N=7146 HCQ=517 IFN=1429	N=916 HCQ=85 IFN=139
Simonovic et al. 2020	Convalescent plasma 1 infusion Titer >1:800 N=228	SOC ³⁵ + 1 Administration of placebo (saline solution)	NA	ICU without precision N=67 Convalescent plasma N=25 Placebo	

		N=105			
Li et al. 2020	Convalescent plasma 1 infusion 4 to 13 mL/kg of recipient body weight N=52	SOC ³⁶ N=51	Convalescent plasma N=15 Placebo N=15	Convalescent plasma N=21 Placebo N=23	Convalescent plasma N=14 Placebo N=11
Agarwal et al. 2020	Convalescent plasma 2 doses of 200mL 24hours apart N=235	SOC ³⁷ N=229	PLASMA N=235 SOC N=229	0 (exclusion criteria)	0 (exclusion criteria)
Kalil et al. 2020	Baricitinib 4 mg/day for 14 days or until hospital discharge + Remdesivir 200mg on day 1 followed by 100mg/day through 10d or until hospital discharge or death N=515	Remdesivir 200mg on day1 followed by 100mg/day through 10d or until hospital discharge or death + PBO + SOC ³⁸ N=518	BARI+RDV N=288 (55.9) RDV N= 276 (53.3) INTERVENTION -Oxygen therapy 56% -NIV (including HFO) 20% -MIV 10% COMPARATOR - Oxygen therapy 53% -NIV (including HFO) 22% -MIV 11%	BARI+RDV N=103 (20.0) RDV N= 113 (21.8)	BARI+RDV N=54 (10.5) RDV N= 57 (11.0)
Fu et al. 2020	Interferon kappa 2mg in 5 mL sterilized water also containing 5mg of trefoil factor 2 delivered for 20-30 min by a nasal mask from the first day of hospitalization 6 times every 24 h N=40	SOC ³⁹ N=40	0	0	0
Salama et al.	TCZ IV 8mg/kg one or two doses N=249	SOC ⁴⁰ +PBO N=128	TCZ= 161 SOC= 81	TCZ=64 SOC=36	0 (exclusion criteria)

1: The current standard care for Covid-19 was at the discretion of the treating physicians. 0 to 3% of patients received hydroxychloroquine, lopinavir–ritonavir, or interleukin-6 antagonists; 2: Current standard care + intravenous ceftriaxone (1g 2x for 7 days) plus azithromycin (500 mg 1x for 5 days) or clarithromycin (500 mg 2x for 7 days), starting on day 1; 3: The current standard care for Covid-19 was at the discretion of the treating physicians; 4: Standard care (Hydroxychloroquine sulfate, Lopinavir, and Naproxen); 5: All patients meeting ARDS criteria used preemptive intravenous ceftriaxone (1 g 2x for 7 days) plus azithromycin (500 mg 1x for 5 days) or clarithromycin (500 mg 2x for 7 days), starting on Day 1; 6: The current standard care for Covid-19 was at the discretion of the treating physicians. 0 to 3% of patients received hydroxychloroquine, lopinavir–ritonavir, or interleukin-6 antagonists; 7: NA; 8: NA; 9: paracetamol, oxygen, fluids (according to assessment), empiric antibiotic (cephalosporins), oseltamivir if needed (75 mg/12 hours for 5 days), and hydrocortisone for severe cases. 10: The current standard care for Covid-19 was at the discretion of the treating physicians. The use of glucocorticoids, other immunomodulators, antibiotic agents, and antiviral agents was allowed; 11: Paracetamol, oxygen, fluids (according to assessment), empiric antibiotic (cephalosporins), oseltamivir if needed (75 mg/12 hours for 5 days), and hydrocortisone for severe cases. 12: NA; 13: NA; 14: Skipper None; 15 NA; 16 The treatment consisted of: (1) ceftriaxone 2 g daily for 7 days ± azithromycin 500 mg on day 1 and 250 mg on days 2–5; or (2) levofloxacin 750 mg daily for 5 d; or (3) levofloxacin 500 mg daily; or (4) moxifloxacin 400 mg daily for 7–14 days for subjects allergic to ceftriaxone or azithromycin or according to physician discretion. Oseltamivir 75 mg b.i.d. was administered for 5 days to subjects presenting with concomitant influenza A or B infection); 17 NA; 18 NA; 19: Usual care included antibiotic agents, antiviral agents, corticosteroids, vasopressor support, and anticoagulants; 20: Some patients received remdesivir as concomitant treatment, whereas no patients received dexamethasone. Antiviral therapy, hydroxychloroquine, and glucocorticoids were permitted as concomitant treatment; 21: Patients in the control arm received supportive care following the treatment protocols of each center. All drugs were allowed but IL-1 blockers, Jak inhibitors, and tumor necrosis factor inhibitors. Steroids were allowed if already taken before hospitalization. In case of occurrence of documented clinical worsening, patients randomized in both arms could receive any therapy, including steroids, and, for patients randomized in the control arm, tocilizumab. 22 NA; 23: antibiotic agents, antiviral agents, corticosteroids, vasopressor support, anticoagulants) was provided at the discretion of the clinicians. 24: SoC treatment included antiviral therapy, supplemental oxygen, noninvasive and invasive ventilation, corticosteroid, antibiotic agents, vasopressor support, renal-replacement therapy, and extracorporeal membrane oxygenation. 25: HCQ+lopinavir/ritonavir or atazanavir-ritonavir. Based on patients' clinical conditions, azithromycin, intravenous ascorbic acid, antibiotics, intravenous immunoglobulin (IVIG), or a corticosteroid, was added to the antiviral regimens; 26 NA; 27: Lopinavir/ritonavir (400/100 mg BD) or atazanavir/ritonavir (300/100 mg daily) plus hydroxychloroquine (400 mg BD in first day and then 200 mg BD) for 7–10 days. Other supportive cares such as fluid therapy, stress ulcer prophylaxis, deep vein thrombosis, treatment of electrolyte disorders and antibiotic therapy were considered according to the hospital protocols. 28: At least both one antiviral and one chloroquine-class drug; 29: hydroxychloroquine, lopinavir/ritonavir and supportive care; 30: Including but not limited to lung protective ventilation, thrombosis prophylaxis, renal replacement therapy when indicated, and access to advanced therapies including extracorporeal membrane oxygenation. Hydroxychloroquine was allowed during the study; active concomitant treatment with antiviral or other immunomodulatory drugs was not allowed. 31: nebulized IFN- α -2a alone for 10 days; 32: supportive treatment (Arbidol, Lianhua Qingwen Capsule, Magnesium Isoglycyrrhizinate, and Cefoperazone); 33: HCQ and/or lopinavir/ritonavir and/or IV dexamethasone. 34: NA; 35: Patients were allowed to receive antiviral agents, glucocorticoids, or both according to the standard of care at the provider health care institution. 36: Possible treatments included antiviral medications, antibacterial medications, steroids, human immunoglobulin, Chinese herbal medicines, and other medication. 37: followed by the participating clinical sites for the management of patients with covid-19 included antivirals (hydroxychloroquine, remdesivir, lopinavir/ritonavir, oseltamivir), broad spectrum antibiotics, immunomodulators (steroids, tocilizumab), and supportive management. 38 Venous thromboembolism prophylaxis was recommended for all the patients without a major contraindication. If a hospital had a written policy for Covid-19 treatments, patients could receive those treatments. In the absence of a written policy, other experimental treatment and off-label use of marketed medications intended as specific treatment for Covid-19 were prohibited. This included glucocorticoids, which were permitted only for standard indications such as adrenal insufficiency, asthma exacerbation, laryngeal edema, septic shock, and acute respiratory distress syndrome. 39 Standard care included symptomatic treatment with hydroxychloroquine, antibiotic agents, vasopressors, antifever medicine, vitamin C, immune enhancers, or traditional Chinese medicines. 40 Standard care according to local practice, which could include antiviral treatment, the limited use of systemic glucocorticoids (recommended dose, ≤ 1 mg per kilogram of body weight of methylprednisolone or equivalent), and supportive care.

Online Supplementary Table S5. Effect of immunomodulatory drugs assessed by prospective studies on mortality, invasive and non-invasive ventilation and on oxygen support in severe COVID-19

Online Supplementary Text S7

List of abbreviations

Outcome	Drug	Author, year [ref]	Study groups	Results	RoB
Mortality	Mavrilimumab	De Luca et al. 2020	MAV+SOC vs SOC	No difference in mortality (p=0.086)	Unclear
	Sarilumab	Della Torre et al. 2020	SARI+SOC vs SOC	No difference between groups in death rate	High
	rhIL-7	Laterre et al. 2020	IL-7+SOC vs SOC	30-day mortality did not differ between groups	High
	Eculizumab	Annane et al 2020	ECU+SOC vs SOC	Significant difference in survival curves between groups (P = 0.04)	Unclear
	Tocilizumab + glucocorticoids	Ramiro et al 2020	SOC+TCZ+MTP vs SOC	At day 14, 38% vs 12% (p<0.0001) HR of mortality 0.26 (0.13 to 0.52) (multivariable)	Unclear
		Martínez-Urbistondo et al 2020	SOC+Early TCZ+MTP vs SOC+Standard TCZ+MTP	Survival ET: RR 0.18, p 0.01 and HR 0.13, p 0.01	High
		Sanz Herrero et al. 2020	SOC + TCZ+ MTP vs SOC+ TCZ	RR for mortality in favor of combination 0.20, 95% CI: 0.08–0.47, P < 0.01.	High
		Rodríguez Garcia	SOC+ BARI+MTP vs SOC + MTP	No significant differences between CS and BARI+CS	High
		Giudice et al. 2020	RUXO+ECU+SOC VS SOC	No differences between groups	High
		Galvez-Romero et al. 2020	SOC+CSA+MTP SOC+MTP	The mortality in the CsA group was 22% compared to 35% in the control group (p=0.02)	High
Non-invasive or invasive mechanical ventilation	Mavrilimumab	De Luca et al. 2020	MAV+SOC vs SOC	No difference in need of MV (p=0.14)	Unclear
	Sarilumab	Della Torre et al. 2020	SARI+SOC vs SOC	No difference between groups in the need of MV and time to MV	High
	Lenzilumab	Temesgen et al 2020	LEN+SOC vs SOC	No difference in ventilator-free survival between groups	High
	Eculizumab	Annane et al 2020	ECU+SOC vs SOC	In patients who were ventilated at baseline no difference in the number of days free of mechanical ventilation at day 15	Unclear
	Tocilizumab + glucocorticoids	Ramiro et al 2020	SOC+TCZ+MTP vs SOC	28% vs 12% p=0.0003 HR of mechanical ventilation 0.22 (0.10 to 0.52)	Unclear
		Giudice et al. 2020	RUXO+ECU+SOC VS SOC	None of the patients on the treated arm required invasive mechanical ventilation or high-flow nasal oxygenation after or during treatment	High
Oxygen support	Tocilizumab + glucocorticoids	Ramiro et al 2020	SOC+TCZ+MTP vs SOC	53% vs 29% (p=0.0003); HR for becoming independent from oxygen support 2.36 (1.45 to 3.83)	Unclear
	Baricitinib + glucocorticoids	Rodríguez Garcia et al. 2020	SOC+ BARI+MTP vs SOC + MTP	Lower proportion of patients required supplemental oxygen both at discharge and 1 month later in BARI+CS vs CS. The proportion of patients requiring supplemental oxygen at discharge and 1 month later was similar in BARI low dose vs high dose	High

ARDS, acute respiratory distress syndrome

CI, confidence interval

COVID-19, coronavirus disease 2019

CoV-2, coronavirus 2

DEX, dexamethasone

HCQ, hydroxychloroquine

HCT, hydrocortisone

HLH, haemophagocytic lymphohistocytosis

HR, hazard ratio

IFN, interferon

IMV, invasive mechanical ventilation

IVIg, intravenous immunoglobulins

JAK, Janus kinase

MAS, macrophage activation syndrome

MTP, methylprednisolone

OR, odds ratio

PICO, population intervention comparator and outcome

PtC, points to consider

RCT, randomized controlled trial

RMDs, rheumatic and musculoskeletal diseases

RoB, risk of bias

SARS, severe acute respiratory syndrome

SLR, systematic literature review

SOC, standard of care

TCZ, tocilizumab