ONLINE RESEARCH on 28.04.2020

By Atanas Valev

Methods

1. PubMed search

   a) COVID-19 AND model   (255 results)
   b) COVID-19 AND hypothesis   (30 results)
   c) COVID-19 AND theory   (18 results)
   d) COVID-19 AND model AND immunology   (11 results)
   e) COVID-19 AND hypothesis AND immunology   (3 results)
   f) COVID-19 AND theory AND immunology   (0 results)
   g) COVID-19 AND model AND immunological   (2results)
   h) COVID-19 AND hypothesis AND immunological   (1 results)
   i) COVID-19 AND theory AND immunological (0 results)

Search	Add to builder	Query	Items found	Time
#28	Add	Search **COVID-19 AND model AND immunology**	11	05:05:11
#27	Add	Search **COVID-19 AND model**	255	05:04:51
#8	Add	Search **(COVID-19) AND theory AND immunological** Schema: **all**	0	04:52:45
#7	Add	Search **(COVID-19) AND theory AND immunological**	0	04:52:44
#6	Add	Search **(COVID-19) AND theory AND immunology** Schema: **all**	0	04:52:36
#5	Add	Search **(COVID-19) AND theory AND immunology**	0	04:52:35
#10	Add	Search **(COVID-19) AND hypothesis AND immunological**	1	04:50:01
#4	Add	Search **(COVID-19) AND hypothesis AND immunology**	3	04:49:04
#11	Add	Search **(COVID-19) AND model AND immunological**	2	04:48:20
#2	Add	Search **(COVID-19) AND model AND immunology**	11	04:47:58
#1	Add	Search **(COVID-19) AND theory**	18	04:42:52
#24	Add	Search **(COVID-19) AND hypothesis**	30	04:40:54
#23	Add	Search **(COVID-19) AND model**	255	04:40:17
#21	Add	**Cited In** for **PubMed** (Select 32105090)	10	04:21:10

Note: No innate immunity models were found. One study of IgA and IgG trends (Guo et al.) was found as well as several on ACE2-depndent cell entry mechanism and possible therapeutic targets. One pathogenesis model study (Lin et al.).

Search lists:

Pubmed search

COVID-19 AND "model" AND "immunology"

11 results:

1: Kissler SM, Tedijanto C, Goldstein E, Grad YH, Lipsitch M. Projecting the transmission dynamics of SARS-CoV-2 through the postpandemic period. Science. 2020 Apr 14. pii: eabb5793. doi:10.1126/science.abb5793. [Epub ahead of print]

2: Boettler T, Newsome PN, Mondelli MU, Maticic M, Cordero E, Cornberg M, Berg T. Care of patients with liver disease during the COVID-19 pandemic: EASL-ESCMID position paper. JHEP Rep. 2020 Jun;2(3):100113. doi: 10.1016/j.jhepr.2020.100113. Epub 2020 Apr 2. Review.

3: Li K, Li Z, Wohlford-Lenane C, Meyerholz DK, Channappanavar R, An D, Perlman S, McCray PB Jr, He B. Single-Dose, Intranasal Immunization with Recombinant Parainfluenza Virus 5 Expressing Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Spike Protein Protects Mice from Fatal MERS-CoV Infection. mBio. 2020 Apr 7;11(2). pii: e00554-20. doi:10.1128/mBio.00554-20.

4: Kim YI, Kim SG, Kim SM, Kim EH, Park SJ, Yu KM, Chang JH, Kim EJ, Lee S, Casel MAB, Um J, Song MS, Jeong HW, Lai VD, Kim Y, Chin BS, Park JS, Chung KH, Foo SS, Poo H, Mo IP, Lee OJ, Webby RJ, Jung JU, Choi YK. Infection and Rapid Transmission of SARS-CoV-2 in Ferrets. Cell Host Microbe. 2020 Apr 5 doi:10.1016/j.chom.2020.03.023. [Epub ahead of print]

5: Bai Z, Gong Y, Tian X, Cao Y, Liu W, Li J. The Rapid Assessment and Early Warning Models for COVID-19. Virol Sin. 2020 Apr 1. doi:10.1007/s12250-020-00219-0. [Epub ahead of print] Review. PubMed PMID: 32239446.

6: Qiang XL, Xu P, Fang G, Liu WB, Kou Z. Using the spike protein feature to predict infection risk and monitor the evolutionary dynamic of coronavirus. Infect Dis Poverty. 2020 Mar 25;9(1):33. doi: 10.1186/s40249-020-00649-8. PubMed PMID: 32209118; PubMed Central PMCID: PMC7093988.

7: Nie J, Li Q, Wu J, Zhao C, Hao H, Liu H, Zhang L, Nie L, Qin H, Wang M, Lu Q, Li X, Sun Q, Liu J, Fan C, Huang W, Xu M, Wang Y. Establishment and validation of a pseudovirus neutralization assay for SARS-CoV-2. Emerg Microbes Infect. 2020 Dec;9(1):680-686. doi: 10.1080/22221751.2020.1743767. PubMed PMID: 32207377; PubMed Central PMCID: PMC7144318.

8: Baig AM, Khaleeq A, Ali U, Syeda H. Evidence of the COVID-19 Virus Targeting the CNS: Tissue Distribution, Host-Virus Interaction, and Proposed Neurotropic Mechanisms. ACS Chem Neurosci. 2020 Apr 1;11(7):995-998. doi: 10.1021/acschemneuro.0c00122. Epub 2020 Mar 13. PubMed PMID: 32167747; PubMed Central PMCID: PMC7094171.

9: Wang H, Wang Z, Dong Y, Chang R, Xu C, Yu X, Zhang S, Tsamlag L, Shang M, Huang J, Wang Y, Xu G, Shen T, Zhang X, Cai Y. Phase-adjusted estimation of the number of Coronavirus Disease 2019 cases in Wuhan, China. Cell Discov. 2020 Feb 24;6:10. doi: 10.1038/s41421-020-0148-0. eCollection 2020. PubMed PMID: 32133152; PubMed Central PMCID: PMC7039910.

10: Ling Y, Xu SB, Lin YX, Tian D, Zhu ZQ, Dai FH, Wu F, Song ZG, Huang W, Chen J, Hu BJ, Wang S, Mao EQ, Zhu L, Zhang WH, Lu HZ. Persistence and clearance of viral RNA in 2019 novel coronavirus disease rehabilitation patients. Chin Med J (Engl). 2020 Feb 28. doi: 10.1097/CM9.0000000000000774. [Epub ahead of print] PubMed PMID: 32118639; PubMed Central PMCID: PMC7147278.

11: Cheng ZJ, Shan J. 2019 Novel coronavirus: where we are and what we know. Infection. 2020 Apr;48(2):155-163. doi: 10.1007/s15010-020-01401-y. Epub 2020 Feb 18. Review. PubMed PMID: 32072569.

Pubmed search
COVID-19 AND "hypothesis" AND "immunology":

3 results:

1: Huang Z, Zhao S, Xu L, Chen J, Lin W, Zeng H, Chen Z, Du L, Shi Y, Zhang N, Song B. Imaging features and mechanisms of novel coronavirus pneumonia (COVID-19): Study Protocol Clinical Trial (SPIRIT Compliant). Medicine (Baltimore). 2020 Apr;99(16):e19900. doi: 10.1097/MD.0000000000019900. PubMed PMID: 32312018.
2: Misra DP, Agarwal V, Gasparyan AY, Zimba O. Rheumatologists' perspective on coronavirus disease 19 (COVID-19) and potential therapeutic targets. Clin Rheumatol. 2020 Apr 10. doi: 10.1007/s10067-020-05073-9. [Epub ahead of print] Review. PubMed PMID: 32277367.
3: Lin L, Lu L, Cao W, Li T. Hypothesis for potential pathogenesis of SARS-CoV-2 infection-a review of immune changes in patients with viral pneumonia. Emerg Microbes Infect. 2020 Dec;9(1):727-732. doi: 10.1080/22221751.2020.1746199. PubMed PMID: 32196410.

Pubmed search
COVID-19 AND "theory" AND "immunology"

No items found.

Pubmed search:
COVID-19 AND "model" AND "immunological"

2 results found.

1: de Leon J, Ruan CJ, Schoretsanitis G, De Las Cuevas C. A Rational Use of Clozapine Based on Adverse Drug Reactions, Pharmacokinetics, and Clinical Pharmacopsychology. Psychother Psychosom. 2020 Apr 14:1-15. doi: 10.1159/000507638. [Epub ahead of print] Review. PubMed PMID: 32289791.

2: Zhang J, Zeng H, Gu J, Li H, Zheng L, Zou Q. Progress and Prospects on Vaccine Development against SARS-CoV-2. Vaccines (Basel). 2020 Mar 29;8(2). pii: E153. doi: 10.3390/vaccines8020153. Review. PubMed PMID: 32235387.

Pubmed search
COVID-19 AND "hypothesis" AND "immunological"

1 result found.

1. Emerg Microbes Infect. 2020 Dec;9(1):727-732. doi: 10.1080/22221751.2020.1746199. Hypothesis for potential pathogenesis of SARS-CoV-2 infection-a review of immune changes in patients with viral pneumonia. Lin L(1), Lu L(1), Cao W(1), Li T(1)(2)(3)(4).

Pubmed search
COVID-19 AND "theory" AND "immunological"

No items found

2. Google search (COVID-19 + exact keywords)

One paper focusing on evasion of adaptive immune response (Prompetchara et al.)

Lin et al., Hypothesis for potential pathogenesis of SARSCoV- 2 infection–a review of immune changes in patients with viral pneumonia
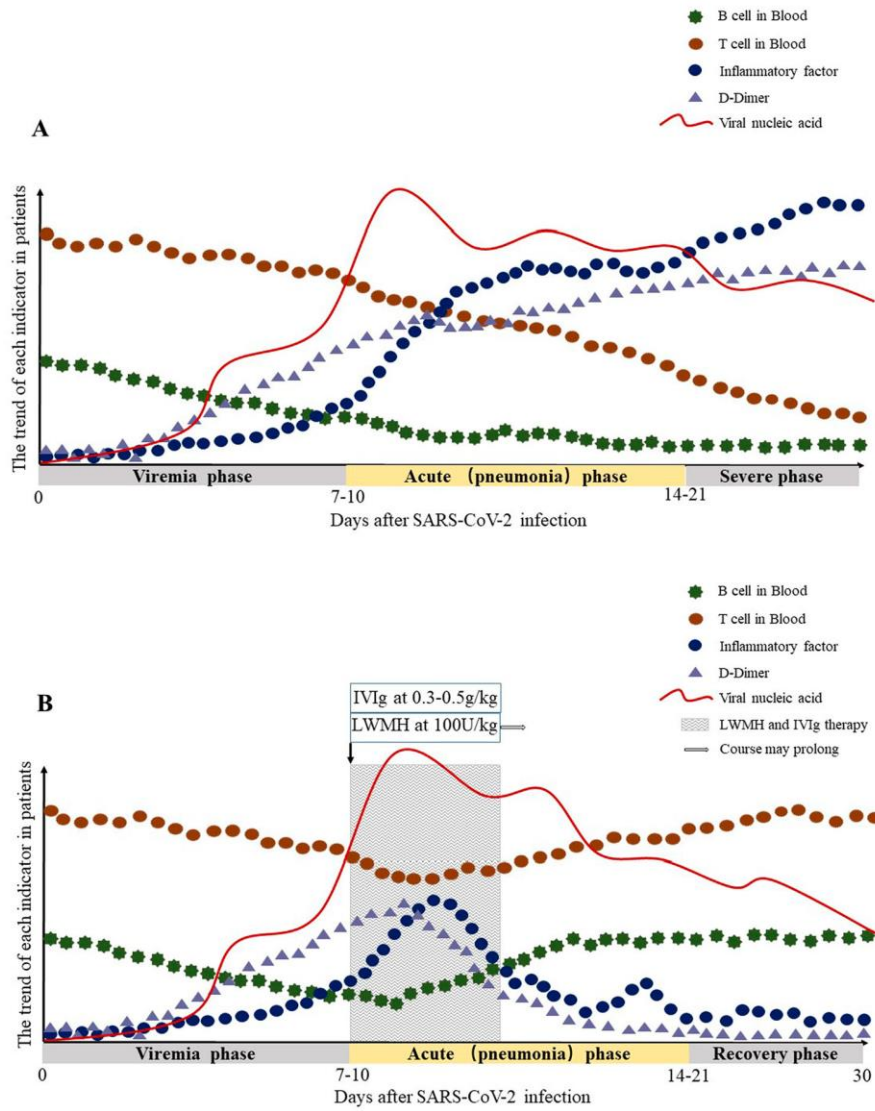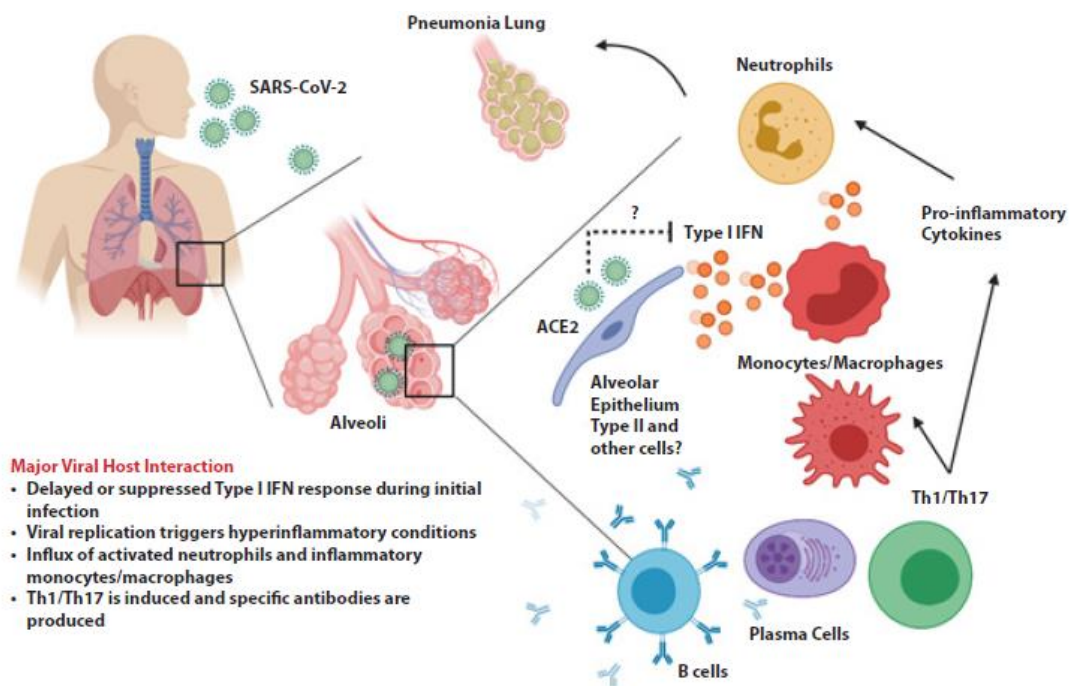

Fig. 1. Hypothetical pathogenesis of COVID-19

Fig. 2. Overview of predicted immune responses to SARS-CoV-2 and implication of dampening of Type I IFN response in alveolar type 2 cells, followed by influx of neutrophils and macrophages, cytokine storm and subsequent immunopathology of the lung.
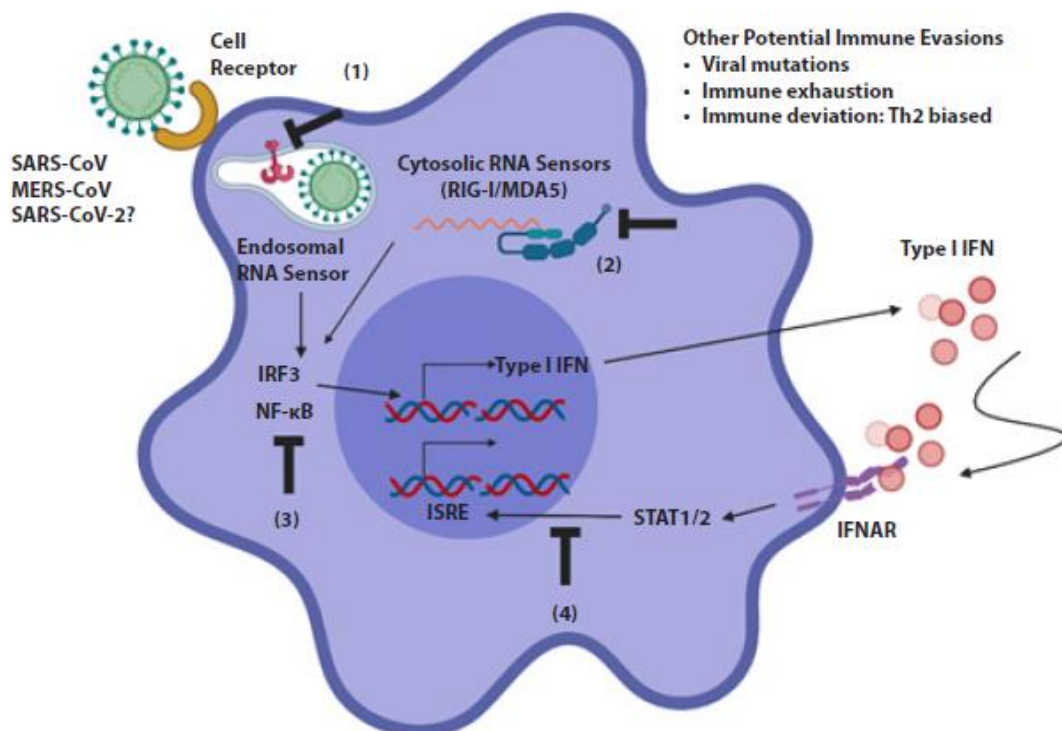

Fig. 3. Potential shared immune evasion mechanisms of coronaviruses (SARS-CoV, MERS-CoV, SARS-CoV-2).
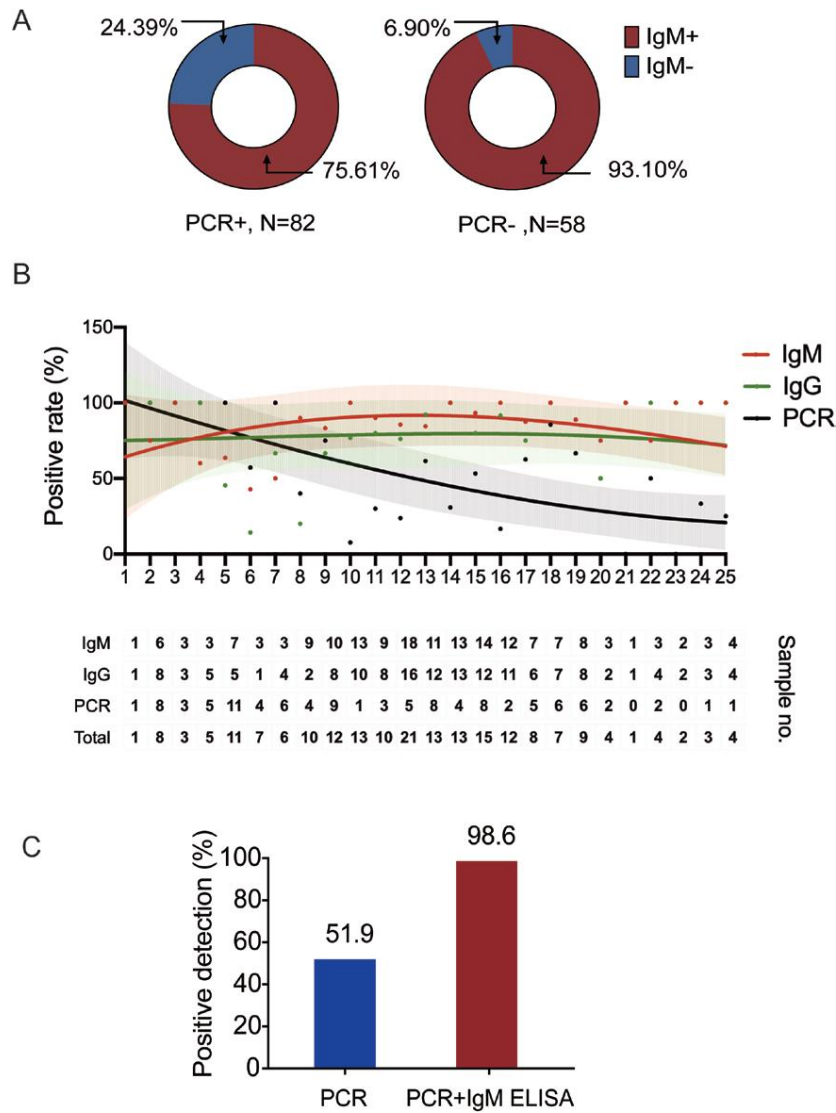
Fig. 4B. Fitted curve of detected IgM in patients after symptom onset.

Results:

ONE model (Prompetchara et al.) implying innate immunity's protective role in a model based on SARS and MERS comparison to CoV-2, but focusing on Type I IFN.