

REFERENCES

- Abbas, A. K., Lichtman, A. H., & Pillai, S. (2020). *Basic immunology: Functions and disorders of the immune system*. Elsevier.
- Aftab, S. O., Ghouri, M. Z., Masood, M. U., Haider, Z., Khan, Z., Ahmad, A., & Munawar, N. (2020). Analysis of SARS-COV-2 RNA-dependent RNA polymerase as a potential therapeutic drug target using a computational approach. *Journal of Translational Medicine*, 18(1). <https://doi.org/10.1186/s12967-020-02439-0>
- Alefishat, E., Jelinek, H. F., Mousa, M., Tay, G. K., & Alsafar, H. S. (2022). Immune response to SARS-COV-2 variants: A focus on severity, susceptibility, and preexisting immunity. *Journal of Infection and Public Health*, 15(2), 277–288. <https://doi.org/10.1016/j.jiph.2022.01.007>
- Altmann, D. M., & Boyton, R. J. (2020). SARS-COV-2 T cell immunity: Specificity, function, durability, and role in protection. *Science Immunology*, 5(49). <https://doi.org/10.1126/sciimmunol.abd6160>
- Almofti, Y. A., Abd-elrahman, K. A., & Eltilib, E. E. (2021). Vaccinomic approach for novel multi epitopes vaccine against severe acute respiratory syndrome coronavirus-2 (SARS-COV-2). *BMC Immunology*, 22(1). <https://doi.org/10.1186/s12865-021-00412-0>
- Aran, D., Beachler, D. C., Lanes, S., & Overhage, J. M. (2020). Prior presumed coronavirus infection reduces COVID-19 risk: A cohort study. *The Journal of infection*, 81(6), 923–930. <https://doi.org/10.1016/j.jinf.2020.10.023>
- Beans, C. (2022). Researchers getting closer to a “universal” flu vaccine. *Proceedings of the National Academy of Sciences*, 119(5). <https://doi.org/10.1073/pnas.2123477119>
- Beretta, A., Cranage, M., & Zipeto, D. (2020). Is cross-reactive immunity triggering COVID-19 immunopathogenesis? *Frontiers in Immunology*, 11. <https://doi.org/10.3389/fimmu.2020.567710>
- Boechat, J. L., Chora, I., Morais, A., & Delgado, L. (2021). The immune response to SARS-COV-2 and COVID-19 immunopathology – current perspectives. *Pulmonology*, 27(5), 423–437. <https://doi.org/10.1016/j.pulmoe.2021.03.008>
- Bui, H.-H., Sidney, J., Dinh, K., Southwood, S., Newman, M. J., & Sette, A. (2006). Predicting population coverage of T-cell epitope-based diagnostics and vaccines. *BMC Bioinformatics*, 7(1). <https://doi.org/10.1186/1471-2105-7-153>
- Bui, H.-H., Sidney, J., Li, W., Fusseder, N., & Sette, A. (2007). Development of an epitope conservancy analysis tool to facilitate the design of epitope-based diagnostics and vaccines. *BMC Bioinformatics*, 8(1). <https://doi.org/10.1186/1471-2105-8-361>
- Calis, J. J., Maybeno, M., Greenbaum, J. A., Weiskopf, D., De Silva, A. D., Sette, A., Keşmir, C., & Peters, B. (2013). Properties of MHC class I presented peptides that enhance immunogenicity. *PLoS Computational Biology*, 9(10). <https://doi.org/10.1371/journal.pcbi.1003266>
- Cascella, M., Rajnik, M., Aleem, A., Dulebohn, S. C., & Napoli, R. D. (2021). *Features, evaluation, and treatment of coronavirus (COVID-19)*. StatPearls [Internet]. Retrieved 2021, from <https://www.ncbi.nlm.nih.gov/books/NBK554776/>.

- Deng, H., Yan, X., & Yuan, L. (2021). Human genetic basis of coronavirus disease 2019. *Signal Transduction and Targeted Therapy*, 6(1). <https://doi.org/10.1038/s41392-021-00736-8>
- Dhanda, S. K., Vir, P., & Raghava, G. P. S. (2013). Designing of interferon-gamma inducing MHC class-II binders. *Biology Direct*, 8(1). <https://doi.org/10.1186/1745-6150-8-30>
- Echeverría, G., Guevara, Á., Coloma, J., Ruiz, A. M., Vasquez, M. M., Tejera, E., & de Waard, J. H. (2021). Pre-existing T-cell immunity to SARS-CoV-2 in Unexposed healthy controls in Ecuador, as detected with A COVID-19 interferon-gamma RELEASE ASSAY. *International Journal of Infectious Diseases*, 105, 21–25. <https://doi.org/10.1016/j.ijid.2021.02.034>
- Erbelding, E. J., Post, D. J., Stemmy, E. J., Roberts, P. C., Augustine, A. D., Ferguson, S., Paules, C. I., Graham, B. S., & Fauci, A. S. (2018). A universal influenza vaccine: The strategic plan for the National Institute of Allergy and Infectious Diseases. *The Journal of Infectious Diseases*, 218(3), 347–354. <https://doi.org/10.1093/infdis/jiy103>
- Ferretti, A. P., Kula, T., Wang, Y., Nguyen, D. M. V., Weinheimer, A., Dunlap, G. S., Xu, Q., Nabils, N., Perullo, C. R., Cristofaro, A. W., Whitton, H. J., Virbasius, A., Olivier, K. J., Buckner, L. R., Alistar, A. T., Whitman, E. D., Bertino, S. A., Chattopadhyay, S., & MacBeath, G. (2020). Unbiased screens show CD8+ T cells of COVID-19 patients recognize shared epitopes in SARS-COV-2 that largely reside outside the spike protein. *Immunity*, 53(5). <https://doi.org/10.1016/j.immuni.2020.10.006>
- Forni, D., Cagliani, R., Clerici, M., & Sironi, M. (2017). Molecular Evolution of Human Coronavirus Genomes. *Trends in microbiology*, 25(1), 35–48. <https://doi.org/10.1016/j.tim.2016.09.001>
- Grifoni, A., Weiskopf, D., Ramirez, S. I., Mateus, J., Dan, J. M., Moderbacher, C. R., Rawlings, S. A., Sutherland, A., Premkumar, L., Jardi, R. S., Marrama, D., de Silva, A. M., Frazier, A., Carlin, A. F., Greenbaum, J. A., Peters, B., Krammer, F., Smith, D. M., Crotty, S., & Sette, A. (2020). Targets of T cell responses to SARS-COV-2 coronavirus in humans with covid-19 disease and unexposed individuals. *Cell*, 181(7). <https://doi.org/10.1016/j.cell.2020.05.015>
- Gustiananda, M. (2020). What do T cells see in SARS-CoV2? Immunoinformatics analysis to identify T cell epitopes from SARS- CoV2 ORF1ab polyprotein. *Indonesian Journal of Life Sciences*, 02(01), 29–43.
- Gustiananda, M., Sulisty, B. P., Agustriawan, D., & Andarini, S. (2021). Immunoinformatics analysis of SARS-COV-2 orf1ab polyproteins to identify promiscuous and highly conserved T-cell epitopes to formulate vaccine for Indonesia and the World Population. *Vaccines*, 9(12), 1459. <https://doi.org/10.3390/vaccines9121459>
- Gonzalez-Galarza, F. F., McCabe, A., Santos, E. J. M. dos, Jones, J., Takeshita, L., Ortega-Rivera, N. D., Cid-Pavon, G. M. D., Ramsbottom, K., Ghattaoraya, G., Alfirevic, A., Middleton, D., & Jones, A. R. (2019). Allele frequency net database (AFND) 2020 update: Gold-standard data classification, open access genotype data and New Query Tools. *Nucleic Acids Research*. <https://doi.org/10.1093/nar/gkz1029>
- Haider, N., Rothman-Ostrow, P., Osman, A. Y., Arruda, L. B., Macfarlane-Berry, L., Elton, L., Thomason, M. J., Yeboah-Manu, D., Ansumana, R., Kapata, N., Mboera, L., Rushton, J., McHugh, T. D., Heymann, D. L., Zumla, A., & Kock, R. A. (2020). COVID-19-Zoonosis or Emerging Infectious Disease?. *Frontiers in public health*, 8, 596944. <https://doi.org/10.3389/fpubh.2020.596944>
- Hewitt E. W. (2003). The MHC class I antigen presentation pathway: strategies for viral immune evasion. *Immunology*, 110(2), 163–169. <https://doi.org/10.1046/j.1365-2567.2003.01738.x>

- Holland, C. J., Cole, D. K., & Godkin, A. (2013). Re-directing CD4+ T cell responses with the flanking residues of MHC class II-bound peptides: The core is not enough. *Frontiers in Immunology*, 4. <https://doi.org/10.3389/fimmu.2013.00172>
- Hsu, J. C.-C., Laurent-Rolle, M., Pawlak, J. B., Wilen, C. B., & Cresswell, P. (2021). Translational shutdown and evasion of the innate immune response by SARS-COV-2 NSP14 protein. *Proceedings of the National Academy of Sciences*, 118(24). <https://doi.org/10.1073/pnas.2101161118>
- Jacob-Dolan, C., Feldman, J., McMahan, K., Yu, J., Zahn, R., Wegmann, F., Schuitemaker, H., Schmidt, A. G., & Barouch, D. H. (2021). Coronavirus-specific antibody cross-reactivity in rhesus macaques following SARS-COV-2 vaccination and infection. *Journal of Virology*, 95(11). <https://doi.org/10.1128/jvi.00117-21>
- Jungreis, I., Sealfon, R., & Kellis, M. (2021). SARS-COV-2 gene content and covid-19 mutation impact by comparing 44 sarbecovirus genomes. *Nature Communications*, 12(1). <https://doi.org/10.1038/s41467-021-22905-7>
- Koff, W. C., & Berkley, S. F. (2021). A universal coronavirus vaccine. *Science*, 371(6531), 759–759. <https://doi.org/10.1126/science.abh0447>
- Kundu, R., Narean, J. S., Wang, L., Fenn, J., Pillay, T., Fernandez, N. D., Conibear, E., Koycheva, A., Davies, M., Tolosa-Wright, M., Hakki, S., Varro, R., McDermott, E., Hammett, S., Cutajar, J., Thwaites, R. S., Parker, E., Rosadas, C., McClure, M., ... Lalvani, A. (2022). Cross-reactive memory T cells associate with protection against SARS-COV-2 infection in COVID-19 contacts. *Nature Communications*, 13(1). <https://doi.org/10.1038/s41467-021-27674-x>
- Langton, D. J., Bourke, S. C., Lie, B. A., Reiff, G., Natu, S., Darlay, R., Burn, J., & Echevarria, C. (2021). The influence of HLA genotype on the severity of COVID-19 infection. *HLA*, 98(1), 14–22. <https://doi.org/10.1111/tan.14284>
- Lawton G. (2021). Sights set on universal vaccine. *New scientist (1971)*, 249(3323), 8–9. [https://doi.org/10.1016/S0262-4079\(21\)00302-X](https://doi.org/10.1016/S0262-4079(21)00302-X)
- Lee, C. H., Pinho, M. P., Buckley, P. R., Woodhouse, I. B., Ogg, G., Simmons, A., Napolitani, G., & Koohy, H. (2020). Potential CD8+ T cell cross-reactivity against SARS-COV-2 conferred by other coronavirus strains. *Frontiers in Immunology*, 11. <https://doi.org/10.3389/fimmu.2020.579480>
- Leone, P., Shin, E.-C., Perosa, F., Vacca, A., Dammacco, F., & Racanelli, V. (2013). MHC class I antigen processing and presenting machinery: Organization, function, and defects in tumor cells. *JNCI Journal of the National Cancer Institute*, 105(16), 1172–1187. <https://doi.org/10.1093/jnci/djt184>
- Lim, Y., Ng, Y., Tam, J., & Liu, D. (2016). Human Coronaviruses: A review of virus–host interactions. *Diseases*, 4(4), 26. <https://doi.org/10.3390/diseases4030026>
- Liu, D. X., Liang, J. Q., & Fung, T. S. (2021). Human Coronavirus-229E, -OC43, -NL63, and -HKU1 (Coronaviridae). *Encyclopedia of Virology*, 428–440. <https://doi.org/10.1016/B978-0-12-809633-8.21501-X>
- Mateus, J., Grifoni, A., Tarke, A., Sidney, J., Ramirez, S. I., Dan, J. M., Burger, Z. C., Rawlings, S. A., Smith, D. M., Phillips, E., Mallal, S., Lammers, M., Rubiro, P., Quiambao, L., Sutherland, A., Yu, E. D., da Silva Antunes, R., Greenbaum, J., Frazier, A., ... Weiskopf, D. (2020). Selective and cross-reactive SARS-COV-2 T cell epitopes in unexposed humans. *Science*, 370(6512), 89–94. <https://doi.org/10.1126/science.abd3871>

- Megasari, N. L., Utsumi, T., Yamani, L. N., Juniastuti, Gunawan, E., Furukawa, K., Nishimura, M., Lusida, M. I., & Mori, Y. (2021). Seroepidemiological study of SARS-COV-2 infection in East Java, Indonesia. *PLOS ONE*, *16*(5). <https://doi.org/10.1371/journal.pone.0251234>
- Migliorini, F., Torsiello, E., Spiezia, F., Oliva, F., Tingart, M., & Maffulli, N. (2021). Association between HLA genotypes and covid-19 susceptibility, severity and progression: A comprehensive review of the literature. *European Journal of Medical Research*, *26*(1). <https://doi.org/10.1186/s40001-021-00563-1>
- Milinski, M., Griffiths, S., Wegner, K. M., Reusch, T. B., Haas-Assenbaum, A., & Boehm, T. (2005). Mate choice decisions of stickleback females predictably modified by MHC peptide ligands. *Proceedings of the National Academy of Sciences*, *102*(12), 4414–4418. <https://doi.org/10.1073/pnas.0408264102>
- Morens, D. M., Taubenberger, J. K., & Fauci, A. S. (2021). A centenary tale of two pandemics: The 1918 influenza pandemic and covid-19, part I. *American Journal of Public Health*, *111*(6), 1086–1094. <https://doi.org/10.2105/ajph.2021.306310>
- Morens, D. M., Taubenberger, J. K., & Fauci, A. S. (2021). A centenary tale of two pandemics: The 1918 influenza pandemic and covid-19, part II. *American Journal of Public Health*, *111*(7), 1267–1272. <https://doi.org/10.2105/ajph.2021.306326>
- Morens, D. M., Taubenberger, J. K., & Fauci, A. S. (2022). Universal coronavirus vaccines — an urgent need. *New England Journal of Medicine*, *386*(4), 297–299. <https://doi.org/10.1056/nejmp2118468>
- Naqvi, A., Fatima, K., Mohammad, T., Fatima, U., Singh, I. K., Singh, A., Atif, S. M., Hariprasad, G., Hasan, G. M., & Hassan, M. I. (2020). Insights into SARS-CoV-2 genome, structure, evolution, pathogenesis and therapies: Structural genomics approach. *Biochimica et biophysica acta. Molecular basis of disease*, *1866*(10), 165878. <https://doi.org/10.1016/j.bbdis.2020.165878>
- Nelde, A., Bilich, T., Heitmann, J. S., Maringer, Y., Salih, H. R., Roerden, M., Lübke, M., Bauer, J., Rieth, J., Wacker, M., Peter, A., Hörber, S., Traenkle, B., Kaiser, P. D., Rothbauer, U., Becker, M., Junker, D., Krause, G., Strengert, M., ... Walz, J. S. (2020). Sars-cov-2-derived peptides define heterologous and covid-19-induced t cell recognition. *Nature Immunology*, *22*(1), 74–85. <https://doi.org/10.1038/s41590-020-00808-x>
- Newman, J. A., Douangamath, A., Yadzani, S., Yosaatmadja, Y., Aimon, A., Brandão-Neto, J., Dunnett, L., Gorrie-stone, T., Skyner, R., Fearon, D., Schapira, M., von Delft, F., & Gileadi, O. (2021). Structure, mechanism and crystallographic fragment screening of the SARS-COV-2 NSP13 helicase. *Nature Communications*, *12*(1). <https://doi.org/10.1038/s41467-021-25166-6>
- Nguyen, A., David, J. K., Maden, S. K., Wood, M. A., Weeder, B. R., Nellore, A., & Thompson, R. F. (2020). Human leukocyte antigen susceptibility map for severe acute respiratory syndrome coronavirus 2. *Journal of Virology*, *94*(13). <https://doi.org/10.1128/jvi.00510-20>
- Pacholczyk, M., & Rieseke, P. (2020). In silico studies suggest T-cell cross-reactivity between SARS-COV-2 and less dangerous coronaviruses. <https://doi.org/10.21203/rs.3.rs-73773/v1>
- Pan, Y., Jiang, X., Yang, L., Chen, L., Zeng, X., Liu, G., Tang, Y., Qian, C., Wang, X., Cheng, F., Lin, J., Wang, X., & Li, Y. (2021). SARS-COV-2-specific immune response in COVID-19 convalescent individuals. *Signal Transduction and Targeted Therapy*, *6*(1). <https://doi.org/10.1038/s41392-021-00686-1>

- Poland, G. A., Ovsyannikova, I. G., & Kennedy, R. B. (2020). SARS-CoV-2 immunity: Review and applications to Phase 3 vaccine candidates. *The Lancet*, 396(10262), 1595–1606. [https://doi.org/10.1016/s0140-6736\(20\)32137-1](https://doi.org/10.1016/s0140-6736(20)32137-1)
- Rahman, M. T., Sobur, M. A., Islam, M. S., Levy, S., Hossain, M. J., El Zowalaty, M. E., Rahman, A. T., & Ashour, H. M. (2020). Zoonotic Diseases: Etiology, Impact, and Control. *Microorganisms*, 8(9), 1405. <https://doi.org/10.3390/microorganisms8091405>
- Rastogi, M., Pandey, N., Shukla, A., & Singh, S. K. (2020). SARS coronavirus 2: From genome to infectome. *Respiratory Research*, 21(1). <https://doi.org/10.1186/s12931-020-01581-z>
- Reynisson, B., Barra, C., Kaabinejadian, S., Hildebrand, W. H., Peters, B., & Nielsen, M. (2020). Improved prediction of MHC II antigen presentation through integration and motif deconvolution of mass spectrometry MHC eluted ligand data. *Journal of Proteome Research*, 19(6), 2304–2315. <https://doi.org/10.1021/acs.jproteome.9b00874>
- Roche, P. A., & Furuta, K. (2015). The ins and outs of MHC class II-mediated antigen processing and presentation. *Nature Reviews Immunology*, 15(4), 203–216. <https://doi.org/10.1038/nri3818>
- Salamanna, F., Maglio, M., Landini, M. P., & Fini, M. (2020). Body localization of ace-2: On the trail of the keyhole of SARS-COV-2. *Frontiers in Medicine*, 7. <https://doi.org/10.3389/fmed.2020.594495>
- Sette, A., & Crotty, S. (2020). Pre-existing immunity to sars-cov-2: The knowns and unknowns. *Nature Reviews Immunology*, 20(8), 457–458. <https://doi.org/10.1038/s41577-020-0389-z>
- Shah, V. K., Fimal, P., Alam, A., Ganguly, D., & Chattopadhyay, S. (2020). Overview of immune response during SARS-COV-2 infection: Lessons from the past. *Frontiers in Immunology*, 11. <https://doi.org/10.3389/fimmu.2020.01949>
- Shu, T., Huang, M., Wu, D., Ren, Y., Zhang, X., Han, Y., Mu, J., Wang, R., Qiu, Y., Zhang, D. Y., & Zhou, X. (2020). SARS-Coronavirus-2 Nsp13 Possesses NTPase and RNA Helicase Activities That Can Be Inhibited by Bismuth Salts. *Virologica Sinica*, 35(3), 321–329. <https://doi.org/10.1007/s12250-020-00242-1>
- Song, G., He, W.-ting, Callaghan, S., Anzanello, F., Huang, D., Ricketts, J., Torres, J. L., Beutler, N., Peng, L., Vargas, S., Cassell, J., Parren, M., Yang, L., Ignacio, C., Smith, D. M., Voss, J. E., Nemazee, D., Ward, A. B., Rogers, T., ... Andrabi, R. (2021). Cross-reactive serum and memory B-cell responses to spike protein in SARS-COV-2 and endemic coronavirus infection. *Nature Communications*, 12(1). <https://doi.org/10.1038/s41467-021-23074-3>
- Stranzl, T., Larsen, M. V., Lundegaard, C., & Nielsen, M. (2010). NetCTLpan: pan-specific MHC class I pathway epitope predictions. *Immunogenetics*, 62(6), 357–368. <https://doi.org/10.1007/s00251-010-0441-4>
- Tan, C. C. S., Owen, C. J., Tham, C. Y. L., Bertoletti, A., van Dorp, L., & Balloux, F. (2020). Pre-existing t cell-mediated cross-reactivity to sars-cov-2 cannot solely be explained by prior exposure to endemic human coronaviruses. <https://doi.org/10.1101/2020.12.08.415703>
- Tomita, Y., Sato, R., Ikeda, T., & Sakagami, T. (2020). BCG vaccine may generate cross-reactive T cells against SARS-COV-2: In silico analyses and a hypothesis. *Vaccine*, 38(41), 6352–6356. <https://doi.org/10.1016/j.vaccine.2020.08.045>

- Tomita, Y., Ikeda, T., Sato, R., & Sakagami, T. (2020). Association between HLA gene polymorphisms and mortality of COVID-19: An in silico analysis. *Immunity, Inflammation and Disease*, 8(4), 684–694. <https://doi.org/10.1002/iid3.358>
- Trougakos, I. P., Stamatielopoulou, K., Terpos, E., Tsitsilonis, O. E., Aivalioti, E., Paraskevis, D., Kastritis, E., Pavlakis, G. N., & Dimopoulos, M. A. (2021). Insights to SARS-COV-2 life cycle, pathophysiology, and rationalized treatments that target COVID-19 clinical complications. *Journal of Biomedical Science*, 28(1). <https://doi.org/10.1186/s12929-020-00703-5>
- Vardhana, S., Baldo, L., Morice, W. G., & Wherry, E. J. (2022). Understanding T-cell responses to covid-19 is essential for informing Public Health Strategies. *Science Immunology*. <https://doi.org/10.1126/sciimmunol.abo1303>
- Vita, R., Mahajan, S., Overton, J. A., Dhanda, S. K., Martini, S., Cantrell, J. R., Wheeler, D. K., Sette, A., & Peters, B. (2018). The Immune Epitope Database (IEDB): 2018 update. *Nucleic Acids Research*, 47(D1). <https://doi.org/10.1093/nar/gky1006>
- Wang, F., Huang, S., Gao, R., Zhou, Y., Lai, C., Li, Z., Xian, W., Qian, X., Li, Z., Huang, Y., Tang, Q., Liu, P., Chen, R., Liu, R., Li, X., Tong, X., Zhou, X., Bai, Y., Duan, G., ... Liu, L. (2020). Initial whole-genome sequencing and analysis of the host genetic contribution to COVID-19 severity and susceptibility. *Cell Discovery*, 6(1). <https://doi.org/10.1038/s41421-020-00231-4>
- Wieczorek, M., Abualrous, E. T., Sticht, J., Álvaro-Benito, M., Stolzenberg, S., Noé, F., & Freund, C. (2017). Major histocompatibility complex (MHC) class I and MHC class II proteins: Conformational plasticity in antigen presentation. *Frontiers in Immunology*, 8. <https://doi.org/10.3389/fimmu.2017.00292>
- World Health Organization. (2022). *WHO coronavirus (COVID-19) Dashboard*. World Health Organization. Retrieved May 18, 2022, from <https://covid19.who.int/>.
- World Health Organization. (2022). *Tracking sars-cov-2 variants*. World Health Organization. Retrieved May 18, 2021, from <https://www.who.int/en/activities/tracking-SARS-CoV-2-variants/>.
- Yoo, J.-S., Sasaki, M., Cho, S. X., Kasuga, Y., Zhu, B., Ouda, R., Orba, Y., de Figueiredo, P., Sawa, H., & Kobayashi, K. S. (2021). SARS-COV-2 inhibits induction of the MHC class I pathway by targeting the STAT1-IRF1-nlrc5 axis. *Nature Communications*, 12(1). <https://doi.org/10.1038/s41467-021-26910-8>
- Yoshimoto, F. K. (2020). The proteins of severe acute respiratory syndrome coronavirus-2 (SARS COV-2 or N-COV19), the cause of covid-19. *The Protein Journal*, 39(3), 198–216. <https://doi.org/10.1007/s10930-020-09901-4>
- Zhang, S.-fen, Tuo, J.-ling, Huang, X.-bin, Zhu, X., Zhang, D.-mei, Zhou, K., Yuan, L., Luo, H.-jiao, Zheng, B.-jian, Yuen, K.-yung, Li, M.-feng, Cao, K.-yuan, & Xu, L. (2018). Epidemiology characteristics of human coronaviruses in patients with respiratory infection symptoms and phylogenetic analysis of HCoV-OC43 during 2010-2015 in Guangzhou. *PLOS ONE*, 13(1). <https://doi.org/10.1371/journal.pone.0191789>
- Zhang, Y., Su, L., Chen, Y., Yu, S., Zhang, D., Mao, H., & Fang, L. (2021). Etiology and clinical characteristics of SARS-COV-2 and other human coronaviruses among children in Zhejiang Province, China 2017–2019. *Virology Journal*, 18(1). <https://doi.org/10.1186/s12985-021-01562-8>

- Zhao, J., Cui, W., & Tian, B.-ping. (2020). The potential intermediate hosts for SARS-COV-2. *Frontiers in Microbiology*, *11*. <https://doi.org/10.3389/fmicb.2020.580137>
- Zhao, X., Ding, Y., Du, J., & Fan, Y. (2020). 2020 update on human Coronaviruses: One health, One world. *Medicine in Novel Technology and Devices*, *8*, 100043. <https://doi.org/10.1016/j.medntd.2020.100043>
- Zhao, J., Zhao, J., Mangalam, A. K., Channappanavar, R., Fett, C., Meyerholz, D. K., Agnihothram, S., Baric, R. S., David, C. S., & Perlman, S. (2016). Airway memory cd4 + t cells mediate protective immunity against emerging respiratory coronaviruses. *Immunity*, *44*(6), 1379–1391. <https://doi.org/10.1016/j.immuni.2016.05.006>
- Zheng, J. (2020). SARS-CoV-2: an emerging coronavirus that causes a global threat. *International Journal of biological sciences*, *16*(10), 1678.