

VII. References

- Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., & Walter, P. (2002). Analyzing protein structure and function. In Molecular Biology of the Cell. 4th edition. Garland Science.
- Andersen, K. G., Rambaut, A., Lipkin, W. I., Holmes, E. C., & Garry, R. F. (2020). The proximal origin of SARS-CoV-2. *Nature medicine*, 26(4), 450-452.
- Atri, C., Guerfali, F. Z., & Laouini, D. (2018). Role of Human Macrophage Polarization in Inflammation during Infectious Diseases. *International journal of molecular sciences*, 19(6), 1801. <https://doi.org/10.3390/ijms19061801>
- Ayyagari, V. S., T C, V., K, A. P., & Srirama, K. (2022). Design of a multi-epitope-based vaccine targeting M-protein of SARS-CoV2: an immunoinformatics approach. *Journal of biomolecular structure & dynamics*, 40(7), 2963–2977. <https://doi.org/10.1080/07391102.2020.1850357>
- Bachmann, M. F., & Oxenius, A. (2007). Interleukin 2: from immunostimulation to immunoregulation and back again. *EMBO reports*, 8(12), 1142–1148. <https://doi.org/10.1038/sj.embor.7401099>
- Barh, D., Barve, N., Gupta, K., Chandra, S., Jain, N., Tiwari, S., Leon-Sicairos, N., Canizalez-Roman, A., dos Santos, A. R., Hassan, S. S., Almeida, S., Ramos, R. T., de Abreu, V. A., Carneiro, A. R., Soares, S., Castro, T. L., Miyoshi, A., Silva, A., Kumar, A., Misra, A. N., ... Azevedo, V. (2013). Exoproteome and secretome derived broad spectrum novel drug and vaccine candidates in *Vibrio cholerae* targeted by *Piper betel* derived compounds. *PLoS one*, 8(1), e52773. <https://doi.org/10.1371/journal.pone.0052773>
- Bojin, F., Gavriliuc, O., Margineanu, M. B., & Paunescu, V. (2020). Design of an epitope-based synthetic long peptide vaccine to counteract the novel china coronavirus (2019-nCoV).
- Bolarin, J. A., Oluwatoyosi, M. A., Orege, J. I., Ayeni, E. A., Ibrahim, Y. A., Adeyemi, S. B., Tiamiyu, B. B., Gbadegesin, L. A., Akinyemi, T. O., Odoh, C. K., Umeobi, H. I., & Adeoye, A. B. (2021). Therapeutic drugs for SARS-CoV-2 treatment: Current state and perspective. *International immunopharmacology*, 90, 107228. <https://doi.org/10.1016/j.intimp.2020.107228>
- Callaway, E. (2021). Could new COVID variants undermine vaccines? Labs scramble to find out. *Nature*, 589(7841), 177-178.
- Callaway, E. (2021). Heavily mutated Omicron variant puts scientists on alert. *Nature*. doi: 10.1038/d41586-021-03552-w
- Callewaert, L., & Michiels, C. W. (2010). Lysozymes in the animal kingdom. *Journal of biosciences*, 35(1), 127–160. <https://doi.org/10.1007/s12038-010-0015-5>
- Cantrell D. (2015). Signaling in lymphocyte activation. *Cold Spring Harbor perspectives in biology*, 7(6), a018788. <https://doi.org/10.1101/cshperspect.a018788>
- Carrasco Pro, S., Lindestam Arlehamn, C. S., Dhanda, S. K., Carpenter, C., Lindvall, M., Faruqi, A. A., Santee, C. A., Renz, H., Sidney, J., Peters, B., & Sette, A. (2018). Microbiota epitope similarity either dampens or enhances the immunogenicity of disease-associated antigenic epitopes. *PLoS one*, 13(5), e0196551. <https://doi.org/10.1371/journal.pone.0196551>

Challen, R., Brooks-Pollock, E., Read, J. M., Dyson, L., Tsaneva-Atanasova, K., & Danon, L. (2021). Risk of mortality in patients infected with SARS-CoV-2 variant of concern 202012/1: matched cohort study. *BMJ (Clinical research ed.)*, 372, n579. <https://doi.org/10.1136/bmj.n579>

Chen, X., Zaro, J. L., & Shen, W. C. (2013). Fusion protein linkers: property, design and functionality. *Advanced drug delivery reviews*, 65(10), 1357–1369. <https://doi.org/10.1016/j.addr.2012.09.039>

Chowdhury, M. A., Hossain, N., Kashem, M. A., Shahid, M. A., & Alam, A. (2020). Immune response in COVID-19: A review. *Journal of infection and public health*, 13(11), 1619-1629.

Clem A. S. (2011). Fundamentals of vaccine immunology. *Journal of global infectious diseases*, 3(1), 73–78. <https://doi.org/10.4103/0974-777X.77299>

Couture, A., Garnier, A., Docagne, F., Boyer, O., Vivien, D., Le-Mauff, B., ... & Toutirais, O. (2019). HLA-class II Artificial antigen presenting cells in CD4+ T cell-based immunotherapy. *Frontiers in immunology*, 10, 1081.

Crimeen-Irwin, B., Scalzo, K., Gloster, S., Mottram, P. L., & Plebanski, M. (2005). Failure of immune homeostasis-the consequences of under and over reactivity. *CURRENT DRUG TARGETS-IMMUNE ENDOCRINE AND METABOLIC DISORDERS-*, 5(4), 413.

Cusick, M. F., Libbey, J. E., & Fujinami, R. S. (2012). Molecular mimicry as a mechanism of autoimmune disease. *Clinical reviews in allergy & immunology*, 42(1), 102–111. <https://doi.org/10.1007/s12016-011-8294-7>

Dalod, M., Chelbi, R., Malissen, B., & Lawrence, T. (2014). Dendritic cell maturation: functional specialization through signaling specificity and transcriptional programming. *The EMBO journal*, 33(10), 1104–1116. <https://doi.org/10.1002/embj.201488027>

Durell, S. R., & Ben-Naim, A. (2017). Hydrophobic-hydrophilic forces in protein folding. *Biopolymers*, 107(8), 10.1002/bip.23020. <https://doi.org/10.1002/bip.23020>

Emary, K. R., Golubchik, T., Aley, P. K., Ariani, C. V., Angus, B., Bibi, S., ... & Oxford COVID-19 Vaccine Trial Group. (2021). Efficacy of ChAdOx1 nCoV-19 (AZD1222) vaccine against SARS-CoV-2 variant of concern 202012/01 (B. 1.1. 7): an exploratory analysis of a randomised controlled trial. *The Lancet*, 397(10282), 1351-1362.

Fast, E., & Chen, B. (2020). Potential T-cell and B-cell epitopes of 2019-nCoV. *BioRxiv*.

Feng, Y., Qiu, M., Zou, S., Li, Y., Luo, K., Chen, R., ... & Mo, F. (2020). Multi-epitope vaccine design using an immunoinformatics approach for 2019 novel coronavirus in China (SARS-CoV-2). *BioRxiv*.

Ferris, L. K., Mburu, Y. K., Mathers, A. R., Fluharty, E. R., Larregina, A. T., Ferris, R. L., & Falo, L. D., Jr (2013). Human beta-defensin 3 induces maturation of human langerhans cell-like dendritic cells: an antimicrobial peptide that functions as an endogenous adjuvant. *The Journal of investigative dermatology*, 133(2), 460–468. <https://doi.org/10.1038/jid.2012.319>

Galvan, M. D., Greenlee-Wacker, M. C., & Bohlson, S. S. (2012). C1q and phagocytosis: the perfect complement to a good meal. *Journal of leukocyte biology*, 92(3), 489–497. <https://doi.org/10.1189/jlb.0212099>

Grossman, W. J., Verbsky, J. W., Tollefson, B. L., Kemper, C., Atkinson, J. P., & Ley, T. J. (2004). Differential expression of granzymes A and B in human cytotoxic lymphocyte subsets and T regulatory cells. *Blood*, 104(9), 2840–2848. <https://doi.org/10.1182/blood-2004-03-0859>

Gupta, S., Kapoor, P., Chaudhary, K., Gautam, A., Kumar, R., & Raghava, G. P. (2015). Peptide toxicity prediction. *Methods in molecular biology* (Clifton, N.J.), 1268, 143–157. https://doi.org/10.1007/978-1-4939-2285-7_7

Haghayegh Jahromi, N., Marchetti, L., Moalli, F., Duc, D., Basso, C., Tardent, H., ... & Engelhardt, B. (2020). Intercellular adhesion molecule-1 (ICAM-1) and ICAM-2 differentially contribute to peripheral activation and CNS entry of autoaggressive Th1 and Th17 cells in experimental autoimmune encephalomyelitis. *Frontiers in immunology*, 3056.

Halle, S., Halle, O., & Förster, R. (2017). Mechanisms and dynamics of T cell-mediated cytotoxicity in vivo. *Trends in immunology*, 38(6), 432-443.

Harrison, A. G., Lin, T., & Wang, P. (2020). Mechanisms of SARS-CoV-2 Transmission and Pathogenesis. *Trends in immunology*, 41(12), 1100–1115. <https://doi.org/10.1016/j.it.2020.10.004>

Herget, M., Baldauf, C., Schölz, C., Parcej, D., Wiesmüller, K. H., Tampé, R., ... & Bordignon, E. (2011). Conformation of peptides bound to the transporter associated with antigen processing (TAP). *Proceedings of the National Academy of Sciences*, 108(4), 1349-1354.

Huang, Y., Yang, C., Xu, X. F., Xu, W., & Liu, S. W. (2020). Structural and functional properties of SARS-CoV-2 spike protein: potential antivirus drug development for COVID-19. *Acta pharmacologica Sinica*, 41(9), 1141–1149. <https://doi.org/10.1038/s41401-020-0485-4>

Jaspard, E., Macherel, D., & Hunault, G. (2012). Computational and statistical analyses of amino acid usage and physico-chemical properties of the twelve late embryogenesis abundant protein classes. *PloS one*, 7(5), e36968. <https://doi.org/10.1371/journal.pone.0036968>

Kaur, S. P., & Gupta, V. (2020). COVID-19 Vaccine: A comprehensive status report. *Virus research*, 288, 198114. <https://doi.org/10.1016/j.virusres.2020.198114>

Kaur, N., Singh, R., Dar, Z., Bijarnia, R. K., Dhingra, N., & Kaur, T. (2021). Genetic comparison among various coronavirus strains for the identification of potential vaccine targets of SARS-CoV2. *Infection, genetics and evolution : journal of molecular epidemiology and evolutionary genetics in infectious diseases*, 89, 104490. <https://doi.org/10.1016/j.meegid.2020.104490>

Kelley, L. A., Mezulis, S., Yates, C. M., Wass, M. N., & Sternberg, M. J. (2015). The Phyre2 web portal for protein modeling, prediction and analysis. *Nature protocols*, 10(6), 845–858. <https://doi.org/10.1038/nprot.2015.053>

Khare, S., Gurry, C., Freitas, L., Schultz, M. B., Bach, G., Diallo, A., Akite, N., Ho, J., Lee, R. T., Yeo, W., Curation Team, G. C., & Maurer-Stroh, S. (2021). GISAID's Role in Pandemic Response. *China CDC weekly*, 3(49), 1049–1051. <https://doi.org/10.46234/ccdcw2021.255>

Kozakov, D., Hall, D. R., Xia, B., Porter, K. A., Padhorny, D., Yueh, C., Beglov, D., & Vajda, S. (2017). The ClusPro web server for protein-protein docking. *Nature protocols*, 12(2), 255–278. <https://doi.org/10.1038/nprot.2016.169>

Kubo, A., Ishizaki, I., Kubo, A., Kawasaki, H., Nagao, K., Ohashi, Y., & Amagai, M. (2013). The stratum corneum comprises three layers with distinct metal-ion barrier properties. *Scientific reports*, 3, 1731. <https://doi.org/10.1038/srep01731>

Kumar, S., Stecher, G., Li, M., Knyaz, C., & Tamura, K. (2018). MEGA X: molecular evolutionary genetics analysis across computing platforms. *Molecular biology and evolution*, 35(6), 1547.

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. *Journal of the National Cancer Institute*, 105(16), 1172-1187.

Lim, J. P., & Gleeson, P. A. (2011). Macropinocytosis: an endocytic pathway for internalising large gulps. *Immunology and cell biology*, 89(8), 836–843. <https://doi.org/10.1038/icb.2011.20>

Lin, L., Ting, S., Yufei, H., Wendong, L., Yubo, F., & Jing, Z. (2020). Epitope-based peptide vaccines predicted against novel coronavirus disease caused by SARS-CoV-2. *Virus research*, 288, 198082.

Lu, R., Zhao, X., Li, J., Niu, P., Yang, B., Wu, H., ... & Tan, W. (2020). Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. *The lancet*, 395(10224), 565-574.

Magee, C. N., Boenisch, O., & Najafian, N. (2012). The role of costimulatory molecules in directing the functional differentiation of alloreactive T helper cells. *American journal of transplantation : official journal of the American Society of Transplantation and the American Society of Transplant Surgeons*, 12(10), 2588–2600. <https://doi.org/10.1111/j.1600-6143.2012.04180.x>

Malik, J. A., Ahmed, S., Mir, A., Shinde, M., Bender, O., Alshammari, F., Ansari, M., & Anwar, S. (2022). The SARS-CoV-2 mutations versus vaccine effectiveness: New opportunities to new challenges. *Journal of infection and public health*, 15(2), 228–240. <https://doi.org/10.1016/j.jiph.2021.12.014>

Marion D. (2013). An introduction to biological NMR spectroscopy. *Molecular & cellular proteomics : MCP*, 12(11), 3006–3025. <https://doi.org/10.1074/mcp.O113.030239>

Mascellino, M. T., Di Timoteo, F., De Angelis, M., & Oliva, A. (2021). Overview of the Main Anti-SARS-CoV-2 Vaccines: Mechanism of Action, Efficacy and Safety. *Infection and drug resistance*, 14, 3459–3476. <https://doi.org/10.2147/IDR.S315727>

Maurer-Stroh, S., Krutz, N. L., Kern, P. S., Gunalan, V., Nguyen, M. N., Limviphuvadh, V., Eisenhaber, F., & Gerberick, G. F. (2019). AllerCatPro-prediction of protein allergenicity potential from the protein sequence. *Bioinformatics (Oxford, England)*, 35(17), 3020–3027. <https://doi.org/10.1093/bioinformatics/btz029>

Mei, H. F., Jin, X. B., Zhu, J. Y., Zeng, A. H., Wu, Q., Lu, X. M., ... & Shen, J. (2012). β -Defensin 2 as an adjuvant promotes anti-melanoma immune responses and inhibits the growth of implanted murine melanoma in vivo. *PLoS one*, 7(2), e31328.

Mediatama, G. (2022). Ada 63.956 Kasus Covid-19 17 Februari 2022, Ini Perbedaan Gejala Omicron dan Delta. Retrieved 26 May 2022, from <https://nasional.kontan.co.id/news/ada-63956-kasus-covid-19-17-februari-2022-ini-perbedaan-gejala-omicron-dan-delta>

Merle, N. S., Noe, R., Halbwachs-Mecarelli, L., Fremaux-Bacchi, V., & Roumenina, L. T. (2015). Complement System Part II: Role in Immunity. *Frontiers in immunology*, 6, 257. <https://doi.org/10.3389/fimmu.2015.00257>

Mestecky, J., Moldoveanu, Z., Smith, P. D., Hei, Z., & Alexander, R. C. (2009). Mucosal immunology of the genital and gastrointestinal tracts and HIV-1 infection. *Journal of reproductive immunology*, 83(1-2), 196-200.

Molteni, M., Gemma, S., & Rossetti, C. (2016). The Role of Toll-Like Receptor 4 in Infectious and Noninfectious Inflammation. *Mediators of inflammation*, 2016, 6978936. <https://doi.org/10.1155/2016/6978936>

Mosser, D. M., & Edwards, J. P. (2008). Exploring the full spectrum of macrophage activation. *Nature reviews immunology*, 8(12), 958-969.

Muntasell, A., Berger, A. C., & Roche, P. A. (2007). T cell-induced secretion of MHC class II-peptide complexes on B cell exosomes. *The EMBO journal*, 26(19), 4263-4272. <https://doi.org/10.1038/sj.emboj.7601842>

Naz, A., Shahid, F., Butt, T. T., Awan, F. M., Ali, A., & Malik, A. (2020). Designing multi-epitope vaccines to combat emerging coronavirus disease 2019 (COVID-19) by employing immuno-informatics approach. *Frontiers in Immunology*, 1663.

Neefjes, J., Jongsma, M. L., Paul, P., & Bakke, O. (2011). Towards a systems understanding of MHC class I and MHC class II antigen presentation. *Nature reviews. Immunology*, 11(12), 823-836. <https://doi.org/10.1038/nri3084>

Nezafat, N., Ghasemi, Y., Javadi, G., Khoshnoud, M. J., & Omidinia, E. (2014). A novel multi-epitope peptide vaccine against cancer: an in silico approach. *Journal of theoretical biology*, 349, 121-134. <https://doi.org/10.1016/j.jtbi.2014.01.018>

Nicholson L. B. (2016). The immune system. *Essays in biochemistry*, 60(3), 275-301. <https://doi.org/10.1042/EBC20160017>

Noack, M., & Miossec, P. (2021). Importance of lymphocyte–stromal cell interactions in autoimmune and inflammatory rheumatic diseases. *Nature Reviews Rheumatology*, 1-15.

Nugraha, B., Wahyuni, L. K., Laswati, H., Kusumastuti, P., Tulaar, A. B., & Gutenbrunner, C. (2020). COVID-19 pandemic in Indonesia: Situation and challenges of rehabilitation medicine in Indonesia. *Acta medica Indonesiana*, 52(3), 299-305.

Oh, S. A., & Li, M. O. (2013). TGF- β : guardian of T cell function. *Journal of immunology (Baltimore, Md. : 1950)*, 191(8), 3973-3979. <https://doi.org/10.4049/jimmunol.1301843>

Oliveira, D. S., Medeiros, N. I., & Gomes, J. (2020). Immune response in COVID-19: What do we currently know?. *Microbial pathogenesis*, 148, 104484. <https://doi.org/10.1016/j.micpath.2020.104484>

Park, J. H., Yamaguchi, Y., & Inouye, M. (2012). Intramolecular regulation of the sequence-specific mRNA interferase activity of MazF fused to a MazE fragment with a linker cleavable by specific proteases. *Applied and environmental microbiology*, 78(11), 3794-3799.

Patronov, A., & Doytchinova, I. (2013). T-cell epitope vaccine design by immunoinformatics. *Open biology*, 3(1), 120139.

Pelanda, R., & Torres, R. M. (2012). Central B-cell tolerance: where selection begins. *Cold Spring Harbor perspectives in biology*, 4(4), a007146. <https://doi.org/10.1101/cshperspect.a007146>

Pieper, K., Grimbacher, B., & Eibel, H. (2013). B-cell biology and development. *The Journal of allergy and clinical immunology*, 131(4), 959–971. <https://doi.org/10.1016/j.jaci.2013.01.046>

Polack, F. P., Thomas, S. J., Kitchin, N., Absalon, J., Gurtman, A., Lockhart, S., Perez, J. L., Pérez Marc, G., Moreira, E. D., Zerbini, C., Bailey, R., Swanson, K. A., Roychoudhury, S., Koury, K., Li, P., Kalina, W. V., Cooper, D., Frenck, R. W., Jr, Hammitt, L. L., Türeci, Ö., ... C4591001 Clinical Trial Group (2020). Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine. *The New England journal of medicine*, 383(27), 2603–2615. <https://doi.org/10.1056/NEJMoa2034577>

Potocnakova, L., Bhide, M., & Pulzova, L. B. (2016). An Introduction to B-Cell Epitope Mapping and In Silico Epitope Prediction. *Journal of immunology research*, 2016, 6760830. <https://doi.org/10.1155/2016/6760830>

Rapin, N., Lund, O., Bernaschi, M., & Castiglione, F. (2010). Computational immunology meets bioinformatics: the use of prediction tools for molecular binding in the simulation of the immune system. *PLoS one*, 5(4), e9862. <https://doi.org/10.1371/journal.pone.0009862>

Reynisson, B., Alvarez, B., Paul, S., Peters, B., & Nielsen, M. (2020). NetMHCpan-4.1 and NetMHCIIPan-4.0: improved predictions of MHC antigen presentation by concurrent motif deconvolution and integration of MS MHC eluted ligand data. *Nucleic acids research*, 48(W1), W449–W454. <https://doi.org/10.1093/nar/gkaa379>

Ritchie, H., Mathieu, E., Rodés-Guirao, L., Appel, C., Giattino, C., & Ortiz-Ospina, E. et al. (2022). Coronavirus Pandemic (COVID-19). Retrieved 26 May 2022, from <https://ourworldindata.org/coronavirus/country/indonesia#how-many-tests-are-performed-each-day>

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>

Rock, K. L., Reits, E., & Neefjes, J. (2016). Present Yourself! By MHC Class I and MHC Class II Molecules. *Trends in immunology*, 37(11), 724–737. <https://doi.org/10.1016/j.it.2016.08.010>

Rosales, C. (2018). Neutrophil: a cell with many roles in inflammation or several cell types?. *Frontiers in physiology*, 9, 113.

Rouzbahani, A. K., Kheirandish, F., & Hosseini, S. Z. (2022). Design of a multi-epitope-based peptide vaccine against the S and N proteins of SARS-CoV-2 using immunoinformatics approach. *Egyptian Journal of Medical Human Genetics*, 23(1), 1-18.

Roy, A., Kucukural, A., & Zhang, Y. (2010). I-TASSER: a unified platform for automated protein structure and function prediction. *Nature protocols*, 5(4), 725–738. <https://doi.org/10.1038/nprot.2010.5>

Sahay, A., Piprodhe, A., & Pise, M. (2020). In silico analysis and homology modeling of strictosidine synthase involved in alkaloid biosynthesis in catharanthus roseus. *Journal, genetic engineering & biotechnology*, 18(1), 44. <https://doi.org/10.1186/s43141-020-00049-3>

SARS-CoV-2 variants of concern as of 26 November 2021. (2021). Retrieved 28 November 2021, from <https://www.ecdc.europa.eu/en/covid-19/variants-concern>

Sadoff, J., Gray, G., Vandebosch, A., Cárdenas, V., Shukarev, G., Grinsztejn, B., Goepfert, P. A., Truyers, C., Fennema, H., Spiessens, B., Offergeld, K., Scheper, G., Taylor, K. L., Robb, M. L., Treanor, J., Barouch, D. H., Stoddard, J., Ryser, M. F., Marovich, M. A., Neuzil, K. M., ... ENSEMBLE Study Group (2021). Safety and Efficacy of Single-Dose Ad26.COV2.S Vaccine against Covid-19. *The New England journal of medicine*, 384(23), 2187–2201. <https://doi.org/10.1056/NEJMoa2101544>

Schmid-Wendtner, M. H., & Korting, H. C. (2006). The pH of the skin surface and its impact on the barrier function. *Skin pharmacology and physiology*, 19(6), 296–302. <https://doi.org/10.1159/000094670>

Shende, G., Haldankar, H., Barai, R. S., Bharmal, M. H., Shetty, V., & Idicula-Thomas, S. (2017). PBIT: Pipeline Builder for Identification of drug Targets for infectious diseases. *Bioinformatics*, 33(6), 929–931.

Smyth, M. S., & Martin, J. H. (2000). x ray crystallography. *Molecular pathology* : MP, 53(1), 8–14. <https://doi.org/10.1136/mp.53.1.8>

Speiser, D. E., & Bachmann, M. F. (2020). COVID-19: Mechanisms of Vaccination and Immunity. *Vaccines*, 8(3), 404. <https://doi.org/10.3390/vaccines8030404>

Steinman, R. M., Turley, S., Mellman, I., & Inaba, K. (2000). The induction of tolerance by dendritic cells that have captured apoptotic cells. *The Journal of experimental medicine*, 191(3), 411–416. <https://doi.org/10.1084/jem.191.3.411>

Stranzl, T., Larsen, M. V., Lundgaard, 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>

Syed, A. M., Ciling, A., Khalid, M. M., Sreekumar, B., Chen, P. Y., Kumar, G. R., Silva, I., Milbes, B., Kojima, N., Hess, V., Shacreaw, M., Lopez, L., Brobeck, M., Turner, F., Spraggan, L., Taha, T. Y., Tabata, T., Chen, I. P., Ott, M., & Doudna, J. A. (2022). Omicron mutations enhance infectivity and reduce antibody neutralization of SARS-CoV-2 virus-like particles. *medRxiv : the preprint server for health sciences*, 2021.12.20.21268048. <https://doi.org/10.1101/2021.12.20.21268048>

Tai, Y., Wang, Q., Korner, H., Zhang, L., & Wei, W. (2018). Molecular Mechanisms of T Cells Activation by Dendritic Cells in Autoimmune Diseases. *Frontiers in pharmacology*, 9, 642. <https://doi.org/10.3389/fphar.2018.00642>

Thompson, C. P., Lourenço, J., Walters, A. A., Obolski, U., Edmans, M., Palmer, D. S., Kooblall, K., Carnell, G. W., O'Connor, D., Bowden, T. A., Pybus, O. G., Pollard, A. J., Temperton, N. J., Lambe, T., Gilbert, S. C., & Gupta, S. (2018). A naturally protective epitope of limited variability as an influenza vaccine target. *Nature communications*, 9(1), 3859. <https://doi.org/10.1038/s41467-018-06228-8>

Treanor B. (2012). B-cell receptor: from resting state to activate. *Immunology*, 136(1), 21–27. <https://doi.org/10.1111/j.1365-2567.2012.03564.x>

Tregoning, J. S., Flight, K. E., Higham, S. L., Wang, Z., & Pierce, B. F. (2021). Progress of the COVID-19 vaccine effort: viruses, vaccines and variants versus efficacy, effectiveness and escape. *Nature reviews. Immunology*, 21(10), 626–636. <https://doi.org/10.1038/s41577-021-00592-1>

Trinchieri G. (2007). Interleukin-10 production by effector T cells: Th1 cells show self control. *The Journal of experimental medicine*, 204(2), 239–243. <https://doi.org/10.1084/jem.20070104>

Tumer, G., Simpson, B., & Roberts, T. K. (2021). Genetics, Human Major Histocompatibility Complex (MHC). In *StatPearls*. StatPearls Publishing.

Turvey, S. E., & Broide, D. H. (2010). Innate immunity. *The Journal of allergy and clinical immunology*, 125(2 Suppl 2), S24–S32. <https://doi.org/10.1016/j.jaci.2009.07.016>

Van Doremalen, N., Bushmaker, T., Morris, D. H., Holbrook, M. G., Gamble, A., Williamson, B. N., ... & Munster, V. J. (2020). Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. *New England journal of medicine*, 382(16), 1564-1567.

Venkatesan, A., Gopal, J., Candavelou, M., Gollapalli, S., & Karthikeyan, K. (2013). Computational approach for protein structure prediction. *Healthcare informatics research*, 19(2), 137–147. <https://doi.org/10.4258/hir.2013.19.2.137>

Vignali, D. A., Collison, L. W., & Workman, C. J. (2008). How regulatory T cells work. *Nature reviews. Immunology*, 8(7), 523–532. <https://doi.org/10.1038/nri2343>

Wang, Y. Y., Hu, C., Li, J., You, X., & Gao, F. G. (2016). Increased translocation of antigens to endosomes and TLR4 mediated endosomal recruitment of TAP contribute to nicotine augmented cross-presentation. *Oncotarget*, 7(25), 38451–38466. <https://doi.org/10.18632/oncotarget.9498>

Weisel, F., & Shlomchik, M. (2017). Memory B Cells of Mice and Humans. *Annual review of immunology*, 35, 255–284. <https://doi.org/10.1146/annurev-immunol-041015-055531>

Welsh, R. M., & Fujinami, R. S. (2007). Pathogenic epitopes, heterologous immunity and vaccine design. *Nature reviews. Microbiology*, 5(7), 555–563. <https://doi.org/10.1038/nrmicro1709>

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, 292.

Wiederstein, M., & Sippl, M. J. (2007). ProSA-web: interactive web service for the recognition of errors in three-dimensional structures of proteins. *Nucleic acids research*, 35(Web Server issue), W407–W410. <https://doi.org/10.1093/nar/gkm290>

Wilkins, M. R., & Gasteiger, E. (1999). Bairoch a, Sanchez JC, Williams KL, Appel RD, et al. Protein identification and analysis tools in the ExPASy server. *Methods Mol Biol*, 112, 531-52.

World Health Organization. (2020). *Transmission of SARS-CoV-2: implications for infection prevention precautions: scientific brief*, 09 July 2020 (No. WHO/2019-nCoV/Sci_Brief/Transmission_modes/2020.3). World Health Organization.

World Health Organization. (2021). Tracking SARS-CoV-2 variants. Retrieved 28 November 2021, from <https://www.who.int/en/activities/tracking-SARS-CoV-2-variants/>

Xia X. (2021). Domains and Functions of Spike Protein in Sars-Cov-2 in the Context of Vaccine Design. *Viruses*, 13(1), 109. <https://doi.org/10.3390/v13010109>

Xu, X., Chen, P., Wang, J., Feng, J., Zhou, H., Li, X., ... & Hao, P. (2020). Evolution of the novel coronavirus from the ongoing Wuhan outbreak and modeling of its spike protein for risk of human transmission. *Science China Life Sciences*, 63(3), 457-460.

Yuliwulandari, R., Kashiwase, K., Nakajima, H., Uddin, J., Susmiarsih, T. P., Sofro, A. S., & Tokunaga, K. (2009). Polymorphisms of HLA genes in Western Javanese (Indonesia): close affinities to Southeast Asian populations. *Tissue antigens*, 73(1), 46–53. <https://doi.org/10.1111/j.1399-0039.2008.01178.x>

Zelenova, M., Ivanova, A., Semyonov, S., & Gankin, Y. (2021). Analysis of 329,942 SARS-CoV-2 records retrieved from GISAID database. *Computers in biology and medicine*, 139, 104981. Advance online publication. <https://doi.org/10.1016/j.combiomed.2021.104981>

Zhang, Y., Zeng, G., Pan, H., Li, C., Hu, Y., Chu, K., Han, W., Chen, Z., Tang, R., Yin, W., Chen, X., Hu, Y., Liu, X., Jiang, C., Li, J., Yang, M., Song, Y., Wang, X., Gao, Q., & Zhu, F. (2021). Safety, tolerability, and immunogenicity of an inactivated SARS-CoV-2 vaccine in healthy adults aged 18-59 years: a randomised, double-blind, placebo-controlled, phase 1/2 clinical trial. *The Lancet. Infectious diseases*, 21(2), 181–192. [https://doi.org/10.1016/S1473-3099\(20\)30843-4](https://doi.org/10.1016/S1473-3099(20)30843-4)

Zheng, D., Liwinski, T., & Elinav, E. (2020). Interaction between microbiota and immunity in health and disease. *Cell research*, 30(6), 492-506.

Zhou, H., Chen, X., Hu, T., Li, J., Song, H., Liu, Y., Wang, P., Liu, D., Yang, J., Holmes, E. C., Hughes, A. C., Bi, Y., & Shi, W. (2020). A Novel Bat Coronavirus Closely Related to SARS-CoV-2 Contains Natural Insertions at the S1/S2 Cleavage Site of the Spike Protein. *Current biology : CB*, 30(19), 3896. <https://doi.org/10.1016/j.cub.2020.09.030>

Zhou, P., Yang, X. L., Wang, X. G., Hu, B., Zhang, L., Zhang, W., ... & Shi, Z. L. (2020). A pneumonia outbreak associated with a new coronavirus of probable bat origin. *nature*, 579(7798), 270-273.