

DAFTAR PUSTAKA

Ackermann, M. *et al.* (2021) 'Patients with COVID-19: in the dark-NETs of neutrophils', *Cell Death and Differentiation*, 28(11), pp. 3125–3139. Available at: <https://doi.org/10.1038/s41418-021-00805-z>.

Ahmed, F., Jo, D.H. and Lee, S.H. (2020) 'Can Natural Killer Cells Be a Principal Player in Anti-SARS-CoV-2 Immunity?', *Frontiers in Immunology*, 11(December), pp. 1–8. Available at: <https://doi.org/10.3389/fimmu.2020.586765>.

Ariawan, I. *et al.* (2021) *Proyeksi COVID-19 di Indonesia*.

Bakhshandeh, B. *et al.* (2021) 'Mutations in SARS-CoV-2; Consequences in structure, function, and pathogenicity of the virus', *Microbial Pathogenesis*, 154(February), p. 104831. Available at: <https://doi.org/10.1016/j.micpath.2021.104831>.

Bansal, M. (2020) 'Cardiovascular disease and COVID-19', *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, 14(3), pp. 247–250. Available at: <https://doi.org/10.1016/j.dsx.2020.03.013>.

Bao, C. *et al.* (2021) 'Natural killer cells associated with SARS - CoV - 2 viral RNA shedding , antibody response and mortality in COVID - 19 patients', *Experimental Hematology & Oncology*, pp. 4–7. Available at: <https://doi.org/10.1186/s40164-021-00199-1>.

BD Biosciences (2004) *The BD™ Cytometric Bead Array System (CBA), Brochure*.

Biswas, M. *et al.* (2021) 'Association of Sex, Age, and Comorbidities with Mortality in COVID-19 Patients: A Systematic Review and Meta-Analysis', *Intervirology*, 64(1), pp. 36–47. Available at: <https://doi.org/10.1159/000512592>.

Boukhris, M. *et al.* (2020) 'Cardiovascular Implications of the COVID-19 Pandemic: A Global Perspective', *Canadian Journal of Cardiology*, 36(7), pp. 1068–1080. Available at: <https://doi.org/10.1016/j.cjca.2020.05.018>.

Bozzano, F. *et al.* (2021) 'Extensive activation, tissue trafficking, turnover and functional impairment of NK cells in COVID-19 patients at disease onset associates with subsequent disease severity', *PLoS Pathogens*, 17(4), pp. 1–18. Available at: <https://doi.org/10.1371/journal.ppat.1009448>.

Bulut, C. and Kato, Y. (2020) 'Epidemiology of covid-19', *Turkish Journal of Medical Sciences*, pp. 563–570. Available at: <https://doi.org/10.3906/sag-2004-172>.

Carolina, A. *et al.* (2020) 'IFN- γ is an independent risk factor associated with mortality in patients with moderate and severe COVID-19 infection', (January).

Carsetti, R. *et al.* (2020) ‘Different Innate and Adaptive Immune Responses to SARS-CoV-2 Infection of Asymptomatic, Mild, and Severe Cases’, *Frontiers in Immunology*, 11(December), pp. 1–16. Available at: <https://doi.org/10.3389/fimmu.2020.610300>.

Chiswick, E, Duffy, E, Japp, B, and Remick, D. (2012) ‘Detection and Quantification of Cytokines and Other Biomarkers’, *Methods in molecular biology (Clifton, N.J.)*, 844(1), pp. 15–30. Available at: <https://doi.org/10.1007/978-1-61779-527-5>.

Dahlan, M.S. (2009) *Besar sampel dan cara pengambilan sampel dalam penelitian kedokteran dan kesehatan*. 3rd edn. Jakarta: Salemba Medika.

Dhar, S.K. *et al.* (2021) ‘IL-6 and IL-10 as predictors of disease severity in COVID-19 patients: results from meta-analysis and regression’, *Heliyon*, 7(2), p. e06155. Available at: <https://doi.org/10.1016/j.heliyon.2021.e06155>.

Diao, B. *et al.* (2020) ‘Reduction and Functional Exhaustion of T Cells in Patients With Coronavirus Disease 2019 (COVID-19)’, *Frontiers in Immunology*, 11, pp. 1–14. Available at: <https://doi.org/10.3389/fimmu.2020.00827>.

van Eeden, C. *et al.* (2020) ‘Natural killer cell dysfunction and its role in covid-19’, *International Journal of Molecular Sciences*, 21(17), pp. 1–17. Available at: <https://doi.org/10.3390/ijms21176351>.

Guan, W. *et al.* (2020) ‘Clinical characteristics of coronavirus disease 2019 in China’, *New England Journal of Medicine*, 382(18), pp. 1708–1720. Available at: <https://doi.org/10.1056/NEJMoa2002032>.

Han, H. *et al.* (2020) ‘Profiling serum cytokines in COVID-19 patients reveals IL-6 and IL-10 are disease severity predictors’, *Emerging Microbes and Infections*, 9(1), pp. 1123–1130. Available at: <https://doi.org/10.1080/22221751.2020.1770129>.

Huang, C. *et al.* (2020) ‘Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China’, *The Lancet*, 395(10223), pp. 497–506. Available at: [https://doi.org/10.1016/S0140-6736\(20\)30183-5](https://doi.org/10.1016/S0140-6736(20)30183-5).

Huang, W. *et al.* (2020) ‘Lymphocyte Subset Counts in COVID-19 Patients: A Meta-Analysis’, *Cytometry Part A*, 97(8), pp. 772–776. Available at: <https://doi.org/10.1002/cyto.a.24172>.

Islam, H. *et al.* (2021) ‘Elevated Interleukin-10 Levels in COVID-19: Potentiation of Pro-Inflammatory Responses or Impaired Anti-Inflammatory Action?’, *Frontiers in Immunology*, 12(June), pp. 10–14. Available at: <https://doi.org/10.3389/fimmu.2021.677008>.

De Jager, W. *et al.* (2009) ‘Prerequisites for cytokine measurements in clinical

trials with multiplex immunoassays’, *BMC Immunology*, 10, p. 52. Available at:
<https://doi.org/10.1186/1471-2172-10-52>.

Jiang, Y. *et al.* (2020) ‘COVID-19 pneumonia: CD8+ T and NK cells are decreased in number but compensatory increased in cytotoxic potential’, *Clinical Immunology*, 218(June), p. 108516. Available at:
<https://doi.org/10.1016/j.clim.2020.108516>.

Junejo, Y. *et al.* (2020) ‘Novel SARS-CoV-2/COVID-19: Origin, pathogenesis, genes and genetic variations, immune responses and phylogenetic analysis’, *Gene Reports*, 20(June), p. 100752. Available at:
<https://doi.org/10.1016/j.genrep.2020.100752>.

Kemendes RI (2020) *Pedoman Tatalaksana COVID-19*. edisi 2.
KEMENTERIAN KESEHATAN RI.

Khartabil, T.A. *et al.* (2020) ‘A summary of the diagnostic and prognostic value of hemocytometry markers in COVID-19 patients’, *Critical Reviews in Clinical Laboratory Sciences*, 57(6), pp. 415–431. Available at:
<https://doi.org/10.1080/10408363.2020.1774736>.

Lauw, F.N. *et al.* (2000) ‘Proinflammatory Effects of IL-10 During Human Endotoxemia’, *The Journal of Immunology*, 165(5), pp. 2783–2789. Available at:
<https://doi.org/10.4049/jimmunol.165.5.2783>.

Liu, K. *et al.* (2021) ‘A systematic meta-analysis of immune signatures in patients with COVID-19’, *Reviews in Medical Virology*, 31(4), pp. 1–40. Available at:
<https://doi.org/10.1002/rmv.2195>.

Liu, Y. *et al.* (2020) ‘Elevated plasma levels of selective cytokines in COVID-19 patients reflect viral load and lung injury’, *National Science Review*, 7(6), pp. 1003–1011. Available at: <https://doi.org/10.1093/nsr/nwaa037>.

Lu, L. *et al.* (2021) ‘A Potential Role of Interleukin 10 in COVID-19 Pathogenesis’, *Trends in Immunology*, 42(1), pp. 3–5. Available at:
<https://doi.org/10.1016/j.it.2020.10.012>.

Maggi, E., Canonica, G.W. and Moretta, L. (2020) ‘COVID-19: Unanswered questions on immune response and pathogenesis’, *Journal of Allergy and Clinical Immunology*, 146(1), pp. 18–22. Available at:
<https://doi.org/10.1016/j.jaci.2020.05.001>.

Mangalmurti, N. and Hunter, C.A. (2020) ‘Cytokine Storms: Understanding COVID-19’, *Immunity*, 53(1), pp. 19–25. Available at:
<https://doi.org/10.1016/j.immuni.2020.06.017>.

Market, M. *et al.* (2020) ‘Flattening the COVID-19 Curve With Natural Killer Cell Based Immunotherapies’, *Frontiers in Immunology*, 11(June), pp. 1–23.

Available at: <https://doi.org/10.3389/fimmu.2020.01512>.

Mazzoni, A. *et al.* (2020) 'Impaired immune cell cytotoxicity in severe COVID-19 is IL-6 dependent', *Journal of Clinical Investigation*, 130(9), pp. 4694–4703. Available at: <https://doi.org/10.1172/JCI138554>.

McKenna, E. *et al.* (2022) 'Neutrophils in COVID-19: Not Innocent Bystanders', *Frontiers in Immunology*, 13(June), pp. 1–12. Available at: <https://doi.org/10.3389/fimmu.2022.864387>.

Meizlish, M.L. *et al.* (2021) 'A neutrophil activation signature predicts critical illness and mortality in COVID-19', *Blood Advances*, 5(5), pp. 1164–1177. Available at: <https://doi.org/10.1182/bloodadvances.2020003568>.

Mohammadi, E. *et al.* (2021) 'Novel and emerging mutations of SARS-CoV-2: Biomedical implications', *Biomedicine and Pharmacotherapy*, 139, p. 111599. Available at: <https://doi.org/10.1016/j.biopha.2021.111599>.

Moll-Bernardes, R. *et al.* (2021) 'IL-10 and IL-12 (P70) Levels Predict the Risk of Covid-19 Progression in Hypertensive Patients: Insights From the BRACE-CORONA Trial', *Frontiers in Cardiovascular Medicine*, 8(July), pp. 1–10. Available at: <https://doi.org/10.3389/fcvm.2021.702507>.

Murphy, K. and Weaver, C. (2018) *Janeway's Immunobiology. Ninth Edition*. By Kenneth Murphy and Casey Weaver; with contributions by Allan Mowat, Leslie Berg, and David Chaplin; with acknowledgment to: Charles A. Janeway, Jr., Paul Travers, and Mark Walport. New York: Garland Science, *The Quarterly Review of Biology*. Available at: <https://doi.org/10.1086/696793>.

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

Osman, M. *et al.* (2020) 'Impaired natural killer cell counts and cytolytic activity in patients with severe COVID-19', *Blood Advances*, 4(20), pp. 5035–5039. Available at: <https://doi.org/10.1182/BLOODADVANCES.2020002650>.

Parham, P. (2015) *The Immune System*. 4th editio. New York: Garland Science.

Qin, C., Zhou, L., Hu, Z., Zhang, S., Yang, S., Tao, Y., Xie, C., Ma, K., Shang, K., Wang, W. and Tian, D.S. (2020) 'Dysregulation of immune response in patients with coronavirus 2019 (COVID-19) in Wuhan, China', *Clinical Infectious Diseases*, 71(15), pp. 762–768. Available at: <https://doi.org/10.1093/cid/ciaa248>.

Qin, C., Zhou, L., Hu, Z., Zhang, S., Yang, S., Tao, Y., Xie, C., Ma, K., Shang, K., Wang, W. and Tian, D.-S. (2020) 'Dysregulation of Immune Response in Patients with COVID-19 in Wuhan, China', *SSRN Electronic Journal* [Preprint].

Available at: <https://doi.org/10.2139/ssrn.3541136>.

Quan, C.C.L.H.M.Y.L. y H. (2021) 'Immunopathogenesis of Coronavirus-Induced Acute Respiratory Distress Syndrome (ARDS): Potential Infection_Associated Hemophagocytic Lymphohistiocytosis', (October 2020), pp. 1–27.

Reusch, N. *et al.* (2021) 'Neutrophils in COVID-19', *Frontiers in Immunology*, 12(March), pp. 1–9. Available at: <https://doi.org/10.3389/fimmu.2021.652470>.

Richens, J.L. *et al.* (2010) 'Quantitative validation and comparison of multiplex cytokine kits', *Journal of Biomolecular Screening*, 15(5), pp. 562–568. Available at: <https://doi.org/10.1177/1087057110362099>.

Sachdeva, N. and Asthana, D. (2007) 'Cytokine quantitation: Technologies and applications', *Frontiers in Bioscience*, 12(12), pp. 4682–4695. Available at: <https://doi.org/10.2741/2418>.

Salahshoori, I. *et al.* (2021) 'Overview of COVID-19 Disease: Virology, Epidemiology, Prevention Diagnosis, Treatment, and Vaccines', *Biologics*, 1(1), pp. 2–40. Available at: <https://doi.org/10.3390/biologics1010002>.

Satgas COVID19 (2022) *Situasi COVID-19 | Covid19.go.id, Satgas COVID19*.

Schroder, Kate, Hertzog, Paul, Ravasi, Timoty, Huve, D. (2004) 'Interferon- γ : an overview of signals, mechanisms and functions', *Journal of Leukocyte Biology*, 75, pp. 163–169.

Septyaningtrias, D.E. *et al.* (2020) 'Review of immune responses correlated with COVID-19 outcomes: the fight, debacle and aftermath in the Indonesian context', *Journal of the Medical Sciences (Berkala Ilmu Kedokteran)*, 52(03), pp. 29–53. Available at: <https://doi.org/10.19106/jmedscisi005203202004>.

Sun, L, He, C, Nair, L, Yeung, J, Egwuage, C. (2015) 'Interleukin 12 (IL-12) Family Cytokines: Role in Immune Pathogenesis and Treatment of CNS Autoimmune Disease', *Cytokine*, 75(2), pp. 249–255. Available at: <https://doi.org/10.1016/j.cyto.2015.01.030>. Interleukin.

Tsai, P.H. *et al.* (2021) 'Clinical manifestation and disease progression in COVID-19 infection', *Journal of the Chinese Medical Association*, 84(1), pp. 3–8. Available at: <https://doi.org/10.1097/JCMA.0000000000000463>.

Villas, B.H. (1998) 'Flow cytometry: an overview.', *Cell vision : the journal of analytical morphology*, 5(1), pp. 56–61. Available at: https://doi.org/10.1007/978-94-017-0623-0_1.

Wang, D. *et al.* (2020) 'Clinical Characteristics of 138 Hospitalized Patients with 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China', *JAMA - Journal*

of the American Medical Association, 323(11), pp. 1061–1069. Available at:
<https://doi.org/10.1001/jama.2020.1585>.

Wang, Fan *et al.* (2020) ‘Characteristics of peripheral lymphocyte subset alteration in covid-19 pneumonia’, *Journal of Infectious Diseases*, 221(11), pp. 1762–1769. Available at: <https://doi.org/10.1093/INFDIS/JIAA150>.

Wang, Feng *et al.* (2020) ‘The laboratory tests and host immunity of COVID-19 patients with different severity of illness’, *JCI Insight*, 5(10), pp. 1–11. Available at: <https://doi.org/10.1172/JCI.INSIGHT.137799>.

WHO (2020) *Clinical Management of COVID-19*. New York: WHO.

WHO (2022) *WHO Coronavirus Disease (COVID-19) Dashboard With Vaccination Data | WHO Coronavirus (COVID-19) Dashboard With Vaccination Data*, World Health Organization.

Wu, Y., Tian, Z. and Wei, H. (2017) ‘Developmental and functional control of natural killer cells by cytokines’, *Frontiers in Immunology*, 8(AUG). Available at: <https://doi.org/10.3389/fimmu.2017.00930>.

Yang, A.-P. *et al.* (2020) ‘The diagnostic and predictive role of NLR, d-NLR and PLR in COVID-19 patients’, *Bioorganic Chemistry*, 103(January), p. 104230.

Yang, L. *et al.* (2021) ‘The signal pathways and treatment of cytokine storm in COVID-19’, *Signal Transduction and Targeted Therapy*, 6(1), pp. 1–20. Available at: <https://doi.org/10.1038/s41392-021-00679-0>.

Zhang, C. *et al.* (2008) ‘Interleukin-12 improves cytotoxicity of natural killer cells via upregulated expression of NKG2D’, *Human Immunology*, 69(8), pp. 490–500. Available at: <https://doi.org/10.1016/j.humimm.2008.06.004>.

Zhang, Z. *et al.* (2021) ‘Associations of immunological features with COVID-19 severity: a systematic review and meta-analysis’, *BMC Infectious Diseases*, 21(1), pp. 1–9. Available at: <https://doi.org/10.1186/s12879-021-06457-1>.

Zhao, K. *et al.* (2020) ‘Clinical features in 52 patients with COVID-19 who have increased leukocyte count: a retrospective analysis’, *European Journal of Clinical Microbiology and Infectious Diseases*, 39(12), pp. 2279–2287. Available at: <https://doi.org/10.1007/s10096-020-03976-8>.

Zhao, Y. *et al.* (2020) ‘Longitudinal COVID-19 profiling associates IL-1RA and IL-10 with disease severity and RANTES with mild disease’, *JCI Insight*, 5(13), pp. 4–14. Available at: <https://doi.org/10.1172/jci.insight.139834>.