

## REFERENCES

- Aderem, A., & Underhill, D. M. (1999). Mechanisms of phagocytosis in macrophages. Annual review of immunology, 17, 593–623. <https://doi.org/10.1146/annurev.immunol.17.1.593>
- Agard, M., Asakrah, S., & Morici, L. (2013). PGE2 suppression of innate immunity during mucosal bacterial infection. Frontiers In Cellular And Infection Microbiology, 3. doi: 10.3389/fcimb.2013.00045
- Ahlmann, M., & Hempel, G. (2016). The effect of cyclophosphamide on the immune system: implications for clinical cancer therapy. Cancer chemotherapy and pharmacology, 78(4), 661–671. <https://doi.org/10.1007/s00280-016-3152-1>
- Akira, S., Uematsu, S., & Takeuchi, O. (2006). Pathogen Recognition and Innate Immunity. Cell, 124(4), 783-801. doi: 10.1016/j.cell.2006.02.015
- Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., & Walter, P. (2021). B Cells and Antibodies. Retrieved 15 January 2021, from [https://www.ncbi.nlm.nih.gov/books/NBK26884/#:~:text=There%20are%20five%20classe s%20of%20antibodies%20\(IgA%2C%20IgD%2C%20IgE,%2C%20and%20CE%BC%2C%20re sp ectively\).](https://www.ncbi.nlm.nih.gov/books/NBK26884/#:~:text=There%20are%20five%20classe s%20of%20antibodies%20(IgA%2C%20IgD%2C%20IgE,%2C%20and%20CE%BC%2C%20re sp ectively).)
- Alderton, G. (2014). Turning macrophages on, off and on again. Nature Reviews Immunology, 14(3), 137–137. doi: 10.1038/nri3634
- Arozal, W., Louisa, M., & Soetikno, V. (2020). Selected Indonesian Medicinal Plants for the Management of Metabolic Syndrome: Molecular Basis and Recent Studies. Frontiers in cardiovascular medicine, 7, 82. <https://doi.org/10.3389/fcvm.2020.00082>
- Asherson, R. A., Gunter, K., Daya, D., & Shoenfeld, Y. (2008). Multiple autoimmune diseases in a young woman: tuberculosis and splenectomy as possible triggering factors? Another example of the "mosaic" of autoimmunity. The Journal of rheumatology, 35(6), 1224–1226.
- Baas, J., Senninger, N., & Elser, H. (1994). Das retikuloendotheliale System. Eine Übersicht über Funktion, Pathologie und neuere Messmethoden [The reticuloendothelial system. An overview of function, pathology and recent methods of measurement]. Zeitschrift für Gastroenterologie, 32(2), 117–123.
- Bakema, J. E., & van Egmond, M. (2011). The human immunoglobulin A Fc receptor Fc $\alpha$ RI: a multifaceted regulator of mucosal immunity. Mucosal immunology, 4(6), 612–624. <https://doi.org/10.1038/mi.2011.36>
- Bascones-Martinez, A., Mattila, R., Gomez-Font, R., & Meurman, J. H. (2014). Immunomodulatory drugs: oral and systemic adverse effects. Medicina oral, patología oral y cirugía bucal, 19(1), e24–e31. <https://doi.org/10.4317/medoral.19087>
- Basu, S., Hodgson, G., Katz, M., Dunn, A.R. (2002). Evaluation of role of G-CSF in the production, survival, and release of neutrophils from bone marrow into circulation. Blood 100, 854-861.
- Behl, T., Kumar, K., Brisc, C., Rus, M., Nistor-Cseppento, D., & Bustea, C. et al. (2021). Exploring the multifocal role of phytochemicals as immunomodulators.
- Berger A. (2000). Th1 and Th2 responses: what are they?. BMJ (Clinical research ed.), 321(7258), 424. <https://doi.org/10.1136/bmj.321.7258.424>
- Biozzi, G., Benacerraf, B., & Halpern, B. N. (1953). Quantitative study of the granuloectic activity of the reticulo-endothelial system. II. A study of the kinetics of the R. E. S. in relation to the dose of carbon injected; relationship between the weight of the organs and their activity. British journal of experimental pathology, 34(4), 441–457.

- Bonilla, F. A., & Oettgen, H. C. (2010). Adaptive immunity. *The Journal of allergy and clinical immunology*, 125(2 Suppl 2), S33–S40. <https://doi.org/10.1016/j.jaci.2009.09.017>
- Brillinger, D. (1984). "The Collected Works of John W. Tukey".
- Brindha, P. (2016). Role of phytochemicals as immunomodulatory agents: A review. *International Journal of Green Pharmacy*, 10.
- Britannica, T. Editors of Encyclopaedia (2020). Phagocytosis. Encyclopedia Britannica. <https://www.britannica.com/science/phagocytosis>.
- Brouwer, A., & Knook, D. (1983). The reticuloendothelial system and aging: A review. *Mechanisms Of Ageing And Development*, 21(3-4), 205-228. doi: 10.1016/0047-6374(83)90042-8
- Campbell, K. S., & Hasegawa, J. (2013). Natural killer cell biology: an update and future directions. *The Journal of allergy and clinical immunology*, 132(3), 536–544. <https://doi.org/10.1016/j.jaci.2013.07.006>
- Canetti, C., Serezani, C., Atrasz, R., White, E., Aronoff, D., & Peters-Golden, M. (2007). Activation of Phosphatase and Tensin Homolog on Chromosome 10 Mediates the Inhibition of Fc $\gamma$ R Phagocytosis by Prostaglandin E2 in Alveolar Macrophages. *The Journal Of Immunology*, 179(12), 8350-8356. doi: 10.4049/jimmunol.179.12.8350
- Canton, J., Neculai, D., & Grinstein, S. (2013). Scavenger receptors in homeostasis and immunity. *Nature reviews. Immunology*, 13(9), 621–634. <https://doi.org/10.1038/nri3515>
- Çekici, Y., Yılmaz, M., & Seçen, Ö. (2019). New inflammatory indicators: association of high eosinophil-to-lymphocyte ratio and low lymphocyte-to-monocyte ratio with smoking. *The Journal of international medical research*, 47(9), 4292–4303. <https://doi.org/10.1177/0300060519862077>
- Chaplin D. D. (2010). Overview of the immune response. *The Journal of allergy and clinical immunology*, 125(2 Suppl 2), S3–S23. <https://doi.org/10.1016/j.jaci.2009.12.980>
- Chiu, S., & Bharat, A. (2016). Role of monocytes and macrophages in regulating immune response following lung transplantation. *Current opinion in organ transplantation*, 21(3), 239–245. <https://doi.org/10.1097/MOT.0000000000000313>
- Current Immunology Reviews, 9(1), 44-55. doi: 10.2174/1573395511309010006
- cyclophosphamide-induced immunosuppression mice. *Experimental And Therapeutic Medicine*. doi: 10.3892/etm.2018.5810
- Dahlgren, C., & Karlsson, A. (1999). Respiratory burst in human neutrophils. *Journal Of Immunological Methods*, 232(1-2), 3-14. doi: 10.1016/s0022-1759(99)00146-5
- Dai, G., & McMurray, D. N. (1998). Altered cytokine production and impaired antimycobacterial immunity in protein-malnourished guinea pigs. *Infection and immunity*, 66(8), 3562–3568. <https://doi.org/10.1128/IAI.66.8.3562-3568.1998>
- Dambuza, I. M., & Brown, G. D. (2015). C-type lectins in immunity: recent developments. *Current opinion in immunology*, 32, 21–27. <https://doi.org/10.1016/j.co.2014.12.002>
- Delves, P. J.; Martin, S. J.; Burton, D. R.; Roitt, I. M. (2006). *Roitt's Essential Immunology* (11th ed.). Malden, MA: Blackwell Publishing. [ISBN 978-1-4051-3603-7](https://doi.org/10.1002/9781444305402).
- Desjardins M. (1995). Biogenesis of phagolysosomes: the 'kiss and run' hypothesis. *Trends in cell biology*, 5(5), 183–186. [https://doi.org/10.1016/s0962-8924\(00\)88989-8](https://doi.org/10.1016/s0962-8924(00)88989-8)
- Di Pucchio, T., Pilla, L., Capone, I., Ferrantini, M., Montefiore, E., & Urbani, F. et al. (2006). Immunization of Stage IV Melanoma Patients with Melan-A/MART-1 and gp100 Peptides plus IFN- $\alpha$  Results in the Activation of Specific CD8+ T Cells and Monocyte/Dendritic Cell Precursors. *Cancer Research*, 66(9), 4943-4951. doi: 10.1158/0008-5472.can-05-3396

- Dimeloe, S., Frick, C., Fischer, M., Gubser, P. M., Razik, L., Bantug, G. R., Ravon, M., Langenkamp, A., & Hess, C. (2014). Human regulatory T cells lack the cyclophosphamide-extruding transporter ABCB1 and are more susceptible to cyclophosphamide-induced apoptosis. *European journal of immunology*, 44(12), 3614–3620. <https://doi.org/10.1002/eji.201444879>
- Ding, Z. C., Aboeella, N. S., Bryan, L., Shi, H., & Zhou, G. (2021). The Monocytes That Repopulate in Mice After Cyclophosphamide Treatment Acquire a Neutrophil Precursor Gene Signature and Immunosuppressive Activity. *Frontiers in immunology*, 11, 594540. <https://doi.org/10.3389/fimmu.2020.594540>
- Djeu JY. (1992). Monocyte/macrophage functions. In (Rose NR, deMacario EC, Fahey JL, Friedman H, Penn GM): Manual of Clinical Laboratory Immunology. 4th edition. American Society for Microbiology.
- Dodge, Y. (2008). The Concise Encyclopedia of Statistics. Springer.
- Dunkelberger, J., & Song, W. (2009). Complement and its role in innate and adaptive immune responses. *Cell Research*, 20(1), 34-50. doi: 10.1038/cr.2009.139
- Dutta, P., & Nahrendorf, M. (2014). Regulation and consequences of monocytosis. *Immunological reviews*, 262(1), 167–178. <https://doi.org/10.1111/imr.12219>
- Eeverds, N. (2007). Hematology of the Laboratory Mouse. *The Mouse In Biomedical Research*, 133-170. doi: 10.1016/b978-012369454-6/50059-5
- Fan, Y., Ma, L., Zhang, W., Xu, Y., Suolangzhaxi, Zhi, X., Cui, E., & Song, X. (2014). Microemulsion can improve the immune-enhancing activity of propolis flavonoid on immunosuppression and immune response. *International journal of biological macromolecules*, 63, 126–132. <https://doi.org/10.1016/j.ijbiomac.2013.09.039>
- Ficken, M., & Barnes, H. (1988). Effect of Cyclophosphamide on Selected Hematologic Parameters of the Turkey. *Avian Diseases*, 32(4), 812. doi: 10.2307/1591003
- Fisher, R. (1992). Statistical Methods for Research Workers. Springer Series In Statistics, 66-70. doi: 10.1007/978-1-4612-4380-9\_6
- Flannagan, R. S., Jaumouillé, V., & Grinstein, S. (2012). The cell biology of phagocytosis. *Annual review of pathology*, 7, 61–98. <https://doi.org/10.1146/annurev-pathol-011811-132445>
- Freeman, S. A., & Grinstein, S. (2014). Phagocytosis: receptors, signal integration, and the cytoskeleton. *Immunological reviews*, 262(1), 193–215. <https://doi.org/10.1111/imr.12212>
- Freeman, S. A., Goyette, J., Furuya, W., Woods, E. C., Bertozzi, C. R., Bergmeier, W., Hinz, B., van der Merwe, P. A., Das, R., & Grinstein, S. (2016). Integrins Form an Expanding Diffusional Barrier that Coordinates Phagocytosis. *Cell*, 164(1-2), 128–140. <https://doi.org/10.1016/j.cell.2015.11.048>
- Frey B. M. (1993). Wirkungsmechanismus der Immunosuppressiva [Mechanism of action of immunosuppressive agents]. *Therapeutische Umschau. Revue therapeutique*, 50(2), 71–76.
- Frontiers in physiology, 9, 113. <https://doi.org/10.3389/fphys.2018.00113>
- Ganeshpurkar, A., & Saluja, A. (2017). Experimental animal models used for evaluation of potential immunomodulators: A mini review. *Bulletin Of Faculty Of Pharmacy, Cairo University*, 55(2), 211-216. doi: 10.1016/j.bfopcu.2017.08.002
- Garcia, R., Araújo, É., Dambrós, B., Schneider, A., & Abib, R. (2021). The effect of vitamin C supplementation on neutropenia induced by cyclophosphamide in mice.
- Gassmann, W., Uharek, L., Wottge, H. U., Schmitz, N., Löffler, H., & Mueller-Ruchholtz, W. (1988).

- Comparison of cyclophosphamide, cytarabine, and etoposide as immunosuppressive agents before allogeneic bone marrow transplantation. *Blood*, 72(5), 1574–1579.
- Goldstein, M., Roos, W. P., & Kaina, B. (2008). Apoptotic death induced by the cyclophosphamide analogue mafosfamide in human lymphoblastoid cells: contribution of DNA replication, transcription inhibition and Chk/p53 signaling. *Toxicology and applied pharmacology*, 229(1), 20–32. <https://doi.org/10.1016/j.taap.2008.01.001>
- Gonick, L. (1993). *The Cartoon Guide to Statistics*. HarperPerennial.
- Gordon S. (2016). Phagocytosis: An Immunobiologic Process. *Immunity*, 44(3), 463–475. <https://doi.org/10.1016/j.immuni.2016.02.026>
- Greenberg, S., & Grinstein, S. (2002). Phagocytosis and innate immunity. *Current opinion in immunology*, 14(1), 136–145. [https://doi.org/10.1016/s0952-7915\(01\)00309-0](https://doi.org/10.1016/s0952-7915(01)00309-0)
- Guo, B., Abdelraouf, K., Ledesma, K., Chang, K., Nikolaou, M., & Tam, V. (2011). Quantitative Impact of Neutrophils on Bacterial Clearance in a Murine Pneumonia Model. *Antimicrobial Agents And Chemotherapy*, 55(10), 4601-4605. doi: 10.1128/aac.00508-11
- Hedrick S. M. (2008). Thymus lineage commitment: a single switch. *Immunity*, 28(3), 297–299. <https://doi.org/10.1016/j.immuni.2008.02.011>
- Henneke, P., & Golenbock, D. T. (2004). Phagocytosis, innate immunity, and host-pathogen specificity. *The Journal of experimental medicine*, 199(1), 1–4. <https://doi.org/10.1084/jem.20031256>
- Hensel, M., Grädel, L., Kutz, A., Haubitz, S., Huber, A., Mueller, B., Schuetz, P., & Hügle, T. (2017). Peripheral moncytosis as a predictive factor for adverse outcome in the emergency department: Survey based on a register study. *Medicine*, 96(28), e7404. <https://doi.org/10.1097/MD.00000000000007404>
- Hidanah, S., Sabdoningrum, E., Wahjuni, R., & Chusniati, S. (2018). Effects of meniran (*Phyllanthus niruri* L.) administration on leukocyte profile of broiler chickens infected with *Mycoplasma gallisepticum*. *Veterinary World*, 11(6), 834-839. doi: 10.14202/vetworld.2018.834-839
- Hirayama, D., Iida, T., & Nakase, H. (2017). The Phagocytic Function of Macrophage-Enforcing Innate Immunity and Tissue Homeostasis. *International journal of molecular sciences*, 19(1), 92. <https://doi.org/10.3390/ijms19010092>
- Hoffman, W., Lakkis, F., & Chalasani, G. (2015). B Cells, Antibodies, and More. *Clinical Journal Of The American Society Of Nephrology*, 11(1), 137-154. doi: 10.2215/cjn.09430915 <https://doi.org/10.3389/fimmu.2020.01066>
- Hurd, E. R., & Giuliano, V. J. (1975). The effect of cyclophosphamide on B and T lymphocytes in patients with connective tissue diseases. *Arthritis and rheumatism*, 18(1), 67–75. <https://doi.org/10.1002/art.1780180113>
- Huyan, X., Lin, Y., Gao, T., Chen, R., & Fan, Y. (2011). Immunosuppressive effect of cyclophosphamide on white blood cells and lymphocyte subpopulations from peripheral blood of Balb/c mice. *International Immunopharmacology*, 11(9), 1293-1297. doi: 10.1016/j.intimp.2011.04.011
- Iwasaki, A., & Medzhitov, R. (2015). Control of adaptive immunity by the innate immune system.
- Janeway C. A., Travers P., Walport M., Shlomchik M. J. (2005). “Chapter 14 Manipulation of the Immune Response” in *Immunobiology: the immune system in health and disease*, 6th Edition (New York, USA: Garland Science Publishing; )
- Jantan, I., Ahmad, W., & Bukhari, S. (2015). Plant-derived immunomodulators: an insight on their preclinical evaluation and clinical trials. *Frontiers In Plant Science*, 6. doi: 10.3389/fpls.2015.00655

- Jantan, I., Ahmad, W., & Bukhari, S. N. (2015). Plant-derived immunomodulators: an insight on their preclinical evaluation and clinical trials. *Frontiers in plant science*, 6, 655. <https://doi.org/10.3389/fpls.2015.00655>
- Jantan, I., Haque, M. A., Ilangkovan, M., & Arshad, L. (2019). An Insight Into the Modulatory Effects and Mechanisms of Action of *Phyllanthus* Species and Their Bioactive Metabolites on the Immune System. *Frontiers in pharmacology*, 10, 878. <https://doi.org/10.3389/fphar.2019.00878>
- Jenkinson, E. J., Jenkinson, W. E., Rossi, S. W., & Anderson, G. (2006). The thymus and T-cell commitment: the right niche for Notch?. *Nature reviews. Immunology*, 6(7), 551–555. <https://doi.org/10.1038/nri1883>
- Kaur, B., Kaur, N., & Gautam, V. (2016). EVALUATION OF ANTI-*HELICOBACTER PYLORI* (DSMZ 10242) ACTIVITY AND QUALITATIVE ANALYSIS OF QUERCETIN BY HPLC IN *PHYLLANTHUS NIRURI* L.INN.
- Kita H. (2011). Eosinophils: multifaceted biological properties and roles in health and disease. *Immunological reviews*, 242(1), 161–177. <https://doi.org/10.1111/j.1600-065X.2011.01026.x>
- Kondělková, K., Vokurková, D., Krejsek, J., Borská, L., Fiala, Z., & Ctirad, A. (2010). Regulatory T cells (TREG) and their roles in immune system with respect to immunopathological disorders. *Acta medica (Hradec Kralove)*, 53(2), 73–77. <https://doi.org/10.14712/18059694.2016.63>
- Kovalszki, A., & Weller, P. F. (2016). Eosinophilia. *Primary care*, 43(4), 607–617. <https://doi.org/10.1016/j.pop.2016.07.010>
- Kovalszki, A., & Weller, P. F. (2016). Eosinophilia. *Primary care*, 43(4), 607–617. <https://doi.org/10.1016/j.pop.2016.07.010>
- Krystel-Whittemore, M., Dileepan, K. N., & Wood, J. G. (2016). Mast Cell: A Multi-Functional Master Cell. *Frontiers in immunology*, 6, 620. <https://doi.org/10.3389/fimmu.2015.00620>
- Lebish, I.J., Moraski, R.M., 1987. Mechanisms of Immunomodulation by Drugs\*. *Toxicology Pathology* 15, 338–345.
- Lewicka, A., Szymański, Ł., Rusiecka, K., Kucza, A., Jakubczyk, A., Zdanowski, R., & Lewicki, S. (2019). Supplementation of Plants with Immunomodulatory Properties during Pregnancy and Lactation-Maternal and Offspring Health Effects. *Nutrients*, 11(8), 1958. <https://doi.org/10.3390/nu11081958>
- Li, K., & Underhill, D. M. (2020). C-Type Lectin Receptors in Phagocytosis. *Current topics in microbiology and immunology*, 429, 1–18. [https://doi.org/10.1007/82\\_2020\\_198](https://doi.org/10.1007/82_2020_198)
- Lord, B.I. (1992). Myeloid cell kinetics in response to haemopoietic growth factors. *Baillieres Clin Haematol* 5, 533-550.
- Lord, BT, Molineux, G., Pojda, Z., Souza, L.M., Mermod, J.J., Dexter, T.M. (1991 b). Myeloid cell kinetics in mice treated with recombinant interleukin3, granulocyte colony-stimulating factor (CSF), or granulocyte-macrophageCSF in vivo. *Blood* 77, 2154-2159.
- Ma'at S. (1996). *Phyllanthus niruri* L. sebagai pada mencit. Disertasi Program Pasca Sarjana Universitas Airlangga. Surabaya.
- Manayi, A., Vazirian, M., & Saeidnia, S. (2015). *Echinacea purpurea*: Pharmacology, phytochemistry and analysis methods. *Pharmacognosy reviews*, 9(17), 63–72. <https://doi.org/10.4103/0973-7847.156353>
- Marshall, J. S., Warrington, R., Watson, W., & Kim, H. L. (2018). An introduction to immunology and

- immunopathology. Allergy, asthma, and clinical immunology : official journal of the Canadian Society of Allergy and Clinical Immunology, 14(Suppl 2), 49. <https://doi.org/10.1186/s13223-018-0278-1>
- McBride, W. H., Hoon, D. B., Jung, T., Naungayan, J., Nizze, A., & Morton, D. L. (1987). Cyclophosphamide-induced alterations in human monocyte functions. *Journal of leukocyte biology*, 42(6), 659–666. <https://doi.org/10.1002/jlb.42.6.659>
- Meszaros, P., Hummel, I., Klappe, K., Draghiciu, O., Hoekstra, D., & Kok, J. (2013). The function of the ATP-binding cassette (ABC) transporter ABCB1 is not susceptible to actin disruption. *Biochimica Et Biophysica Acta (BBA) - Biomembranes*, 1828(2), 340-351. doi: 10.1016/j.bbamem.2012.10.007
- Middleton, E. J., Kandaswami, C. and Theoharides, T., 2000, 'The effects of plant flavonoids on mammalian cells: implications for inflammation, heart disease, and cancer', *Pharmacol Rev*, 52(4), pp. 673–751.
- Miller, R. G. (1997). Beyond ANOVA: Basics of Applied Statistics. Boca Raton, FL: Chapman & Hall.
- Moschella, F., Torelli, G., Valentini, M., Urbani, F., Buccione, C., & Petrucci, M. et al. (2013). Cyclophosphamide Induces a Type I Interferon-Associated Sterile Inflammatory Response Signature in Cancer Patients' Blood Cells: Implications for Cancer Chemoimmunotherapy. *Clinical Cancer Research*, 19(15), 4249-4261. doi: 10.1158/1078-0432.ccr-12-3666
- Müller US, Wirth W, Junge-Hülsing G, Hauss WH. (1973). Suppressive effects in mesenchyme and immunosuppressive effects of cytostatics. *Int J Clin Pharmacol* 7:228–233
- Müller US, Wirth W, Thöne F, Junge-Hülsing G, Hauss WH. (1973). Animal experiments on the anti inflammatory and immunosuppressive effect of cytostatic agents. *Arzneimittelforschung* 23:487–491
- Müller, U. S., Wirth, W., Thöne, F., Junge-Hülsing, G., & Hauss, W. H. (1973). Tierexperimentelle Untersuchungen über die antinflammatorische und immunsuppressive Wirkung von Zytostaika [Animal experiments on the anti-inflammatory and immunosuppressive effect of cytostatic agents]. *Arzneimittel-Forschung*, 23(4), 487–491.
- Murphy, K., Travers, P., & Walport, M. (2008). Janeway's immunobiology. New York: Garland.
- Muthulakshmi, M., Subramani, P. A., & Michael, R. D. (2016). Immunostimulatory effect of the aqueous leaf extract of *Phyllanthus niruri* on the specific and nonspecific immune responses of *Oreochromis mossambicus* Peters. *Iranian journal of veterinary research*, 17(3), 200–202.
- Nakanishi, Y., Nagaosa, K., & Shiratsuchi, A. (2011). Phagocytic removal of cells that have become unwanted: Implications for animal development and tissue homeostasis. *Development, Growth & Differentiation*, 53(2), 149-160. doi: 10.1111/j.1440-169x.2010.01224.x
- Nature immunology*, 16(4), 343–353. <https://doi.org/10.1038/ni.3123>
- Nunomura, R., Oliveira, V., Da Silva, S., & Nunomura, S. (2009). Characterization of bergenin in Endopleura uchi bark and its anti-inflammatory activity. *Journal Of The Brazilian Chemical Society*, 20(6), 1060-1064. doi: 10.1590/s0103-50532009000600009
- O'Connell, K. E., Mikkola, A. M., Stepanek, A. M., Vernet, A., Hall, C. D., Sun, C. C., Yildirim, E., Staropoli, J. F., Lee, J. T., & Brown, D. E. (2015). Practical murine hematopathology: a comparative review and implications for research. *Comparative medicine*, 65(2), 96–113.
- Ortuño-Sahagún, D., Rawat, A., & Zänker, K. (2019). Natural Immunomodulators 2018. *Journal Of Immunology Research*, 2019, 1-3. doi: 10.1155/2019/4341698
- Ostrowski, P. P., Grinstein, S., & Freeman, S. A. (2016). Diffusion Barriers, Mechanical Forces, and the Biophysics of Phagocytosis. *Developmental cell*, 38(2), 135–146. <https://doi.org/10.1016/j.devcel.2016.06.023>

- Panda, S., & Colonna, M. (2019). Innate Lymphoid Cells in Mucosal Immunity. *Frontiers In Immunology*, 10. doi: 10.3389/fimmu.2019.00861
- Patel, P., & Asdaq, S. M. (2010). Immunomodulatory activity of methanolic fruit extract of *Aegle marmelos* in experimental animals. *Saudi pharmaceutical journal : SPJ : the official publication of the Saudi Pharmaceutical Society*, 18(3), 161–165. <https://doi.org/10.1016/j.jsp.2010.05.006>
- Ponkshe, C. A., & Indap, M. M. (2002). In vivo and in vitro evaluation for immunomodulatory activity of three marine animal extracts with reference to phagocytosis. *Indian journal of experimental biology*, 40(12), 1399–1402.
- Potel J, Brock N (1965) The influence of anticarcinogenic substances on immunologic reactions. 2. The influence of N, N-bis- (2-chloreethyl)-N', O-propylenephosphoric acid ester diamide on antibody formation. *Arzneimittelforschung* 15:659–666
- Potel J, Brock N. (1965). The influence of anticarcinogenic substances on immunologic reactions. 2. The influence of N, N-bis- (2-chloreethyl)-N', O-propylenephosphoric acid ester diamide on antibody formation. *Arzneimittelforschung* 15:659–666
- Puggioni, F., Alves-Correia, M., Mohamed, M., Stomeo, N., Mager, R., & Marinoni, M. et al. (2019). Immunostimulants in respiratory diseases: focus on Pidotimod. *Multidisciplinary Respiratory Medicine*, 14(1). doi: 10.1186/s40248-019-0195-2
- Qi, Q., Dong, Z., Sun, Y., Li, S., & Zhao, Z. (2018). Protective Effect of Bergenin against Cyclophosphamide-Induced Immunosuppression by Immunomodulatory Effect and Antioxidation in Balb/c Mice. *Molecules* (Basel, Switzerland), 23(10), 2668. <https://doi.org/10.3390/molecules23102668>
- Rasheed, H.M.F., Rasheed, F., Qureshi, A.W., Jabeen, Q., 2016. Immunostimulant activities of the aqueous methanolic extract of *Leptadenia pyrotechnica*, a plant from Cholistan desert. *Journal of Ethnopharmacology* 186, 244–250. <https://doi.org/10.1016/j.jep.2016.03.039>
- Rosales C. (2018). Neutrophil: A Cell with Many Roles in Inflammation or Several Cell Types?. *Frontiers in physiology*, 9, 113. <https://doi.org/10.3389/fphys.2018.00113>
- Rosales, C., & Uribe-Querol, E. (2013). Antibody - Fc Receptor Interactions in Antimicrobial Functions.
- Rosales, C., & Uribe-Querol, E. (2017). Phagocytosis: A Fundamental Process in Immunity. *BioMed research international*, 2017, 9042851. <https://doi.org/10.1155/2017/9042851>
- Sagala, R., & Murwanti, R. (2020). The Combination of Ethanol Extracts of *Phyllanthus niruri* Linn, *Typhonium flagelliforme* and *Piper crocatum* increase the Macrophage Phagocytosis In Vitro. *Majalah Obat Tradisional*, 25(2), 67. doi: 10.22146/mot.46705
- Saito, H., Matsumoto, K., Denburg, A.E., Crawford, L., Ellis, R., Inman, M.D., et al. (2002). Pathogenesis of murine experimental allergic rhinitis: a study of local and systemic consequences of IL-5 deficiency. *J Immunol* 168, 3017-3023.
- Shah, A., & Juvekar, A. (2010). In vitro and vivo immunostimulatory activity of *Woodfordia fruticosa* flowers on non-specific immunity. *Pharmaceutical Biology*, 48(9), 1066-1072. doi: 10.3109/13880200903490497
- Sharma, P., Kumar, P., Sharma, R., Gupta, G., & Chaudhary, A. (2017). Immunomodulators: Role of medicinal plants in immune system. *National Journal Of Physiology, Pharmacy And Pharmacology*, 7(6), 1. doi: 10.5455/njPPP.2017.7.0203808032017
- Sholikhah, E. (2016). Indonesian medicinal plants as sources of secondary metabolites for pharmaceutical industry. *Journal Of Thee Medical Sciences (Berkala Ilmu Kedokteran)*, 48(04), 226-239. doi: 10.19106/jmedsci004804201606
- Shukla, S., Bajpai, V., & Kim, M. (2012). Plants as potential sources of natural immunomodulators. *Reviews In Environmental Science And Bio/Technology*, 13(1), 17-33. doi: 10.1007/s11157-

- Singh, N., Tailang, M., Mehta, S.C., 2016. A Review on Herbal Plants as Immunomodulators. International Journal of Pharmaceutical Sciences and Research 7, 3602. [https://doi.org/10.13040/IJPSR.0975-8232.7\(9\).3602-10](https://doi.org/10.13040/IJPSR.0975-8232.7(9).3602-10)
- Smith, N., Rise, M., & Christian, S. (2019). A Comparison of the Innate and Adaptive Immune Systems in Cartilaginous Fish, Ray-Finned Fish, and Lobe-Finned Fish. *Frontiers In Immunology*, 10. doi: 10.3389/fimmu.2019.02292
- Srikumar, R., Jeya Parthasarathy, N., & Sheela Devi, R. (2005). Immunomodulatory Activity of Triphala on Neutrophil Functions. *Biological & Pharmaceutical Bulletin*, 28(8), 1398-1403. doi: 10.1248/bpb.28.1398
- Stephens, L., Ellson, C., & Hawkins, P. (2002). Roles of PI3Ks in leukocyte chemotaxis and phagocytosis. *Current opinion in cell biology*, 14(2), 203–213. [https://doi.org/10.1016/s0955-0674\(02\)00311-3](https://doi.org/10.1016/s0955-0674(02)00311-3)
- Stone, K. D., Prussin, C., & Metcalfe, D. D. (2010). IgE, mast cells, basophils, and eosinophils. *The Journal of allergy and clinical immunology*, 125(2 Suppl 2), S73–S80. <https://doi.org/10.1016/j.jaci.2009.11.017>
- Stuart, L. M., & Ezekowitz, R. A. (2005). Phagocytosis: elegant complexity. *Immunity*, 22(5), 539–550. <https://doi.org/10.1016/j.jimmuni.2005.05.002>
- Su, Y., Rolph, M., Cooley, M., & Sewell, W. (2006). Cyclophosphamide augments inflammation by reducing immunosuppression in a mouse model of allergic airway disease. *Journal Of Allergy And Clinical Immunology*, 117(3), 635-641. doi: 10.1016/j.jaci.2005.10.042
- Takahama Y. (2006). Journey through the thymus: stromal guides for T-cell development and selection. *Nature reviews. Immunology*, 6(2), 127–135. <https://doi.org/10.1038/nri1781>
- The Western journal of medicine, 126(1), 14–31.
- Thyagarajan, S. P., Subramanian, S., Thirunalasundari, T., Venkateswaran, P. S., & Blumberg, B. S. (1988). Effect of *Phyllanthus amarus* on chronic carriers of hepatitis B virus. *Lancet (London, England)*, 2(8614), 764–766. [https://doi.org/10.1016/s0140-6736\(88\)92416-6](https://doi.org/10.1016/s0140-6736(88)92416-6)
- Tjandrawinata, Raymond & Nofiarny, Dwi & Maat, Suprapto. (2005). Effects of standardized *Phyllanthus Niruri* extract on changes in immunological parameters: correlation between pre-clinical and clinical studies.. *Medika*. 31. 367-371.
- Tomaki, M., Zhao, L.L., Lundahl, J., Sjostrand, M., Jordana, M., Linden, A., et al. (2000). Eosinophilopoiesis in a murine model of allergic airway eosinophilia: involvement of bone marrow IL-5 and IL-5 receptor alpha. *J Immunol* 165, 4040-4050.
- Tsai-Turton, M., Luong, B., Tan, Y., & Luderer, U. (2007). Cyclophosphamide-Induced Apoptosis in COV434 Human Granulosa Cells Involves Oxidative Stress and Glutathione Depletion. *Toxicological Sciences*, 98(1), 216-230. doi: 10.1093/toxsci/kfm087
- 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>
- Uribe-Querol, E., & Rosales, C. (2020). Phagocytosis: Our Current Understanding of a Universal Biological Process. *Frontiers in immunology*, 11, 1066.
- van Lookeren Campagne, M., Wiesmann, C., & Brown, E. J. (2007). Macrophage complement receptors and pathogen clearance. *Cellular microbiology*, 9(9), 2095–2102. <https://doi.org/10.1111/j.1462-5822.2007.00981.x>

- Wang, D., Li, Q., Qu, Y., Wang, M., Li, L., Liu, Y., & Li, Y. (2018). The investigation of immunomodulatory activities of *Gloeostereum incaratum* polysaccharides in *Gloeostereum incaratum*. *Frontiers in Immunology*, 9, 292. <https://doi.org/10.3389/fimmu.2018.00292>
- 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. <https://doi.org/10.3389/fimmu.2017.00292>
- Wilson, J., & Hunt, T. (2002). Molecular biology of the cell, 4th edition. New York: Garland Science.
- Wing, E. J., & Remington, J. S. (1977). Cell-mediated immunity and its role in resistance to infection.
- Wiseman A. C. (2016). Immunosuppressive Medications. *Clinical journal of the American Society of Nephrology : CJASN*, 11(2), 332–343. <https://doi.org/10.2215/CJN.08570814>
- Yáñez, A., Coetzee, S. G., Olsson, A., Muench, D. E., Berman, B. P., Hazelett, D. J., Salomonis, N., Grimes, H. L., & Goodridge, H. S. (2017). Granulocyte-Monocyte Progenitors and Monocyte-Dendritic Cell Progenitors Independently Produce Functionally Distinct Monocytes. *Immunity*, 47(5), 890–902.e4. <https://doi.org/10.1016/j.jimmuni.2017.10.021>
- Yang, J., Zhang, L., Yu, C., Yang, X. F., & Wang, H. (2014). Monocyte and macrophage differentiation: circulation inflammatory monocyte as biomarker for inflammatory diseases. *Biomarker research*, 2(1), 1. <https://doi.org/10.1186/2050-7771-2-1>
- Yazaki, K., Arimura, G., & Ohnishi, T. (2017). ‘Hidden’ Terpenoids in Plants: Their Biosynthesis, Localization and Ecological Roles. *Plant And Cell Physiology*, 58(10), 1615-1621. doi: 10.1093/pcp/pcx123
- Yona, S., & Gordon, S. (2015). From the Reticuloendothelial to Mononuclear Phagocyte System – The Unaccounted Years. *Frontiers In Immunology*, 6. doi: 10.3389/fimmu.2015.00328
- Yu, Q., Nie, S., Wang, J., Huang, D., Li, W., & Xie, M. (2015). Molecular mechanism underlying chemoprotective effects of *Ganoderma atrum* polysaccharide in cyclophosphamide-induced immunosuppressed mice. *Journal Of Functional Foods*, 15, 52-60. doi: 10.1016/j.jff.2015.03.015
- Zhang, N., & Bevan, M. (2011). CD8+ T Cells: Foot Soldiers of the Immune System. *Immunity*, 35(2), 161-168. doi: 10.1016/j.jimmuni.2011.07.010