



DAFTAR PUSTAKA

- Abidi, K., Belayachi, J., Derras, Y., Khayari, M. El, Dendane, T., Madani, N., Khoudri, I., Zeggwagh, A. A., & Abouqal, R. (2011). Eosinopenia, an early marker of increased mortality in critically ill medical patients. *Intensive Care Medicine*, 37(7), 1136–1142. <https://doi.org/10.1007/s00134-011-2170-z>
- Acharya, K. R., & Ackerman, S. J. (2014). Eosinophil granule proteins: Form and function. *Journal of Biological Chemistry*, 289(25), 17406–17415. <https://doi.org/10.1074/jbc.R113.546218>
- Adrie, C., Lugosi, M., Sonneville, R., Souweine, B., Ruckly, S., Cartier, J. C., Garrouste-Orgeas, M., Schwebel, C., Timsit, J. F., Timsit, J. F., Azoulay, E., Cohen, Y., Garrouste-Orgeas, M., Soufir, L., Zahar, J. R., Adrie, C., Darmon, M., Alberti, C., Clec'h, C., ... Fournier, J. (2017). Persistent lymphopenia is a risk factor for ICU-acquired infections and for death in ICU patients with sustained hypotension at admission. *Annals of Intensive Care*, 7(1). <https://doi.org/10.1186/s13613-017-0242-0>
- Al Duhaileib, Z., Farooqi, M., Piticaru, J., Alhazzani, W., & Nair, P. (2021). The role of eosinophils in sepsis and acute respiratory distress syndrome: a scoping review. *Canadian Journal of Anesthesia*, 68(5), 715–726. <https://doi.org/10.1007/s12630-021-01920-8>
- Andreu-Ballester, J. C., Tormo-Calandín, C., Garcia-Ballesteros, C., Pérez-Griera, J., Amigó, V., Almela-Quilis, A., Del Castillo, J. R., Peñarroja-Otero, C., & Ballester, F. (2013). Association of $\gamma\delta$ T cells with disease severity and mortality in septic patients. *Clinical and Vaccine Immunology*, 20(5), 738–746. <https://doi.org/10.1128/CVI.00752-12>
- Angus, D., & van der Poll, T. (2013). Severe Sepsis and Septic Shock. *New England Journal of Medicine*, 369(21), 840–851. <https://doi.org/10.1056/nejmc1312226>
- Arif, S. K. (2019). Eosinopenia as an indicator for organ dysfunction in sepsis patients. *Critical Care & Shock*, 22(4), 243–248. <http://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=138599472&site=ehost-live>
- AVR, S., & Johnson, S. (2015). Comparison of Different Scoring Systems Used in the Intensive Care Unit. *Journal of Pulmonary & Respiratory Medicine*, 05(04). <https://doi.org/10.4172/2161-105x.1000276>
- Banta, J. E., Joshi, K. P., Beeson, L., & Nguyen, H. B. (2012). Patient and hospital characteristics associated with inpatient severe sepsis mortality in California, 2005–2010. *Critical Care Medicine*, 40(11), 2960–2966. <https://doi.org/10.1097/CCM.0b013e31825bc92f>
- Bass, D. A., Gonwa, T. A., Szejda, P., Cousart, M. S., DeChatelet, L. R., & McCall, C. E. (1980). Eosinopenia of acute infection. Production of eosinopenia by chemotactic factors of acute inflammation. *Journal of Clinical Investigation*, 65(6), 1265–1271. <https://doi.org/10.1172/JCI109789>
- Biron, B. M., Ayala, A., & Lomas-Neira, J. L. (2015). Biomarkers for sepsis: What is and what might be? *Biomarker Insights*, 10, 7–17. <https://doi.org/10.4137/BMI.S29519>



- Bonilla, F. A., & Oettgen, H. C. (2010). Adaptive immunity. *Journal of Allergy and Clinical Immunology*, 125(2 SUPPL. 2), S33–S40. <https://doi.org/10.1016/j.jaci.2009.09.017>
- Boomer, J. S., Shuherk-Shaffer, J., Hotchkiss, R. S., & Green, J. M. (2012). A prospective analysis of lymphocyte phenotype and function over the course of acute sepsis. *Critical Care*, 16(3), R112. <https://doi.org/10.1186/cc11404>
- Boomer, J. S., To, K., Chang, K. C., Takasu, O., Osborne, D. F., Walton, A. H., Bricker, T. L., Jarman, S. D., Kreisel, D., Krupnick, A. S., Srivastava, A., Swanson, P. E., Green, J. M., & Hotchkiss, R. S. (2011). Immunosuppression in patients who die of sepsis and multiple organ failure. *JAMA - Journal of the American Medical Association*, 306(23), 2594–2605. <https://doi.org/10.1001/jama.2011.1829>
- Bouffi, C., Kartashov, A. V., Schollaert, K. L., Chen, X., Bacon, W. C., Weirauch, M. T., Barski, A., & Fulkerson, P. C. (2015). Transcription Factor Repertoire of Homeostatic Eosinophilopoiesis. *The Journal of Immunology*, 195(6), 2683–2695. <https://doi.org/10.4049/jimmunol.1500510>
- Brady, J., Horie, S., & Laffey, J. G. (2020). Role of the adaptive immune response in sepsis. *Intensive Care Medicine Experimental*, 8(S1), 1–19. <https://doi.org/10.1186/s40635-020-00309-z>
- Brinkhoff, A., Zeng, Y., Sieberichs, A., Dolff, S., Shilei, X., Sun, M., Engler, H., Benson, S., Korth, J., Schedlowski, M., Kribben, A., Witzke, O., & Wilde, B. (2019). B-cell dynamics during experimental endotoxemia in humans. *Bioscience Reports*, 39(5), 1–10. <https://doi.org/10.1042/BSR20182347>
- Cai, X. (2011). Sepsis and immune response. *World Journal of Emergency Medicine*, 2(2), 117. <https://doi.org/10.5847/wjem.j.issn.1920-8642.2011.02.007>
- Cao, C., Chai, Y., Shou, S., Wang, J., Huang, Y., & Ma, T. (2018). International Immunopharmacology Toll-like receptor 4 deficiency increases resistance in sepsis-induced immune dysfunction. *International Immunopharmacology*, 54(September 2017), 169–176. <https://doi.org/10.1016/j.intimp.2017.11.006>
- Cao, C., Yu, M., & Chai, Y. (2019). Pathological alteration and therapeutic implications of sepsis-induced immune cell apoptosis. *Cell Death and Disease*, 10(10), 1–14. <https://doi.org/10.1038/s41419-019-2015-1>
- Carrillo, J. L. M., Rodríguez, F. P. C., Coronado, O. G., García, M. A. M., & Cordero, J. F. C. (2017). Physiology and Pathology of Innate Immune Response Against Pathogens. *Physiology and Pathology of Immunology*. <https://doi.org/10.5772/intechopen.70556>
- Cavaillon, J. (2017). Pathogen-associated molecular pattern. *Molecular and Cellular Mechanism to the Clinic*, 17–56.
- Cavaillon, J. M., & Adib-Conquy, M. (2010). Immune status in sepsis: The bug, the site of infection and the severity can make the difference. *Critical Care*, 14(3). <https://doi.org/10.1186/cc9046>
- Ceccato, A., Panagiotarakou, M., Ranzani, O. T., Martin-Fernandez, M., Almansa-Mora, R., Gabarrus, A., Bueno, L., Cilloniz, C., Liapikou, A., Ferrer, M., Bermejo-Martin, J. F., & Torres, A. (2019). Lymphocytopenia as a Predictor of Mortality in Patients with ICU-Acquired Pneumonia. *Journal of Clinical*



- Medicine*, 8(6), 843. <https://doi.org/10.3390/jcm8060843>
- Chelazzi, C., Villa, G., Mancinelli, P., De Gaudio, A. R., & Adembri, C. (2015). Glycocalyx and sepsis-induced alterations in vascular permeability. *Critical Care*, 19(1), 1–7. <https://doi.org/10.1186/s13054-015-0741-z>
- Cheng, M., & Hu, S. (2017). Lung-resident $\gamma\delta$ T cells and their roles in lung diseases. *Immunology*, 151(4), 375–384. <https://doi.org/10.1111/imm.12764>
- Chiche, L., Forel, J. M., Thomas, G., Farnarier, C., Cognet, C., Guervilly, C., Zandotti, C., Vély, F., Roch, A., Vivier, E., & Papazian, L. (2012). Interferon- γ production by natural killer cells and cytomegalovirus in critically ill patients. *Critical Care Medicine*, 40(12), 3162–3169. <https://doi.org/10.1097/CCM.0b013e318260c90e>
- Chu, A. J. (2011). Tissue Factor, Blood Coagulation, and Beyond: An Overview. *International Journal of Inflammation*, 2011, 1–30. <https://doi.org/10.4061/2011/367284>
- Chung, K. P., Chang, H. T., Lo, S. C., Chang, L. Y., Lin, S. Y., Cheng, A., Huang, Y. T., Chen, C. C., Lee, M. R., Chen, Y. J., Hou, H. H., Hsu, C. L., Jerng, J. S., Ho, C. C., Huang, M. T., Yu, C. J., & Yang, P. C. (2015). Severe Lymphopenia Is Associated with Elevated Plasma Interleukin-15 Levels and Increased Mortality during Severe Sepsis. *Shock*, 43(6), 569–575. <https://doi.org/10.1097/SHK.0000000000000347>
- Churpek, M. M., Zadravec, F. J., Winslow, C., Howell, M. D., & Edelson, D. P. (2015). Incidence and prognostic value of the systemic inflammatory response syndrome and organ dysfunctions in ward patients. *American Journal of Respiratory and Critical Care Medicine*, 192(8), 958–964. <https://doi.org/10.1164/rccm.201502-0275OC>
- Cohen, J., Vincent, J. L., Adhikari, N. K. J., Machado, F. R., Angus, D. C., Calandra, T., Jaton, K., Giulieri, S., Delaloye, J., Opal, S., Tracey, K., van der Poll, T., & Pelfrene, E. (2015). Sepsis: A roadmap for future research. *The Lancet Infectious Diseases*, 15(5), 581–614. [https://doi.org/10.1016/S1473-3099\(15\)70112-X](https://doi.org/10.1016/S1473-3099(15)70112-X)
- Cuenca, A. G., Delano, M. J., Kelly-Scumpia, K. M., Moreno, C., Scumpia, P. O., LaFace, D. M., Heyworth, P. G., Efron, P. A., & Moldawer, L. L. (2011). A paradoxical role for myeloid-derived suppressor cells in sepsis and trauma. *Molecular Medicine*, 17(3–4), 281–292. <https://doi.org/10.2119/molmed.2010.00178>
- Dasgupta, P., & Keegan, A. D. (2012). Contribution of alternatively activated macrophages to allergic lung inflammation: A tale of mice and men. *Journal of Innate Immunity*, 4(5–6), 478–488. <https://doi.org/10.1159/000336025>
- Davido, B., Makhlofi, S., Matt, M., Calin, R., Senard, O., Perronne, C., Dinh, A., & Salomon, J. (2017). Changes in eosinophil count during bacterial infection: revisiting an old marker to assess the efficacy of antimicrobial therapy. *International Journal of Infectious Diseases*, 61, 62–66. <https://doi.org/10.1016/j.ijid.2017.06.005>
- de Jager, C. P. C., van Wijk, P. T. L., Mathoera, R. B., de Jongh-Leuvenink, J., van der Poll, T., & Wever, P. C. (2010). Lymphocytopenia and neutrophil-lymphocyte count ratio predict bacteremia better than conventional infection



- markers in an emergency care unit. *Critical Care*, 14(5). <https://doi.org/10.1186/cc9309>
- de Pablo, R., Monserrat, J., Prieto, A., & Alvarez-Mon, M. (2014). Role of Circulating Lymphocytes in Patients with Sepsis. *BioMed Research International*, 2014. <https://doi.org/10.1155/2014/671087>
- Delano, M. J., Kelly-scumpia, K. M., Thayer, T. C., Winfield, R. D., Scumpia, O., Cuenca, A. G., Harrington, P. B., Malley, K. A. O., Gabrilovich, S., Mathews, C. E., Laface, D., Heyworth, P. G., Ramphal, R., Strieter, R. M., Moldawer, L. L., & Efron, P. A. (2011). *Neutrophil Mobilization from the Bone Marrow During Polymicrobial Sepsis Is Dependent On CXCL12 Signaling*. 187(2), 911–918. <https://doi.org/10.4049/jimmunol.1100588.Neutrophil>
- Delano, M. J., Thayer, T., Gabrilovich, S., Kelly-scumpia, K. M., Winfield, D., Scumpia, P. O., Cuenca, A. G., Warner, E., Wallet, S. M., Wallet, M. A., Malley, K. A. O., Ramphal, R., Clare-salzer, M., Philip, A., Mathews, C. E., & Moldawer, L. L. (2013). *Sepsis Induces Early Alterations in Innate Immunity*. 186(1), 195–202. <https://doi.org/10.4049/jimmunol.1002104.SEPSIS>
- Delano, M. J., & Ward, P. A. (2016a). *Sepsis-induced immune dysfunction : can immune therapies reduce mortality?* 126(1), 23–31. <https://doi.org/10.1172/JCI82224.Sepsis>
- Delano, M. J., & Ward, P. A. (2016b). The Immune System's Role in Sepsis Progression, Resolution and Long-Term Outcome. *Immunology*, 274(1), 330–353. <https://doi.org/10.1111/imr.12499.The>
- Denk, S., Taylor, R. P., Wiegner, R., Cook, E. M., Lindorfer, M. A., Pfeiffer, K., Paschke, S., Eiseler, T., Weiss, M., Barth, E., Lambris, J. D., Kalbitz, M., Martin, T., Barth, H., Messerer, D. A. C., Gebhard, F., & Huber-Lang, M. S. (2017). Complement C5a-Induced Changes in Neutrophil Morphology During Inflammation. *Scandinavian Journal of Immunology*, 86(3), 143–155. <https://doi.org/10.1111/sji.12580>
- Dhooria, S., Sehgal, I. S., & Agarwal, R. (2016). The quest for the optimal blood pressure in septic shock. *Journal of Thoracic Disease*, 8(9), E1019–E1022. <https://doi.org/10.21037/jtd.2016.08.27>
- Drewry, A., Samra, N., Skrupky, L., Fuller, B., Compton, S., & Hotchkiss, R. (2014). Persistent lymphopenia after diagnosis of sepsis predicts mortality. *Shock*, 42(5), 383–391. <https://doi.org/10.1097/SHK.0000000000000234>
- Drifte, G., Dunn-Siegrist, I., Tissières, P., & Pugin, J. (2013). Innate immune functions of immature neutrophils in patients with sepsis and severe systemic inflammatory response syndrome. *Critical Care Medicine*, 41(3), 820–832. <https://doi.org/10.1097/CCM.0b013e318274647d>
- Drumheller, B. C., Agarwal, A., Mikkelsen, M. E., Sante, S. C., Weber, A. L., Goyal, M., & Gaieski, D. F. (2016). Risk factors for mortality despite early protocolized resuscitation for severe sepsis and septic shock in the emergency department. *Journal of Critical Care*, 31(1), 13–20. <https://doi.org/10.1016/j.jcrc.2015.10.015>
- Duffin, R., Leitch, A. E., Fox, S., Haslett, C., & Rossi, A. G. (2010). Targeting granulocyte apoptosis: Mechanisms, models, and therapies. *Immunological*



- Reviews*, 236(1), 28–40. <https://doi.org/10.1111/j.1600-065X.2010.00922.x>
- Dugani, S., Veillard, J., & Kissoon, N. (2017). Reducing the global burden of sepsis. *Cmaj*, 189(1), E2–E3. <https://doi.org/10.1503/cmaj.160798>
- Eberl, G. (2016). Immunity by equilibrium. *Nature Reviews Immunology*, 16(8), 524–532. <https://doi.org/10.1038/nri.2016.75>
- Escobar-Valdivia, E. J., González-Aguirre, J. E., Carrillo-Cisneros, E. R., Guerra-Leza, K. C., & Mercado-Longoría, R. (2015). Eosinophil count at intensive care unit admission was not predictor of hospital mortality: Results of a case control study. *Journal of Intensive Care*, 3(1), 4–9. <https://doi.org/10.1186/s40560-015-0093-4>
- Esposito, S., De Simone, G., Boccia, G., De Caro, F., & Pagliano, P. (2017). Sepsis and septic shock: New definitions, new diagnostic and therapeutic approaches. *Journal of Global Antimicrobial Resistance*, 10, 204–212. <https://doi.org/10.1016/j.jgar.2017.06.013>
- Fleischmann, C., Scherag, A., Adhikari, N. K., & Hartog, C. S. (2016). Assessment of Global Incidence and Mortality of hospital-treated sepsis – Current estimates and limitations. In *American Journal of Respiratory and Critical Care Medicine* (Vol. 193).
- Francois, B., Jeannet, R., Daix, T., Walton, A. H., Shotwell, M. S., Unsinger, J., Monneret, G., Rimmelé, T., Blood, T., Morre, M., Gregoire, A., Mayo, G. A., Blood, J., Durum, S. K., Sherwood, E. R., & Hotchkiss, R. S. (2018). Interleukin-7 restores lymphocytes in septic shock: the IRIS-7 randomized clinical trial. *JCI Insight*, 3(5). <https://doi.org/10.1172/jci.insight.98960>
- Frydrych, L. M., Fattahi, F., He, K., Ward, P. A., & Delano, M. J. (2017). Diabetes and sepsis: Risk, recurrence, and ruination. *Frontiers in Endocrinology*, 8(OCT). <https://doi.org/10.3389/fendo.2017.00271>
- Gaieski, D. F., Edwards, J. M., Kallan, M. J., & Carr, B. G. (2013). Benchmarking the incidence and mortality of severe sepsis in the united states. *Critical Care Medicine*, 41(5), 1167–1174.
- Gatta, A., Verardo, A., & Bolognesi, M. (2012). Hypoalbuminemia. *Internal and Emergency Medicine*, 7(SUPPL. 3), 193–199. <https://doi.org/10.1007/s11739-012-0802-0>
- Ginde, A. A., Moss, M., Shapiro, N. I., & Schwartz, R. S. (2013). Impact of older age and nursing home residence on clinical outcomes of US emergency department visits for severe sepsis. *Journal of Critical Care*, 28(5), 606–611. <https://doi.org/10.1016/j.jcrc.2013.03.018>
- Goodwin, A. J., Rice, D. A., Simpson, K. N., & Ford, D. W. (2015). Frequency, cost, and risk factors of readmissions among severe sepsis survivors. *Critical Care Medicine*, 43(4), 738–746. <https://doi.org/10.1097/CCM.0000000000000859>
- Gouel-Chéron, A., Venet, F., Allaouchiche, B., & Monneret, G. (2012). CD4+T-lymphocyte alterations in trauma patients. *Critical Care*, 16(3), 69437. <https://doi.org/10.1186/cc11376>
- Grailer, J. J., Kalbitz, M., Zetoune, F. S., & Ward, P. A. (2014). Persistent neutrophil dysfunction and suppression of acute lung injury in mice following cecal ligation and puncture sepsis. *Journal of Innate Immunity*, 6(5), 695–705.

<https://doi.org/10.1159/000362554>

- Grimaldi, D., Llitjos, J. F., & Pène, F. (2014). Post-infectious immune suppression: A new paradigm of severe infections. *Medecine et Maladies Infectieuses*, 44(10), 455–463. <https://doi.org/10.1016/j.medmal.2014.07.017>
- Guignant, C., Lepape, A., Huang, X., Kherouf, H., Denis, L., Poitevin, F., Malcus, C., Chéron, A., Allaouchiche, B., Gueyffier, F., Ayala, A., Monneret, G., & Venet, F. (2011). Programmed death-1 levels correlate with increased mortality, nosocomial infection and immune dysfunctions in septic shock patients. *Critical Care*, 15(2), 1–11. <https://doi.org/10.1186/cc10112>
- Gül, F., Arslantaş, M. K., Cinel, İ., & Kumar, A. (2017). Changing definitions of sepsis. *Turk Anesteziyoloji ve Reanimasyon Derneği Dergisi*, 45(3), 129–138. <https://doi.org/10.5152/TJAR.2017.93753>
- Gyawali, B., Ramakrishna, K., & Dhamoon, A. S. (2019). Sepsis: The evolution in definition, pathophysiology, and management. *SAGE Open Medicine*, 7, 205031211983504. <https://doi.org/10.1177/2050312119835043>
- Hajishengallis, G., Reis, E. S., Mastellos, D. C., Ricklin, D., & Lambris, J. D. (2017). Novel Mechanisms and Functions of Complement. *Nat Immunol*, 18(12), 1288–1298. <https://doi.org/10.1097/CCM.0000000000002427>
- Hashiba, M., Huq, A., Tomino, A., Hirakawa, A., Hattori, T., Miyabe, H., Tsuda, M., & Takeyama, N. (2015). Neutrophil extracellular traps in patients with sepsis. *Journal of Surgical Research*, 194(1), 248–254. <https://doi.org/10.1016/j.jss.2014.09.033>
- Hattori, Y., Takano, K. I., Teramae, H., Yamamoto, S., Yokoo, H., & Matsuda, N. (2010). Insights into sepsis therapeutic design based on the apoptotic death pathway. *Journal of Pharmacological Sciences*, 114(4), 354–365. <https://doi.org/10.1254/jphs.10R04CR>
- Ho, K. M., & Towler, S. C. (2009). A comparison of eosinopenia and C-reactive protein as a marker of bloodstream infections in critically ill patients: A case control study. *Anaesthesia and Intensive Care*, 37(3), 450–456. <https://doi.org/10.1177/0310057x0903700319>
- Hogan, S. P., Rosenberg, H. F., Moqbel, R., Phipps, S., Foster, P. S., Lacy, P., Kay, A. B., & Rothenberg, M. E. (2008). Eosinophils: Biological properties and role in health and disease. In *Clinical and Experimental Allergy* (Vol. 38, Issue 5). <https://doi.org/10.1111/j.1365-2222.2008.02958.x>
- Hogan, S. P., Waddell, A., & Fulkerson, P. C. (2013). Eosinophils in infection and intestinal immunity. *Current Opinion in Gastroenterology*, 29(1), 7–14. <https://doi.org/10.1097/MOG.0b013e32835ab29a>
- Hota, P. K., & Reddy, B. G. (2017). Role of eosinophil count and neutrophil lymphocyte count ratio as prognostic markers in patients with sepsis. *International Surgery Journal*, 4(7), 2243. <https://doi.org/10.18203/2349-2902.isj20172774>
- Hotchkiss, R. S., & Crouser, E. (2015). Imaging apoptosis in sepsis - A technology we would die for! *Critical Care Medicine*, 43(11), 2506–2508. <https://doi.org/10.1097/CCM.0000000000001289>
- Hotchkiss, R. S., Moldawer, L. L., Opal, S. M., Reinhart, K., Turnbull, I. R., & Vincent, J.-L. (2016). Sepsis and septic shock. *Nature Reviews*, 2(16045).



<https://doi.org/10.1038/nrdp.2016.45.Sepsis>

- Hotchkiss, R. S., Monneret, G., & Payen, D. (2013). Sepsis-induced immunosuppression: from cellular dysfunctions to immunotherapy. *Nat Immunol*, 13(12), 862–874. <https://doi.org/10.1038/nri3552>
- Huber-Lang, M., Lambris, J. D., & Ward, P. A. (2018). Innate immune responses to trauma review-article. *Nature Immunology*, 19(4), 327–341. <https://doi.org/10.1038/s41590-018-0064-8>
- Hussain, J., Popuri, S. Sen, Prabhu, M. M., & Shetty, M. (2021). *Eosinopenia as a Diagnostic and Prognostic Marker in Sepsis*. 8(2), 17–21.
- Ilmarinen, P., Moilanen, E., & Kankaanranta, H. (2014). Regulation of Spontaneous Eosinophil Apoptosis—A Neglected Area of Importance. *Journal of Cell Death*, 7, 57–68. <https://doi.org/10.4137/JCD.S13588>. RECEIVED
- Inoue, S., Suzuki-Utsunomiya, K., Okada, Y., Taira, T., Iida, Y., Miura, N., Tsuji, T., Yamagiwa, T., Morita, S., Chiba, T., Sato, T., & Inokuchi, S. (2013). Reduction of immunocompetent T cells followed by prolonged lymphopenia in severe sepsis in the elderly. *Critical Care Medicine*, 41(3), 810–819. <https://doi.org/10.1097/CCM.0b013e318274645f>
- Iwashyna, T. J., Ely, E. W., Smith, D. M., & Langa, K. M. (2010). Long-term cognitive impairment and functional disability among survivors of severe sepsis. *JAMA - Journal of the American Medical Association*, 304(16), 1787–1794. <https://doi.org/10.1001/jama.2010.1553>
- Jiang, J., Du, H., Su, Y., Li, X., Zhang, J., Chen, M., Ren, G., He, F., & Niu, B. (2019). Nonviral infection-related lymphocytopenia for the prediction of adult sepsis and its persistence indicates a higher mortality. *Medicine*, 98(29), e16535. <https://doi.org/10.1097/MD.00000000000016535>
- Johnston, J. A., Bacon, C. M., Finbloom, D. S., Rees, R. C., Kaplan, D., Shibuya, K., Ortaldo, J. R., Gupta, S., Chen, Y. Q., Giri, J. D., & O'Shea, J. J. (1995). Tyrosine phosphorylation and activation of STAT5, STAT3, and Janus kinases by interleukins 2 and 15. *Proceedings of the National Academy of Sciences of the United States of America*, 92(19), 8705–8709. <https://doi.org/10.1073/pnas.92.19.8705>
- Joy, A. P., Murali, A. B., Joshi, M. A., & Parambil, J. C. (2020). Absolute eosinophil count as a diagnostic and prognostic marker compared to C-reactive protein and Procalcitonin in patients with sepsis. *Clinical Epidemiology and Global Health*, 8(2), 632–636. <https://doi.org/10.1016/j.cegh.2019.12.017>
- Jung, Y., & Rothenberg, M. E. (2014). Roles and Regulation of Gastrointestinal Eosinophils in Immunity and Disease. *The Journal of Immunology*, 193(3), 999–1005. <https://doi.org/10.4049/jimmunol.1400413>
- Kaukonen, K.-M., Bailey, M., Pilcher, D., Cooper, D. J., & Bellomo, R. (2015). Systemic Inflammatory Response Syndrome Criteria in Defining Severe Sepsis. *New England Journal of Medicine*, 372(17), 1629–1638. <https://doi.org/10.1056/nejmoa1415236>
- Kawai, T., & Akira, S. (2010). The role of pattern-recognition receptors in innate immunity: Update on toll-like receptors. *Nature Immunology*, 11(5), 373–384.



<https://doi.org/10.1038/ni.1863>

- Kendall, H., Abreu, E., & Cheng, A. L. (2019). Serum Albumin Trend Is a Predictor of Mortality in ICU Patients With Sepsis. *Biological Research for Nursing*, 21(3), 237–244. <https://doi.org/10.1177/1099800419827600>
- Khouri, H., Astua, A., Dombrowski, W., Ahmad, F., Homel, P., Shapiro, J., Singh, J., Nallamothu, R., Mahbub, H., Eden, E., & Delfiner, J. (2011). Changes in health-related quality of life and factors predicting long-term outcomes in older adults admitted to intensive care units. *Critical Care Medicine*, 39(4), 731–737. <https://doi.org/10.1097/CCM.0b013e318208edf8>
- Kim, Y. H., Park, H. Bin, Kim, M. J., Kim, H. S., Lee, H. S., Han, Y. K., Kim, K. W., Sohn, M. H., & Kim, K. E. (2013). Prognostic usefulness of eosinopenia in the pediatric intensive care unit. *Journal of Korean Medical Science*, 28(1), 114–119. <https://doi.org/10.3346/jkms.2013.28.1.114>
- Koenderman, L., Buurman, W., & Daha, M. R. (2014). The innate immune response. *Immunology Letters*, 162(2), 95–102. <https://doi.org/10.1016/j.imlet.2014.10.010>
- Kovach, M. A., & Standiford, T. J. (2012). The function of neutrophils in sepsis. *Current Opinion in Infectious Diseases*, 25(3), 321–327. <https://doi.org/10.1097/QCO.0b013e3283528c9b>
- Lafrenie, R. M. (2011). The innate immune system. *Molecular Aspects of Infectious Diseases*, 63–88. <https://doi.org/10.1093/med/9780199204854.003.050101>
- Lambden, S., Laterre, P. F., Levy, M. M., & Francois, B. (2019). The SOFA score - Development, utility and challenges of accurate assessment in clinical trials. *Critical Care*, 23(1), 1–9. <https://doi.org/10.1186/s13054-019-2663-7>
- László, I., Trásy, D., Molnár, Z., & Fazakas, J. (2015). Sepsis: From Pathophysiology to Individualized Patient Care. *Journal of Immunology Research*, 2015. <https://doi.org/10.1155/2015/510436>
- Lavoignet, C. E., Le Borgne, P., Chabrier, S., Bidoire, J., Slimani, H., Chevrolet-Lavoignet, J., Lefebvre, F., Jebri, R., Sengler, L., & Bilbault, P. (2019). White blood cell count and eosinopenia as valuable tools for the diagnosis of bacterial infections in the ED. *European Journal of Clinical Microbiology and Infectious Diseases*, 38(8), 1523–1532. <https://doi.org/10.1007/s10096-019-03583-2>
- Lerman, Y. V., Lim, K., Hyun, Y. M., Falkner, K. L., Yang, H., Pietropaoli, A. P., Sonnenberg, A., Sarangi, P. P., & Kim, M. (2014). Sepsis lethality via exacerbated tissue infiltration and TLR-induced cytokine production by neutrophils is integrin $\alpha 3\beta 1$ -dependent. *Blood*, 124(24), 3515–3523. <https://doi.org/10.1182/blood-2014-01-552943>
- Levi, M., & Poll, T. Van Der. (2011). Coagulation in Patients with Severe Sepsis. *International Journal of Cardiology*, 148(3), 276–279. <https://doi.org/10.1055/s-0034-1398376>
- Levi, M., & van der Poll, T. (2017). Coagulation and sepsis. *Thrombosis Research*, 149, 38–44. <https://doi.org/10.1016/j.thromres.2016.11.007>
- Levy, M. M., Fink, M. P., Marshall, J. C., Abraham, E., Angus, D., Cook, D., Cohen, J., Opal, S. M., Vincent, J. L., & Ramsay, G. (2003). 2001 SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definitions Conference.



- Critical Care Medicine*, 31(4), 1250–1256.
<https://doi.org/10.1097/01.CCM.0000050454.01978.3B>
- Li, L., & Bonventre, J. V. (2016). Endothelial glycocalyx: Not just a sugar coat. *American Journal of Respiratory and Critical Care Medicine*, 194(4), 390–393. <https://doi.org/10.1164/rccm.201603-0624ED>
- Lichtenstern, C., Brenner, T., Bardenheuer, H. J., & Weigand, M. A. (2012). Predictors of survival in sepsis: What is the best inflammatory marker to measure? *Current Opinion in Infectious Diseases*, 25(3), 328–336. <https://doi.org/10.1097/QCO.0b013e3283522038>
- Linch, S. N., Danielson, E. T., Kelly, A. M., Tamakawa, R. A., Lee, J. J., & Gold, J. A. (2012). Interleukin 5 is protective during sepsis in an eosinophil-independent manner. *American Journal of Respiratory and Critical Care Medicine*, 186(3), 246–254. <https://doi.org/10.1164/rccm.201201-0134OC>
- Liu, X., Shen, Y., Wang, H., Ge, Q., Fei, A., & Pan, S. (2016). Prognostic Significance of Neutrophil-to-Lymphocyte Ratio in Patients with Sepsis: A Prospective Observational Study. *Mediators of Inflammation*, 2016. <https://doi.org/10.1155/2016/8191254>
- Liu, Y., Zheng, J., Zhang, D., & Jing, L. (2019). Neutrophil-lymphocyte ratio and plasma lactate predict 28-day mortality in patients with sepsis. *Journal of Clinical Laboratory Analysis*, 33(7), 1–6. <https://doi.org/10.1002/jcla.22942>
- Lu, T. X., Lim, E.-J., Besse, J. A., Itsckovich, S., Plassard, A. J., Fulkerson, P. C., Aronow, B. J., & Rothenberg, M. E. (2013). MiR-223 deficiency increases eosinophil progenitor proliferation. *The Journal of Immunology*, 190(4), 1576–1582. <https://doi.org/10.4049/jimmunol.1202897.MiR-223>
- Luan, Y. Y., Yao, Y. M., Xiao, X. Z., & Sheng, Z. Y. (2015). Insights into the apoptotic death of immune cells in sepsis. *Journal of Interferon and Cytokine Research*, 35(1), 17–22. <https://doi.org/10.1089/jir.2014.0069>
- Machado, F. R., De Assunção, M. S. C., Cavalcanti, A. B., Japiassú, A. M., De Azevedo, L. C. P., & Oliveira, M. C. (2016). Getting a consensus: Advantages and disadvantages of Sepsis 3 in the context of middle-income settings. *Revista Brasileira de Terapia Intensiva*, 28(4), 361–365. <https://doi.org/10.5935/0103-507X.20160068>
- Mahmoud, O., Chen, B., Chakraborti, A., & Salonia, J. (2020). *Eosinopenia as a Predictor of Mortality in the Intensive Care Unit: A Retrospective Analysis*. A6321–A6321. https://doi.org/10.1164/ajrcm-conference.2020.201.1_meetingabstracts.a6321
- Mandrekar, J. N. (2010). Receiver operating characteristic curve in diagnostic test assessment. *Journal of Thoracic Oncology*, 5(9), 1315–1316. <https://doi.org/10.1097/JTO.0b013e3181ec173d>
- Mann, E. A., Baun, M. M., Meininger, J. C., & Wade, C. E. (2012). Comparison of mortality associated with sepsis in the Burn, trauma, and general intensive care unit patient: A systematic review of the literature. *Shock*, 37(1), 4–16. <https://doi.org/10.1097/SHK.0b013e318237d6bf>
- Mansur, A., Mulwande, E., Steinau, M., Bergmann, I., Frederik Popov, A., Ghadimi, M., Beissbarth, T., Bauer, M., & Hinz, J. (2015). Chronic kidney disease is associated with a higher 90-day mortality than other chronic medical



- conditions in patients with sepsis. *Scientific Reports*, 5(April), 1–8. <https://doi.org/10.1038/srep10539>
- Marik, P. E., & Taeb, A. M. (2017). SIRS, qSOFA and new sepsis definition. *Journal of Thoracic Disease*, 9(4), 943–945. <https://doi.org/10.21037/jtd.2017.03.125>
- Marshall, J. S., Warrington, R., Watson, W., & Kim, H. L. (2018). An introduction to immunology and immunopathology. *Allergy, Asthma and Clinical Immunology*, 14(s2), 1–10. <https://doi.org/10.1186/s13223-018-0278-1>
- Martin-Lloeches, I., Guia, M. C., Valleccoccia, M. S., Suarez, D., Ibarz, M., Irazabal, M., Ferrer, R., & Artigas, A. (2019). Risk factors for mortality in elderly and very elderly critically ill patients with sepsis: a prospective, observational, multicenter cohort study. *Annals of Intensive Care*, 9(1). <https://doi.org/10.1186/s13613-019-0495-x>
- Mazzone, A., Dentali, F., La Regina, M., Foglia, E., Gambacorta, M., Garagiola, E., Bonardi, G., Clerici, P., Concia, E., Colombo, F., & Campanini, M. (2016). Clinical features, short-term mortality, and prognostic risk factors of septic patients admitted to internal medicine units results of an italian multicenter prospective study. *Medicine (United States)*, 95(4), 1–5. <https://doi.org/10.1097/MD.0000000000002124>
- Merino, C. A., Martínez, F. T., Cardemil, F., & Rodríguez, J. R. (2012). Absolute eosinophils count as a marker of mortality in patients with severe sepsis and septic shock in an intensive care unit. *Journal of Critical Care*, 27(4), 394–399. <https://doi.org/10.1016/j.jcrc.2011.10.010>
- Mira, J. C. (2017). Sepsis Pathophysiology, Chronic Critical Illness and PICS. *Crit Care Med*, 45(2), 253–262. <https://doi.org/10.1097/CCM.0000000000002074>
- Mollnes, T. E., & Huber-Lang, M. (2020). Complement in sepsis—when science meets clinics. *FEBS Letters*, 594(16), 2621–2632. <https://doi.org/10.1002/1873-3468.13881>
- Monserrat, J., de Pablo, R., Diaz-Martín, D., Rodríguez-Zapata, M., de la Hera, A., Prieto, A., & Alvarez-Mon, M. (2013). Early alterations of B cells in patients with septic shock. *Critical Care*, 17(3), R105. <https://doi.org/10.1186/cc12750>
- Mustafić, S., Brkić, S., Prnjavorac, B., Sinanović, A., Porobić-Jahić, H., & Salkić, S. (2018). Diagnostic and prognostic value of procalcitonin in patients with sepsis. *Medicinski Glasnik*, 15(2), 93–100. <https://doi.org/10.17392/963-18>
- Nedeva, C., Menassa, J., & Puthalakath, H. (2019). Sepsis: Inflammation is a necessary evil. *Frontiers in Cell and Developmental Biology*, 7(JUN), 1–12. <https://doi.org/10.3389/fcell.2019.00108>
- Newton, K., & Dixit, V. M. (2012). Signaling in innate immunity and inflammation. *Cold Spring Harbor Perspectives in Biology*, 4(3). <https://doi.org/10.1101/cshperspect.a006049>
- Novosad, S. A., Sapiano, M. R. P., Grigg, C., Lake, J., Robyn, M., Dumyati, G., Felsen, C., Blog, D., Dufort, E., Zansky, S., Wiedeman, K., Avery, L., Dantes, R. B., Jernigan, J. A., Magill, S. S., Fiore, A., & Epstein, L. (2016). Vital Signs: Epidemiology of Sepsis: Prevalence of Health Care Factors and Opportunities for Prevention. *MMWR. Morbidity and Mortality Weekly Report*, 65(33), 864–869. <https://doi.org/10.15585/mmwr.mm6533e1>



- Opal, S. M., & van der Poll, T. (2015). Endothelial barrier dysfunction in septic shock. *Journal of Internal Medicine*, 277(3), 277–293. <https://doi.org/10.1111/joim.12331>
- Otto, G. P., Sosdorf, M., Claus, R. A., Rödel, J., Menge, K., Reinhart, K., Bauer, M., & Riedemann, N. C. (2011). The late phase of sepsis is characterized by an increased microbiological burden and death rate. *Critical Care*, 15(4), R183. <https://doi.org/10.1186/cc10332>
- Park, Y. M., & Bochner, B. S. (2010). Eosinophil survival and apoptosis in health and disease. *Allergy, Asthma and Immunology Research*, 2(2), 87–101. <https://doi.org/10.4168/aaair.2010.2.2.87>
- Ramirez, G. A., Yacoub, M. R., Ripa, M., Mannina, D., Cariddi, A., Saporiti, N., Ciceri, F., Castagna, A., Colombo, G., & Dagna, L. (2018). Eosinophils from Physiology to Disease: A Comprehensive Review. *BioMed Research International*, 2018(Figure 1). <https://doi.org/10.1155/2018/9095275>
- Roeker, L. E., Horkan, C. M., Gibbons, F. K., & Christopher, K. B. (2016). Eosinopenia in ICU survivors and post-hospital outcomes. *Intensive Care Med Exp*. [https://doi.org/10.1016/S0140-6736\(19\)32989-7](https://doi.org/10.1016/S0140-6736(19)32989-7)
- Rosenberg, H. F., Dyer, K. D., & Foster, P. S. (2013). Eosinophils: Changing perspectives in health and disease. *Nature Reviews Immunology*, 13(1), 9–22. <https://doi.org/10.1038/nri3341>
- Rowe, T. A., & McKoy, J. M. (2017). Sepsis in Older Adults. *Infectious Disease Clinics of North America*, 31(4), 731–742. <https://doi.org/10.1016/j.idc.2017.07.010>
- Salomão, R., Ferreira, B. L., Salomão, M. C., Santos, S. S., Azevedo, L. C. P., & Brunialti, M. K. C. (2019). Sepsis: Evolving concepts and challenges. *Brazilian Journal of Medical and Biological Research*, 52(4), 1–14. <https://doi.org/10.1590/1414-431x20198595>
- Sartelli, M., Kluger, Y., Ansaloni, L., Hardcastle, T. C., Rello, J., Watkins, R. R., Bassetti, M., Giamarelou, E., Coccolini, F., Abu-Zidan, F. M., Adesunkanmi, A. K., Augustin, G., Baiocchi, G. L., Bala, M., Baraket, O., Beltran, M. A., Jusoh, A. C., Demet rashvili, Z., De Simone, B., ... Catena, F. (2018). Raising concerns about the Sepsis-3 definitions. *World Journal of Emergency Surgery*, 13(1), 1–9. <https://doi.org/10.1186/s13017-018-0165-6>
- Schrijver, I. T., Théroude, C., & Roger, T. (2019). Myeloid derived suppressor cells sepsis. *Frontiers in Immunology*, 10(FEB), 1–10. <https://doi.org/10.3389/fimmu.2019.00327>
- Schulte, W., Bernhagen, J., & Bucala, R. (2013). Cytokines in sepsis: Potent immunoregulators and potential therapeutic targets - An updated view. *Mediators of Inflammation*, 2013. <https://doi.org/10.1155/2013/165974>
- Semeraro, N., Ammollo, C. T., Semeraro, F., & Colucci, M. (2012). Sepsis, thrombosis and organ dysfunction. *Thrombosis Research*, 129(3), 290–295. <https://doi.org/10.1016/j.thromres.2011.10.013>
- Seymour, C. W., Liu, V. X., Iwashyna, T. J., Brunkhorst, F. M., Rea, T. D., Scherag, A., Rubenfeld, G., Kahn, J. M., Shankar-Hari, M., Singer, M., Deutschman, C. S., Escobar, G. J., & Angus, D. C. (2016). Assessment of clinical criteria for sepsis for the third international consensus definitions for sepsis and septic



- shock (sepsis-3). *JAMA - Journal of the American Medical Association*, 315(8), 762–774. <https://doi.org/10.1001/jama.2016.0288>
- Shaaban, H., Daniel, S., Sison, R., Slim, J., & Perez, G. (2010). Eosinopenia: Is it a good marker of sepsis in comparison to procalcitonin and C-reactive protein levels for patients admitted to a critical care unit in an urban hospital? *Journal of Critical Care*, 25(4), 570–575. <https://doi.org/10.1016/j.jcrc.2010.03.002>
- Shankar-Hari, M., Fear, D., Lavender, P., Mare, T., Beale, R., Swanson, C., Singer, M., & Spencer, J. (2017). Activation-Associated accelerated apoptosis of memory B cells in critically III patients with sepsis. *Critical Care Medicine*, 45(5), 875–882. <https://doi.org/10.1097/CCM.0000000000002380>
- Shankar-Hari, M., Phillips, G. S., Levy, M. L., Seymour, C. W., Liu, V. X., Deutschman, C. S., Angus, D. C., Rubenfeld, G. D., & Singer, M. (2016). Developing a newdefinition and assessing newclinical criteria for Septic shock: For the third international consensus definitions for sepsis and septic shock (sepsis-3). *JAMA - Journal of the American Medical Association*, 315(8), 775–787. <https://doi.org/10.1001/jama.2016.0289>
- Singer, M., Deutschman, C. S., Seymour, C., Shankar-Hari, M., Annane, D., Bauer, M., Bellomo, R., Bernard, G. R., Chiche, J. D., Coopersmith, C. M., Hotchkiss, R. S., Levy, M. M., Marshall, J. C., Martin, G. S., Opal, S. M., Rubenfeld, G. D., Poll, T. Der, Vincent, J. L., & Angus, D. C. (2016). The third international consensus definitions for sepsis and septic shock (sepsis-3). *JAMA - Journal of the American Medical Association*, 315(8), 801–810. <https://doi.org/10.1001/jama.2016.0287>
- Singh, A., Mohan, A., Dey, A. B., & Mitra, D. K. (2013). Inhibiting the programmed death 1 pathway rescues *Mycobacterium tuberculosis*-specific interferon γ -producing T cells from apoptosis in patients with pulmonary tuberculosis. *Journal of Infectious Diseases*, 208(4), 603–615. <https://doi.org/10.1093/infdis/jit206>
- Soeters, P. B., Wolfe, R. R., & Shenkin, A. (2019). Hypoalbuminemia: Pathogenesis and Clinical Significance. *Journal of Parenteral and Enteral Nutrition*, 43(2), 181–193. <https://doi.org/10.1002/jpen.1451>
- Sudarmono, P., Aman, A. T., Arif, M., Syarif, A. K., Kosasih, H., Karyana, M., Chotpitayasunondh, T., Vandepitte, W. P., Boonyasiri, A., Lapphra, K., Chokephaibulkit, K., Rattanaumpawan, P., Thamlikitkul, V., Laongnualpanich, A., Teparrakkul, P., Srisamang, P., Phuc, P. H., Hai, L. T., Van Kin, N., ... Lau, C. Y. (2017). Causes and outcomes of sepsis in southeast Asia: a multinational multicentre cross-sectional study. *The Lancet Global Health*, 5(2), e157–e167. [https://doi.org/10.1016/S2214-109X\(17\)30007-4](https://doi.org/10.1016/S2214-109X(17)30007-4)
- Taeb, A. M., Hooper, M. H., & Marik, P. E. (2017). Sepsis: Current definition, pathophysiology, diagnosis, and management. *Nutrition in Clinical Practice*, 32(3), 296–308. <https://doi.org/10.1177/0884533617695243>
- Terradas, R., Grau, S., Blanch, J., Riu, M., Saballs, P., Castells, X., Horcajada, J. P., & Knobel, H. (2012). Eosinophil count and neutrophil-lymphocyte count ratio as prognostic markers in patients with bacteremia: A retrospective cohort study. *PLoS ONE*, 7(8), 1–8. <https://doi.org/10.1371/journal.pone.0042860>



- Tiwari, S., Pratyush, D. D., Gahlot, A., & Singh, S. K. (2011). Sepsis in diabetes: A bad duo. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, 5(4), 222–227. <https://doi.org/10.1016/j.dsx.2012.02.026>
- Torio, C. M., & Andrews, R. M. (2013). National Inpatient Hospital Costs: the Most Expensive Conditions by Payer, 2011.Statistical Brief #160. Healthcare Cost and Utilization Project (HCUP) Statistical Briefs. *Health Cost And Utilization Project*, 31(1), 1–12.
- Tsao, C. M., Ho, S. T., & Wu, C. C. (2015). Coagulation abnormalities in sepsis. *Acta Anaesthesiologica Taiwanica*, 53(1), 16–22. <https://doi.org/10.1016/j.aat.2014.11.002>
- Unsinger, J., McGlynn, M., Kasten, K. R., Hoekzema, A. S., Muenzer, J. T., McDonough, J. S., Tschoep, J., Ferguson, A., McDunn, J. E., Morre, M., Hildeman, D. A., Charles, C., & Hotchkiss, R. S. (2010). IL-7 Promotes T Cell Viability, Trafficking, and Functionality and Improves Survival in Sepsis. *Journal of Immunology Research*, 184(7), 3768–3779. <https://doi.org/10.4049/jimmunol.0903151.IL-7>
- Venet, F., & Monneret, G. (2018). Advances in the understanding and treatment of sepsis-induced immunosuppression. *Nature Reviews Nephrology*, 14(2), 121–137. <https://doi.org/10.1038/nrneph.2017.165>
- Vincent, J. L., Moreno, R., Takala, J., Willatts, S., De Mendonça, A., Bruining, H., Reinhart, C. K., Suter, P. M., & Thijs, L. G. (1996). The SOFA (Sepsis-related Organ Failure Assessment) score to describe organ dysfunction/failure. *Intensive Care Medicine*, 22(7), 707–710. <https://doi.org/10.1007/BF01709751>
- Vulliamy, P. E., Perkins, Z. B., Brohi, K., & Manson, J. (2016). Persistent lymphopenia is an independent predictor of mortality in critically ill emergency general surgical patients. *European Journal of Trauma and Emergency Surgery*, 42(6), 755–760. <https://doi.org/10.1007/s00068-015-0585-x>
- Wang, Y., Ouyang, Y., Liu, B., Ma, X., & Ding, R. (2018). Platelet activation and antiplatelet therapy in sepsis: A narrative review. *Thrombosis Research*, 166(April), 28–36. <https://doi.org/10.1016/j.thromres.2018.04.007>
- Wang, Z., Ren, J., Wang, G., Liu, Q., Guo, K., & Li, J. (2017). Association between diabetes mellitus and outcomes of patients with sepsis: A meta-analysis. *Medical Science Monitor*, 23, 3546–3555. <https://doi.org/10.12659/MSM.903144>
- Ward, P. A. (2010). The harmful Role of C5a on innate immunity in sepsis. *Journal of Innate Immunity*, 2(5), 439–445. <https://doi.org/10.1159/000317194>
- Wherry, E. J. (2011). T cell exhaustion. *Nature Immunology*, 12(6), 492–499. <https://doi.org/10.1038/ni.2035>
- Wibrow, B. A., Ho, K. M., Flexman, J. P., Keil, A. D., & Kohrs, D. L. (2011). Eosinopenia as a diagnostic marker of bloodstream infection in hospitalised paediatric and adult patients: A case-control study. *Anaesthesia and Intensive Care*, 39(2), 224–230. <https://doi.org/10.1177/0310057x1103900211>
- Wong, C. K., Lau, K. M., Chan, I. H. S., Hu, S., Lam, Y. Y. O., Choi, A. O. K., & Lam, C. W. K. (2013). MicroRNA-21 * regulates the prosurvival effect of



- GM-CSF on human eosinophils. *Immunobiology*, 218(2), 255–262. <https://doi.org/10.1016/j.imbio.2012.05.019>
- Wu, D., Molofsky, A. B., Liang, H.-E., Ricardo-Gonzalez, R. R., A., H., Jouihan, Bando, J. K., Chawla, A., & Locksley, R. M. (2012). Eosinophils sustain adipose alternatively activated. *Changes*, 29(6), 997–1003. <https://doi.org/10.1126/science.1201475>
- Yan, C., & Gao, H. (2012). New insights for C5a and C5a receptors in sepsis. *Frontiers in Immunology*, 3(DEC). <https://doi.org/10.3389/fimmu.2012.00368>
- Yang, Y., Yang, K. S., Hsann, Y. M., Lim, V., & Ong, B. C. (2010). The effect of comorbidity and age on hospital mortality and length of stay in patients with sepsis. *Journal of Critical Care*, 25(3), 398–405. <https://doi.org/10.1016/j.jcrc.2009.09.001>
- Yuan, S., & Akey, C. W. (2013). Apoptosome structure, assembly, and procaspase activation. *Structure*, 21(4), 501–515. <https://doi.org/10.1016/j.str.2013.02.024>
- Zheng, D., Yu, Y., Li, M., Wang, G., Chen, R., Fan, G. C., Martin, C., Xiong, S., & Peng, T. (2016). Inhibition of MicroRNA 195 Prevents Apoptosis and Multiple-Organ Injury in Mouse Models of Sepsis. *Journal of Infectious Diseases*, 213(10), 1661–1670. <https://doi.org/10.1093/infdis/jiv760>