

DAFTAR PUSTAKA

- Abdalla, A.E., Lambert, N., Duan, X., and Xie, J., 2016. Interleukin-10 Family and Tuberculosis: An Old Story Renewed. *Int J Biol Sci*, 12(6):710-717. doi:10.7150/ijbs.13881. Available at <http://www.ijbs.com/v12p0710.htm>.
- Achkar, J.M., Chan, J., and Casadevall, A., 2015. B cells and Antibodies in the Defense against *Mycobacterium tuberculosis* infection. *Immunological Reviews*, 264(1): 167–181. Doi: 10.1111/imr.12276
- Alliannejad, R., Bahrmand, A., Abtahi, H., Seifi, M., Safavi, E., Abdolrahimi, F., and Shahriaran, S., 2016. Accuracy a new rapid antigen detection test for pulmonary tuberculosis. *Iranian Journal of Microbiology*, 8(4):238-242.
- Aghababa, H., Mobarez, A.M., Behmanesh, M., Khoramabadi, N., and Mobarhan, M., 2011. Production and purification of mycolyl transferase B of *Mycobacterium tuberculosis*. *Tanaffos*, 10(4):23-30.
- Ahmad, S., 2011. Pathogenesis, immunology, and diagnosis of latent *Mycobacterium tuberculosis* infection. *Clinical and Developmental Immunology*, ID. 814943.
- Albert. B., Jonson, A., lewis, J., Raff, M., Robert, K., and Walter, P., 2002. *Molecular biology of The Cell*. 4th ed., Garland Science;3:485-491.
- Axelsson-Robertson, R., Rao, M., Loxton, A.G., Walzl, G., Bates, M., Zumla, A., and Maeurer, M., 2015. Frequency of *Mycobacterium tuberculosis*-specific CD8+T-cell in the course of anti-tuberculosis treatment. *International Journal of Infectious Diseases*, 32: 23-29.
- Basu, J., Shin, D-M., and Jo, E-K., 2012. Mycobacterial signaling through toll-like receptors. *Frontiers in Cellular and Infection Microbiology*, 2, 145. Doi: 10.3389/fcimb.2012.00145.
- Behar, S.M., Martin, C.J., Booty, M.G., Nishimura, T., Zhao, X., Gan, H., Divangahi, M., and Remold, H.G., 2011. Apoptosis is an innate defense function of macrophage against *Mycobacterium tuberculosis*. *Mucosa Immunologi*, 4(3): 279-287.
- Besra, G.S., and Brennan, P.J., 1997. The mycobacterial cell wall: biosynthesis of arabinogalactan and lipoarabinomannan. *Biochem. Soc Trans*, 25:845-50.
- Bourigault, M.L., Segueni, N., Rose, S., Court, N., Vacher, R., Vasseur, V., Erard, F., Le Bert, M., Garcia, I., Iwakura, Y., Jacobs, M., Ryffel, B., and Quesniaux, V.F., 2013. Relative contribution of IL-1 α , IL-1 β and TNF to the host response to *Mycobacterium tuberculosis* and attenuated M. bovis BCG. *Immunity, inflammation and disease*, 1(1): 47-62. doi:10.1002/iid3.9
- Brosch, R., Gordon, S. V., Garnier, T., Eiglmeier, K., Frigui, W., Valenti, P., et al., 2007. Genome plasticity of BCG and impact on vaccine efficacy. *Proc. Natl. Acad. Sci. USA*, 104(13):5596–5601.
- Camus, J.C., Pryor, M.J., Medigue, C., and Cole, S.T., 2002. Re-annotation of the genome sequence of *Mycobacterium tuberculosis* H37Rv. *Microbiol*, 148(10):2967.

- Cantini, F., Nannini, C., Niccoli, L., Iannone, F., Delogu, G., Garlaschi, G., Sanduzzi, A., Matucci, A., Prignano, F., Conversano, M. *et al.*, 2015. Guidance for the management of patients with latent tuberculosis infection requiring biologic therapy in rheumatology and dermatology clinical practice. *Autoimmunity reviews*, 14(6): 503-509. Doi:10.1016/j.autrev.2015.01.011.
- Chatterjee, D., Lowell, K., Rivoire, B., McNeil, M.R and Brennan, P., 1992. Lipoarabinomannan of *Mycobacterium tuberculosis*. Capping with mannosyl residues in some strains. *J. Biol. Chem*, 267: 6234-39.
- Chen, M., Gan, H., and Remold, H. G., 2006. A mechanism of virulence: virulent *Mycobacterium tuberculosis* strain H37Rv, but not attenuated H37Ra, causes significant mitochondrial inner membrane disruption in macrophages leading to necrosis. *The Journal of Immunology*, 176(6):3707-3716.
- Chin, J., and Kadun, I.N., 2000. Manual Pemberantasan Penyakit Menular., Infomedika Jakarta, Edisi 20, 631-633.
- Crick, D.C., Mahapatra, S and Brennan, P.J., 2001. Biosynthesis of the arabinogalactan-peptidoglycan complex of *Mycobacterium tuberculosis*. *Glycobiology*, 11: 107R – 8R.
- Chauhan, A.H., Lofton, E., Maloney, J., Moore, M., Fol, M.V., Madiraju., and Rajagopalan, M., 2006. Interference of *Mycobacterium tuberculosis* cell division by Rv2719c, a cell wall hydrolase. *Mol. Microbiol*, 62:132-47.
- Chronos, Z.C., Midde, K., Sever-Chroneos, Z and Jagannath, C., 2009. Pulmonary surfactant and tuberculosis. *Tuberculosis*. Suppl 1: S10-4.
- Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry, C.E., Tekaiia, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Moule, S., Murphy, L., Oliver, K., Osborne, J., Quail, M.A., Rajandream, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, J., Squares, R., Squares, S., Sulston, J.E., Taylor, K., Whitehead, S and Barrell, B.G., 1999. Deciphering the biology of *Mycobacterium tuberculosis* from the complete genome. *Nature*, 393: 537-544.
- Cowley, S.C., and Elkins, K.E., 2003. CD4+ T Cells Mediate IFN- γ Independent Control of *Mycobacterium tuberculosis* Infection Both In Vitro and In Vivo. *J. Immunol*, 171: 4689-99.
- Cooper, A. M., 2009. Cell mediated immune responses in Tuberculosis. *Annual Review of Immunology*, 27:393-422. doi:10.1146/annurev.immunol.021908.132703.
- Cooper, A.M., and Torrado, E., 2012. Protection versus pathology in tuberculosis: recent insights. *Current Opinion in Immunology*, 24:1-7.
- Ceylan, H., and Erdogan, O., 2017. Cloning, expression, and characterization of human brain acetylcholinesterase in *Escherichia coli* using a SUMO fusion tag. *Turk J Biol*, 41: 77-87.
- Datta, B.N., 2004. *Textbook of Pathology*. 2th Edition. New Delhi: Jaypee Brothers Medical Publishers Ltd. 239-246.

- Departemen Kesehatan RI., 2011. *Pedoman Nasional Penanggulangan Tuberkulosis di Indonesia*. Depkes RI. Jakarta.
- Daniel, H. Lajiness., 2011. Trehalose Monomycolate Biosynthesis and Utilization in *Mycobacterium tuberculosis*, *Dissertation Published by ProQuest*.
- Datta, P., Dasgupta, A., Singh, A.K., Mukherjee, P., Kundu, M., and Basu., 2006. Interaction between FtsW and penicillin-binding protein 3 (PBP3) directs PBP3 to mid-cell, controls cell septation and mediates the formation of a trimeric complex involving FtsZ, FtsW and PBP3 in mycobacteria. *Mol. Microbiol*, 62:1655–1673.
- Dasgupta, A., Datta, P., Kundu, M., and Basu, J., 2006. The serine/threonine kinase PknB of *Mycobacterium tuberculosis* phosphorylates PBPA, a penicillin-binding protein required for cell division. *Microbiology*, 152:493-504.
- Deng, L.L., Humphries, D.E., Arbeit, R.D., Carlton, L.E., Smole, S.C., and Carroll, D., 2005. Identification of a novel peptidoglycan hydrolase CwIM in *Mycobacterium tuberculosis*. *Biochim. Biophys. Acta*, 1747: 57 – 66.
- De Souza, S.V., Rosseels, M. Romano, A., Tanghe, O. Denis, F., Jurion, N., Castiglione, A., Vanonckelen, K., Palfliet., and Kris Huygen., 2002. Mapping of murine Th1 helper T-cell epitopes of mycolyl transferases Ag85A, Ag85B, and Ag85C from *Mycobacterium tuberculosis*. *Infect. Immun*, 71(1):483.
- Deretic, V., Singh, S., Master, S., Harris, J., Roberts, E., Kyei, G., Davis, A., deHaro, S., Naylor, J., Lee, H.H and Vergne, I., 2006. *Mycobacterium tuberculosis* inhibition of phagolysosome biogenesis and autophagy as a host defence mechanism, 8 :719-27.
- Dewi, D.N.S.S., Soedarsono., Mertaniasih, N.M., 2018. T cell epitopes of the *esxA* full gene of *Mycobacterium tuberculosis* from sputum of MDR-TB patients. *African Journal Infectious Disease*, 12(2): 66-77. Doi:10.21010/ajid.v12i2.10.
- Dewi, I.P., 2016. B-cell epitope of *Mycobacterium tuberculosis* Ag85 antigen in *Proceeding ICMHS*.
- Dietrich, J., Aagard, C., Leah, R, Olsen, A.W., Stryhn, A., Doherty, T.M., Andersen, P., 2014. Vaccine Efficacy. *Immunol*, 174:6332-6339.
- Diel, R., Loddenkemper, R., Meywald-Walter, K., Gottschalk, R., and Nienhaus A., 2009. Comparative performance of tuberculin skin test, QuantiFERON TB gold in tube assay, and T-Spot. TB test in contact investigation tuberculosis, *Chest*, 135:1010-1018.
- Dillon, D.C., Alderson, M.R., Day, C.H., Bement, T., Campos-Neto, A., Skeiky, Y.A.W., Badaro, R., Reed, S.G., Houghton, R., 2000. Molecular and Immunological Characterization of *Mycobacterium tuberculosis* CFP-10, an Immunodiagnostic Antigen Missing in *Mycobacterium bovis* BCG. *J.Clin. Microbiol*, 38 (9).
- Dillon, B.J., and Horwitz, M.A., 2000. Recombinant bacillus Calmette-Gue´rin (BCG) vaccines expressing the *Mycobacterium tuberculosis* 30 kDa major secretory protein induce greater protective immunity against tuberculosis than conventional BCG vaccines in a highly susceptible animal model. *97(25):13853–13858*.

- Di Paolo, N.C., Shafiani, S., Day, T., Papayannopoulou, T., Russell, D.W., Iwakura, Y., Sherman, D., Urdahl, K., and Shayakhmetov, D.M., 2015. Interdependence between interleukin-1 and tumor necrosis factor regulates TNF-Dependent Control of *Mycobacterium tuberculosis* infection. *Immunity*, 43(6), 1125–1136. doi:10.1016/j.immuni.2015.11.016
- Dorhoi, A., Reece, S.T., and Kaufmann, S.H., 2011. For better or for worse: the immune response against *Mycobacterium tuberculosis* balances pathology and protection. *Immunol Rev*, 240: 235-51.
- Dutta, N.K., and Karakaousis, P.S., 2014. Latent tuberculosis infection: myths, models, and molecular mechanisms. *MMBR journal*, 78(3): 343-371.
- Endharti, A.T., 2007. Spontaneous activation of T cell Lymphocytes in mice lacking interleukin-2 reseptor. *Journal Kedokteran Brawijaya*, 13(1):40-46
- Favrot, L., and Ronning, D.R., 2012. Targeting the mycobacterial envelope for tuberculosis drug development. *Expert Rev Anti Infect Ther*, 10:1023-1036
- Flandrois, J-P., Lina, G., and Dumitrescu, O., 2014. MUBII-TB-DB: a database of mutations associated with antibiotic resistance in *Mycobacterium tuberculosis*. *BMC Bioinformatics*, 15:107.
- Ferrari, G., Langen, H., Naito, M., and Pieters, J., 1999. A coat protein on phagosomes involved in the intracellular survival of mycobacteria. *Cell*, 97: 435–47.
- Fleischmann, R.D., Alland, D., Eisen, J.A., Carpenter, L., White, O., Peterson, J., et al., 2002. Whole genome comparison of *Mycobacterium tuberculosis* clinical and laboratory strains. *J. Bacteriol*, 184(19):5479.
- Forrelad, A.M., Kleep, L.I., Gloffre, A., Garsia, J.S.Y., Morbidoni, H.R., Santangelo, MdIP., Cataldi, A.A., and Bigi, F., 2013. Virulence Factors of The *Mycobacterium tuberculosis* Complex. *Virulence. Landes Bioscience*, 4(1):3-66.
- Fulton, S. A., Reba, S. M., Pai, R. K., Pennini, M., Torres, M., Harding, C.V., and Boom, W. H., 2004. Inhibition of major histocompatibility complex II expression and antigen processing in murine alveolar macrophages by mycobacterium bovis BCG and the 19-kilodalton mycobacterial lipoprotein. *Infect. Immunol*, 72(4):2101–2110.
- Fuchs, M., Kämpfer, S., Helmsing, S., Spallek, R., Oehlmann, W., Prilop, W., Frank, R., Dubel, S., and Hust, M., 2014. Novel Human antibodies against *Mycobacterium tuberculosis* antigen 85B. *BMC Biotechnolog*, 14:68.
- Frieden, T.R. Sterling, T.R., Munsiff, S.S., Watt, C.J., and Dye, C., 2003. Tuberculosis. *The Lancet*, 362(9387):887–899.
- Fremond, C.M., Togbe, D., Doz, E., Rose, S., Vasseur, V., Maillet, I., Jacobs, M., Ryffel, B., Quesniaux, V.F.J., 2007. IL-1 receptor-mediated signal is an essential component of MyD88-dependent innate response to *Mycobacterium tuberculosis* infection. *Journal of Immunology*, 179:1178-1189.
- Garnier, T., Eiglmeier, K., Camus, J.C., Medina, N., Mansoor, H., Pryor, M., et al., 2003. The complete genome sequence of *Mycobacterium bovis*. *Proc. Natl. Acad. Sci. USA*, 100(13):7877–7882.

- Garrity, G.M., Bell, J.A., and Lilburn, T.G., 2004. *Taxonomic Outline of the prokaryotes. Bergey's manual of systematic bacteriology*, Second edition., Release 5.0., Springer-Verlag, New York. Pages. Doi: 10.1007/bergeysoutline200405.
- García-Romo, G.S., Pedroza-Gonzalez, A., Aguilar-Leon, D., Orozco-Estevez, H., Lambrecht, B.N., Estrada-Garcia, I., Flores-Romo, L., and Hernández-Pando, R., 2004. Airways infection with virulent *Mycobacterium tuberculosis* delays the influx of dendritic cells and the expression of costimulatory molecules in mediastinal lymph nodes. *Immunology*, 112: 661 – 8.
- Geluk, A., Meijgaarden, K.E., Franken, K.L., Drijfhout, J.W., D'souza, S.L., Necker, A., Huygen, K., and Ottenhoff, T.H., 2000. Identification of major epitopes of *Mycobacterium tuberculosis* Ag85B that are recognized by HLA-A*0201-restricted CD8+ T cells in HLA-transgenic mice and humans. *Journal of immunology*, 165(11):6463-71. Doi:10.4049/jimmunol.165.11.6463
- Gengenbacher, M., and Kaufmann, S.H.E., 2012. *Mycobacterium tuberculosis*: Success through dormancy. *FEMS Microbiol Rev*, 36(3): 514-532.
- Geneaid., 2010. High-Speed Plasmid Mini Kit PD100/PD300: Manual kits. Geneaid Biotech. <http://www.geneaid.com>.
- Gopal, G.J and Kumar, A., 2013. Strategies for the production of recombinant protein in *Escherichia coli*. *Protein J*, Doi:10.1007/s10930-013-9502-5.
- Griffiths, G., Nyström, B., Sable, S.B., and Khuller, G.K., 2010. Nanobead-based interventions for the treatment and prevention of tuberculosis. *Nature Reviews Microbiology*, 8:827-834.
- Gupta, N., Salam, N., Srivastava, V., Singla, R., Behera, D., Khayyam, K.U., Korde, R., Malhotra, P., Saxena, R and Natarajan, K., 2009. Voltage Gated Calcium Channels Negatively Regulate Protective Immunity to *Mycobacterium tuberculosis*. *Plos ONE*, 4: e5305.
- Gutierrez, M.G., Master, S.S., Singh, S.B., Taylor, G.A., Colombo, M.I., and Deretic, V., 2004. Autophagy is a defense mechanism inhibiting BCG and *Mycobacterium tuberculosis* survival in infected macrophages. *Cell*, 119: 753-66.
- Gugino, G., Orlando, V., Cutrera, S., La Manna, M.P., Liberto, D.D., Vanini, V., Petruccioli, E., Dieli, F., Golletti, D., Caccamo, N., 2015. Granzyme A as a potential biomarker of *Mycobacterium tuberculosis* infection and disease. *Immunologi Letters*, 166:87-91.
- Giuliana, G., Valentina, O., Stella, C., Marco, P.L.M, Diana, D.L., Valentina, V., Elisa, P., Francesco, D., Delia, G., and Nadia, C., 2017. Granzyme A as a potential biomarker of *Mycobacterium tuberculosis* infection and disease. *Immunologi letters*, 166:87-91.
- He, H., Hovey, R., Kane, ., Singh, V., and Tzahrt, T.C., 2006. MprAB is a stress-responsive two-component system that directly regulates expression of sigma factors SigB and SigE in *Mycobacterium tuberculosis*. *J. Bacteriol*, 188:2134–43.

- Hingley-Wilson, S.M., Sambandamurthy, V.K., and Jacobs, W.R., Jr., 2003. Survival perspectives from the world's most successful pathogen, *Mycobacterium tuberculosis*. *Nature Immunol*, 4(10):94-955.
- Horwitz, M.A., Harth, G., Dillon, B.J., and Maslesa-Galic', S., 2000. Recombinant Bacillus Calmette-Gue´rin (BCG) vaccines expressing the *Mycobacterium tuberculosis* 30 kDa major secretory protein induce greater protective immunity against tuberculosis than conventional BCG vaccines in a highly susceptible animal model. *Proceedings of the National Academy of Sciences of the United States of America*, 97(25):13853–13858. doi:10.1073/pnas.250480397.
- Howe, C.J. 2007. *Gene cloning and manipulation*, 2th Ed. Cambridge university press. New york.
- Huygen, K., 2014. The immunodominant T-cell epitopes of the mycolyl-transferases of the antigen 85 complex of *M. tuberculosis*. *Frontiers in Immunology*, 321(5):1-11. doi:10.3389/fimmu.2014.00321.
- Invitrogen, 2010. Champion™ pET SUMO Protein Expression System. User Manual;part no.25-0709.
- Indrigo, J., Hunter, R.L., Actor, J.K., 2003. Cord Factor trehalosa 6,6'-dimikolat (TDM) mediates trafficking events during mycobacterial infection of murine macrophages. *Mycrobiology*, 149: 2049-2059.
- Indonesian Health Ministry., 2014. Profile of Indonesian Health 2018. Jakarta, Indonesia.
- Janardhan, S., Vivek, M.R., Sastry, G.N., 2016. Modeling the permeability of drug-like molecules through the cell wall of *Mycobacterium tuberculosis*: an analogue based approach. *Mol.BioSyst*, 12: 3377-3384.
- Jawetz, E., Melnick, J., Adelberg's, E., Brooks. F.G., Butel. S.J., Morse.A. S., 2006. *Mikrobiologi Kedokteran(terjemahan)*, Salemba Medika Jakarta, 1: 453-469.
- Jiang, Y., Liu, H., Li, M., Li, G., Pang, H., Dou, X., Zhao, X., and Wan, K., 2015. Single nucleotide polymorphism in Ag85 genes of *Mycobacterium tuberculosis complex*: Analysis of 178 clinical isolates from China and 13 BCG strains. *Int.J.Med.Sci*, 12(2):126-134.
- Jiang, Q., Zhang, J., Chen, X., Xia, M., Lu, Y., Qiu, W., Feng, G., Zhao, D., Li, Y., He, F., Peng, G., and Wang, Y., 2013. A novel recombinant DNA vaccine encoding *Mycobacterium tuberculosis* ESAT-6 and FL protects against *Mycobacterium* challenge in mice. *JBR*, 406-420.
- Jonez-Lopez, E. C., Namungga, O., Mumbowa, F., Ssebidandi, S., Mbabazi, O., Moine, S., Mboowa, G., Fox, M. P., Reilly, N., Ayakaka, I., Kim, S., Okwera, A., Joloo, M., and Fennely, K.P., 2013. Cough aerosols of *Mycobacterium tuberculosis* predict new infection. *Am J Respir Crit Care Med*, 187 (9): 1007-1015.
- Jo, E. K., 2008. Mycobacterial interaction with innate receptors: TLRs, C-type lectins, and NLRs. *Curr. Opinion Infect. Dis*, 21(3):279–286.
- Kang, P.B., Azad, A.K., Torrelles, J.B., Kaufman, T.M., Beharka, A., Tibesar, E., DesJardin, L.E., and Schlesinger, L.S., 2005. The human macrophage mannose receptor directs *Mycobacterium tuberculosis* lipoarabinomannan mediated phagosome biogenesis. *J. Exp. Med*, 202(7);987–999.

- Kang, D.D., Lin, Y., Moreno, J.-R., Randall, T.D., and Khader, S.A., 2011. Profiling Early Lung Immune Responses in the Mouse Model of Tuberculosis. *Plos ONE*, 6: e16161.
- Kaufman, S.H.E., 2002. Protection against tuberculosis: cytokines, T cells, and macrophages. *Ann.Rheum. Dis*, 61: 54 – 8.
- Kaufmann, S.H.E., and McMichael, A.J., 2005. A Review: Annulling a Dangerous Liaison: Vaccination Strategies Against HIV and Tuberculosis. *Nature Medicine*.
- Kaufmann, S.H.E., Weiner, J., and von Reyn, C.F., 2017. Novel approaches to tuberculosis vaccine development. *Int J Infect Dis*, 56: 263-267.
- Kementerian Kesehatan Republik Indonesia., 2015. Profil Kesehatan Indonesia. Kemenkes RI, Jakarta.
- Kemenkes RI., 2014. Strategi Nasional Pengendalian TB di Indonesia 2010-2014, Jakarta.
- Kemenkes RI., 2014. Pedoman Nasional Pengendalian Tuberkulosis. Jakarta: Dirjan P2PL.
- Kleinnijenhuis, J., Oosting, M., Joosten, L.A.B., Netea, M.G and Van Crevel, R., 2011. Innate Immune Recognition of *Mycobacterium tuberculosis*. *Clinn Dev Immunol*, ID:405310.
- Koul, A., Herget, T., Klebl, B., and Ullrich, A., 2004. Interplay between mycobacterium and host signaling pathway. *Nature Review*, 2:189-202.
- Kremer L., W.N. Maughan, R.A., Wilson, L.G. Dover., and Besra, G.S., 2001. The *M. tuberculosis* antigen 85 complex and mycolyltransferase activity, *Letters in Applied Microbiol*, 34: 233–237.
- Kumar, D., Nath, L., Kamal, Md.A.,Varshney, A., Jain, A., Singh, S., and Rao, K.V.S., 2010. Genome-wide analysis of the host intracellular network that regulates survival of *Mycobacterium tuberculosis*. *Cell*, 140:731–743, Elsevier Inc.
- Kuo, C.J., Christopher P., Ching, L., Bruce L., and Yung, F., 2013. Elastin, a Novel extracellular matrix protein adhering to Mycobacterial antigen 85 complex. *The Journal of Biological Chemistry*, 288 (6): 3886-3896.
- Launois, P., Annie, D., Eliane, B., Pierre C., Claire-Mich`ele, F., Jean-Paul, V.V ., Kris, H., 2011. T cell reactivity against mycolyl transferase antigen 85 of *M. tuberculosis* in HIV-TB coinfecting subjects and in AIDS patients suffering from Tuberculosis and Non tuberculous Mycobacterial infections. *Clinic. and Dev. Immunol*, 10:1155-1166.
- Lazarevic, V and Flynn, J., 2002. CD8+ cells in tuberculosis. *Am J Crit Care Med*, Vol 16: 1116-1121. Doi:10.1164/rccm.2204027.
- Lemos, M.P., McKiney, J., and Rhee, K.Y., 2011. Dispensability of Surfactant Proteins A and D in Immune Control of *Mycobacterium tuberculosis* Infection following Aerosol Challenge of Mice. *Infect Immun*, 79 : 1077 – 85.
- Lee, J., Hartman, M., Kornfeld, H., 2009. Macrophage apoptosis in tuberculosis. *Yonsei Med* 3, 50(1):1-11.
- Lee, C-D., Sun, H-C., Hu, S-M., Chiu, C-F., Homhuan, A., Liang, C-H., Leng, C-H., and Wang, T-F., 2008. An improved SUMO fusion protein System for effective production of native proteins. *Protein science*, 17:1241–1248.

- Lehninger, A. L. 2004. *Principles of Biochemistry*. Amhrest: Elsevier Science.
- Liu, F., Hu, Y., Li, H. M., Gao, G.F., Liu, C.H., and Zhu, B., 2014. Comparative genomic analysis of Mycobacterium tuberculosis clinical isolates. *BMC Genomic*, 15:469.
- Li, N., and Wu, X., 2016. Ag85A/ESAT-6 chimeric DNA vaccine induces an adverse response in tuberculosis-infected mice. *Mol Med Repr*, 14: 1146-1152.
- Liang, Y., Bai, X., Zhang, J., Song, J., Yang, Y., Yu, Q., Lee, J., Hartman, M., Kornfeld, H., 2009. Macrophage apoptosis in tuberculosis. *Yonsei Med J* 50(1):1-11.
- Lodish, B., Berk, A., Matsudaira, P., Kaiser, C.A., Klegler M., Scott, M.D., 2003. *Molecular cell biology*. 5th ed. Freeman & Co. USA.
- Lu, C-C., Wu, T-S., Hsu, Y-J., Chang, C-J., Lin, C-S., Chia, J-H., Wu, T-L., Huang, T-T., Martel, J., Ojcius, D.M., Young, J.D., and Lai, H-C., 2015. NK cells killing mycobacteria directly by releasing perforin and granulysin. *JLB*, 96(6): 1119-1129.
- Luo, S., McNeill, M., Myers, T.G., Hohman, R.J., Levine, R.L. 2008. Lon protease promotes survival of *Escherichia coli* during anaerobic glucose starvation. *Arch microbiol*, 189(2): 181-185
- Lyashchenko, K., R. Colangeli, M. Houde, H.A., Jahdali, D., Menzies., and Gennaro, M.L., 1998. Heterogeneous antibody responses in tuberculosis. *Infect.Immun*, 66:3936–3940.
- Marrakchi, H., Lane´elle, M.A., and Daffe´, M., 2014. Mycolic acids: structures, biosynthesis, and beyond. *Chem Biol*, 21: 67–85.
- Malhotra, V., Sharma, D., Ramanathan, V.D., Shakila, H., Saini, D.K., Chakravorty, S., Das, T.K., Li, Q., Silver, R.F., Narayanan, P.R., and Tyagi, S., 2004. Disruption of response regulator gene, devR, leads to attenuation in virulence of Mycobacterium tuberculosis. *FEMS Microbiol Lett*, 231: 237–45.
- Malik, Z.A., Thompson, C.R., Hasmi, S., Porter, B., Iyer, S.S and Kusner, D.J., 2003. *Mycobacterium tuberculosis* blocks Ca²⁺ signaling and phagosome maturation in human macrophages via specific inhibition of sphingosine kinase. *J Immunol*, 170: 2811–5
- McBryde, E.S., Meehan, M.T., Doan, T.N., Ragonnet, R., Marais, B.J., Guernier, V., and Trauer, J.M., 2017. The risk of global epidemic replacement with drug-resistant Mycobacterium tuberculosis strains. *Int J Infect Dis*, <http://dx.doi.org/10.1016/j.ijid.2017.01.031>.body.
- Metcalf, H.J., Steinbach, S., Jones, G.J., Connelley, T., Morrison, W.I., Vordermeier, M., Villarreal-Ramos, B., 2016. Protection associated with a TB vaccine is linked to increased frequency of Ag85A-specific CD⁺ T cells but no increase in avidity for Ag85A. *Vaccine*, 34: 4520-4525.
- Miranda, M.S., Breiman, A., Allain, S., Deknuydt, F., and Altare, F., 2012. The Tuberculous Granuloma: An Unsuccessful Host Defence Mechanism Providing a Safety Shelter for the Bacteria. *Clinical and Developmental Immunology*, Article ID 139127 : 1-14.
- Mohapatra, P.R., and Janmeja, A.K., 2009. Tuberculous Lymphadenitis. *JAPI*, 57: 585-90.

- Murray, *et al.*, 2009. *Harper's illustrated biochemistry*. Twenty-Eighth Ed. New York: Mc Graw Hill Medical.
- Nair, P.K., and Chourasia, E., 2016. Use of genexpert assay for diagnosis of tuberculosis from fluid specimens, a 2 years study. *J.Microbiol Biotechnol*, 1(1): 000105.
- Nober, A., Alarico, S., Maranha, A., Mendes, V., and Empadinhas., 2014. The molecular biology of mycobacterial trehalose in the quest for advanced tuberculosis therapies. *Microbiology review*, 160: 1547-1570.
- Noss, E.H., Pai, R.K., Sellati, T.J., *et al.*, 2001. Toll-like recepto 2-dependent inhibition of macrophage class II MHC expression and antigen processing by 19-kDa lipoprotein of *Mycobacterium tuberculosis*. *J. Immunol*, 167(2): 910-918.
- Nigou, J., Zelle-Rieser, C., Gilleron, M., Thurnher, M., and Puzo, G., 2001. Mannosylated lipoarabinomannans inhibit IL-12 production by human dendritic cells: evidence for a negative signal delivered through the mannose receptor. *J. Immunol*, 166(12):7477-7485.
- O'Shea, M.K., and McShane, H., 2016. A review of clinical models for the evaluation of human TB vaccine. *Human Vaccine & Immunotherapeutics*. 12(5): 1177-1187.
- Otu, A.A., 2013. Is the directly observed therapy short course (DOTS) an effective strategy for tuberculosis control in a developing country. *Asian. Pac. J. trop Dis*, 3(3):227-231.
- Parish, T., 2014. Two-component regulatory systems of mycobacteria. *Microbiol Spectrum*, 2(1):MGM2-0010-2013. doi:10.1128/microbiolspec. MGM2-0010-2013.
- Pai, R.K., Pennini, M.E., Tobian, A.A.R., Canaday, W.D.H., Boom, H., and Harding, C.V., 2004. Prolonged toll like receptor signaling by *Mycobacterium tuberculosis* and its 19-kilodalton lipoprotein inhibits gamma interferon-induced regulation of selected genes in macrophages. *Infect. Immun*, 72(11):6603-6614.
- Park, J.S., Tamayo, M.H., Gonzalez Juarrero, M., Orme, I.M., and Ordway, D.J. 2006. Virulent clinical isolates of *Mycobacterium tuberculosis* grow rapidly and induce cellular necrosis but minimal apoptosis in murine macrophages. *J. Leukocyte. Biol*, 79:80-86.
- Piubelli, L., Campa, M., Temporini, C., Binda, E., Mangione, F., Amicosante, M., Pollegioni, L., 2013. Optimizing *Escherichia coli* as a protein expression platform to produce *Mycobacterium tuberculosis* immunogenic proteins. *Microbial Cell Factories*, 12:115.
- Podos, S.D., Thanassi, J.A., and Pucci, M.J. 2012. Mechanistic assessment of DNA ligase as an antibacterial target in *Staphylococcus aureus*. *Antimicrobial agents and chemotherapy*, 56(8): 4095-4102. doi:10.1128/AAC.00215-12
- Prisic, S., and Husson, R.N., 2014. *Mycobacterium tuberculosis* Serine/Threonine protein kinases. *Microbiol Spectr*, 2(5): doi:10.1128/microbiolspec.MGM2-0006-2013
- Pfyffer, G.E., and Wittwer, F., 2012. Incubation time of *Mycobacterium* cultures: how long is long enough to issue a final negative report to the clinician. *JMC*, 50 (12): 4188-4189.

- Raviglione, M.C., and O'Brian, R.J., 2001. Tuberculosis, *In Harrison's Principles of Internal Medicine*, 15th ed., 1024-1035, McGraw-Hill, New York.
- Ramakrishnan, L., Federspiel, N.A., Falkow, S., 2000. Granuloma-specific expression of Mycobacterium virulence proteins from the glycine-rich PEPGRS family. *Science*, 288(5470):1436-1439.
- Reece, R.J., 2004. *Analysis of Gene and Genome*. John Wiley & Sons, Ltd, England.
- Reece, S.T., and Kauffman, S.H.E., 2012. Floating between the poles of pathology and protection: can we pin down the granuloma in tuberculosis. *Current Opinion in Microbiology*, 15: 63-70.
- Rizzi, C., Bianco, M.V., Blanco, F.C., Soria, M., Gravisaco, M.J., Montenegro, V., Vagnoni, L., Buddle, B., Garbaccio, S., Delgado, F., Leal, K.S., Cataldi, A.A., Dellagostin, O.A., and Bigi, F., 2012. Vaccination with a BCG strain overexpressing Ag85B protects cattle against *Mycobacterium bovis* challenge. *Plos ONE*, 7(12):e51396.
- Rothfield, L., Taghbalout, A., and Shih, Y.L., 2005. Spatial control of bacterial division-site placement. *Nat Rev Microbiol*, 3: 959-968;
- Rosano, G.L., and Ceccarelli, E.A., 2014. Recombinant protein expression in *Escherichia coli*: advances and challenges. *Frontiers in microbiology*, 5(172): doi: 10.3389/fmicb.2014.00172.
- Rosenkrands, I., King, A., Weldingh, K., Moniatte, M., Moertz, E., Andersen, P., 2000. Towards the proteome of *Mycobacterium tuberculosis*. *Electrophoresis*. 21(17): 3740-56.
- Ryan, K.J, and Ray, C.G (editors)., 2004. *Sherris Medical Microbiology (4th ed.)*. McGraw Hill. ISBN 0-8385-8529-9.
- Santi, I., Dhar, N., Bousbaine, D., Wakamoto, Y., McKinney, J. D., 2013. Single-cell dynamics of the chromosome replication and cell division cycle in mycobacteria. *Nature Communications*, 4:2470.Doi:10.1038/ncomms3470
- Saeed, M., Iram, S., Hussain, S., Ahmed, A., Akbar, M., and Aslam, M., 2017. GeneXpert: A new tool for the rapid detection of rifampicin resistance in *Mycobacterium tuberculosis*. *J Park Med Assoc*, 67(2): 270-274.
- Syafa'ah, I., and Yudhawati, R., 2016. Peran imunitas mukosa terhadap infeksi *Mycobacterium tuberculosis*. *Jurnal Respirasi*, 2(2):61-68.
- Seyhan, E.C., Gunluoglu, G., Gunluoglu, M.Z., Taral, S., and Sökücü, S., 2016. Predictive value of the tuberculin skin test and QuantiFERON-tuberculosis Gold in Tube- test for development of active tuberculosis in hemodialysis patients. *Ann. of Thorac. Med*, 11:114-20.
- Schnappinger, D., Ehrh, S., Voskuil, M.I., Liu Y., Mangan, J. A., Monahan, I.M., Dolganov, G., Efron, B., Butcher, P.D., Nathan, C., Schoolnik, G.K., 2003. Transcriptional adaptation of *Mycobacterium tuberculosis* within Macrophages: Insights into the Phagosomal Environment. *J. Exp Med*, 198(5):693-704
- Sendide, K., Deghmane, A-E., Reyrat, J-M., Talal, A., and Hmam, Z., 2004. *Mycobacterium bovis* BCG urease attenuates major histocompatibility complex class II trafficking to the macrophage cell surface. *Infect. Immun*, 72: 4200-9.

- Silva, D., Ponte, C.G.G., Hacker, M.A., and Antas, P.R.Z., 2013. A whole assay as a simple, broad assessment of cytokines and chemokines to evaluate human immune responses to *Mycobacterium tuberculosis* antigens. *Acta Tropica*, 127:75-81
- Shiloh, M.U., and Champion, P.A.D., 2010. To catch a killer. What can mycobacterial models teach us about *Mycobacterium tuberculosis* pathogenesis. *Curr. Opin. Microbiol*, 13(1):86–92.
- Shin, D. M., Jeon, B.Y., Lee, H.M., in, H.S., Yuk, .M., Song, C.H., Lee, S.H., Lee, Z.W., Cho, S.N., Kim, J.M., Friedman, R.L and Jo, E.K., 2010. *Mycobacterium tuberculosis* eis regulates autophagy, inflammation, and cell death through redox-dependent signaling. *PLoS Pathogens*, 6: e1001230.
- Smit, I., 2003. *Mycobacterium tuberculosis* pathogenesis and molecular determinant of virulence. *Clin Mycob Rev*, 16(3): 463-496.
- Steingart, K.R., Sohn, H., Schiller, I., Kloda, L.A., Boehme, C.C., Pai, M., and Dendukuri, N., 2013. Xpert®MTB/RIF assay for pulmonary tuberculosis and rifampicin resistance in adult. *Cochrane Database of Systematic Reviews*. Issue 1.Art.No.:CD009593.Doi:10.1002/14651858.CD009593.
- Stansfield., William D., Colome, J.S., and Cano, R.J., 2003. *Schaum's Easy Outlines Molecular and Cell Biology*. McGraw-Hill Companies. New York.
- Talbot, E.A., and von Reyn, C.F., 2005. The importance of culture for diagnosing tuberculosis. *Clin Infect Dis*, 41: 1213-1214.
- Tambunan, B.A., Priyanto, H., Nugraha, J., and Soedarsono., 2018. CD4+ and CD8+ T-Cells expressing interferon gamma in aktive pulmonary tuberculosis patients. *Afr J Infect Dis*, 12(S):49-53.
- Todar, K., 2012. *Mycobacterium tuberculosis* and tuberculosis. <http://textbookofbacteriology.net/tuberculosis>.
- Thakur, M., and Chakraborti P.K., 2006. GTP-ase activity of mycobacterial FtsZ is impaired due to its transphosphorylation by the eukaryotic-type Ser/Thr kinase, PknA. *J. Biol. Chem*, 281: 40107–13.
- Todar, K., 2008. *Mycobacterium tuberculosis and Tuberculosis*. Department of Bacteriology, Wisconsin.
- Tufariello, J.M., Chan, J., and Flynn, J. L., 2003. Latent tuberculosis: mechanisms of host and bacillus that contribute to persistent infection. *Infect.Diseases*, 3(9):578–590.
- Van-Crevel, R., Ottenhoff, T.H.M., and Vd Meer, J.W.M., 2002. Innate immunity to *Mycobacterium tuberculosis*. *CMR*, 15:294-309
- Wang, D., Jia, X., Yonghui, F., Ying, L., Solum, M., Fengping, S., Jin-Ichi S., and Chanlong, L., 2010. Liposomal oral DNA vaccine (mycobacterium DNA) elicits immune response. China dan Jepang. *Elsevier, Vaccine* 28:3134–3142.
- Wang X, Chen S, Xu Y, Zheng H, Xio T, Chen X, Huang M, Zhang H, Fang X, Jiang Y., *et al.*, 2017. Identification and evaluation of the novel immunodominant antigen Rv2351c from *Mycobacterium tuberculosis*. *Emerging Microbes & Infections*. 6:1-8. doi:10.1038/emi.2017.34.

- Wang, X., Barnes, P.F., Dobos-Elder, K.M., Townsent, J.C., Chung, Y-T., Shams, H., Weis, S.E., and Samten, B. (2009). ESAT-6 inhibits of IFN- γ by Mycobacterium tuberculosis-responsive human T cells. *J Immunol*, 182 (6): 3668-3677.
- Williams, C.M.L., Cheah, E.S.G., Malkin, J., Pettel, H., Otu, J., Mlaga, K., Sutherland, J.S., Antonio, M., Perera, N., Woltmann, G., Haidar, P., Garton, N.J., and Barer, M.R., 2014. Face mask sampling for detection of *Mycobacterium tuberculosis* in expelled aerosols. *Plos One*, 9(8):e104921.
- World Health Organization., 2015. *Global Tuberculosis Report 2015*. WHO Report. Geneva, Switzerland.
- World Health Organization., 2016. *Global Tuberculosis Report 2016*. WHO Report. Geneva, Switzerland.
- World Health Organization., 2018. *Global Tuberculosis Control: WHO Report 2018*. World Health Organization Press, Geneva, Switzerland.
- Wiker, H.G., and Wilson, M. A., 2000. Schoolnik GK. Extracytoplasmic proteins of *Mycobacterium tuberculosis* - mature secreted proteins often start with aspartic acid and proline. *Microbiol*, 146 (7):1525–1533.
- Wiker, H.G., Tomazella, G.G., and de Souza, G.A., 2011. A quantitative view on *Mycobacterium leprae* antigens by proteomics. *J. Proteome*, 74(9):1711-1719.
- Xu, J-N., Chen, J-P., and Chen, D-L., 2012. Serodiagnosis efficacy and immunogenicity of the fusion protein of *Mycobacterium tuberculosis* composed of the 10-Kilodalton culture filtrate protein, ESAT-6, and the extracellular domain fragment of PPE68. *Clinical and Vaccine Immunology. J.ASM*, 19(4):536-544.
- Yamamoto, M., Sato, S., Hemmi, H., Hoshino, K., Kaisho, T., Sanjo, H., Takeuchi, O., Sugiyama, M., Okabe, M., Takeda, K., and Akira, S., 2003. Role of adaptor TRIF in the MyD88-independent toll-like receptor signaling pathway. *Science*, 301(5633):640–643.
- Yamada, H., Mizumo S, Horai, R., Iwakura, Y., Sugawara, I., 2000. Protective role of interleukin-1 in mycobacterial infection in IL-1 alpha/beta double-knockout mice. *Laboratory Investigation*. 80:759–767. Doi: 10.1038/labinvest.3780079.
- Yuen, C.M., Weyenga, H.O., Kim, A.A., 2014. Comparison of trends in tuberculosis incidence among adults Living with HIV and adults without HIV – Kenya 1998–2012. *Plos One*, 9 : e99880.
- Yuk, J.-M., & Jo, E.-K., 2014. Host immune responses to mycobacterial antigens and their implications for the development of a vaccine to control tuberculosis. *Clinical and Experimental Vaccine Research*, 3(2), 155–167. <http://doi.org/10.7774/cevr.2014.3.2.155>
- Zarif, R., Sankian, M., Gholubi, a, Farshadzadeh, Z., Soleimanpour, S., Youssefi, F., Varasteh, A R., 2013. Cloning and expression of *Mycobacterium tuberculosis* major secreted protein antigen 85B (Ag85B) in *Escherichia coli*. *Jundishapur J. Microbiol*, 6(2):112–116 doi:10.5812/jjm.4701.

- Zhang, F., Lu, X., Guo, N., Zhang, Y., Ji, P., Hu, J., Zhang, Z., Li, Z., Li, F., Ding, J., 2016. The prediction of T- and B-combined epitope of Ag85B antigen of *Mycobacterium tuberculosis*. *International Journal Clinical and Experimental Medicine*, 9(2):1408-1421. www.ijcem.com /ISSN:1940-5901/IJCEM0016951
- Zhou, F., Xu, X., Wu, S., Cui, X., Fan, L., and Pan, W., 2015. Protein array identification of protein markers for serodiagnosis of *Mycobacterium tuberculosis* infection. *Scientific reports*, 5:15349. Doi:10.1038/srep15349
- Zheng, H., Lu, L., Wang, B., Pu, S., Zhang, X., Zhu, G., et al., 2008. Genetic basis of virulence attenuation revealed by comparative genomic analysis of *Mycobacterium tuberculosis* strain H37Ra versus H37Rv. *PloS ONE*, 3(6):e2375
- Zuniga, J., Torres-Garcia, D., Santos-Mendoza, T., Rodriguez-Reyna, T., Granados, J and Yunis, E., 2012. Cellular and humoral mechanisms involved in the control of tuberculosis. *Clinical and Developmental Immunology*. Article ID 193923: 1 – 18.
- Zvi, A., Naomi, A., John, F., Jerald, C. S., and Avigdor, S., 2008. Whole genome identification of *Mycobacterium tuberculosis* vaccine candidates by comprehensive data mining and bioinformatic analyses. *BMC Medical Genomics*, 2-18.