

## DAFTAR PUSTAKA

- Abdoel TH, Rob Pastoor, Henk L. Smits, Hatta M 2007. Laboratory evaluation of a simple and rapid latex agglutination assay for the serodiagnosis of typhoid fever. *Transactions of the Royal Society of Tropical Medicine and Hygiene*. 101 (10); 1032-1038.
- Abel, L., Sanchez, F. O., Oberti, J., Thuc, N. V., Hoa, L. V., Lap, V. D., Skamene, E., Lagrange, P. H., Schurr, E. 1998. Susceptibility to leprosy is linked to the human NRAMP1 gene. *J. Infect. Dis.* 177: 133-145.
- Akagawa K, 2004. The activation of bactericidal mechanisms of macrophages against intracellular bacteria. *Molecular Medicine*. 41: 991-998
- Alam Sher Malik, 2002. Complications of Bacteriologically Confirmed Typhoid Fever in Children, *Journal of Tropical Pediatrics*, 48 (2); 102–108, <https://doi.org/10.1093/tropej/48.2.102>
- Alba S., Mirjam, IB., Hatta M, Pauline FDS., Ressay D, Romi U, Andi R. S., Sabir M., Nataniel, T., Masyhudi A, Yadi Y, Rob P, Stella VB., Henk LS. 2016. Risk factors of typhoid infection in the Indonesian archipelago. *PLOS One*. 9;11(6):e0155286. doi: 10.1371/journal.pone.015528
- Alcasis, A., Sanchez, F. O., Thuc, N. V., Lap, V. D., Oberti, J., Lagrange, P. H., Schurr, E., Abel, L. 2000. Granulomatous reaction to intradermal injection of lepromin (Mitsuda reaction) is linked to the human NRAMP1 gene in Vietnamese leprosy sibships. *J. Infect. Dis.* 181: 302-308.
- Amanda J. Griffin, Stephen J. McSorley 2011. Development of protective immunity to Salmonella, a mucosal pathogen with a systemic agenda. *Mucosal Immunol*, 4(4): 371–382. doi: 10.1038/mi.2011.2. PMID: PMC4084725
- Ao TT, Feasey NA, Gordon MA, Keddy KH, Angulo FJ, Crump JA. 2010. Global burden of invasive nontyphoidal Salmonella disease, *Emerg Infect Dis*. 2015;21(6)
- Baker S, Michael Favorov, Gordon Dougan. 2010. Searching for the elusive typhoid diagnostic. *BMC Infectious Diseases*. 10:45

- Basnyat B. 2007. The treatment of enteric fever. *Journal of the Royal Society of Medicine*, 100(4), 161–162. doi:10.1258/jrsm.100.4.161
- Blackwell JM, Goswami T, Evans CA, Sibthorpe D, Papo N. 2001. SLC11A1 (formerly NRAMP1) and disease resistance. *Cell Microbiol*;3:773–784.
- Bhutta Z. A. 2006. Current concepts in the diagnosis and treatment of typhoid fever. *BMJ (Clinical research ed.)*, 333(7558), 78–82. doi:10.1136/bmj.333.7558.78
- Canonne-Hergaux F, Fleming MD, Levy JE, Gauthier S, Ralph T, Picard V, Andrews NC, Gros P. 2000. The Nramp2/DMT1 iron transporter is induced in the duodenum of microcytic anemia mk mice but is not properly targeted to the intestinal brush border. *Blood*. 2000;96:3964–3970
- Cruickshank R, 1968. *Medical Microbiology: A Guide to the Laboratory Diagnosis and Control of Infection*, Edinburgh: E & S Livingstone Ltd.
- Crump JA, et al. 2003. Estimating the incidence of typhoid fever and other febrile illnesses in developing countries. *Emerg Infect Dis*, 9: 539
- Crump JA, Mintz ED, 2010. Global trends in typhoid and paratyphoid Fever. *Clinical Infectious Diseases*. 50 (2): 241–6. doi:10.1086/64954
- Crump JA, Luby SP, Mintz ED 2004. The global burden of typhoid fever. *Bull World Health Organ*. 82 (5): 346–353.
- de Jong, H. K., Parry, C. M., van der Poll, T., & Wiersinga, W. J. 2012. Host-pathogen interaction in invasive Salmonellosis. *PLoS pathogens*, 8(10), e1002933. doi:10.1371/journal.ppat.1002933
- Di Domenico, E. G., Cavallo, I., Pontone, M., Toma, L., Ensoli, F. 2017. Biofilm Producing *Salmonella Typhi*: Chronic Colonization and Development of Gallbladder Cancer. *Int. J. Mol. Sci.*, 18(9), [1887], 1-14; doi:10.3390/ijms18091887
- Dubaniewicz, A., Jamieson, S. E., Dubaniewicz-Wybiecalska, M., Fakiola, M., Miller, E. N., Blackwell, J. M. 2005, Association between SLC11A1 (formerly NRAMP1) and the risk of sarcoidosis in Poland. *Europ. J. Hum. Genet*. 13: 829-834.
- Dunstan SJ, Ho VA, Duc CM, Lanh MN, Phuong CX, Luxemburger C, Wain J, Dudbridge F, Peacock CS, House D, Parry C, Hien TT, Dougan G, Farrar J, Blackwell JM. 2001. Typhoid fever and genetic

polymorphisms at the natural resistance-associated macrophage protein 1. *J Infect Dis.* 183(7):1156-60. Epub 2001 Mar 1.

- Dwiyanti, R., Hatta M, Natzir R, Pratiwi S, Sabir M, Yadi Y, Noviyanthi RA, Junita AR, Tandirogang N, Masyhudi A, Fias M, Saning J, Bahar B. 2017a. Association of Typhoid Fever Severity with Polymorphisms NOD2, VDR and NRAMP1 Genes in Endemic Area, Indonesia. *J. Med. Sci.*, 17 (3): 133-139. July-September, DOI: 10.3923/jms.2017.133.139
- Dwiyanti, R., Rizki, AN., Natzir R, Sabir M., Yadi, Y., Junita AR., Nataniel, T., Masyhudi, A., Hatta M. 2017b. The relationship polymorphisms gene NOD2 and titer antibody to Lipopolysachatrudin Typhoid fever. Annual Scientific Meeting (ASM) PAMKI 2017, page 22, Padang, 12-14 October 2017.
- Dwiyanti, R., Yadi Yr, Sabir M, Natzir R, Rahardjo SR, Purnamasari NI, Saning J, Hatta M. 2015. Titer IgG anti-flagellum Antibody and Flagellin Gene Variants of Salmonella enterica Serovar Typhi as Risk Factor for Typhoid Fever Carriers. *American Journal of Infectious Diseases and Microbiology*, Vol. 3, No. 2, 65-69. DOI:10.12691/ajidm-3-2-1
- Easmon C. 2015. Typhoid fever and paratyphoid fever. Find out what causes typhoid fever and paratyphoid fever and how it's spread? Diakses 02 Desember 2019. Available from: <http://www.netdoctor.co.uk/conditions/infections/a5690/typhoid-fever-and-paratyphoid-fever/>
- Fitness J, Floyd S, Warndirff DK, Schali L, Mwaungulu L, Crampin AC, Fine PEM, Hill AVS. 2004. Large-scale candidate gene of leprosy susceptibility in the Karonga district of Northern Malawi. *Am. J. Trop. Med. Hyg.* 71(3): 330–340.
- Gary J. Doherty and Harvey T. McMahon. 2009. Mechanisms of Endocytosis. *Annual Review of Biochemistry*; 78:857-902. <https://doi.org/10.1146/annurev.biochem.78.081307.110540>.
- Ganz, Tomas. 2017. Macrophages and Iron Metabolism, p 803-812. In Gordon, Siamon(ed), *Myeloid Cells in Health and Disease*. doi:10.1128/microbiolspec.MCHD-0037-2016

- Georges-Fernand Widal. Available from: [http://en.wikipedia.org/wiki/Georges-Fernand\\_Widal](http://en.wikipedia.org/wiki/Georges-Fernand_Widal). [Download 10 Desember 2019]
- Gordon S. Alternative activation of macrophages. *Nat Rev Immunol*;3(1):23-35. doi: 10.1038/nri978. PMID: 12511873
- Grossman, D. A., Witham, N. D., Burr, G. K., Schoolnik, and J. Parsonett. 1995. Flagellar Serotypes of Salmonella Typhi in Indonesia: Relationships among Motility, Invasiveness. And Clinical Illness, *The Journal of Infectious Disease*. 171:6 : 212-216.
- Gunn, J. S., Marshall JM, Baker S, Dongol S, Charles RC, Ryan ET. 2014. Salmonella chronic carriage: epidemiology, diagnosis and gallbladder persistence. *Trends Microbiology*. 22(11): 648–655. doi:10.1016/j.tim.2014.06.007.
- Hatta M, Goris MGA, Heerkens E, Gussenhoven GC, Goosken J, Smits. 2002a. Simple dipstick assay for the detection of Salmonella typhi-specific immunoglobulin M antibodies and the evolution of the immune response in patients with typhoid fever *American J. Tropical Medicine and Hygiene*. 66: 4; 416-421.
- Hatta M, Halim M, Abdoel TH, Smits HL. 2002b. Antibody response in typhoid fever in endemic Indonesia and relevance of serology and culture to diagnosis. *Southeast Asian Journal of Tropical Medicine and Public Health*. 33: no 4; 182-191.
- Hatta M and Henk L Smits. 2007. Detection of Salmonella typhi by nested Polymerase Chain Reaction in blood, urine and stool samples. *American J. Tropical Medicine Hygiene*. 76;139-143.
- Hatta M and Ratnawati. 2008. Enteric fever in endemic areas of Indonesia: an increasing problem of resistance. *J. Infection Developing Countries (JIDC)*. 2(4); 298-301.
- Hatta M, Baker M, Beer van S, Abdoel TH, Smits HL. 2009. Risk factors for clinical typhoid fever in villages in Rural South Sulawesi, Indonesia. *International Journal of Tropical Medicine*. 4 (3): 91-99.
- Hatta M, Ratnawati, Tanaka M, Ito J, Shirakawa T, Kawabata M. 2010a. NRAMP1/SLC11A1 gene polymorphisms and host susceptibility to Mycobacterium tuberculosis and leprae in South Sulawesi, Indonesia. *Southeast Asian J. Trop Med Public Health*. Vol. 41 No. 2 : 386-394.

- Hatta M, Rob Pastoor, Pauline FD Scheelbeck, A.R. Sultan, Ressay Dwiyantri, Ibrahim Labeda, H.L. Smits. 2011a. Multi-Locus Variable-Number Tandem Repeat Profiling of *Salmonella enterica* Serovar Typhi Isolates from Blood Cultures and Gallbladder Specimens from Makassar, South-Sulawesi, Indonesia. *PloS ONE* (Public Library of Science ONE). 6 (9): e24983, 1-11.
- Hatta M, Sultan AR, Pastoor R, Smits HL. 2011b. New Flagelin Gene for *Salmonella enterica* serovar Typhi from the East Indonesian Archipelago. *American J. Tropical Medicine and Hygiene.*, 84(3); 429-434.
- Hatta, M., Smits HL. 2010b. Diversity flagella variants and MDR of *S. enterica* serovar Typhi in Indonesia archipelago. Conference "Bacterial Waterborne and Emerging Infectious Diseases in North Africa and Middle East : Opportunity for Collaboration". Department of Health and Human Service, National Institute of Allergy and Infectious Diseases, National Institute of Health (NIH), USA. Rabat, Morocco, June 28-July 1, hal 23.
- Hoffman, S. L., Woodward, T. E., Hornick, R. B., Punjabi, N. H., & Greisman, S. E. 1984. Effective treatment and prevention of typhoid fever: updated. *Transactions of the American Clinical and Climatological Association*, 95, 52–65.
- International Typhoid Consortium, Vanessa K. Wong, Stephen Baker, [...]. Mochammad Hatta, [...], Gordon Dougan. 2016. Molecular Surveillance Identifies Multiple Transmissions of Typhoid in West Africa. *PLOS Neglected Tropical Diseases*. DOI:10.1371/journal.pntd.0004781.
- Iwasaki, Y., Otsuka, H., Yanagisawa, N., Hisamitsu, H., Manabe, A., Nonaka, N., & Nakamura, M. 2011. In situ proliferation and differentiation of macrophages in dental pulp. *Cell and tissue research*, 346(1), 99–109. <https://doi.org/10.1007/s00441-011-1231-5>
- Jawetz, Melnick, Adelberg's. 2005. *Medical Microbiology*. The McGraw-Hill Companies, Inc.: United States of America.
- Jeng Hsien Yen, Chia Hui Lin. 2005. Natural resistance-associated macrophage protein 1 gene polymorphisms in rheumatoid arthritis. *Immunology Letters*. 32:291-298.

- Jonas D. Van Belleghem, Paul L. Bollyky. 2018. Macrophages and innate immune memory against *Staphylococcus* skin infections. *Proceedings of the National Academy of Sciences*;115 (47) 11865-11867; DOI: 10.1073/pnas.1816935115
- Kissler, S., Stern, P., Takahashi, K., Hunter, K., Peterson, L. B., Wicker, L. S. 2006. In vivo RNA interference demonstrates a role for Nramp1 in modifying susceptibility to type 1 diabetes. *Nature Genet.* 38: 479-483.
- Kumar P, Kumar R, 2017. Enteric Fever. *Indian Journal of Pediatrics.* 84 (3): 227–230. doi:10.1007/s12098-016-2246-4
- Larabi A, Barnich N, Nguyen HTT. 2020. New insights into the interplay between autophagy, gut microbiota and inflammatory responses in IBD. *Autophagy*;16(1):38-51. doi: 10.1080/15548627.2019.1635384. Epub 2019 Jul 9. PMID: 31286804; PMCID: PMC6984609.
- Ligia María Cruz Espinoza, Ellen McCreedy, Marianne Holm, Justin Im. Ondari D. 2019. Occurrence of Typhoid Fever Complications and Their Relation to Duration of Illness Preceding Hospitalization: A Systematic Literature Review and Meta-analysis. *Clinical Infectious Diseases*, Volume 69, Issue Supplement\_6, 1 January 2019.
- Marineli, F., Tsoucalas, G., Karamanou, M., & Androutsos, G. 2013. Mary Mallon (1869-1938) and the history of typhoid fever. *Annals of gastroenterology*, 26(2), 132–134.
- Marmion DE. 1952. The treatment of typhoid fever with chloramphenicol; a clinical study of 330 cases of enteric fever treated in Egypt. *Trans R Soc Trop Med Hyg.* 1952 Nov;46(6):619–638.
- Mastroeni, P., Menager, N. 2003. Development of acquired immunity to *Salmonella*. *Journal of Medical Microbiology.* Vol. 52, 453-459.
- Merino, K. M., Allers, C., Didier, E. S., & Kuroda, M. J. 2017. Role of Monocyte/Macrophages during HIV/SIV Infection in Adult and Pediatric Acquired Immune Deficiency Syndrome. *Frontiers in immunology*, 8, 1693. <https://doi.org/10.3389/fimmu.2017.01693>.
- Mitsuyama M. 2000. Protective immunity against intracellular Parasitic bacteria. *Jpn J Leprosy.* 69: 83-86
- Mustafa H and Hatta M. 2011. Analysis polymorphism of nucleotide binding oligomerization domain 2 (NOD2) gene locus exon 4 802 on leprosy

- patients in Makassar: *Tropical Medicine & International Health*. 16. Supplement 1:188, [Abstract No. 1.3-074], October (2011). First published: 3 October 2011. DOI: 10.1111/j.1365-3156.2011.02861.x
- Parry CM, Beeching NJ, 2009. Treatment of enteric fever. *BMJ*. 338: b1159. doi:10.1136/bmj.b1159.
- Raffatellu M, R. Paul Wilson, Sebastian E. Winter, Andreas J. Bäumlér 2008. Clinical pathogenesis of typhoid fever. *J Infect Dev Ctries*. 2(4): 260–266.
- Rasheed MK, Hasan SS. Babar Z, Ahmed SI. 2019. Extensively drug-resistant typhoid fever in Pakistan. *Lancet Infect Dis*. 19 (3): 242-243. DOI:[https://doi.org/10.1016/S1473-099\(19\)30051-9](https://doi.org/10.1016/S1473-099(19)30051-9)
- Ragland SA, Criss AK .2017. From bacterial killing to immune modulation: Recent insights into the functions of lysozyme. *PLoS Pathog* 13(9): e1006512. <https://doi.org/10.1371/journal.ppat.1006512>
- Rosania GR, Swanson JA. 1996. Microtubules can modulate pseudopod activity from a distance inside macrophages. *Cell Motil Cytoskeleton* ;34(3):230-45. doi: 10.1002/(SICI)1097-0169(1996)34:3.
- Ryan, K.J., Ray, C.G. 2004. *Sherris Medical Microbiology: An Introduction to Infectious Diseases*. 4th Edition. The McGraw-Hill Companies, Inc.: United States of America.
- Sabir, M., Dwiyantri R, Febrianty A, Tandirogang N, Yadi Y, Masyhudi A, Sultan AR, Purnamasari NI, Primaguna MR, Hatta M. 2014. Relationships between Flagellin Genes Variants of *Salmonella enterica* Serovar Typhi and Severity of Illness from Acute and Carriers State of Typhoid Fever. *American Journal of Infectious Diseases and Microbiology*, Vol. 2, No. 4, 74-80. DOI: 10.12691/ajidm-2-4-1.
- Samajpati, S., Das S, Ray U, Dutta S. 2018. Report of Relapse Typhoid Fever Cases from Kolkata, India: Recurrences or Reinfection?. *Jpn. J. Infect. Dis.*, 71, 209–213.
- Silva, T. M. 2012. Classical Labeling of Bacterial Pathogens According to Their Lifestyle in the Host: Inconsistencies and Alternatives. *Front Microbiol*; 3: 71. Published online 2012 Februari 29. doi: 10.3389/fmicb.2012.00071. PMID: PMC3289908.

- Soe-Lin, S., Apte, S. S., Andriopoulos, B., Jr., Andrews, M. C., Schranzhofer, M., Kahawita, T., Garcia-Santos, D., Ponka, P. 2009. Nramp1 promotes efficient macrophage recycling of iron following erythrophagocytosis in vivo. *Proc. Nat. Acad. Sci.* 106: 5960-5965, 2009.
- Susanna, L., Patrick, W., Clair, C., Wai-Lan, W., Gibson, W., Kwok-Yung, Y. 2005. Typhoid fever associated with acute appendicitis caused by an H1-j strain of *Salmonella enterica* serotype Typhi. *Journal of clinical microbiology*, 43(3) : 1470-2.
- Tabuchi M, Yoshida T, Takegawa K, Kishi F. Functional analysis of the human NRAMP family expressed in fission yeast. *Biochem J.* 1999;344 Pt 1(Pt 1):211-219.
- Wain J, Rene S. Hendriksen, Matthew L. Mikoleit, Karen H. Keddy, R. Leon Ochiai 2015. Typhoid fever. *Lancet*, 385(9973): 1136–1145. doi: 10.1016/S0140-6736(13)62708-7
- Wain, J., Hosoglu, S. 2008. The Laboratory Diagnosis of Enteric Fever. *J Infect Developing Countries*, Vol. 2. No. 6:421-425.
- Weiss G. 2009. Iron metabolism in the anemia of chronic disease. *Biochimica et Biophysica Acta (BBA) - General Subjects.* 2009;1790(7):682–693. doi: 10.1016/j.bbagen.2008.08.006.
- Wessling-Resnick M. 2015. Nramp1 and Other Transporters Involved in Metal Withholding during Infection. *The Journal of biological chemistry*, 290(31), 18984–18990. doi:10.1074/jbc.R115.643973
- WHO. 2008. Weekly epidemiological record. Typhoid vaccines: WHO position paper, No. 6, 2008, 83, 49–60. Available from: <http://www.who.int/wer>
- Yang YS, Kim SJ, Kim JW, Koh EM. 2000. NRAMP1 gene polymorphisms in patients with rheumatoid arthritis in Koreans. *J Korean Med Sci.* 2000 Feb;15(1):83-7.



## Lampiran 1. Kuesioner penderita Akut Rekuren Demam Tifoid (ARDT) dan DT

**CASE RECORD FORM**

Pertama DT: ...../...../.....

Kedua DT: ...../...../.....

IDPasien 

- |                       |                      |  |                          |                      |              |
|-----------------------|----------------------|--|--------------------------|----------------------|--------------|
| 1. Age                | <input type="text"/> | tahun  | 2. Sex                   | <input type="text"/> | 1.L 2.P      |
| 3. Temperature        | <input type="text"/> | °C   | 4. Duration of illness   | <input type="text"/> | 1. Yes 2. No |
| 5. Malaise            | <input type="text"/> | 1. Yes 2. No   | 6. Lidah Kotor           | <input type="text"/> | 1. Yes 2. No |
| 7. Sakit Kepala       | <input type="text"/> | 1. Yes 2. No   | 8. Nafsu makan turun     | <input type="text"/> | 1. Yes 2. No |
| 9. Bradikardi         | <input type="text"/> | 1. Yes 2. No   | 10. Muntah               | <input type="text"/> | 1. Yes 2. No |
| 12. Nyeri Otot        | <input type="text"/> | 1. Yes 2. No   | 13. Apati                | <input type="text"/> | 1. Yes 2. No |
| 14. Stupor            | <input type="text"/> | 1. Yes 2. No   | 15. Koma                 | <input type="text"/> | 1. Yes 2. No |
| 16. Konstipation      | <input type="text"/> | 1. Yes 2. No   | 17. Abdominal distention | <input type="text"/> | 1. Yes 2. No |
| 18. Diare             | <input type="text"/> | 1. Yes 2. No   | 19. Sakit perut          | <input type="text"/> | 1. Yes 2. No |
| 20. Melena            | <input type="text"/> | 1. Yes 2. No   | 21. Septisemia           | <input type="text"/> | 1. Yes 2. No |
| 22. Perforasi         | <input type="text"/> | 1. Yes 2. No   | 23. Hepatomegali         | <input type="text"/> | 1. Yes 2. No |
| 24. Splenomegali      | <input type="text"/> | 1. Yes 2. No   | 25. Ikterus              | <input type="text"/> | 1. Yes 2. No |
| 26. Lama kekambuhan   | <input type="text"/> | hari   | 27. Pengobatan Lengkap   | <input type="text"/> | 1. Yes 2. No |
| 28. Jenis Antibiotik: | <input type="text"/> | 1. Ampicilline 2. Amoxicillin 3. Sulfamethoxazole-trimethoprim<br>4. Ceftriaxon; 5. Cepefime 6. Cefixime 7. Ofloxacin<br>8. Chloramphenicol. |                          |                      |              |

29. Widal

O antigen  1 = 160 2 = 320 3 = 640 4 = >640H antigen  1 = 160 2 = 320 3 = 640 4 = >64030. No Sampel

## Lampiran 2. Data Akut Rekuren Demam Tifoid (ARDT); n=30

IDPasien	Waktu	1.Umur	2.Sex	3.Suhu	4.Lama	5.Malaise	6.Lidah	7.Kepala	8.Makan	9.Bradikardi	10.Muntah	12.Nyeri	13.Apati	14.Stufor	15.Koma
SDT060	9	23	2	38	6	1	1	1	1	1	2	2	1	2	2
SDT061	12	13	2	37.8	5	1	1	1	1	1	2	2	2	2	2
SDT062	34	16	1	38	6	1	1	1	1	2	2	2	2	2	2
SDT063	24	27	2	39	5	1	1	1	1	1	2	2	2	2	2
SDT064	21	17	1	39	7	1	1	1	1	2	2	2	2	2	2
SDT065	8	17	1	38.5	5	1	1	1	1	2	2	2	2	2	2
SDT066	37	18	2	37.8	6	1	1	1	2	2	1	2	1	2	2
SDT067	16	12	1	38	5	1	1	1	1	2	2	2	2	2	2
SDT068	20	14	2	38.5	5	1	1	1	1	1	2	2	2	2	2
SDT069	15	31	2	39	8	1	1	1	1	2	2	2	2	3	2
SDT070	7	26	2	38	5	1	1	1	2	1	2	2	2	2	2
SDT071	22	14	1	38	7	1	1	1	1	1	2	2	2	2	2
SDT072	33	21	1	37.8	5	1	1	1	1	2	2	2	2	2	2
SDT073	49	17	1	38	5	1	1	1	1	1	2	2	2	2	2
SDT074	35	9	2	37.8	6	1	1	1	1	2	2	2	1	2	2
SDT075	14	10	2	39	5	1	1	1	1	1	2	2	2	2	2
SDT076	27	24	1	38	7	1	1	1	1	2	2	2	2	2	2
SDT077	20	24	2	39	5	1	1	1	1	2	2	2	2	3	2
SDT078	29	28	1	38.5	6	1	1	1	1	1	2	2	1	2	2
SDT079	12	48	2	38.5	5	1	1	1	1	1	1	2	2	2	2
SDT080	21	42	1	37.8	7	1	1	1	2	2	2	2	2	2	2
SDT081	14	40	2	38.5	5	1	1	1	1	1	2	2	2	2	2
SDT082	31	17	1	38	5	1	1	1	1	2	2	2	2	2	2
SDT083	16	18	1	39	6	1	1	1	1	1	2	2	1	3	2
SDT084	8	17	2	38.5	5	1	1	1	1	1	1	2	1	2	2
SDT085	10	15	2	37.8	7	1	1	1	1	2	2	2	2	2	2
SDT086	24	18	2	38	5	1	1	1	1	1	2	2	2	2	2
SDT087	17	9	1	38.7	10	1	1	1	1	1	2	2	2	1	2
SDT088	11	31	2	38.5	5	1	1	1	1	2	1	2	2	2	2
SDT089	8	14	2	38	6	1	2	1	2	1	1	2	1	2	2



## Lampiran 3. Data penderita Demam Tifoid (DT); n=30

IDPasien	1.Umur	2.Sex	3.Suhu	4.Lama	5.Malaise	6.Lidah	7.Kepala	8.Makan	9.Bradikardi	10.Muntah	12.Nyeri	13.Apati	14.Stufor	15.Koma
SDT001	33	2	39	5	1	1	1	1	1	2	2	2	2	2
SDT002	26	1	38.1	8	1	1	1	1	1	2	2	2	2	2
SDT003	17	2	37.9	7	1	1	1	1	2	2	2	2	2	2
SDT004	30	2	38.8	6	1	1	1	1	1	2	2	1	2	2
SDT005	29	2	38.6	7	1	1	1	1	2	2	2	2	2	2
SDT006	25	1	38.7	6	1	1	1	1	2	1	2	2	2	2
SDT007	31	2	38.8	5	1	1	1	2	2	2	2	2	2	2
SDT008	28	1	37.7	7	1	1	1	1	2	2	2	2	2	2
SDT009	18	2	38.4	6	1	1	1	1	1	1	2	2	2	2
SDT010	24	1	38.1	7	2	1	1	1	2	2	2	2	2	2
SDT011	22	2	39	6	1	1	1	2	1	2	2	1	2	2
SDT012	15	1	38.1	6	1	1	1	1	1	2	2	2	2	2
SDT013	31	2	38.3	5	1	1	1	1	2	2	2	2	2	2
SDT014	36	2	38.5	8	1	1	1	1	1	2	2	2	1	2
SDT015	11	1	37.9	6	1	1	1	1	2	2	2	2	2	2
SDT016	19	2	38.9	6	1	1	1	1	1	2	2	2	2	2
SDT017	27	1	38.1	8	1	1	1	1	2	2	2	2	1	2
SDT018	24	2	38.7	6	1	1	1	1	2	2	2	2	2	2
SDT019	19	1	38.7	5	1	1	1	1	1	2	2	1	2	2
SDT020	43	1	38.4	5	1	1	1	1	1	2	2	2	2	2
SDT021	46	1	37.6	6	1	1	1	2	2	2	2	2	2	2
SDT022	41	2	38.2	5	1	1	1	1	1	2	2	2	2	2
SDT023	18	1	37.7	6	1	1	1	1	2	2	2	2	2	2
SDT024	10	1	38.9	7	1	1	1	1	1	2	2	2	2	2
SDT025	28	2	38.5	6	1	1	1	1	1	1	2	1	1	2
SDT026	33	1	37.8	6	1	1	1	1	2	2	2	2	2	2
SDT027	18	2	38.1	7	1	1	1	1	1	2	2	2	2	2
SDT028	13	2	37.9	9	1	1	1	1	1	2	2	2	2	2
SDT029	42	1	38.1	8	1	1	1	1	2	2	2	2	2	2
SDT030	24	1	38.7	5	1	1	1	2	2	1	2	2	1	2



## Lampiran 4. HASIL ANALISA Human NRAMP-1 ELISA Kit Cat. No: CSB-E17597h

## PLATE 1 (Demam tifoid)

No	No Sampel	Konsentrasi pg/ml
1	S01	14731,339
2	S02	11656,586
3	S03	6066,127
4	S04	16128,954
5	S05	13613,247
6	S06	10608,375
7	S07	7323,980
8	S08	16757,881
9	S09	16059,073
10	S10	13962,651
11	S11	14102,412
12	S12	15430,146
13	S13	3620,301
14	S14	6834,815
15	S15	16478,358
16	S16	3131,135
17	S17	8092,668
18	S18	12425,274
19	S19	13753,009
20	S20	6485,411
21	S21	13403,605
22	S22	14591,578
23	S23	5367,319
24	S24	16618,119
25	S25	16198,835
26	S26	7743,265
27	S27	12355,394
28	S28	11167,421
29	S29	2711,851
30	S30	3410,658

## PLATE 2 (Acute Recurrence)

No	No Sampel	Konsentrasi pg/ml
1	S31	13377,057
2	S32	10126,848
3	S33	7721,693
4	S34	13312,053
5	S35	14222,111
6	S36	4211,467
7	S37	11426,931
8	S38	12141,977
9	S39	2326,346
10	S40	13572,069
11	S41	10906,898
12	S42	15197,174
13	S43	13832,086
14	S44	3756,438
15	S45	11751,952
16	S46	14027,099
17	S47	11816,956
18	S48	15392,187
19	S49	14612,136
20	S50	11686,948
21	S51	11101,910
22	S52	14352,120
23	S53	14807,149
24	S54	11036,906
25	S55	3496,421
26	S56	15522,195
27	S57	14482,128
28	S58	2976,388
29	S59	9866,831
30	S60	5186,530

## PLATE 3 (Healthy Persons)

No	No Sampel	Konsentrasi pg/ml
1	S61	21296,107
2	S62	19125,430
3	S63	21228,273
4	S64	21838,776
5	S65	24145,119
6	S66	23059,781
7	S67	19668,099
8	S68	19261,098
9	S69	18854,096
10	S70	22788,447
11	S71	21635,275
12	S72	18921,930
13	S73	24348,620
14	S74	20142,935
15	S75	23738,117
16	S76	23195,448
17	S77	24077,286
18	S78	20549,937
19	S79	19261,098
20	S80	23127,615
21	S81	19057,597
22	S82	22652,779
23	S83	18379,260
24	S84	22042,277
25	S85	22449,278
26	S86	20278,602
27	S87	18854,096
28	S88	19125,430
29	S89	21363,940
30	S90	18650,595



## Lampiran 5

## Data Hasil Widal, Stupor dan Kadar NRAMP-1 pada ARDT

26.Widal	27.No.	28. NRAMP	13.Apati	14.Stufor
2	S31	13,377,057	1	2
2	S32	10,126,848	2	2
2	S33	7,721,693	2	2
2	S34	13,312,053	2	2
2	S35	14,222,111	2	2
3	S36	4,211,467	2	2
2	S37	11,426,931	1	2
2	S38	12,141,977	2	2
2	S39	2,326,346	2	2
3	S40	13,572,069	2	3
3	S41	10,906,898	2	2
2	S42	15,197,174	2	2
2	S43	13,832,086	2	2
3	S44	3,756,438	2	2
2	S45	11,751,952	1	2
2	S46	14,027,099	2	2
2	S47	11,816,956	2	2
2	S48	15,392,187	2	3
2	S49	14,612,136	1	2
2	S50	11,686,948	2	2
3	S51	11,101,910	2	2
2	S52	14,352,120	2	2
2	S53	14,807,149	2	2
2	S54	11,036,906	1	3
2	S55	3,496,421	1	2
2	S56	15,522,195	2	2
2	S57	14,482,128	2	2
3	S58	2,976,388	2	3
2	S59	9,866,831	2	2
2	S60	5,186,530	1	2

## Lampiran 6

## Data Hasil Widal, Stupor dan Kadar NRAMP-1 pada DT

27.No.Sampel	NRAMP	26.Widal	13.Apati	14.Stufor
S01	14,731,339	2	2	2
S02	11,656,586	3	2	2
S03	6,066,127	2	2	2
S04	16,128,954	2	1	2
S05	13,613,247	2	2	2
S06	10,608,375	2	2	2
S07	7,323,980	2	2	1
S08	16,757,881	3	2	1
S09	16,059,073	2	2	2
S10	13,962,651	2	2	2
S11	14,102,412	2	1	2
S12	15,430,146	2	2	2
S13	3,620,301	2	2	2
S14	6,834,815	2	2	1
S15	16,478,358	2	2	2
S16	3,131,135	3	2	2
S17	8,092,668	2	2	1
S18	12,425,274	2	2	2
S19	13,753,009	2	1	2
S20	6,485,411	2	2	2
S21	13,403,605	2	2	2
S22	14,591,578	2	2	2
S23	5,367,319	2	2	2
S24	16,618,119	2	2	1
S25	16,198,835	2	1	2
S26	7,743,265	2	2	2
S27	12,355,394	2	2	2
S28	11,167,421	2	2	2
S29	2,711,851	2	2	2
S30	3,410,658	3	2	1

Lampiran 7  
Rekomendasi persetujuan etik



KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN  
UNIVERSITAS HASANUDDIN FAKULTAS KEDOKTERAN  
KOMITE ETIK PENELITIAN KESEHATAN  
RSPTN UNIVERSITAS HASANUDDIN  
RSUP Dr. WAHIDIN SUDIROHUSODO MAKASSAR  
Sekretariat : Lantai 2 Gedung Laboratorium Terpadu  
JL.PERINTIS KEMERDEKAAN KAMPUS TAMALANREA KM.10 MAKASSAR 90245.



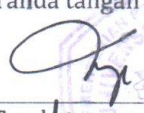

Contact Person: dr. Agussalim Bukhari., MMed, PhD, SpGK TELP. 081241850858, 0411 5780103, Fax : 0411-581431

**REKOMENDASI PERSETUJUAN ETIK**

Nomor : 613/UN4.6.4.5.31/ PP36/ 2020

Tanggal: 5 Oktober 2020

Dengan ini Menyatakan bahwa Protokol dan Dokumen yang Berhubungan Dengan Protokol berikut ini telah mendapatkan Persetujuan Etik :

No Protokol	UH20100542		No Sponsor Protokol	
Peneliti Utama	<b>dr. Ade Rifka Junita, S. Ked</b>		Sponsor	
Judul Peneliti	PENENTUAN KADAR PROTEIN NATURAL RESISTANCE ASSOCIATED MACROPHAGE PROTEIN-1 (NRAMP-1) PADA PENDERITA AKUT REKUREN DEMAM TIFOID (ARDT)			
No Versi Protokol	<b>1</b>		Tanggal Versi	<b>30 September 2020</b>
No Versi PSP			Tanggal Versi	
Tempat Penelitian	<b>Laboratorium Imunologi dan Biologi Molekuler Fakultas Kedokteran Universitas Hasanuddin Makassar</b>			
Jenis Review	<input checked="" type="checkbox"/> Exempted <input type="checkbox"/> Expedited <input type="checkbox"/> Fullboard Tanggal		Masa Berlaku <b>5 Oktober 2020</b> sampai <b>5 Oktober 2021</b>	Frekuensi review lanjutan
Ketua Komisi Etik Penelitian Kesehatan FKUH	Nama <b>Prof.Dr.dr. Suryani As'ad, M.Sc.,Sp.GK (K)</b>		Tanda tangan 	
Sekretaris Komisi Etik Penelitian Kesehatan FKUH	Nama <b>dr. Agussalim Bukhari, M.Med.,Ph.D.,Sp.GK (K)</b>		Tanda tangan 	

Kewajiban Peneliti Utama:

- Menyerahkan Amandemen Protokol untuk persetujuan sebelum di implementasikan
- Menyerahkan Laporan SAE ke Komisi Etik dalam 24 Jam dan dilengkapi dalam 7 hari dan **Lapor SUSAR** dalam 72 Jam setelah Peneliti Utama menerima laporan
- Menyerahkan Laporan Kemajuan (progress report) setiap 6 bulan untuk penelitian resiko tinggi dan setiap setahun untuk penelitian resiko rendah
- Menyerahkan laporan akhir setelah Penelitian berakhir
- Melaporkan penyimpangan dari prokol yang disetujui (protocol deviation / violation)
- Mematuhi semua peraturan yang ditentukan

Lampiran 8  
Surat keterangan jurnal



**KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN**  
**UNIVERSITAS HASANUDDIN**  
**SEKOLAH PASCASARJANA**  
Sekretariat lantai 3 Jl. Perintis Kemerdekaan KM. 10 Makassar, 90245

**SURAT KETERANGAN JURNAL**

Yang bertanda tangan di bawah ini menerangkan bahwa:

Nama : Ade Rifka Junita  
NIM : P062191028  
Program Studi : Biomedik  
Judul Jurnal : Natural Resistance Associated Macrophage Protein-1 Expression in *Salmonella typhi* Infection with Acute Recurrence State of Typhoid Fever in Endemic Areas, Indonesia

Naskah tersebut telah diterima/accept pada **Microbiology Research Journal International (ISSN: 2456-7043)** dan sementara proses proof reading yang terindex **Copernicus** dan mempunyai **Impact factor** -

Makassar, 26 Oktober 2020  
a.n Dekan,  
Wakil Dekan Bidang Akademik  
dan Publikasi Ilmiah

**Prof. Dr. Ir. Laode Asrul, M.P.**  
NIP. 19630307 198812 1 001

Setelah ditandatangani, Silahkan digandakan/Fotocopy



Lampiran 9  
Surat keterangan bebas plagiasi



KEMENTERIAN RISET, TEKNOLOGI, DAN PENDIDIKAN TINGGI  
UNIVERSITAS HASANUDDIN  
SEKOLAH PASCASARJANA

JL. PERINTIS KEMERDEKAAN KM. 10 MAKASSAR 90245 TELP.:(0411) 585034,585036 FAX. : (0411) 585868  
E-mail : [info@pasca.unhas.ac.id](mailto:info@pasca.unhas.ac.id) Website : <http://pasca.unhas.ac.id>

**SURAT KETERANGAN BEBAS PLAGIASI**

Yang bertandatangan di bawah ini, menerangkan bahwa :

Nama : Ade Rifka Junita  
NIM : P062191028  
Program Pendidikan : Magister  
Program Studi : Ilmu Biomedik  
Judul Tesis/Disertasi : Penentuan Kadar Protein Natural Resistance Associated Macrophage Protein-1 (Nramp-1) Pada Penderita Akut Rekuren Demam Tifoid

benar naskah Tesis/Disertasi yang bersangkutan telah melalui proses deteksi plagiasi menggunakan aplikasi Turnitin (maksimal 30%) dengan persentase tingkat kemiripan naskah tersebut sebesar 14 %

Demikian surat keterangan ini dibuat untuk dipergunakan sebagaimana mestinya.

Makassar, 22 Oktober 2020

Menyetujui  
Ketua Program Studi S2  
Ilmu Biomedik

**Dr.dr. Ika Yustisia, M.Sc**

Pemeriksa,

**Arman Jaya, S.Kom.**

Mengetahui,

Wakil Dekan Bidang Akademik, Riset  
dan Publikasi Ilmiah

**Prof.Dr.Ir. Laode Asrul, M.P.**  
NIP. 196303071988121001

Lampiran 10  
Dokumentasi kegiatan

