

DAFTAR PUSTAKA

1. A Kasim VN. Peran Imunitas Pada Infeksi Salmonella Typhi. Edisi 5. Hadrianti S, editor. Artha Samudra. Gorontalo. 2020.
2. Imara F. Salmonella typhi Bakteri Penyebab Demam Tifoid. Pros Semin Nas Biol di Era Pandemi COVID-19 [Internet]. 2020;6(1):1–5. Available from: <http://journal.uin-alauddin.ac.id/index.php/psb/>
3. Laila ON. Perilaku, sanitasi lingkungan rumah dan kejadian demam tifoid. Jurnal Penelitian Kesehatan Suara Forikes. 2022;13(2):525–9. Available from: <http://forikes-ejournal.com/index.php/SF>
4. Elisabeth Purba I, Wandra T, Nugrahini N, Nawawi S, Kandun N. Program Pengendalian Demam Tifoid di Indonesia: Tantangan dan Peluang. Media Penelit dan Pengemb Kesehat. 2016;26(2):99–108.
5. Gunawan D. Ramuan Tradisional untuk Keharmonisan Suami Istri. 5th ed. Jakarta: Penerba Swadaya; 2005.
6. Subowo S. Efek Imunomodulator Dari Tumbuhan Obat. Warta Tumbuhan Obat Indonesia. 1996; 3.
7. Darmawati I, Hnes M, Herwiyanti S. Pengaruh Ekstrak Metanol Akar Pasak Bumi (*Eurycoma Longifolia* Jack) terhadap Jumlah Splenosit Mencit Diinfeksi *Listeria monocytogenes* The Effect of Methanol Extract of *Eurycoma Longifolia* Jack. Root on The Number of Splenocytes of Mice Infected *Listeria monocytogenes*. Mutiara Medika. 2011;11(2):101–10. Available from : <https://journal.umy.ac.id/index.php/mm/article/view/935/1029>.

8. Nurani LH. Kajian Aktivitas Antioksidan dan Imunomodulator Agen Kemopreventif sediaan Terstandar Isolat Aktif Kuasinoid Ekstrak Akar *Eurycoma Longifolia* Jack, Pada Kanker Payudara Tikus SD Putih (Sprague Dawley) yang Diinduksi DMBA. Universitas Ahmad Dahlan. 2010;50–60. Available from :
<https://staff.uad.ac.id/index.php/profile/60990195-laela-hayu-nurani>.
9. Mulyani H, Widyastuti SH, Ekowati VI. Tumbuhan Herbal Sebagai Jamu Pengobatan Tradisional Terhadap Penyakit Dalam Serat Primbon Jampi Jawi Jilid I. *Jurnal Penelitian Humaniora*. 2016;21(2):73–91. Available from :
<https://journal.uny.ac.id/index.php/humaniora/article/view/13109>.
10. Chan KL, Choo CY, Abdullah NR, Ismail Z. Antiplasmodial Studies of *Eurycoma longifolia* Jack using the Lactate dehydrogenase Assay of *Plasmodium falciparum* *Jurnal Ethnopharmacol. National Library Medicine PubMed*. 2004. Available From :
<https://pubmed.ncbi.nlm.nih.gov/15138004/>.
11. Aldi Y, Rasyadi Y, Handayani D. Immunomodulatory Activity of Meniran Extracts (*Phyllanthus niruri* Linn.) on Broiler Chickens. *Jurnal Sains Farmasi Klinik*. 2014;1(1):20–6. Available from :
<http://jsfkonline.org/index.php/jsfk/article/view/21>
12. Abbas A., Lichtman A, Pillai S. *Imunologi Dasar Fungsi dan Kelainan Sistem Imun*. Edisi 1. Kalim H, editor. elsevier; 2016.
13. Kresno SB. *Imunologi : Diagnosis dan Prosedur Laboratorium*. Edisi 5. Badan

Penerbit Fakultas Kedokteran Universitas Indonesia. Jakarta: 2010.

14. Bonardo B, Christina H, Fransisca C, Kristin K, Sudiono J. Peran Monosit (Makrofag) pada Proses Angiogenesis dan Fibrosis. In: Seminar Nasional Cendekiawan. 2015. p. 254–9. Available from :
<https://www.neliti.com/id/publications/171148/peran-monosit-makrofag-pada-proses-angiogenesis-dan-fibrosis>.
15. Handajani A, Roosihermiatio B, Maryani H. Faktor-Faktor yang Berhubungan dengan Pola Kematian Pada Penyakit Degeneratif di Indonesia. Buletin Penelitian Sistem Kesehatan. 2010;13(1):42–53. Available from :
<https://www.neliti.com/id/publications/21301/faktor-faktor-yang-berhubungan-dengan-pola-kematian-pada-penyakit-degeneratif-di>.
16. Kusmardi, Shirly Kumala EET. Efek Imunomodulator Ekstrak Daun Ketepeng Cina (*Cassia alata* L) terhadap Aktivitas dan Kapasitas Fagositosis Makrofag. Makara, Kesehatan. 2007;11(2):50–3. Available from :
https://www.researchgate.net/publication/47406834_Efek_Imunomodulator_Ekstrak_Daun_Ketepeng_Cina_Cassia_Alata_L_Terhadap_Aktivitas_Dan_Kapasitas_Fagositosis_Makrofag.
17. Alamgir M, Uddin SJ. Recent Advances on the Ethnomedicinal Plants as Immunomodulatory Agents. Ethnomedicine Plants. 2010;661(2):227–44. Available from :
<https://www.semanticscholar.org/paper/8.-Recent-advances-on-the-ethnomedicinal-plants-as-Alamgir-Uddin/02f7b136b9467c11b305fa7fc644583a9fe28869>.

18. Ali AH, Abed SM, Ildephonse H. Microencapsulation by Complex Coacervation : Methods, Techniques, Microencapsulation by Complex Coacervation : Methods, Techniques, Benefits, and Applications - A Review. 2016.
Available from : <https://www.mdpi.com/1420-3049/27/16/5142>.
19. Ramadon D, Mun'im A. Pemanfaatan Nanoteknologi dalam Sistem Penghantaran Obat Baru untuk Produk Bahan Alam. Jurnal Ilmu Kefarmasian Indonesia. 2016;14(2)(2):118–27.
Available from: <file:///C:/Users/pc/AppData/Local/Temp/20-25-12-1-10-20170904.pdf>
20. Ansari SH, Islam F, Sameem M. Influence of nanotechnology on herbal drugs: A Review. Journal of Advanced Pharmaceutical Technology and Research. 2012;3(3):142–6. Available from :
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3459443/>.
21. Martien R, Adhyatmika, Irianto IDK, Farida V, Sari DP. Perkembangan Teknologi Nanopartikel Sebagai Sistem Penghantaran Obat. Majalah Farmaseutik. 2012;8(1):133–44.
Available from :
<https://jurnal.ugm.ac.id/majalahfarmaseutik/article/view/24067>.
22. Rajalakshmi R, Indira Muzib Y, Aruna U, Vinesha V, Rupangada V, Krishna Moorthy SB. Chitosan Nanoparticles-an Emerging Trend in Nanotechnology. International Journal of Drug Delivery. 2014;6(3):204–29. Available from :
<http://www.arjournals.org/index.php/ijdd/index>.

23. Djajakusumah TS. the Role of Immunomodulator in the Treatment of Sexually Transmitted Infections. 2010;144–63. Available from :
<https://docplayer.info/54801343-The-role-of-immunomodulator-in-the-treatment-of-sexually-transmitted-infections.html>.
24. Supartini S, Cahyono DDN. Rendemen Akar, Batang dan Daun Pasak Bumi (*Eurycoma longifolia* Jack) Sebagai Bahan Baku Obat Herbal. Jurnal Riset Teknologi Industri. 2020;14(2):142. Available from :
<https://media.neliti.com/media/publications/451337-none-e0783dac.pdf>.
25. Rahim MA, Suartha IN, Sudimartini LM. Efek Imunostimulator Ekstrak Daun Kasturi (*Mangifera Casturi*) Pada Mencit. Indonesia Medicus Veterinus. 2017;6(1):10–9. Available from :
<https://ojs.unud.ac.id/index.php/imv/article/view/32158>.
26. Kensarita, Yasmon A, Wibowo A. Potensi Ekstrak Metanol Akar Pasak Bumi (*Eurycoma Longifolia* Jack) Sebagai Immunomodulator Mencit Putih Jantan (*Mus Musculus*) Terhadap Vaksin BCG = The Potency of Methanol Extract of Pasak Bumi Root (*Eurycoma Longifolia* Jack) as Immunomodulators In Male White Mice (*mus musculus*). Universitas Indonesia. 2014.
Available from: <https://lib.ui.ac.id/detail?id=20403877&lokasi=lokal%0A>
27. Nurani LH, Widyarini S, Mursyidi A. Uji Sitotoksik Dan Uji Kombinasi Fraksi Etil Asetat Ekstrak Etanol Akar Pasak Bumi (*Eurycoma Longifolia* Jack) dan Doksorubisin Pada Sel Limfosit. Journal Tropical Pharmacy Chemistry. 2015;3(2):138–47. Available from :
<https://jtpc.farmasi.unmul.ac.id/index.php/jtpc/article/view/100>.

28. Faisal GG, Zakaria SM, Najmuldeen GF. In vitro antibacterial activity of *Eurycoma longifolia* Jack (Tongkat Ali) root extract. *International Medical Journal Malaysia*. 2015;14(1):77–81. Available from :
<https://journals.iium.edu.my/kom/index.php/imjm/article/view/460>.
29. Widaryanto E, Azizah N. *Perspektif Tanaman Obat Berkhasiat [Internet]. Pertama*. Malang: Universitas Brawijaya Press (UB Press); 2018. 2 p. Available from: <http://www.ubpress.ub.ac.id>
30. Sasmito E. *Imunomodulator Bahan Alami*. Edisi 1. Prabawati A, editor. Rapha Publishing. Yogyakarta: 2017. 200. Available from :
https://unsla-dev.uns.ac.id/neounsla/index.php?p=show_detail&id=231969&keywords=.
31. Purnomo. *Praktik-Praktik Konservasi Lingkungan Secara Tradisional di Jawa*. Edisi 1. Universitas Brawijaya Press (UB Press). Malang : 2015. 68.
32. Sukmono RJ. *Mengatasi Aneka Penyakit dengan Terapi Herbal*. AgroMedia Pustaka. Jakarta : 2009. +228.
33. Hajjouli S, Chateauvieux S, Teiten MH, Orlikova B, Schumacher M, Dicato M, et al. Eurycomanone and Eurycomanol From *Eurycoma Longifolia* Jack as Regulators of Signaling Pathways Involved in Proliferation, Cell Death and Inflammation. *Molecules*. 2014;19(9):14649–66. Available From :
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6270735/>.
34. Zulfahmi. *Keragaman Pasak Bumi di Hutan Larangan Adat Rumbio*. *Angewandte Chemie International Edition*, 6(11), 951–952. CV Mulia Indah Kemala. Pekanbaru : 2015. 951–952.

35. Hadiah J. *Eurycoma longifolia* Jack (Pasak Bumi). *Globinmed*. 2000;2(4):6.
36. Ludang Y. *Keragaman Hayati Ruang Terbuka Hijau Berbasis Pengatahuan Ulayat di Kota Palangka Raya*. Tangerang: AnImage Team; 2017.
37. Bhat R, Karim AA. Tongkat Ali (*Eurycoma longifolia* Jack): A review on its ethnobotany and pharmacological importance. *Fitoterapia*. 2010;81(7):669–79.
Available from :
<http://dx.doi.org/10.1016/j.fitote.2010.04.006>
38. Rehman SU, Choe K, Yoo HH. Review on a traditional herbal medicine, *eurycoma longifolia* Jack (Tongkat Ali): Its traditional uses, chemistry, evidence-based pharmacology and toxicology. *Molecules*. 2016;21(3).
Available from :
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6274257/>.
39. Farouk G., Zakaria S., Najmuldeen G., Al-Ani I. Antibacterial activity of *Eurycoma longifolia* Jack. *Saudi Med*. 2007;28(9):1422–4.
40. Mohd Effendy N, Mohamed N, Muhammad N, Naina Mohamad I, Shuid AN. *Eurycoma longifolia*: Medicinal plant in the prevention and treatment of male osteoporosis due to androgen deficiency. *Evidence-based Complement Altern Med*. 2012;2012.
41. Ang HH, Ngai TH, Tan TH. Effects of *Eurycoma longifolia* Jack on sexual qualities in middle aged male rats. *Phytomedicine*. 2003;10(6–7):590–3.
Available from : <https://pubmed.ncbi.nlm.nih.gov/13678248/>.
42. Chan KL, Choo CY, Abdullah NR. Semisynthetic 15-O-Acyl- and 1,15-Di-O-acyleurycomanones from *Eurycoma longifolia* as potential antimalarials.

Planta Med. 2005;71(10):967–9. Available from :

<https://pubmed.ncbi.nlm.nih.gov/16254833/>.

43. Hidayat S, Napitupulu M, Rodame. Kitab Tumbuhan Obat. Nurrohmah FA, editor. AgriFlo (Penebar Swadaya Grup). Jakarta:2015.
44. Murti SF. Etnofarmakologi dan Pemakaian Tanaman Obat Suku Daya Tunjung di Kalimantan Timur. Media Litbang Kesehatan. vol. 2010. hh. 104–12. Available from :
<https://www.neliti.com/publications/153674/etnofarmakologi-dan-pemakaian-tanaman-obat-suku-dayak-tunjung-di-kalimantan-timu>.
45. Silalahi M. Etnobotani pasak bumi (*Eurycoma longifolia*) pada etnis Batak, Sumatera Utara. biodiversitas Indonesia. 2015;1(1987):743–6. Available from :
<https://smujo.id/psnmbi/article/view/1159/1133>.
46. Saprudin Hasibuan ES dan Ei. Kajian Ekologi Pasak Bumi (*Eurycoma Longifolia* Jack) dan Pemanfaatan Oleh Masyarakat di Sekitar Hutan Larangan Adat Rumbio, Kabupaten Kampar Provinsi Riau. Jurnal Kehutanan Wahana Forestra. 2016;11(2):112–26. Available from :
<https://journal.unilak.ac.id/index.php/forestra/article/view/152>.
47. Mahfudh N, Pihie AHL. Eurycomanone Induces Apoptosis Through The Up-Regulation of P53 in Human Cervical Carcinoma Cells. Jurnal Cancer Molecul. 2008;4(4):109–15.
Available from :
<http://eprints.uad.ac.id/1395/1/UAD-JOCM-Nurkhasanah-eurycomanone->

induces-apoptosis.pdf.

48. Tee TT, Azimahtol HLP. Induction of apoptosis by *Eurycoma longifolia* Jack extracts. *Anticancer Research*. 2005;25(3 B):2205–13. Available from :
<https://pubmed.ncbi.nlm.nih.gov/16158965/>.
49. Kristanti AN, Aminah NSi, Tanjung M, Kurniadi B. *Buku Ajar Fitokimia*. Edisi 1. Airlangga University Press. Surabaya: 2008.
50. Sholikhah AR, Rahayuningsih HM. Pengaruh Ekstrak Lompong (*Colocasia Esculenta* L. Schoot) 30 Menit Pengukusan terhadap Aktivitas Fagositosis dan Kadar No (Nitrit Oksida) Mencit Balb/C Sebelum dan Sesudah Terinfeksi *Listeria monocytogenes*. *Jurnal of Nutrition College*. 2015;4(4):463–8. Available from
<https://ejournal3.undip.ac.id/index.php/jnc/article/view/10148>.
51. Man S, Gao W, Zhang Y, Huang L, Liu C. Chemical Study and Medical Application of Saponins as Anti-Cancer Agents. *Fitoterapia*. 2010;81(7):703–14. Available from:
<http://dx.doi.org/10.1016/j.fitote.2010.06.004>
52. Tizaed I, Partodiredjo M, Hardjosworo S. *Pengantar Imunologi Veteriner*. ad 2. Surabaya: Airlangga University Press; 1987.
53. Francis G, Kerem Z, Makkar HPS, Becker K. The Biological Action of Saponins in Animal Systems: A Review. *British Journal Nutrition*. 2002;88(6):587–605. Available from :
<https://pubmed.ncbi.nlm.nih.gov/12493081/>.
54. Rijayanti RP. *In vitro* Antibacterial Activity test Of Ethanol Extracts Bacang

- mango (*Mangifera foetida* L) Leaves Against *Staphylococcus aureus*. Naskah Publikasi Universitas Tanjung Pura. 2014;1(1):10–2.
55. Yulianingsih SNA, Yuliani R, Munawaroh R. Aktivitas Antibakteri Ekstrak Etanol Daun Belimbing Wuluh (*Averrhoa Bilimbi* L) terhadap *Staphylococcus Aureus* dan *Staphylococcus Epidermidis*. 2012. Available from :
<http://eprints.ums.ac.id/20708/16/>
56. Nagarani B, Debnath S, Kumar S, Bhattacharjee C, Ganesh Kumar G. a Review: Herbs Used As Anticancer Agents. *Irjp* . 2011;2(1):20–4.
Available from: <http://www.irjponline.com>
57. Rosnizar, Eriani K, Ramli IM, Muliani F. Uji Efek Immunostmulan Buah Kurma (*Phoenix dactylifera* Pada Mencit Jantan (*Mus musculus*) Galur Balb/C. Universitas Islam Ar-Raniry. 2015;292–7. Available from :
<https://jurnal.ar-raniry.ac.id/index.php/PBiotik/article/view/2703>.
58. Bone K, Mills S. Principles and Practice of Phytotherapy Modern Herbal Medicine. *Modern Herbal Medicine*. 2013;1–1051. Availble from :
<https://www.elsevier.com/books/principles-and-practice-of-phytotherapy/9780443069925>.
59. Hanani E. *Analisi Fitokimia*. Jakarta: Buku Kedokteran EGC; 2017.
60. Kumoro. *Teknologi Ekstraksi Senyawa Bahan Aktif dari Tanaman Obat*. 2015. 1–27.
61. Yuniningsih S, Sota Mm, Studi P, Kimia T, Teknik F, Tribhuwana U, Et Al. Pengaruh Ph Terhadap Kualitas Produk Etanol. *Reka Buana*. 2017;2(2):99–105. Available from :

<https://jurnal.unitri.ac.id/index.php/rekabuana/article/view/725>.

62. Leba MAU. Buku Ajar Ekstraksi dan Real Kromatografi. Edisi 1. Deepublish. Yogyakarta: 2017. 117.
63. R V. Buku Pelajaran Teknologi Farmasi. Neorono Soendari, editor. Yogyakarta: Gajah Mada University press; 1995.
64. Hanani E. Analisis Fitokimia. Hardinata TVD. Buku Kedokteran EGC. Jakarta: 2015.
65. Winarti L. Penggunaan Formulasi Nanopartikel Kitosan Sebagai Penghantaran Obat Gen Non Viral untuk Terapi Gen. Stomatognatic Jurnal Kedokteran Gigi. 2011;8(3):142–50. Available from :
<https://jurnal.unej.ac.id/index.php/STOMA/article/view/2125>.
66. Sugita P, Bintang M, Achmadi SS, Pradono DI, Irwadi TT, Darusman KL. Segi Kimiawi dan Biokimiawi dari Sistem Pengantar Obat. 1st ed. Sari MS, Andari ND, editors. PT. Penerbit IPB Press. Bogor : 2017.
67. Efiana NA, Nugroho AK, Martien R. Formulasi Nanopartikel Losartan dengan Pembawa Kitosan (Formulation of Losartan Nanoparticles with Chitosan as a Carrier). Jurnal Ilmu Kefarmasian Indonesia. 2013;11(1):7–12. Available from :
<http://jifi.farmasi.univpancasila.ac.id/index.php/jifi/article/download/225/159/>.
68. Ajazuddin, Saraf S. Applications of novel drug delivery system for herbal formulations. Fitoterapia [Internet]. 2010;81(7):680–9. Available from :
<http://dx.doi.org/10.1016/j.fitote.2010.05.001>
69. Prayoga T, Lisnawati N. No Title. Wandana D, DAZ B, editors. Surabaya: CV.

Jakad Media Publishing; 2020. 73.

70. Rachmawati H, Reker-Smit C, Hooge ML, Leonen-Weemaes A van, Poelstra K, Beljaars L. Chemical modification of interleukin-10 with mannose 6-phosphate groups yields a liver-selective cytokine. *Drug Metab Dispos.* Pubmed. 2007. Available from ;
<https://pubmed.ncbi.nlm.nih.gov/17312017/>
71. Coulter B. *Delsa Nano Series*. 2008.
72. Perdana D. *Pengembangan Awal Sistem Pembawa Polimerik Berbasis Nanopartikel*. Institut Teknologi Bandung. Bandung : 2007.
73. Fahmi MZ. *Nanoteknologi dalam Perspektif Kesehatan*. Edisi 1. Wahyudi R, Febrianto E, editors. Airlangga University Press. Surabaya : 2019. 106.
74. Patravale VB, Date AA, Kulkarni RM. Nanosuspensions: a promising drug delivery strategy. *J Pharm Pharmacol*. 2010;56(7):827–40. Available from :
<https://pubmed.ncbi.nlm.nih.gov/15233860/>.
75. Murdock RC, Braydich-Stolle L, Schrand AM, Schlager JJ, Hussain SM. Characterization of Nanomaterial Dispersion in Solution Prior to in Vitro Exposure Using Dynamic Light Scattering Technique. *Toxicol Sci*. 2008;101(2):239–53.
Available from : <https://pubmed.ncbi.nlm.nih.gov/17872897/>.
76. Delie F, Blanco-Príeto MJ. Polymeric particulates to improve oral bioavailability of peptide drugs. *Molecules*. 2005;10(1):65–80. Available from :
<https://pubmed.ncbi.nlm.nih.gov/18007277/>.

77. Ridwan DGS. Nanopartikel dan Nanofluida Perpindahan Panas: Sintesis, Karakterisasi dan Aplikasi. Edisi 1. Dani Gustaman Syarif, editor. Batan Press. Jakarta : 2016. 133–146.
78. Irianto HE. Proses Dan Aplikasi Nanopartikel Kitosan Sebagai Penghantar obat. *Squalen*. 2011;6(1):1–8. Available from :
<https://adoc.pub/proses-dan-aplikasi-nanopartikel-kitosan-sebagai-penghantar-.html>.
79. Anonim. Chitosan : apakah Manfaat chitosn ? *Naturakos III*. 2008;7.
80. Talu'mu M. Sintesis Kitosan Nanopartikel dengan Metode Sonokimia, Gelasi Ionotropik, dan Kompleks Polielektrolit. *Jurnal Progres Kimia Sains*. 2011;1(2):130–7. Available from :
<https://www.neliti.com/id/publications/210562/sintesis-kitosan-nanopartikel-dengan-metode-sonokimia-gelasi-ionotropik-dan-komp>.
81. Nakorn PN a. Chitin Nanowhisker and Chitosan Nanoparticles in Protein Immobilization for Biosensor Applications. *Jurnal Metal Materials and Minerals*. 2008;18(2):73–7.
Available from :
<https://jmmm.material.chula.ac.th/index.php/jmmm/article/view/314>.
82. Ibrahim HM, El-Bisi MK, Taha GM, El-Alfy EA. Chitosan nanoparticles loaded antibiotics as drug delivery biomaterial. *J Appl Pharm Sci*. 2015;5(10):85–90. Available from :
<https://www.bibliomed.org/?mno=196813>.
83. Rowe RC, Cordes MG. *xPharm: The Comprehensive Pharmacology*

- Reference. 9th ed.. In: Rowe RC, Sheskey PJ, Quinn ME, editors. Povidone. London : 2007. 1–3.
84. Setiawan A, Widiana DR, Nugroho PNA. Sintesis dan Karakterisasi Kitosan Mikropartikel dengan Modifikasi Gelasi Ionik. *Jurnal Perikanan Universitas Gadjah Mada*. 2015;17(2):90–5. Available from :
<https://jurnal.ugm.ac.id/jfs/article/view/10367>.
85. A. L W, H.B Y, M R, Q C, X. F Z. effect of different group containing synthetis of nanoparticles at room temperature. *acta Metal sininica*. 2008;
86. Putri Ai, Sundaryono A, Chandra In. Karakterisasi Nanopartikel Kitosan Ekstrak Daun Ubijalar (*Ipomoea Batatas L.*) Menggunakan Metode Gelasi Ionik. *Alotrop*. 2019;2(2):203–7. Available from :
<https://ejournal.unib.ac.id/index.php/alotropjurnal/article/view/7561>.
87. Tandiono S. Pembuatan dan Evaluasi Suspensi Nanopartikel Kitosan Natrium Tripolufasfat sebagai Anti Bakteri. 2018. Available from:
<https://www.usu.ac.id/id/fakultas.html>
88. Sagalla bili DM. Formulasi Beads Kitosan untuk Pelepasan Obat Terkendali. Skripsi. 2012;11–2. Available from :
<https://lib.ui.ac.id/file?file=digital/20308617-S%2042591-Formulasi%20beads-full%20text.pdf>.
89. Fan W, Yan W, Xu Z, Ni H. Formation mechanism of monodisperse, low molecular weight chitosan nanoparticles by ionic gelation technique. *Colloids Surfaces B Biointerfaces*. 2012;90(1):21–7. Available from:
<http://dx.doi.org/10.1016/j.colsurfb.2011.09.042>

90. Kong M, Chen XG, Xing K, Park HJ. Antimicrobial properties of chitosan and mode of action: A state of the art review. *Int J Food Microbiol.* 2010;144(1):51–63. Available from :
<http://dx.doi.org/10.1016/j.ijfoodmicro.2010.09.012>
91. Fàbregas A, Miñarro M, García-Montoya E, Pérez-Lozano P, Carrillo C, Sarrate R, et al. Impact of physical parameters on particle size and reaction yield when using the ionic gelation method to obtain cationic polymeric chitosan-tripolyphosphate nanoparticles. *International Journal Pharmaceutical.* 2013;446(1–2):199–204. Available. from :
<https://pubmed.ncbi.nlm.nih.gov/23434543/>.
92. Dash M, Chiellini F, Ottenbrite RM, Chiellini E. Chitosan - A versatile semi-synthetic polymer in biomedical applications. *Prog Polym Sci.* 2011;36(8):981–1014. Available from :
<http://dx.doi.org/10.1016/j.progpolymsci.2011.02.001>
93. XZ S, KJ Z. A novel approach to prepare tripolyphosphate/chitosan complex beads for controlled release drug delivery. *Int J Pharm.* 2000. Available from :
<https://pubmed.ncbi.nlm.nih.gov/10867264/>
94. Shen W-C, Louie S. *Immunology for Pharmacy Students.* 2005. 199.
95. Antari AL. *Imunologi Dasar. Buku Elektronik. Edisi 1.* In: Noviantoko D, Fadilah ER, editors. Grup Penerbitan CV Budi Utama. Yogyakarta : 2017.
96. Bottino C, Castriconi Ro, Moretta L, Moretta A. Cellular ligands of activating NK receptors. *Trends Immunol.* 2005;26(4):221-6.
Available from : <https://pubmed.ncbi.nlm.nih.gov/15797513/> .

97. Baratawidjaja KG, Rengganis I. imunologi Dasar. Badan Penerbit Fakultas Kedokteran Universitas Indonesia. Jakarta : 2014.
98. Abbas AK, Lichtman AH, Pillai S. Cellular and molecular immunology. Edisi 6. Philadelphia Sauders ; 2007.
99. Marlina N, Widhyasih RM. bahan ajar Teknologi Laboratorium Medik (TLM) Imunoserologi. In: Darmanto BA, Pohan FH, editors. Kemenkes RI. Edisi 1. Kementrian Kesehatan RI. Jakarta : 2018.
100. Baratawidjaja KG, Rengganis I. Imunologi Dasar. Edisi 12. Badan Penerbit Fakultas Kedokteran Universitas Indonesia. Jakarta : 2018.
101. Passantino L, Altamura M, Cianciotta A, Patruno R, Tafaro A, Jirillo E, Et Al. And Engulfment Of Candida Albicans By Erythrocytes Of Rainbow Trout (*Salmo Gairdneri* Richardson). 2002;24(4):665–78. Available from : <https://www.tandfonline.com/doi/abs/10.1081/IPH-120016050>.
102. Abbas AK, Lichtman AH, Pillai S. Basic immunology: functions and disorders of the immune system. 5th ed. Elsevier St.Louis; 2016.
103. Yamada K, Hung P, Park TK, Park PJ, Lim BO. A comparison of the immunostimulatory effects of the medicinal herbs Echinacea, Ashwagandha and Brahmi. Journal Ethnopharmacol. 2011;137(1):231–5. Available from: <http://dx.doi.org/10.1016/j.jep.2011.05.017>
104. Maharyati R, Pawarti DR. Mucosal immune system of the upper respiratory tract. Solutions. 2011;4(6):1–6. Available from : <http://journal.unair.ac.id/THTKL@mucosal-immune-system-of-the-upper-respiratory-tract-article-12092-media-43-category-3.html>.

105. Baratawidjaja KG. *Imunologi Dasar*. Fakultas Kedokteran Universitas Indonesia. Jakarta : 2009.
106. Arum I, Purwanto, Rya H. *Phyllanthus niruri* L Terhadap Imunitas Seluler Tikus. *Indonesia Journal Clinical Pathologi Med Lab*. 2011;18(1):4–11.
Available from :
<https://www.indonesianjournalofclinicalpathology.org/index.php/patologi/article/view/358>
107. Imam A. Efek Imunostimulator Ekstrak Etanol Daun Katuk (*Sauropus Androgynus* L Merr) Terhadap Aktivitas Fagositosis Makrofag. *Journal Chem Inf Model*. 2013;53(9):1689–99. Available from :
<https://digitallibrary.ump.ac.id/498/>.
108. Tizard I. *An introduction to veterinary immunology*. In: *immunologi*. Edisi 2. Philadelphia: Philadelphia Sauders; 1982.
109. Hendrasula AR. Uji Aktivitas Imunostimulan Ekstrak Etanol Umbi Sarang Semut (*Myrmecodia archboldiana* Merr. & L.M. Perry) Pada Tikus Putih Jantan. *Pharm Universitas Indonesia*. 2011. Available from :
<https://lib.ui.ac.id/file?file=pdf/metadata-20279359.pdf>
110. Janeway CA, Travers P, Walport M, Scholmchik MJ. *Immunobiology The immune System in Health and Disease*. In: NCBI. 5th ed. Garland Science. New York : 2001.
111. Helgason CD, Miller CL. *Basic Cell Culture Protocols Third edition Methods in Molecular Biology*. From *Methods Mol Biol Basic Cell Cult Protoc*. 2005;290:365. Available from:

https://www.bjcancer.org/Sites_OldFiles/_Library/UserFiles/pdf/Basic_Cell_Culture_3_Edition.pdf

112. Dubois Gc, Oppenheim Jj. Brief Definitive Report Purification And Characterization Of A Novel Monocyte Chemotactic And Activating Factor. 1989;169(April):1485–90. Available from :
<https://pubmed.ncbi.nlm.nih.gov/2926331/>.
113. Noss EH, Pai RK, Sellati TJ, Radolf JD, Belisle J, Golenbock DT, et al. Toll-Like Receptor 2-Dependent Inhibition of Macrophage Class II MHC Expression and Antigen Processing by 19-kDa Lipoprotein of Mycobacterium tuberculosis. *Jurnal Immunol.* 2001;167(2):910–8. Available from :
<https://pubmed.ncbi.nlm.nih.gov/11441098/>.
114. Akbar B. Tumbuhan dengan Kandungan Senyawa Aktif yang Berpotensi sebagai Bahan Antifertilitas. Adabia Press. Jakarta : 2010. vii,55-59.
115. Susanti R, Yuniastuti A. Aktivitas Reactive Oxygen Species Makrofag Akibat Stimulasi Gel Lidah Buaya Pada Infeksi Salmonella Typhimurium. 2012;35(1). Available from :
<https://journal.unnes.ac.id/nju/index.php/JM/article/view/2091>.
116. Handayani N. Uji Aktivitas Fagositosis Makrofag Ekstrak Etanol Daun Suji (*Dracaena Angustifolia* (Medik.)Roxb.) Secara In Vitro. *Jurnal Farmasi Medica/Pharmacy Med J* . 2018;1(1):26–32. Available from:
<https://ejournal.unsrat.ac.id/index.php/pmj/article/download/19648/19233>
117. Steindachner P, Jensch-junior BE, Pressinotti LN, Borges S, Machado R. Characterization of macrophage phagocytosis of the tropical fish.

2006;251:509–15. Available from :

<https://doi.org/10.1016/j.aquaculture.2005.05.042>

118. Riyanto A. Aplikasi Metodologi Penelitian Kesehatan. Edisi 2. Fiddarain A, editor. Nuha Medika. Yogyakarta : 2017.
119. Sugiyono. Metodologi Penelitian Pendidikan. Edisi 25. Alfabeta. Bandung : 2017.
120. Sujarweni VW. Metodologi Penelitian. Pustaka Baru Press. Yogyakarta : 2014.
121. Nuralifah et al. Uji Tosisitas Akut Ekstrak Etanol Daun Notika terhadap Larva artemia salina leach Metode BSLT. 2018;4(1):1–5. Available from :
<https://ojs.uho.ac.id/index.php/pharmauho/article/view/4618>.
122. Hertiani T, Sasmito E, Sumardi, Ulfah M. Preliminary study on immunomodulatory effect of Sarang-Semut tubers *Myrmecodia tuberosa* and *Myrmecodia pendens*. Online Jur Biol Sci. 2010;10(3):136–41. Available from :
<https://www.thescipub.com/abstract/10.3844/ojbsci.2010.136.141>.
123. Sari DI, Triyasmono L. Rendemen dan Flavonoid Total Ekstrak Etanol Kulit Batang Bangkal (*Nauclea subdita*) dengan Metode Maserasi Ultrasonikasi. J Pharmascience. 2017;4(1):48–53. Available from:
<https://ppjp.ulm.ac.id/journal/index.php/pharmascience/article/view/5755>
124. Trevor R. Kandungan Organ Tumbuhan Tinggi. 6th ed. Padmawinata K, editor. Institut Teknologi Bandung. Bandung : 1995. 367.
125. Rinaldi F F, Ibrahim A, Fadraersada J, Rijai L. Identifikasi Metabolit Sekunder dan Pengujian Toksisitas Ekstrak Metanol Kulit Kayu Laban (*Vitex Pinnata*

- L.) dengan Metode Brine Shrimp Lethality Test (Bslt). 2016. Available from :
<https://prosiding.farmasi.unmul.ac.id/index.php/mpc/article/view/172>.
126. Fernanda MAH., Andriani RD, Estulengani Z, Kusumo GG. Identification and Determination of Total Flavonoids in Ethanol Extract of Old and Young Angsana Leaves (*Pterocarpus indicus* Willd.) Using Visible Spectrophotometry. *Sci Technol*. 2019;(Icps):541–4. Available from:
<https://www.scitepress.org/Papers/2018/75466/75466.pdf>
127. Rachel Nimenibo-Uadia; Ifeanyi Ugwu; Theophilus Erameh;, Osunde E. Estimation of tannins, alkaloids, saponins and proximate composition of *Vernonia amygdalina* (Del) root. *Int J Herb Med* [Internet]. 2017;5(3):88–92. Available from:
<https://www.florajournal.com/archives/2017/vol5issue3/PartB/6-1-20-617.pdf>
128. Lailani M, Edward Z, Herman RB. Gambaran Tekanan Darah Tikus Wistar Jantan dan Betina Setelah Pemberian Diet Tinggi Garam. *Jurnal Kesehatan Andalas*. 2013;2(3):146. Available from :
<http://jurnal.fk.unand.ac.id/index.php/jka/article/view/154>.
129. Cahyaningsih RA. Efek Nefroprotektif Infus Daun Sukun (*Artocarpus altilis* (Park.) Fsb.) Pada Tikus Jantan yang Diinduksi Karbon Tetraklorida. *Pharmaceutical and Sciences Research*. 2011;8(2). Available from :
<https://www.neliti.com/id/publications/157843/efek-nefroprotektif-infus-daun-sukun-artocarpus-altilis-park-fsb-pada-tikus-jant>.
130. Suprapti L. *Pedoman Pembutan Media dan Reagensia Racik*. 1st ed. Pramono A, editor. Yogyakarta: Budi Utama; 2020.

131. Hannan A, Asghar S, Naeem T, Ullah MI, Ahmed I, Aneela S, et al. Antibacterial effect of mango (*Mangifera indica* Linn.) leaf extract against antibiotic sensitive and multi-drug resistant *Salmonella typhi*. *Pak J Pharm Sci.* 2013;26(4):715–9.
132. Hartini YS, Wahyuono S, Widyarini S, Yuswanto A. Uji aktivitas fagositosis makrofag senyawa kode PC-2 dari daun sirih merah (*Piper crocatum* Ruiz & Pav.) secara in-vivo. *E-Journal Litbang Kemenkes.* 2013;6(1):68–78. Available from <http://ejournal.litbang.kemkes.go.id/index.php/toi/article/viewFile/8807/804580458139>.
133. Derré I, Isberg RR. Macrophages from mice with the restrictive *Lgn1* allele exhibit multifactorial resistance to *Legionella pneumophila*. *Infect Immun.* 2004;72(11):6221–9. Available from : <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC523022/>.
134. Campbell PA, Canono BP, Drevets DA. Measurement of Bacterial Ingestion and Killing by Macrophages. *Curr Protoc Immunol.* 1994;12(1):1–13. available from : <https://pubmed.ncbi.nlm.nih.gov/18432724/>.
135. Kresno SB. imunologi diagnosis dan prosedur laboratorium. Edisi 4. Fakultas Kedokteran Universitas Indonesia. Jakarta : 2010. 539. Available from : <https://lib.ui.ac.id/detail.jsp?id=135902>
136. Willy Tirza Eden, Buanasari, Shihabuddin NKB. Efek Imunomodulator Ekstrak Etanol Daun Som Jawa Pada Mencit Jantan Galur Swiss. *Media Farm*

Indones. 2016;12(1):1126–35. Available from :

<https://scholar.google.co.id/citations?user=iV4XZR0AAAAJ&hl=en>.

137. Notoatmodjo S. metodologi Penelitian Kesehatan. Jakarta: Rineka Cipta; 2018.
138. Kombinasi P, Dan T, Sebagai S. The Effect Of The Combination Of Tween 80 And Span 80 As Emulsifier On The Encapsulation Of Kenikir Flower Extract Using Arabic Gum Pada Enkapsulasi Ekstrak Bunga Kenikir Menggunakan Gum Tanaman kenikir (*Tagetes erecta* L) . 2022;10(4):493–505.
139. Nadia LMH, Suptijah P-, Ibrahim B-. Production and Characterization Chitosan Nano from Black Tiger Shrimp with Ionic Gelation Methods. Jurnal Pengolahan Hasil Perikanan Indonesia. 2014;17(2):119–26. Available from :
<https://journal.ipb.ac.id/index.php/jphpi/article/view/8700/6798>.
140. Husniati, Oktarina E. Sintesis nano partikel kitosan dan pengaruhnya terhadap inhibisi bakteri pembusuk jus nenas. Jurnal Dinamika Penelitian Industri. 2014;25(2):89–95. Available from :
<https://www.neliti.com/id/publications/76971/sintesis-nano-partikel-kitosan-dan-pengaruhnya-terhadap-inhibisi-bakteri-pembusu>.
141. Ocheke NA, Olorunfemi PO, Ngwuluka NC. Nanotechnology and drug delivery part 2: Nanostructures for drug delivery. Tropical Journal Pharmaceutical Research. 2009;8(3):275–87. Available from :
<https://www.ajol.info/index.php/tjpr/article/view/44547/28049>.
142. Wagner H. Immunostimulans from Higher Plants in Biologically Active Natural Products. Hostattman K, Lea P., editors. Oxford: Clarendon Press; 1989. 127–

143. Jr ME, C K, TC T. The effects of plant flavonoids on mammalian cells: implications for inflammation, heart disease, and cancer. *pharmacol Rev.* 2000;4(52):673–751. Available from :
<https://pubmed.ncbi.nlm.nih.gov/11121513/>
144. Lukiaty B, A A, Darmanto W. Profil Distribusi Inos Dan Kadar No Pankreas Tikus Diabetes Melitus Hasil Induksi Mld-Stz Pasca Pemberian Ekstrak Etanol Temugiring (*Curcuma heyneana*). *Jurnal Kedokteran Hewan-Indonesia Journal Vet Sci.* 2012;6(2). Available from:
<https://jurnal.unsyiah.ac.id/JKH/article/download/343/328>
145. Mubayinah M, Rahayuningsih HM. Pengaruh Ekstrak Lompong (*Colocasia Esculenta* L. Schoot) 45 Menit Pengukusan Terhadap Aktivitas Fagositosis Dan Kadar No (Nitrit Oksida) Mencit Balb/C Sebelum Dan Sesudah Terinfeksi *Listeria Monocytogenes*. *Jurnal Nutrition College.* 2015;4(4):578–84. Available from :
<https://www.neliti.com/id/publications/96281/pengaruh-ekstrak-lompong-colocasia-esculenta-l-schoot-45-menit-pengukusan-terhad>.
146. Ibrahim MN, Widjajanto E, Permatasari N, Sabarudin A. Carboxymethyl Chitosan Reduces Mast Cell Degranulation Induced By Ovalbumin Karboksimetil Kitosan Menurunkan Degranulasi Mast Cell yang Diinduksi Oleh Ovalbumin. *M Ibrahim, E Widjajanto, N Permatasari.* 2009;(11):6–9..
147. Wahyuni W, Yusuf MI, Malik F, Lubis AF, Indalifiany A, Sahidin I. Efek Imunomodulator Ekstrak Etanol *Spongia Melophlus sarasinorum* Terhadap Aktivitas Fagositosis Sel Makrofag Pada Mencit Jantan Balb/C. *Jurnal Farmasi*

Galenika. 2019;5(2):147–57. Available from :

<https://bestjournal.untad.ac.id/index.php/Galenika/article/view/13611>.

148. Abbas AK, Lichtman AH. Basic Immunology. edition 20. elsevier; 2004.
149. Pancawari Ariami, Addien Faqih Pajenengan, Maruni Wiwin Diarti W. Imunostimulator Ekstrak Etanol Anredera Cordifolia Terhadap Titer Widal Salmonella typhi O Pada Rattus Norvergicus Galur Wistar. Poltekita J Ilmu Kesehatan [Internet]. 2021;15(1):12–8. Available from: <https://jurnal.poltekkespalu.ac.id/index.php/JIK/article/download/413/160>
150. Roopchand DE, Carmody RN, Kuhn P, Moskal K, Rojas-Silva P, Turnbaugh PJ, et al. Dietary polyphenols promote growth of the gut bacterium akkermansia muciniphila and attenuate high-fat diet-induced metabolic syndrome. Diabetes. 2015;64(8):2847–58.Desjardins M, Griffiths G. Phagocytosis Latex Leads the way. Elsevier. 2003;4. Available from: [https://doi.org/10.1016/S0955-0674\(03\)00083-8](https://doi.org/10.1016/S0955-0674(03)00083-8)
151. Al-Khayri JM, Sahana GR, Nagella P, Joseph B V., Alessa FM, Al-Mssallem MQ. Flavonoids as Potential Anti-Inflammatory Molecules: A Review. Molecules. 2022;27(9).
152. Desjardins M, Griffiths G. Phagocytosis Latex Leads the way. Elsevier [Internet]. 2003;4. Available from: [https://doi.org/10.1016/S0955-0674\(03\)00083-8](https://doi.org/10.1016/S0955-0674(03)00083-8)
153. Hartini YS, Wahyuono S, Widyarini S, Farmasi F, Sanata U, Farmasi F, et al. Uji Aktivitas Fagositosis Makrofag Senyawa Kode Pc-2 dari Daun Sirih Merah (Piper crocatum Ruiz & Pav) Secara In-vivo. Jurnal Ilmu Kefarmasian

Indonesia. 2004;11:1–12. Available from :

<http://ejournal.litbang.kemkes.go.id/index.php/toi/article/viewFile/8807/804580458139>.

154. Cannon GJ, Swanson JA. The macrophage capacity for phagocytosis. *Jur o Cell Sci*. 1992;913:907–13. Available from :
<https://pubmed.ncbi.nlm.nih.gov/1527185/>.
155. Karimaa A. Uji in Vitro Senyawa Antikanker SA 2014 terhadap Aktivitas Fagositosis Sel Makrofag (Mus musculus). *Jurnal Sains dan Seni ITS*. 2019;7(2). Available from :
https://ejurnal.its.ac.id/index.php/sains_seni/article/view/30846.
156. Lestari LA, Soesatyo MHNE, Iravati S, Harmayani E. Peningkatan aktivitas fagositosis dan produksi nitrit oksida pada makrofag peritoneum tikus Sprague Dawley yang diberi *Lactobacillus plantarum* Mut7 dan ekstrak serat ubi jalar. *J Gizi Klin Indones*. 2012;9(2):64.
157. Bai N, Wenbing Z, Mai K, Wang X, Xu W, Ma H. Effects of discontinuous administration of β -glucan and glycyrrhizin on the growth and immunity of white shrimp *Litopenaeus vannamei*. *Aquaculture*. 2010;306(1–4):218–24
- 158 Makiyah A, Husin UA, Sadeli R. Efek Imunostimulasi Ekstrak Etanol Umbi Iles-iles Terhadap Aktivitas Fagositosis Sel Makrofag pada Tikus Putih Strain Wistar yang Diinokulasi *Staphylococcus aureus*. *Majalah Kedokteran Bandung*. 2016;48(2):68–77. Available from:
<https://journal.fk.unpad.ac.id/index.php/mkb/article/download/759/pdf>