UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA

Abbasi, E. (2025). The Impact of Climate Change on Travel-Related Vector-Borne Diseases: A Case Study on Dengue Virus Transmission. *Travel Medicine and Infectious Disease*, *65*, 1–9. https://doi.org/10.1016/j.tmaid.2025.102841

Abbasi, W. A., Yaseen, A., Hassan, F. U., Andleeb, S., & Minhas, F. U. A. A. (2020). ISLAND: In-Silico Proteins Binding Affinity Prediction using Sequence Information. *BioData Mining*, *13*(1), 1–13. https://doi.org/10.1186/s13040-020-00231-w

Abrusán, G., & Marsh, J. A. (2016). Alpha Helix are More Robust to Mutations than Beta Strands. *PLoS Computational Biology*, *12*(12). https://doi.org/10.1371/journal.pcbi.1005242

Achappa, S., Aldabaan, N. A., Alasmary, M., Shaikh, I. A., Mahnashi, M. H., Desai, S. V, Muddapur, U. M., Khan, A. A., & Mannasaheb, B. A. (2025). Exploration of Effective Pharmacological Inhibitors for NS5 Protein through Computational Approach: A Strategy to Combat the Neglected Kyasanur Forest Disease Virus. *PLOS ONE*, *20*(7 July), 1–44. https://doi.org/10.1371/journal.pone.0325613

Adhav, V. A., & Saikrishnan, K. (2023). The Realm of Unconventional Noncovalent Interactions in Proteins: Their Significance in Structure and Function. *ACS Omega*, *8*(25), 22268–22284. https://doi.org/10.1021/acsomega.3c00205

Afonine, P. V, Klaholz, B. P., Moriarty, N. W., Poon, B. K., Sobolev, O. V, Terwilliger, T. C., Adams, P. D., & Urzhumtsev, A. (2018). New Tools for the Analysis and Validation of Cryo-EM Maps and Atomic Models. *Acta Crystallographica Section D: Structural Biology*, *74*(9), 814–840. https://doi.org/10.1107/S2059798318009324

Akualing, J. S., Aryati, A., Wardhani, P., & Hadi, U. (2017). Identification of Dengue Virus Serotypes at the Dr. Soetomo Hospital Surabaya in 2016 and Its

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Correlation with NS1 Antigen Detection. *Indonesian Journal of Clinical Pathology and Medical Laboratory*, *23*(2), 151–156. https://doi.org/10.24293/ijcpml.v23i2.1138

Alcalá, A. C., & Ludert, J. E. (2023). The Dengue Virus NS1 Protein; New Roles in Pathogenesis due to Similarities with and Afinity for the High-Density Lipoprotein (HDL). *PLoS Pathogens*, *19*(8 August), 1–7. https://doi.org/10.1371/journal.ppat.1011587

Ali, L., Kanwal, N., Saleem, I., Ali, H., Amraiz, D., Akram, M., Shahid, I., & Yang, J. (2025). Molecular and Structural Insights into Dengue Virus Non-Structural Proteins from Pakistani Clinical Isolates for the Identification of Novel Antiviral Targets. *Virus Research*, *361*, 1–11. https://doi.org/10.1016/j.virusres.2025.199637

Ali, N. (2026). Dengue and Chikungunya Interface in South and Southeast Asia: Epidemiology, Challenges and Future Directions. *Journal of Infection and Public Health*, *19*(6), 1–15. https://doi.org/10.1016/j.jiph.2026.103232

Alkaff, A. H., Saragih, M., Fardiansyah, M. A., & Tambunan, U. S. F. (2020). Role of Immunoinformatics in Accelerating Epitope-Based Vaccine Development against Dengue Virus. *The Open Biochemistry Journal*, *14*(1), 9–18. https://doi.org/10.2174/1874091x02014010009

Al-Numair, N. S. (2014). *Analysis of the Impact of Mutation and Prediction of Their Pathogenicity*.

Al-Thiabat, M. G., Saqallah, F. G., Gazzali, A. M., Mohtar, N., Yap, B. K., Choong, Y. S., & Wahab, H. A. (2021). Heterocyclic Substitutions Greatly Improve Affinity and Stability of Folic Acid towards Frα. an In Silico Insight. *Molecules*, *26*(4), 1–28. https://doi.org/10.3390/molecules26041079

Amir, M., Hussain, A., Asif, M., Ahmed, S., Alam, H., Moga, M. A., Cocuz, M. E., Marceanu, L., & Blidaru, A. (2021). Full-Length Genome and Partial Viral

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Genes Phylogenetic and Geographical Analysis of Dengue Serotype 3 Isolates. *Microorganisms*, *9*(2), 1–14. https://doi.org/10.3390/microorganisms9020323

Ammar, A., Cavill, R., Evelo, C., & Willighagen, E. (2023). PSnpBind-ML: Predicting the Effect of Binding Site Mutations on Protein-Ligand Binding Affinity. *Journal of Cheminformatics*, *15*(1), 1–21. https://doi.org/10.1186/s13321-023-00701-3

Anand, A. M., Sistla, S., Dhodapkar, R., Hamide, A., Biswal, N., & Srinivasan, B. (2016). Evaluation of NS1 Antigen Detection for Early Diagnosis of Dengue in a Tertiary Hospital in Southern India. *Journal of Clinical and Diagnostic Research*, *10*(4), DC01–DC04. https://doi.org/10.7860/JCDR/2016/15758.7562

Andriyoko, B., Parwati, I., Tjandrawati, A., & Lismayanti, L. (2012). Penentuan Serotipe Virus Dengue dan Gambaran Manifestasi Klinis serta Hematologi Rutin pada Infeksi Virus Dengue. *Majalah Kedokteran Bandung*, *44*(4), 253–260.

Anh, D. D., Sani, L. M., Riyanti, R., Istinaroh, N., My, T. N., Van Tong, H., Oktarianti, R., Huyen, T. T. T., Song, L. H., Senjarini, K., & Velavan, T. P. (2025). Diagnostic Challenges of Arboviral Infections and Dengue Virus Serotype Distribution in Febrile Patients in East Java, Indonesia. *IJID Regions*, *14*. https://doi.org/10.1016/j.ijregi.2024.100512

Ardy, A. M., Wijaya, A., & Fadilla, R. (2023). Peran Sains Informasi Geografi dalam Analisis Spasial Persebaran Daerah Rawan Penyakit DBD di Kota Depok. *Jurnal Ilmiah Penalaran Dan Penelitian Mahasiswa*, *7*(1), 16–26.

Arguni, E., Indriani, C., Rahayu, A., Supriyati, E., Yohan, B., Hayati, R. F., Wardana, S., Tantowijoyo, W., Anshari, M. R., Rahayu, E., Rubangi, Ahmad, R. A., Utarini, A., Simmons, C. P., & Sasmono, R. T. (2022). Dengue Virus Population Genetics in Yogyakarta, Indonesia prior to City-Wide Wolbachia Deployment. *Infection, Genetics and Evolution*, *102*, 1–12. https://doi.org/10.1016/j.meegid.2022.105308

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Aryati, A., Wrahatnala, B. J., Yohan, B., Fanny, M., Hakim, F. K. N., Sunari, E. P., Zuroidah, N., Wardhani, P., Santoso, M. S., Husada, D., Rohman, A., Tarmizi, S. N., Sievers, J. T. O., & Sasmono, R. T. (2020). Dengue Virus Serotype 4 is Responsible for the Outbreak of Dengue in East Java City of Jember, Indonesia. *Viruses*, *12*(9). https://doi.org/10.3390/v12090913

Aryati, & Wardhani, P. (2010). Profil Virus Dengue di Kota Surabaya Tahun 2008-2009. *Indonesian Journal of Clinical Pathology and Medical Laboratory*, *17*(1), 20–24.

Aryati, Wardhani, P., Yohan, B., Aksono, E. B., & Sasmono, R. T. (2012). Distribusi Serotipe Dengue di Surabaya Tahun 2012. *Indonesian Journal of Clinical Pathology and Medical Laboratory*, *19*(1), 41.

Asishe, Ismarina, Ikhlasiah, M., & Prihayati. (2024). Overview of Dengue Hemorrhagic Fever (DHF) Prevention in The Community Health Center. *Nursing and Health Sciences Journal (NHSJ)*, *4*(3), 356–360. https://doi.org/10.53713/nhsj.v4i3.407

Azzhara, A., Oktavia, L. V., Naviyanto, M. F., Fauziyah, S., Sucipto, T. H., Winarni, D., Wahyuningsih, S. P. A., Churrotin, S., Amarullah, I. H., & Soegijanto, S. (2020). Preliminary Study of Dengue Virus Serotype on Aedes Mosquitoes in Endemic Area, Surabaya, Indonesia, January 2020. *Ecoloy, Environment and Conservation*, *26*, S1–S5. https://www.researchgate.net/publication/347232801

Badan Pusat Statistika Kota Surabaya. (2024). *Kota Surabaya dalam Angka 2024*.

Bailey, S. F., Morales, L. A. A., & Kassen, R. (2021). Effects of Synonymous Mutations beyond Codon Bias: The Evidence for Adaptive Synonymous Substitutions from Microbial Evolution Experiments. *Genome Biology and Evolution*, *13*(9), 1–18. https://doi.org/10.1093/gbe/evab141

Balingit, J. C., Denis, D., Suzuki, R., Hayati, R. F., Ngwe Tun, M. M., Takamatsu, Y., Masyeni, S., Sasmono, R. T., & Morita, K. (2024). Impact of Pre-Existing

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Cross-Reactive Antibodies on Cyclic Dengue Outbreaks in the Hyperendemic Region of Bali, Indonesia. *Virus Research*, *348*, 1–10. https://doi.org/10.1016/j.virusres.2024.199445

Banach, M., Fabian, P., Stapor, K., Konieczny, L., & Roterman, I. (2020). Structure of the Hydrophobic Core Determines the 3D Protein Structure - Verification by Single Mutation Proteins. *Biomolecules*, *10*(5), 1–20. https://doi.org/10.3390/biom10050767

Barbosa, F. D. O., Ropón-Palacios, G., & de Araujo, A. S. (2025, October 28). Impact of Glycosylation on the Structural Dynamics of the Dengue Virus Serotype 2 Envelope Protein. *Proceedings 49TH Annual Meeting of the Brazilian Biophysical Society*. https://proceedings.science/p/210431?lang=en

Bautista, J. J., Santos, C. M. D., Teodoro, J. K., & Duldulao, D. J. C. (2025). Inhibitory Action of Selected Alkaloids Targeting the NonStructural Protein-1 (NS1) of Dengue Virus Type-4 (DENV4) in silico. *Biomedical and Pharmacology Journal*, *18*(1), 929–938. https://doi.org/10.13005/bpj/3141

Begum, M. N., Tony, S. R., Samia, N. S. N., Karim, Y., Ghosh, K., Mobarak, R., Tayab, M. A., Sarkar, P. K., Ahmed, F., Parvez, M., Dola, N. Z., Rashed, A., Khair, S., Alam, S., Jubair, M., & Rahman, M. (2025). Dengue Virus Detection in Nasopharyngeal Swabs among Pediatric Cases in Bangladesh. *IJID Regions*, *15*, 1–6. https://doi.org/10.1016/j.ijregi.2025.100670

Bernard, S., & Parikesit, A. A. (2022). 3D Molecular Structure Analysis of NS2B/NS3 Protease Derived from Dengue Virus and Zika Virus. *Trends in Infection and Global Health*, *2*(1), 22–26. https://doi.org/10.24815/tigh.v2i1.25485

Bertoni, M., Kiefer, F., Biasini, M., Bordoli, L., & Schwede, T. (2017). Modeling Protein Quaternary Structure of Homo- and Hetero-Oligomers Beyond Binary Interactions by Homology. *Scientific Reports*, *7*(1), 1–15. https://doi.org/10.1038/s41598-017-09654-8

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Bhatnagar, P., Sreekanth, G. P., Murali-Krishna, K., Chandele, A., & Sitaraman, R. (2021). Dengue Virus Non-Structural Protein 5 as a Versatile, Multi-Functional Effector in Host–Pathogen Interactions. *Frontiers in Cellular and Infection Microbiology*, *11*. https://doi.org/10.3389/fcimb.2021.574067

Bhattacharjee, N., & Biswas, P. (2013). Helical Ambivalency Induced by Point Mutations. *BMC Structural Biology*, *13*(9), 1–11. http://www.biomedcentral.com/1472-6807/13/9

Bhavana, M. V. (2020). Dengue Tests: What, When, and How? *Pediatric Infectious Disease*, *2*(3), 118–119. https://doi.org/10.5005/jp-journals-10081-1276

Bilgin, E., Tugcu, G., & Aydin, A. (2026). Advancing Torsades de Pointes Risk Prediction: Unveiling the Role of Drug Metabolites through Molecular Docking. *Toxicology Research*, *15*(1), 1–14. https://doi.org/10.1093/toxres/tfaf186

Brinzei, M., Stefaniu, A., Iulian, O., & Ciocirlan, O. (2020). Density Functional Theory (DFT) and Thermodynamics Calculations of Amino Acids with Polar Uncharged Side Chains. *Chemistry Proceedings*, *3*(1). www.mdpi.com/journal/proceedings

Bryan-Marrugo, O. L., Arellanos-Soto, D., Rojas-Martinez, A., Barrera-Saldaña, H., Ramos-Jimenez, J., Vidaltamayo, R., & Rivas-Estilla, A. M. (2016). The Anti-Dengue Virus Properties of Statins May Be Associated with Alterations in the Cellular Antiviral Profile Expression. *Molecular Medicine Reports*, *14*(3), 2155–2163. https://doi.org/10.3892/mmr.2016.5519

Cano, E. A., Maligaya, A., Manuales, B. E., Maravilla, A. A., Melevo, K. J., Plastina, K. G., Pontawe, J., Ramos, P. J., & Regio, P. Z. (2024). In silico Comparative Structural and Functional Analysis of Dengue Virus (Serotypes 1 to 4) Envelope Protein. *International Journal of Mosquito Research*, *11*(2), 13–29. https://doi.org/10.22271/23487941.2024.v11.i2a.764

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Castellano, L. A., McNamara, R. J., Pallares, H. M., Gamarnik, A. V, Alvarez, D. E., & Bazzini, A. A. (2023). *Dengue Virus Preferentially Uses Human and Mosquito Non-Optimal Codons*. https://doi.org/10.1101/2023.06.14.544804

Chakraborty, C., Bhattacharya, M., Islam, M. A., & Agoramoorthy, G. (2025). DENV-1 and DENV-2 More Prevalent in Dengue-Dominated Southeast Asia as a Natural Geographic Cluster. *Annals of Medicine & Surgery*, *87*(4), 2518–2520. https://doi.org/10.1097/ms9.0000000000003160

Chen, H. R., Lai, Y. C., & Yeh, T. M. (2018). Dengue Virus Non-Structural Protein 1: A Pathogenic Factor, Therapeutic Target, and Vaccine Candidate. *Journal of Biomedical Science*, *25*(1), 1–11. https://doi.org/10.1186/s12929-018-0462-0

Chen, J., Zheng, D., Wen, W., Li, R., Liu, K., & Lin, H. (2026). Associations of Human Mobility Patterns with Dengue Fever in China: A Spatiotemporal Modeling Analysis from 2005 to 2023. *International Journal of Infectious Diseases*, *167*, 1–9. https://doi.org/10.1016/j.ijid.2026.108534

Chen, L. H., Marti, C., Perez, C. D., Jackson, B. M., Simon, A. M., & Lu, M. (2023). Epidemiology and Burden of Dengue Fever in the United States: A Systematic Review. *Journal of Travel Medicine*, *30*(7), 1–17. https://doi.org/10.1093/jtm/taad127

Chien, L. J., Liao, T. L., Shu, P. Y., Huang, J. H., Gubler, D. J., & Chang, G. J. J. (2006). Development of Real-Time Reverse Transcriptase PCR Assays to Detect and Serotype Dengue Viruses. *Journal of Clinical Microbiology*, *44*(4), 1295–1304. https://doi.org/10.1128/JCM.44.4.1295-1304.2006

Chin-Inmanu, K., Mairiang, D., Khongthon, P., Sangsrakru, D., Tangphatsornruang, S., Tangthawornchaikul, N., Malasit, P., & Suriyaphol, P. (2023). Genetic Diversity of the Dengue Virus Population in Dengue Fever and Dengue Hemorrhagic Fever Patients. *Asian Pacific Journal of Allergy and Immunology*, *41*(4), 361–371. https://doi.org/10.12932/ap-230620-0887

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Christenbury, J. G., Aw, P. P. K., Ong, S. H., Schreiber, M. J., Chow, A., Gubler, D. J., Vasudevan, S. G., Ooi, E. E., & Hibberd, M. L. (2010). A Method for Full Genome Sequencing of All Four Serotypes of the Dengue Virus. *Journal of Virological Methods*, *169*(1), 202–206. https://doi.org/10.1016/j.jviromet.2010.06.013

Cocherie, T., Zafilaza, K., Leducq, V., Marot, S., Calvez, V., Marcelin, A. G., & Todesco, E. (2023). Epidemiology and Characteristics of SARS-CoV-2 Variants of Concern: The Impacts of the Spike Mutations. *Microorganisms*, *11*(1), 1–13. https://doi.org/10.3390/microorganisms11010030

Coronel-Ruiz, C., Velandia-Romero, M. L., Calvo, E., Camacho-Ortega, S., Parra-Alvarez, S., Beltrán, E. O., Calderón-Pelaez, M. A., Porras-Ramírez, A., Cortés-Muñoz, F., Rojas-Hernandez, J. P., Velasco-Alvarez, S., Pinzón-Junca, A., & Castellanos, J. E. (2023). Improving Dengue Diagnosis and Case Confirmation in Children by Combining Rapid Diagnostic Tests, Clinical, and Laboratory Variables. *Frontiers in Tropical Diseases*, *4*, 1–15. https://doi.org/10.3389/fitd.2023.1118774

Dada, E. G., Oyewola, D. O., Yakubu, J. H., & Fadele, A. A. (2021). Predicting Protein Secondary Structure Based on Ensemble Neural Network. *Journal of Engineering and Technology for Industrial Applications*, *7*(27), 49–56. https://doi.org/10.5935/jetia.v7i27.732

Datu, A. M., Natzir, R., Yustisia, I., Wahid, I., Soraya, G. V., & Kadir, S. (2023). Molecular Detection and Analysis of Dengue Virus Genetic Diversity in North Sulawesi, Indonesia during 2022. *Biodiversitas*, *24*(6), 3407–3413. https://doi.org/10.13057/biodiv/d240636

Davidson, R. B., Hendrix, J., Geiss, B. J., & McCullagh, M. (2018). Allostery in the Dengue Virus NS3 Helicase: Insights into the NTPase Cycle from Molecular Simulations. *PLoS Computational Biology*, *14*(4), 1–28. https://doi.org/10.1371/journal.pcbi.1006103

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Dayananda, P. D., Nissanka, B. G. D., & De Silva, K. (2022). Asymptomatic Dengue and Silent Transmission. *IntechOpen*, 1–22. www.intechopen.com

De Maio, F. A., Risso, G., Iglesias, N. G., Shah, P., Pozzi, B., Gebhard, L. G., Mammi, P., Mancini, E., Yanovsky, M. J., Andino, R., Krogan, N., Srebrow, A., & Gamarnik, A. V. (2016). The Dengue Virus NS5 Protein Intrudes in the Cellular Spliceosome and Modulates Splicing. *PLoS Pathogens*, *12*(8). https://doi.org/10.1371/journal.ppat.1005841

Delgado-Enciso, I., Lopez-Lemus, U. A., Valcarcel-Gamino, J. A., Rodriguez-Sanchez, I. P., Valle-Reyes, S., Martinez-Fierro, M. L., Melnikov, V., Guzman-Esquivel, J., Vaca-Paniagua, F., Valdez-Velazquez, L. L., Baltazar-Rodriguez, L. M., Soriano-Hernandez, A. D., Paz-Michel, B., & Espinoza-Gomez, F. (2018). Dengue Virus-1 NS5 Genetic Variant Associated with a Severe Clinical Infection: Possible Reduction of the Innate Immune Response by Inhibition of Interferon Type 1 and the Janus Kinase-Signal Transducer and Activator of Transcription Signaling Pathway. *International Journal of Molecular Medicine*, *41*(4), 2263–2269. https://doi.org/10.3892/ijmm.2018.3395

Diarsvitri, W., Budiarti, R., Nugraheni, P. A., Ilmawan, M. F., & Biutifasari, V. (2020). Dengue Lurks during Coronavirus Disease-19 Pandemic in Indonesia: A Narrative Review. *Open Access Macedonian Journal of Medical Sciences*, *8*(T1), 391–398. https://doi.org/10.3889/oamjms.2020.5328

Dinas Kesehatan Kota Surabaya. (2020). *Profil Kesehatan Kota Surabaya Tahun 2019*.

Dinas Kesehatan Kota Surabaya. (2024). *Profil Kesehatan Kota Surabaya Tahun 2023*.

Dolan, P. T., Taguwa, S., Rangel, M. A., Acevedo, A., Hagai, T., Andino, R., & Frydman, J. (2021). Principles of Dengue Virus Evolvability Derived from Genotype-Fitness Maps in Human and Mosquito Cells. *ELife*, *10*, 1–61. https://doi.org/10.7554/eLife.61921

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Dong, B., Liu, Z., Xu, D., Hou, C., Niu, N., & Wang, G. (2024). Impact of Multi-Factor Features on Protein Secondary Structure Prediction. *Biomolecules*, *14*(9), 1–20. https://doi.org/10.3390/biom14091155

Du, X., Li, Y., Xia, Y. L., Ai, S. M., Liang, J., Sang, P., Ji, X. L., & Liu, S. Q. (2016). Insights into Protein-Ligand Interactions: Mechanisms, Models, and Methods. *International Journal of Molecular Sciences*, *17*(2), 1–34. https://doi.org/10.3390/ijms17020144

Dwivedi, V. D., Tripathi, I. P., Tripathi, R. C., Bharadwaj, S., & Mishra, S. K. (2017). Genomics, Proteomics and Evolution of Dengue Virus. *Briefings in Functional Genomics*, *16*(4), 217–227. https://doi.org/10.1093/bfgp/elw040

Fadaka, A. O., Sibuyi, N. R. S., Martin, D. R., Goboza, M., Klein, A., Madiehe, A. M., & Meyer, M. (2021). Immunoinformatics Design of a Novel Epitope-Based Vaccine Candidate against Dengue Virus. *Scientific Reports*, *11*(19707), 1–23. https://doi.org/10.1038/s41598-021-99227-7

Fajarani, R., Martini, & Adi, M. S. (2020). Gambaran Variasi Serotipe Virus Dengue pada Pasien Infeksi Dengue di Kota Semarang Tahun 2019 (Penelitian di Rumah Sakit dan Puskesmas Kota Semarang). *Jurnal Kesehatan Masyarakat*, *8*(1), 169–176. http://ejournal3.undip.ac.id/index.php/jkm

Faltejsková, K., Jakubec, D., & Vondrášek, J. (2020). Hydrophobic Amino Acids as Universal Elements of Protein-Induced DNA Structure Deformation. *International Journal of Molecular Sciences*, *21*(11), 1–15. https://doi.org/10.3390/ijms21113986

Farasari, R., & Azinar, M. (2018). Model Buku Saku dan Rapor Pemantauan Jentik dalam Meningkatkan Perilaku Pemberantasan Sarang Nyamuk. *Journal of Health Education*, *3*(2), 110–117. http://journal.unnes.ac.id/sju/index.php/jhealthedu

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Fatmawati, F. (2023). Homology Modelling of Pseudomonas stutzeri ZS04 Lipase. *Journal of Research in Pharmaceutical Science*, *9*(1), 12–17. www.questjournals.org

Ferenczy, G. G., & Kellermayer, M. (2022). Contribution of Hydrophobic Interactions to Protein Mechanical Stability. *Computational and Structural Biotechnology Journal*, *20*, 1946–1956. https://doi.org/10.1016/j.csbj.2022.04.025

Friebe, P., & Harris, E. (2010). Interplay of RNA Elements in the Dengue Virus 5′ and 3′ Ends Required for Viral RNA Replication. *Journal of Virology*, *84*(12), 6103–6118. https://doi.org/10.1128/jvi.02042-09

Fu, Y., Zhao, J., & Chen, Z. (2018). Insights into the Molecular Mechanisms of Protein-Ligand Interactions by Molecular Docking and Molecular Dynamics Simulation: A Case of Oligopeptide Binding Protein. *Computational and Mathematical Methods in Medicine*, *2018*, 1–12. https://doi.org/10.1155/2018/3502514

Gamaarachchi, H., Parameswaran, S., & Smith, M. A. (2019). Featherweight Long Read Alignment using Partitioned Reference Indexes. *Scientific Reports*, *9*(1), 1–12. https://doi.org/10.1038/s41598-019-40739-8

Gan, J., Kong, X., Xiao, Z., Chen, Y., Du, M., Wang, Y., Wang, Z., Cheng, Y., & Xu, B. (2022). Calcium Binding Mechanism of Soybean Peptide with Histidine Alteration by Molecular Docking Analysis and Spectroscopic Methods. *Foods*, *11*(20), 1–14. https://doi.org/10.3390/foods11203290

Gao, Y., He, D., & Patro, R. (2026). QCatch: A Framework for Quality Control Assessment and Analysis of Single-Cell Sequencing Data. *Bioinformatics*, *42*(5), 1–6. https://doi.org/10.1093/bioinformatics/btag184

Gebhard, L. G., Iglesias, N. G., Byk, L. A., Filomatori, C. V., De Maio, F. A., & Gamarnik, A. V. (2016). A Proline-Rich N-Terminal Region of the Dengue

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Virus NS3 Is Crucial for Infectious Particle Production. *Journal of Virology*, *90*(11), 5451–5461. https://doi.org/10.1128/jvi.00206-16

Ghaisani, N. P., Sulistiawati, & Lucia Inge Lusida, M. (2021). Correlation Between Climate Factors with Dengue Hemorrhagic Fever Cases in Surabaya 2007-2017. *Indonesian Journal of Tropical and Infectious DIsease*, *9*(1), 39–44. https://e-journal.unair.ac.id/IJTID/

Glasner, D. R., Puerta-Guardo, H., Beatty, P. R., & Harris, E. (2018). The Good, the Bad, and the Shocking: The Multiple Roles of Dengue Virus Nonstructural Protein 1 in Protection and Pathogenesis. *Annual Review of Virology*, *5*(1), 227–253. https://doi.org/10.1146/annurev-virology-101416-041848

Goh, J. Z. H., De Hayr, L., Khromykh, A. A., & Slonchak, A. (2024). The Flavivirus Non-Structural Protein 5 (NS5): Structure, Functions, and Targeting for Development of Vaccines and Therapeutics. *Vaccines*, *12*(8), 1–29. https://doi.org/10.3390/vaccines12080865

Golding, M. A. J., Noble, S. A. A., Khouri, N. K., Layne-Yarde, R. N. A., Ali, I., & Sandiford, S. L. (2023). Natural Vertical Transmission of Dengue Virus in Latin America and the Carribean: Highlighting its Detection Limitations and Potential Significance. *Parasites and Vectors*, *16*(1). https://doi.org/10.1186/s13071-023-06043-1

Gromiha, M. M., Yugandhar, K., & Jemimah, S. (2017). Protein-Protein Interactions: Scoring Schemes and Binding Affinity. *Current Opinion in Structural Biology*, *44*, 31–38. https://doi.org/10.1016/j.sbi.2016.10.016

Gubler, D. J. (2006). Dengue/Dengue Haemorrhagic Fever: History and Current Status. *New Treatment Strategies for Dengue and Other Flaviviral Diseases: Novartis Foundation Symposium 277*, 3.

Gutiérrez-Barbosa, H., Castañeda, N. Y., & Castellanos, J. E. (2020). Differential Replicative Fitness of the Four Dengue Virus Serotypes Circulating in

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Colombia in Human Liver Huh7 Cells. *Brazilian Journal of Infectious Diseases*, *24*(1), 13–24. https://doi.org/10.1016/j.bjid.2019.11.003

Halim, S., Felecia, F., & Octavia, T. (2021). Statistical Learning for Predicting Dengue Fever Rate in Surabaya. *Jurnal Teknik Industri*, *22*(1), 37–46. https://doi.org/10.9744/jti.22.1.37-46

Harapan, H., Michie, A., Yohan, B., Shu, P. Y., Mudatsir, M., Sasmono, R. T., & Imrie, A. (2019). Dengue Viruses Circulating in Indonesia: A Systematic Review and Phylogenetic Analysis of Data from Five Decades. *Reviews in Medical Virology*, *29*(4), 1–17. https://doi.org/10.1002/rmv.2037

Haron, F. N., Azazi, A., Chua, K. H., Lim, Y. A. L., Lee, P. C., & Chew, C. H. (2022). In silico Structural Modeling and Quality Assessment of Plasmodium knowlesi Apical Membrane Antigen 1 using Comparative Protein Models. *Tropical Biomedicine*, *39*(3), 394–401. https://doi.org/10.47665/tb.39.3.009

Hassan, A. M., Gattan, H. S., Faizo, A. A., Alruhaili, M. H., Alharbi, A. S., Bajrai, L. H., AL-Zahrani, I. A., Dwivedi, V. D., & Azhar, E. I. (2024). Evaluating the Binding Potential and Stability of Drug-like Compounds with the Monkeypox Virus VP39 Protein Using Molecular Dynamics Simulations and Free Energy Analysis. *Pharmaceuticals*, *17*(12), 1–22. https://doi.org/10.3390/ph17121617

Hernández, B., Coïc, Y. M., Kruglik, S. G., Sanchez-Cortes, S., & Ghomi, M. (2025). Influence of Side Chain–Backbone Interactions and Explicit Hydration on Characteristic Aromatic Raman Fingerprints as Analysed in Tripeptides Gly-Xxx-Gly (Xxx = Phe, Tyr, Trp). *International Journal of Molecular Sciences*, *26*(8), 1–19. https://doi.org/10.3390/ijms26083911

Hershan, A. A. (2023). Dengue Virus: Molecular Biology and Recent Developments in Control Strategies, Prevention, Management, and Therapeutics. *Journal of Pharmacology and Pharmacotherapeutics*, *14*(2), 107–124. https://doi.org/10.1177/0976500X231204401

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Hidayatullah, A., Putra, W. E., Salma, W. O., Muchtaromah, B., Permatasari, G. W., Susanto, H., Widiastuti, D., & Kismurtono, M. (2020). Discovery of Drug Candidate from Various Natural Products as Potential Novel Dengue Virus Nonstructural Protein 5 (NS5) Inhibitor. *Chiang Mai University Journal of Natural Sciences*, *20*(1), 1–17. https://cmuj.cmu.ac.th

Hikmawati, I., & Huda, S. (2021). *Peran Nyamuk sebagai Vektor Demam Berdarah Dengue (DBD) melalui Transovarial* (Febriani Safitri, Ed.). Satria Publisher.

Hikmawati, I., Wahjono, H., Martini, M., Darmana, E., Hadisaputro, S., Mustika Djati, K. R., & Mardihusodo, S. J. (2021). Persistence of Dengue Virus (DENV-1, 2, 3, 4) Transovarial-Transgenerational with Realtime Polymerase Chain Reaction (qPCR) in Ae. aegypti and Ae. albopictus (Diptera: Culiciadea). *Women Health Care and Issues*, *4*(8), 01–09. https://doi.org/10.31579/2642-9756/090

Hirasawa, T., Satoh, Y., & Koma, D. (2025). Production of Aromatic Amino Acids and Their Derivatives by Escherichia coli and Corynebacterium glutamicum. *World Journal of Microbiology and Biotechnology*, *41*(2), 1–14. https://doi.org/10.1007/s11274-025-04264-3

Hýsková, A., Maršálková, E., & Šimeček, P. (2026). Balancing Speed and Precision in Protein Folding: A Comparison of AlphaFold2, ESMFold, and OmegaFold. *Frontiers in Genetics*, *16*, 1–10. https://doi.org/10.3389/fgene.2025.1715037

Ilic, I., & Ilic, M. (2024). Global Patterns of Trends in Incidence and Mortality of Dengue, 1990–2019: An Analysis Based on the Global Burden of Disease Study. *Medicina (Lithuania)*, *60*(3), 1–12. https://doi.org/10.3390/medicina60030425

Inderiati, D., Yanti, Y., Sofia, A., & Anhar, C. A. (2025). Diagnostic Validity Analysis of NS1-Based Rapid Test Compared with RT-PCR for Dengue Detection in Batam. *Meditory : The Journal of Medical Laboratory*, *13*(2), 123–134. https://doi.org/10.33992/meditory.v13i2.4801

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Islam, M. T., Quispe, C., Herrera-Bravo, J., Sarkar, C., Sharma, R., Garg, N., Fredes, L. I., Martorell, M., Alshehri, M. M., Sharifi-Rad, J., Daştan, S. D., Calina, D., Alsafi, R., Alghamdi, S., Batiha, G. E. S., & Cruz-Martins, N. (2021). Production, Transmission, Pathogenesis, and Control of Dengue Virus: A Literature-Based Undivided Perspective. *BioMed Research International*, *2021*, 1. https://doi.org/10.1155/2021/4224816

Jaiswal, R., & Kushawaha, P. K. (2025). Designing of a Novel and Potential Multi-Epitope-Based Vaccine using NS5 Protein of Dengue Virus Targeting All Serotypes from India: An Immunoinformatic Approach. *The Microbe*, *7*(100387), 1–15. https://doi.org/10.1016/j.microb.2025.100387

Jarerattanachat, V., Boonarkart, C., Hannongbua, S., Auewarakul, P., & Ardkhean, R. (2023). In Silico and In Vitro Studies of Potential Inhibitors against Dengue Viral Protein NS5 Methyl Transferase from Ginseng and Notoginseng. *Journal of Traditional and Complementary Medicine*, *13*(1), 1–10. https://doi.org/10.1016/j.jtcme.2022.12.002

Jia, H., Zhong, Y., Peng, C., & Gong, P. (2022). Crystal Structures of Flavivirus NS5 Guanylyltransferase Reveal a GMP-Arginine Adduct. *Journal of Virology*, *96*(14), 1–16. https://doi.org/10.1128/jvi.00418-22

Jiang, T., Huang, C., Ruan, Q., Huang, X., Liang, C., Chen, Z., Yu, X., Peng, Y., Liu, Z., Cheng, G., Dai, J., & Sun, J. (2024). Envelope Domain III E 324 , E 351 , and E 380 Mutations Lever Adaptive Evolution of DENV-1 Genotype I. *Journal of Virology*. https://doi.org/10.1128/jvi.01183-24

Jin, J., & Li, J. (2025). MPLBind: Predicting the Effect of Binding Site Point Mutations on Protein–Ligand Binding Affinity Using Protein Large Language Models. *Journal of Chemical Information and Modeling*, *65*(16), 8720–8729. https://doi.org/10.1021/acs.jcim.5c00838

Kabir, M. A., Zilouchian, H., Younas, M. A., & Asghar, W. (2021). Dengue Detection: Advances in Diagnostic Tools from Conventional Technology to Point of Care. *Biosensors*, *11*(7), 1–29. https://doi.org/10.3390/bios11070206

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Kalinina, A. D., Rogachevskii, I. V., Samosvat, D. M., Zegrya, G. G., Butkevich, I. P., Mikhailenko, V. A., Plakhova, V. B., Penniyaynen, V. A., Podzorova, S. A., & Krylov, B. V. (2023). Analgesic Effect of the Lysine-Containing Short Peptide Is Due to Modulation of the NaV1.8 Channel Activation Gating System. *Life*, *13*(9), 1–15. https://doi.org/10.3390/life13091800

Karshikoff, A. (2006). *Non-Covalent Interactions in Protein*. World Scientific Publishing. www.worldscientific.com

Karyanti, M. R., Alam, A., Widyahening, I. S., Rezeki Hadinegoro, S., Munasir, Z., Irawan Satari, H., & Tedjo Sasmono, R. (2025). Community Prevalence and Distribution of Dengue Virus Serotype Based on Antibody Neutralization Assay in Jakarta, Indonesia. *Paediatrica Indonesiana Original Article Paediatr Indones*, *65*(1), 9–15. https://doi.org/10.14238/pi65.1.2025.9-15

Kasenda, S. N., Pinontoan, O. R., & Sumampouw, O. J. (2020). Pengetahuan dan Tindakan tentang Pencegahan Demam Berdarah Dengue. *Journal of Public Health and Community Medicine*, *1*(4), 1–6.

Katzelnick, L. C., Fonville, J. M., Gromowski, G. D., Arriaga, J. B., Green, A., James, S. L., Lau, L., Montoya, M., Wang, C., Van Blargan, L. A., Russell, C. A., Thu, H. M., Pierson, T. C., Buchy, P., Aaskov, J. G., Muñoz-Jordán, J. L., Vasilakis, N., Gibbons, R. V., Tesh, R. B., … Smith, D. J. (2015). Dengue Viruses Cluster Antigenically but not as Discrete Serotypes. *Science*, *349*(6254), 1338–1343. https://doi.org/10.1126/science.aac5017

Kementerian Kesehatan Republik Indonesia. (2024). *Profil Kesehatan Indonesia 2023*.

Keys, A. M., Kastner, D. W., Kiessling, L. L., & Kulik, H. J. (2024). The Energetic Landscape of CH-π Interactions in Protein - Carbohydrate Binding. *Chemical Science*, *16*(4), 1746–1761. https://doi.org/10.1039/d4sc06246a

Khan, M. B., Yang, Z. S., Lin, C. Y., Hsu, M. C., Urbina, A. N., Assavalapsakul, W., Wang, W. H., Chen, Y. H., & Wang, S. F. (2023). Dengue Overview: An

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Updated Systematic Review. *Journal of Infection and Public Health*, *16*(10), 1625–1642. https://doi.org/10.1016/j.jiph.2023.08.001

Khan, R. A., Afroz, S., Minhas, G., Battu, S., & Khan, N. (2019). Dengue Virus Envelope Protein Domain III Induces Pro-Inflamatory Signature and Triggers Activation of Inflammasome. *Cytokine*, *123*, 1–10. https://doi.org/10.1016/j.cyto.2019.154780

Khosavanna, R. R., Kareko, B. W., Brady, A. C., Booty, B. L., Nix, C. D., Lyski, Z. L., Curlin, M. D., & Messer, W. B. (2021). Clinical Symptoms of Dengue Infection among Patients from a Non-Endemic Area and Potential for A Predictive Model: A Multiple Logistic Regression Analysis and Decision Tree. *American Journal of Tropical Medicine and Hygiene*, *104*(1), 121–129. https://doi.org/10.4269/AJTMH.20-0192

Khrustalev, V. V., Khrustaleva, T. A., & Poboinev, V. V. (2018). Amino Acid Content of Beta Strands and Alpha Helices Depends on Their Flanking Secondary Structure Elements. *BioSystems*, *168*, 45–54. https://doi.org/10.1016/j.biosystems.2018.04.002

Klema, V. J., Ye, M., Hindupur, A., Teramoto, T., Gottipati, K., Padmanabhan, R., & Choi, K. H. (2016). Dengue Virus Nonstructural Protein 5 (NS5) Assembles into a Dimer with a Unique Methyltransferase and Polymerase Interface. *PLoS Pathogens*, *12*(2), 1–21. https://doi.org/10.1371/journal.ppat.1005451

Ko, H. Y., Li, Y. T., Yu, H. P., Li, Y. Y., Chiang, M. T., Simanjuntak, Y., Lee, Y. L., Dai, S. S., Chung, P. J., Yu, G. Y., Chao, D. Y., & Lin, Y. L. (2024). Emergence and Increased Epidemic Potential of Dengue Variants with the NS5V357E Mutation After Consecutive Years of Transmission. *IScience*, *27*(11). https://doi.org/10.1016/j.isci.2024.110899

Kronenberger, T., Sá Magalhães Serafim, M., Kumar Tonduru, A., Gonçalves Maltarollo, V., & Poso, A. (2021). Ligand Accessibility Insights to the Dengue Virus NS3-NS2B Protease Assessed by Long-Timescale Molecular Dynamics

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Simulations. *ChemMedChem*, *16*(16), 2524–2534. https://doi.org/10.1002/cmdc.202100246

Kroschewski, H., Siew, P. L., Butcher, R. E., Thai, L. Y., Lescar, J., Wright, P. J., Vasudevan, S. G., & Davidson, A. D. (2008). Mutagenesis of the Dengue Virus Type 2 NS5 Methyltransferase Domain. *Journal of Biological Chemistry*, *283*(28), 19410–19421. https://doi.org/10.1074/jbc.M800613200

Kudlacek, S. T., Metz, S., Thiono, D., Payne, A. M., N Phan, T. T., Tian, S., Forsberg, L. J., Maguire, J., Seim, I., Zhang, S., Tripathy, A., Harrison, J., Nicely, N. I., Soman, S., McCracken, M. K., Gromowski, G. D., Jarman, R. G., Premkumar, L., de Silva, A. M., & Kuhlman, B. (2021). Designed, Highly Expressing, Thermostable Dengue Virus 2 Envelope Protein Dimers Elicit Quaternary Epitope Antibodies. *Science Advances*, *7*, 4084–4099. https://www.science.org

Kumar, A., Arya, H., Verma, P., Singh, S., Kumar, V., Mittal, S., Maheshwari, M., Sagar, P., Singh, A. P., Singh, S., & Singh, K. (2023). A Review of Dengue Virus Genome, Structural and Non-Structural Proteins, and Life Cycle. *Journal of Science Innovations and Nature of Earth*, *3*(2), 06–16. https://doi.org/10.59436/jsiane.com/archives3/2/76

Kundu, S. K., Seraj, M. F., Mohasin, M., & Rahman, T. (2020). Dengue Virus: A Review on Epidemiology, Clinical Manifestation, Diagnosis and Pathogenesis. *Journal of Infectious Diseases & Travel Medicine*, *4*(2), 1. https://doi.org/10.23880/jidtm-16000142

Kurnia, N., Kaitana, Y., Salaki, C. L., Mandey, L. C., Tuda, J. S. B., & Tallei, T. E. (2022). Study of Dengue Virus Transovarial Transmission in Aedes spp. in Ternate City Using Streptavidin-Biotin-Peroxidase Complex Immunohistochemistry. *Infectious Disease Reports*, *14*(5), 765–771. https://doi.org/10.3390/idr14050078

Kurniati, A., Fandi, A., Sariyanti, M., Febrianti, E., & Rizqoh, D. (2021). Perbandingan Tingkat Keparahan Infeksi Sekunder Virus Dengue pada

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Keempat Serotipe di Indonesia: Systematic Review. *Jurnal Kesehatan Andalas*, *10*(1), 49–57.

Lagares, L. M., Minovski, N., Alfonso, A. Y. C., Benfenati, E., Wellens, S., Culot, M., Gosselet, F., & Novič, M. (2020). Homology Modeling of the Human P-Glycoprotein (ABCB1) and Insights into Ligand Binding through Molecular Docking Studies. *International Journal of Molecular Sciences*, *21*(11), 1–37. https://doi.org/10.3390/ijms21114058

Lanciotti, R. S., Calisher, C. H., Gubler, D. J., Chang, G.-J., & Vorndamt, A. V. (1992). Rapid Detection and Typing of Dengue Viruses from Clinical Samples by Using Reverse Transcriptase-Polymerase Chain Reaction. *Journal OF Clinical Microbiology*, *30*(3), 545–551.

Lee, M. F., Wu, Y. S., & Poh, C. L. (2023). Molecular Mechanisms of Antiviral Agents against Dengue Virus. *Viruses*, *15*(3), 1–37. https://doi.org/10.3390/v15030705

Li, H. (2018). Minimap2: Pairwise Alignment for Nucleotide Sequences. *Bioinformatics*, *34*(18), 3094–3100. https://doi.org/10.1093/bioinformatics/bty191

Li, Q., & Kang, C. (2022). Structures and Dynamics of Dengue Virus Nonstructural Membrane Proteins. *Membranes*, *12*(2), 1–16. https://doi.org/10.3390/membranes12020231

Li, Z., Liu, H. Y., He, Z., Chakravarty, A., Golden, R. P., Jiang, Z., You, I., Yue, H., Donovan, K. A., Du, G., Che, J., Tse, J., Che, I., Lu, W., Fischer, E. S., Zhang, T., Gray, N. S., & Yang, P. L. (2024). Discovery of Potent Degraders of the Dengue Virus Envelope Protein. *Advanced Science*, *11*, 1–11. https://doi.org/10.1002/advs.202405829

Lim, S. P., Noble, C. G., & Shi, P. Y. (2015). The Dengue Virus NS5 Protein as a Target for Drug Discovery. *Antiviral Research*, *119*, 57–67. https://doi.org/10.1016/j.antiviral.2015.04.010

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Liu-Wei, W., van der Toorn, W., Bohn, P., Hölzer, M., Smyth, R., & von Kleist, M. (2023). Sequencing Accuracy and Systematic Errors of Nanopore Direct RNA Sequencing. *BioRxiv*, 1–24. https://doi.org/10.1101/2023.03.29.534691

Lobanov, M. Y., Pereyaslavets, L. B., Likhachev, I. V, Matkarimov, B. T., & Galzitskaya, O. V. (2021). Is There an Advantageous Arrangement of Aromatic Residues in Proteins? Statistical Analysis of Aromatic Interactions in Globular Proteins. *Computational and Structural Biotechnology Journal*, *19*, 5960–5968. https://doi.org/10.1016/j.csbj.2021.10.036

Luaces, P., Sánchez, R., Expósito, J., Pérez-Pulido, A. J., Pérez, A. G., & Sanz, C. (2024). Functional and Physiological Characterization of Tyrosine Decarboxylases from Olea europaea L. Involved in the Synthesis of the Main Phenolics in Olive Fruit and Virgin Olive Oil. *International Journal of Molecular Sciences*, *25*(20), 1–14. https://doi.org/10.3390/ijms252010892

Luvira, V., Thawornkuno, C., Lawpoolsri, S., Thippornchai, N., Duangdee, C., Ngamprasertchai, T., & Leaungwutiwong, P. (2023). Diagnostic Performance of Dengue NS1 and Antibodies by Serum Concentration Technique. *Tropical Medicine and Infectious Disease*, *8*(2), 1–12. https://doi.org/10.3390/tropicalmed8020117

Ma, Z., Ajibade, A., & Zou, X. (2024). Docking Strategies for Predicting Protein-Ligand Interactions and Their Application to Structure-Based Drug Design. *Communications in Information and Systems*, *24*(3), 199–230. https://doi.org/10.4310/CIS.241021221101

Mamenun, Koesmaryono, Y., Sopaheluwakan, A., Hidayati, R., Dasanto, B. D., & Aryati, R. (2024). Spatiotemporal Characterization of Dengue Incidence and Its Correlation to Climate Parameters in Indonesia. *Insects*, *15*(5), 1–15. https://doi.org/10.3390/insects15050366

Manullang, E. V., & Hafid, M. (2023). *Deteksi Dini Demam Berdarah Dengue (DBD) dan Pengendaliannya di Indonesia Tahun 2023*. Pusat Data dan Teknologi Informasi Kementerian Kesehatan Republik Indonesia.

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Marsitoh, Y. N., Anggraeni, S., Ipmawati, P. A., & Wardoyo, S. (2025). Prediction of Dengue Hemorrhagic Fever (DHF) Case Distribution using Long Short-Term Memory (LTSM) in Surabaya City. *8th Proceeding International Conference on Health Polytechnic Ministry of Health Surabaya*, 93–100.

Martinez-Gutierrez, M., Correa-Londoño, L. A., Castellanos, J. E., Gallego-Gómez, J. C., & Osorio, J. E. (2014). Lovastatin Delays Infection and Increases Survival Rates in AG129 Mice Infected with Dengue Virus Serotype 2. *PLoS ONE*, *9*(2), 1–11. https://doi.org/10.1371/journal.pone.0087412

Masyeni, S., Fatawy, R. M., Paramasatiari, A. A. A. L., Maheraditya, A., Dewi, R. K., Winianti, N. W., Santosa, A., Setiabudy, M., Sumadewi, N. T., & Herawati, S. (2023). Dengue Seroprevalence Study in Bali. *PLoS ONE*, *18*(7). https://doi.org/10.1371/journal.pone.0271939

Maula, A. W., Fuad, A., & Utarini, A. (2018). Ten-Years Trend of Dengue Research in Indonesia and South-East Asian countries: A Bibliometric Analysis. *Global Health Action*, *11*(1), 1–8. https://doi.org/10.1080/16549716.2018.1504398

Medagama, A., Dalugama, C., Meiyalakan, G., & Lakmali, D. (2020). Risk Factors Associated with Fatal Dengue Hemorrhagic Fever in Adults: A Case Control Study. *Canadian Journal of Infectious Diseases and Medical Microbiology*, *2020*, 1. https://doi.org/10.1155/2020/1042976

Melano, I., Kuo, L. L., Lo, Y. C., Sung, P. W., Tien, N., & Su, W. C. (2021). Effect of Basic Amino Acids and Their Derivatives on SARS-CoV-2 and Influenza-A Virus Infection. *Viruses*, *13*(7), 1–13. https://doi.org/10.3390/v13071301

Miyazawa, H., & Oda, T. (2025). Dotplot: A Lightweight Visualization Tool for BLAST + Alignments and Genomic Annotations. *BMC Bioinformatics*, *26*(1), 1–12. https://doi.org/10.1186/s12859-025-06255-5

Mohamed, N. A., Zulkifly, N. A. H., & Alwi, A. (2025). Homology Modeling of Cu/Zn Superoxide Dismutase in Sweet Potato (Ipomoea batatas). *Journal Of*

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Agrobiotechnology, *16*(2), 108–116. https://doi.org/10.37231/jab.2025.16.2.419

Monath, T. P. (1994). Dengue: The Risk to Developed and Developing Countries. *Proc. Nati. Acad. Sci. USA*, *91*, 2395–2400.

Mughram, M. H. AL., Catalano, C., Herrington, N. B., Safo, M. K., & Kellogg, G. E. (2023). 3D Interaction Homology: The Hydrophobic Residues Alanine, Isoleucine, Leucine, Proline, and Valine Play Different Structural Roles in Soluble and Membrane Proteins. *Frontiers in Molecular Biosciences*, *10*, 1–24. https://doi.org/10.3389/fmolb.2023.1116868

Muller, D. A., Depelsenaire, A. C. I., & Young, P. R. (2017). Clinical and Laboratory Diagnosis of Dengue Virus Infection. *Journal of Infectious Diseases*, *215*, S89–S95. https://doi.org/10.1093/infdis/jiw649

Murugesan, A., & Manoharan, M. (2019). Dengue virus. In *Emerging and Reemerging Viral Pathogens: Volume 1: Fundamental and Basic Virology Aspects of Human, Animal and Plant Pathogens* (pp. 281–359). Elsevier. https://doi.org/10.1016/B978-0-12-819400-3.00016-8

Mushtaq, S., Ihsan, M., Khan, U., Khan, M. T., Shahid, A., Shafiq, R., & Jahan, S. (2024). Genomic Variation in Dengue Virus Non-Structural Protein 5 (NS5). *Journal of Aziz Fatimah Medical & Dental College*, *6*(1), 13–17.

Mushtaq, S., Khan, M. I. U., Khan, M. T., Lodhi, M. S., & Wei, D. Q. (2023). Novel Mutations in Structural Proteins of Dengue Virus Genomes. *Journal of Infection and Public Health*, *16*(12), 1971–1981. https://doi.org/10.1016/j.jiph.2023.10.005

Mustafa, M. S., Rasotgi, V., Jain, S., & Gupta, V. (2015). Discovery of Fifth serotype of Dengue Virus (denv-5): A New Public Health Dilemma in Dengue Control. *Medical Journal Armed Forces India*, *71*(1), 67–70. https://doi.org/10.1016/j.mjafi.2014.09.011

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Mwanyika, G. O., Mboera, L. E. G., Rugarabamu, S., Makange, M., Sindato, C., Lutwama, J. J., Paweska, J. T., & Misinzo, G. (2021). Circulation of Dengue Serotype 1 Viruses during the 2019 Outbreaks in Dar es Salaam, Tanzania. *Pathogens and Global Health*, *115*(7–8), 467–475. https://doi.org/10.1080/20477724.2021.1905302

Nanaware, N., Banerjee, A., Bagchi, S. M., Bagchi, P., & Mukherjee, A. (2021). Dengue Virus Infection: A Tale of Viral Exploitations and Host Responses. *Viruses*, *13*(10), 1–20. https://doi.org/10.3390/v13101967

Nittinger, E., Inhester, T., Bietz, S., Meyder, A., Schomburg, K. T., Lange, G., Klein, R., & Rarey, M. (2017). Large-Scale Analysis of Hydrogen Bond Interaction Patterns in Protein-Ligand Interfaces. *Journal of Medicinal Chemistry*, *60*(10), 4245–4257. https://doi.org/10.1021/acs.jmedchem.7b00101

Nonyong, P., Ekalaksananan, T., Phanthanawiboon, S., Overgaard, H. J., Alexander, N., Thaewnongiew, K., Sawaswong, V., Nimsamer, P., Payungporn, S., Phadungsombat, J., Nakayama, E. E., Shioda, T., & Pientong, C. (2023). Intrahost Genetic Diversity of Dengue Virus in Human Hosts and Mosquito Vectors under Natural Conditions Which Impact Replicative Fitness In Vitro. *Viruses*, *15*(4), 1–13. https://doi.org/10.3390/v15040982

Norazharuddin, H., & Lai, N. S. (2018). Roles and Prospects of Dengue Virus Non-Structural Proteins as Antiviral Targets: An Easy Digest. *Malaysian Journal of Medical Sciences*, *25*(5), 6–15. https://doi.org/10.21315/mjms2018.25.5.2

Norjanah, N., & Ridha, M. R. (2024). Spatial Autocorrelation of Dengue and Its Relationship with Population Density in South Kalimantan, Indonesia. *Althea Medical Journal*, *11*(2), 113–119. https://doi.org/10.15850/amj.v11n2.3190

Nugraheni, E., Rizqoh, D., & Sundari, M. (2023). Manifestasi Klinis Demam Berdarah Dengue (DBD). *Jurnal Kedokteran Dan Kesehatan: Publikasi Ilmiah Fakultas Kedokteran Universitas Sriwijaya*, *10*(3), 267–274. https://doi.org/10.32539/jkk.v10i3.21425

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Nur, A., Ansori, M., Sucipto, T. H., Deka, P. T., Laila, N., Ahwanah, F., Churrotin, S., Kotaki, T., & Soegijanto, S. (2015). Differences of Universal and Multiplex Primer for Detection of Dengue Virus from Patients Suspected Dengue Hemorhagic Fever (DHF) in Surabaya. *Indonesian Journal of Tropical and Infectious Diseases*, *5*(6), 147–151.

Nurfadly, N., Zahara, I. W., & Rahmad, S. M. (2022). Differences in CD95L Levels and Blood Test Results in Primary and Secondary Dengue Infection Patients. *Majalah Kedokteran Bandung*, *54*(4), 215–220. https://doi.org/10.15395/mkb.v54n4.2822

Nusa, R., & Astuti, E. P. (2012). Sebaran Serotipe Virus Dengue di Provinsi Jawa Barat. *Jurnal Ekologi Kesehatan*, *11*(4), 327–332.

Obi, J. O., Kihn, K. C., McQueen, L., Fields, J. K., Snyder, G. A., & Deredge, D. J. (2025). Structural Dynamics of the Dengue Virus Non-Structural 5 (NS5) Interactions with Promoter Stem-Loop A (SLA). *Viruses*, *3*(30), 1–13. https://doi.org/10.1038/s44298-025-00112-1

Ohta, T., Nakazato, T., & Bono, H. (2017). Calculating the Quality of Public High-Throughput Sequencing Data to Obtain a Suitable Subset for Reanalysis from the Sequence Read Archive. *GigaScience*, *6*(6), 1–8. https://doi.org/10.1093/gigascience/gix029

Oroh, M. Y., Pinontoan, O. R., & Tuda, J. B. S. (2020). Faktor Lingkungan, Manusia, dan Pelayanan Kesehatan yang Berhubungan dengan Kejadian Demam Berdarah Dengue. *Indonesian Journal of Public Health and Community Medicine*, *1*(3).

Osawa, T., Aoki, M., Ehara, H., & Sekine, S. ichi. (2023). Structure of Dengue Virus RNA Replicase Complexes. *Molecular Cell*, *83*(15), 2781–2791. https://doi.org/10.1016/j.molcel.2023.06.023

Ospina-Aguirre, C., Soriano, D., Olivar-Tost, G., Galindo-González, Cristian. C., Gómez-Gardeñes, J., & Osorio, G. (2023). Effect of Human Mobility in

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Dengue Spreading: Study Cases for Caldas (CO). *MedRxiv*, *2023*(1). https://doi.org/10.1101/2023.01.10.23284416

Ospina-Aguirreid, C., Soriano-Paños, D., Olivar-Tost, G., Galindo-González, C. C., Gómez-Gardeñes, J., & Osorio, G. (2023). Effects of Human Mobility on the Spread of Dengue in the Region of Caldas, Colombia. *PLoS Neglected Tropical Diseases*, *17*(11 November), 1–20. https://doi.org/10.1371/journal.pntd.0011087

Othman, R., Othman, R., Baharuddin, A., Ramakrishnan, N. R., Rahman, N. A., Yusof, R., & Karsani, S. A. (2017). Molecular Docking Studies of Selected Medicinal Drugs as Dengue Virus-2 Protease Inhibitors. *Sains Malaysiana*, *46*(10), 1865–1875. https://doi.org/10.17576/jsm-2017-4610-25

Phadungsombat, J., Nakayama, E. E., & Shioda, T. (2024). Unraveling Dengue Virus Diversity in Asia: An Epidemiological Study through Genetic Sequences and Phylogenetic Analysis. *Viruses*, *16*(7), 1–33. https://doi.org/10.3390/v16071046

Ponidjan, T. S., Batmomolin, A., Yuliani, F. C., Amanupunnyo, N. A., Ritawati, Handayani, G. L., Subriah, Revinel, Rusherina, Adam, Y., Miniharianti, Tiara, A., Kusmiyati, Sine, J. G. L., Damayanti, D. S., Montolalu, A., Rahman, M. A., Tumurang, M. N., Wabula, W. M., & Kristiani, A. (2025). *Tumbuh Kembang Anak*. Media Pustaka Indo. www.mediapustakaindo.com

Postler, T. S., Beer, M., Blitvich, B. J., Bukh, J., de Lamballerie, X., Drexler, J. F., Imrie, A., Kapoor, A., Karganova, G. G., Lemey, P., Lohmann, V., Simmonds, P., Smith, D. B., Stapleton, J. T., & Kuhn, J. H. (2023). Renaming of the genus Flavivirus to Orthoflavivirus and extension of binomial species names within the family Flaviviridae. *Archives of Virology*, *168*(9). https://doi.org/10.1007/s00705-023-05835-1

Pourzangiabadi, M., Najafi, H., Fallah, A., Goudarzi, A., & Pouladi, I. (2025). Dengue Virus: Etiology, Epidemiology, Pathobiology, and Developments in

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Diagnosis and Control - A Comprehensive Review. *Infection, Genetics and Evolution*, *127*, 1. https://doi.org/10.1016/j.meegid.2024.105710

Prasetyowati, H., & Astuti, E. P. (2010). Serotipe Virus Dengue di Tiga Kabupaten/Kota dengan Tingkat Endemisitas DBD Berbeda di Propinsi Jawa Barat. *Aspirator*, (2), 120–124.

Price, S., Tombeur, S. D. S., Hudson, A., Sathiyamoorthy, N. K., Smyth, P., Singh, A., Peccianti, M., Baroncelli, E., Essaghir, A., Ferlenghi, I., Phogat, S. K., & Singh, G. (2022). TMQuery: A Database of Precomputed Template Modeling Scores for Assessment of Protein Structural Similarity. *Bioinformatics*, *38*(7), 2062–2063. https://doi.org/10.1093/bioinformatics/btac044

Puspitasari, R. D., & Tambunan, U. S. F. (2017). In Silico Mutation Analysis of Non-Structural Protein-5 (NS5) Dengue Virus. *International Symposium on Current Progress in Functional Materials*, *755*(1). https://doi.org/10.1088/1742-6596/755/1/011001

Putri, A. A., Bachtiar, Z., Ferda Pratiwi, D., & Khotimah, H. (2025). Analisis In Silico Interaksi Enzim Esterase dari Enterobacter terhadap Berbagai Turunan Paraben sebagai Kajian Awal Potensi Biodegradasi. *Greensphere: J. Environ. Chem*, *5*(1), 30–36. https://PubChem.ncbi.nl

Rahman, Md. H., Islam, Md. N., Rabby, Md. G., Parul, S. S., Hasan, Md. M., & Biswas, M. (2024). In Silico Identification and Functional Impact of Deleterious Nonsynonymous Single-Nucleotide Polymorphisms (nnSNPs) in Type 2 Diabetes - Associated Genes in South Asian Populations. *Genetics Research*, *2024*(1), 1–17. https://doi.org/10.1155/genr/6893109

Raihan, R., Malo, R., Mia Jewel, Y., Atiquzzaman, A., Ferdousy, F., Abdullah, S. A. H. M., Munshi, S., Khan, M., Hossain, A., Shawon, S., Ranjan, R., Yusuf, Md. A., & Mamun, K. (2025). NS1 Rapid Card Test for Dengue Detection: Insights from the 2023 Outbreak in Bangladesh. *International Journal of General Medicine*, *Volume 18*, 2047–2056. https://doi.org/10.2147/ijgm.s514945

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Rantini, D., Iriawan, N., & Irhamah. (2021). On the Reversible Jump Markov Chain Monte Carlo (Rjmcmc) Algorithm for Extreme Value Mixture Distribution as a Location-Scale Transformation of the Weibull Distribution. *Applied Sciences (Switzerland)*, *11*(16). https://doi.org/10.3390/app11167343

Ratulangi, A. D., Djohan, H., & Kamilla, L. (2025). The Relationship between NS1 Examination and the Examination of Hemoglobin, Hematocrit, Leukocytes, Platelets, and Erythrocytes in Dengue Fever Patients in the Pediatric Ward. *International Medical Scientific Journal*, *7*(1), 32–39. https://journal.ahmareduc.or.id/index.php/medica

Ravi, V., Imran, M., Khare, K., Mishra, P., Mohite, R., Kanika, Khan, M. A., Swaminathan, A., Yadav, A., Sinha, S., Shukla, R., Chattopadhyay, P., Soni, J., Maurya, R., Sethi, T., Tarai, B., Budhiraja, S., & Pandey, R. (2025). Clinico-Genomic Study Reveals Association of Dengue Virus Genome High Frequency Mutations with Dengue Disease Severity. *Scientific Reports*, *15*(1), 1–16. https://doi.org/10.1038/s41598-025-00462-z

Ravi, V., Khare, K., Mohite, R., Mishra, P., Halder, S., Shukla, R., Liu, C. S. C., Yadav, A., Soni, J., Chaudhary, K., Tarai, B., Budhiraja, S., Khosla, P., Sethi, T., Imran, M., & Pandey, R. (2025). Genomic Hotspot in the DENV-2 Serotype (E, NS4B, and NS5 Genes) Are Associated with Dengue Disease Severity in the Endemic Region of India. *PLoS Neglected Tropical Diseases*, *19*(4), e0013034. https://doi.org/10.1371/journal.pntd.0013034

Reddy, S. B. G., Chin, W.-X., & Shivananju, N. S. (2018). Dengue Virus NS2 dan NS4: Minor Proteins, Mammoth Roles. *Biochemical Pharmacology*, *154*, 54–63. https://doi.org/10.1016/j.bcp.2018.04.008

Ren, Q., Li, R., Liu, X., Hao, W., Zhou, X., Liu, M., Zhang, H., Feng, X., Li, X., Zhao, Z., Hu, W., Zhang, J., & Xin, Z. (2025). Epidemiological Trends and Predictive Modeling of Dengue Fever in the Association of Southeast Asian Nations (ASEAN) Countries. *Tropical Medicine and Infectious Disease*, *10*(12), 1–11. https://doi.org/10.3390/tropicalmed10120329

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Ridha, M. R., & Sulasmi, S. (2022). Larval Survey of the Dengue-Endemic Area in Samarinda: Guide to Determine Risk Containers. *International Journal of Public Health Science*, *11*(4), 1176–1183. https://doi.org/10.11591/ijphs.v11i4.21727

Rocha, L. B., Dos Santos Alves, R. P., Caetano, B. A., Pereira, L. R., Mitsunari, T., Amorim, J. H., Polatto, J. M., Botosso, V. F., Gallina, N. M. F., Palacios, R., Precioso, A. R., Granato, C. F. H., Oliveira, D. B. L., Da Silveira, V. B., Luz, D., De Souza Ferreira, L. C., & Piazza, R. M. F. (2017). Epitope Sequences in Dengue Virus NS1 Protein Identified by Monoclonal Antibodies. *Antibodies*, *6*(4), 1–13. https://doi.org/10.3390/antib6040014

Roy, S. K., & Bhattacharjee, S. (2021). Dengue Virus: Epidemiology, Biology, and Disease Aetiology. *Canadian Journal of Microbiology*, *67*(10), 687–702. https://doi.org/10.1139/cjm-2020-0572

Sahili, A. El, & Lescar, J. (2017). Dengue Virus Non-Structural Protein 5. *Viruses*, *9*(4), 1–20. https://doi.org/10.3390/v9040091

Saisawang, C., Kuadkitkan, A., Auewarakul, P., Smith, D. R., & Ketterman, A. J. (2018). Glutathionylation of Dengue and Zika NS5 Proteins Affects Guanylyltransferase and RNA Dependent RNA Polymerase Activities. *PLoS ONE*, *13*(2), 1–15. https://doi.org/10.1371/journal.pone.0193133

Sana, E. (2023). Interaction of Phosphate and Amino Acid in DNA-Binding Proteins. *J Biomol Res Ther*, *12*(6), 1000306–1000307. https://doi.org/10.35248/2167-7956.23.12.306

Santoso, M. S., Nara, M. B. R., Nugroho, D. K., Yohan, B., Purnama, A., Boro, A. M. B., Hayati, R. F., Gae, E. P., Denis, D., Rana, B., Hibberd, M. L., & Sasmono, T. T. (2025). Investigation of Severe Dengue Outbreaks in Maumere, East Nusa Tenggara, Indonesia: Clinical, Serological, and Virological Features. *PLoS ONE*, *20*(2 February). https://doi.org/10.1371/journal.pone.0317854

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Saputra, A. (2021). Community Behavior Patterns That Influence The Causes of Dengue Hemorrhagic Fever (DHF) in The Pondok Petir Elementary Region. *Proceeding The First Muhammadiyah International Public Health and Medicine Conference*, *1*, 811–820. http://e-journal.fkmumj.ac.id/

Saputra, M., & Oktaviannoor, H. (2018). One Health Approach to Dengue Haemorrhagic Fever Control in Indonesia: A Systematic Review. *The 1st International Conference on Global Health*, *4*(1), 201–221. https://doi.org/10.18502/kls.v4i1.1382

Sasmono, R. T., Santoso, M. S., Pamai, Y. W. B., Yohan, B., Afida, A. M., Denis, D., Hutagalung, I. A., Johar, E., Hayati, R. F., Yudhaputri, F. A., Haryanto, S., Stubbs, S. C. B., Blacklaws, B. A., Myint, K. S. A., & Frost, S. D. W. (2020). Distinct Dengue Disease Epidemiology, Clinical, and Diagnosis Features in Western, Central, and Eastern Regions of Indonesia, 2017–2019. *Frontiers in Medicine*, *7*. https://doi.org/10.3389/fmed.2020.582235

Sasmono, R. T., Taurel, A. F., Prayitno, A., Sitompul, H., Yohan, B., Hayati, R. F., Bouckenooghe, A., Hadinegoro, S. R., & Nealon, J. (2018). Dengue virus serotype Distribution Based on Serological Evidence in Pediatric Urban Population in Indonesia. *PLoS Neglected Tropical Diseases*, *12*(6). https://doi.org/10.1371/journal.pntd.0006616

Sharma, S., & Varani, G. (2020). NMR Structure of Dengue West Nile Viruses Stem-Loop B: A Key Cis-Acting Element for Flavivirus Replication. *Biochemical and Biophysical Research Communications*, *531*(4), 522–527. https://doi.org/10.1016/j.bbrc.2020.07.115

Shekari, A., Bella-Omunagbe, M., & Adebiyi, M. (2024). Homology Modelling and Molecular Docking of Some Natural Compounds as Inhibitors of Anopheles gambiae Heat Shock Protein 70KDa and Bifunctional Glutamyl/prolyl-tRNA Synthetase. *Tropical Journal of Natural Product Research*, *8*(10), 8826–8834. https://doi.org/10.26538/tjnpr/v8i10.27

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Shenjaya, R., Putra, G., & Halim, S. (2022). External Factor Prediction of Dengue Fever Spread in Surabaya. *Jurnal Titra*, *10*(2), 25–32.

Shi, Y., Li, S., Li, X., Zheng, K., Yuan, S., & Huang, J. (2016). Epidemiological and Molecular Characterization of Dengue Viruses Imported into Guangzhou during 2009-2013. *SpringerPlus*, *5*(1635), 1–8. https://doi.org/10.1186/s40064-016-3257-3

Shimizu, H., Saito, A., Mikuni, J., Nakayama, E. E., Koyama, H., Honma, T., Shirouzu, M., Sekine, S. I., & Shioda, T. (2019). Discovery of a Small Molecule Inhibitor Targeting Dengue Virus NS5 RNA-Dependent RNA Polymerase. *PLoS Neglected Tropical Diseases*, *13*(11). https://doi.org/10.1371/journal.pntd.0007894

Silva, E. M., Conde, J. N., Allonso, D., Ventura, G. T., Coelho, D. R., Carneiro, P. H., Silva, M. L., Paes, M. V., Rabelo, K., Weissmuller, G., Bisch, P. M., & Mohana-Borges, R. (2019). Dengue Virus Nonstructural 3 Protein Interacts Directly with Human Glyceraldehyde-3-Phosphate Dehydrogenase (GADPH) and Reduces Its Glycolytic Activity. *Scientific Reports*, *9*(1), 1–19. https://doi.org/10.1038/s41598-019-39157-7

Sinha, S., Singh, K., Ravi Kumar, Y. S., Roy, R., Phadnis, S., Meena, V., Bhattacharyya, S., & Verma, B. (2024). Dengue virus Pathogenesis and Host Molecular Machineries. *Journal of Biomedical Science*, *31*(1). https://doi.org/10.1186/s12929-024-01030-9

Sisay, C., Worku, N., Awoke, T., & Alemu, K. (2026). Diagnostic Performance of the Dengue NS1 Ag Rapid Test During Early-Stage Infections at Epidemic-Affected Health Care Facilities in Northeastern and Eastern Ethiopia. *IJID Regions*, 100915. https://doi.org/10.1016/j.ijregi.2026.100915

Škrbić, T., Giacometti, A., Hoang, T. X., Maritan, A., & Banavar, J. R. (2024). Amino-Acid Characteristics in Protein Native State Structures. *Biomolecules*, *14*(7), 1–15. https://doi.org/10.3390/biom14070805

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Soegijanto, S., Mulyanto, K. C., Churotin, S., Kotaki, T., Kamioka, M. N., Konichi, E., Yamanaka, A., & Wikanesthi, D. (2013). Sero-Epidemiology of Dengue Virus Infection in 4 Cities of Indonesia. *Indonesian Journal of Tropical and Infectious Disease*, *4*(4), 26–29.

Soneson, C., Yao, Y., Bratus-Neuenschwander, A., Patrignani, A., Robinson, M. D., & Hussain, S. (2019). A Comprehensive Examination of Nanopore Native RNA Sequencing for Characterization of Complex Transcriptomes. *Nature Communications* , *10*(1), 1–14. https://doi.org/10.1038/s41467-019-11272-z

Sotcheff, S., & Routh, A. (2020). Understanding Flavivirus Capsid Protein Functions: The Tip of the Iceberg. *Pathogens*, *9*(42), 1–18. https://doi.org/10.3390/pathogens9010042

Sousa, B. G., Mebus-Antunes, N. C., Fernandes-Siqueira, L. O., Caruso, M. B., Saraiva, G. N., Carvalho, C. F., Neves-Martins, T. C., Galina, A., Zingali, R. B., Zeidler, J. D., & Da Poian, A. T. (2024). Dengue Virus Non-Structural Protein 3 Inhibits Mitochondrial Respiration by Impairing Complex I Function. *MSphere*, *9*(7), 1–19. https://doi.org/10.1128/msphere.00406-24

Spangenberg, J., Höner Zu Siederdissen, C., Goettsch, W., Köhler, L., Luke, L. M., Papenfort, K., & Marz, M. (2026). Dynamont: A Comprehensive Cross-Species Comparison of ONT Segmentation Tools. *GigaScience*, *15*, 1–19. https://doi.org/10.1093/gigascience/giag005/8429782

Spassov, D. S. (2024). Binding Affinity Determination in Drug Design: Insights from Lock and Key, Induced Fit, Conformational Selection, and Inhibitor Trapping Models. *International Journal of Molecular Sciences*, *25*(13), 1–24. https://doi.org/10.3390/ijms25137124

Stauß, A. C., Fuchs, C., Jansen, P., Repert, S., Alcock, K., Ludewig, S., & Rozhon, W. (2024). The Ninhydrin Reaction Revisited: Optimisation and Application for Quantification of Free Amino Acids. *Molecules*, *29*(14), 1–13. https://doi.org/10.3390/molecules29143262

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Studer, G., Rempfer, C., Waterhouse, A. M., Gumienny, R., Haas, J., & Schwede, T. (2020). QMEANDisCo—Distance Constraints Applied on Model Quality Estimation. *Bioinformatics*, *36*(6), 1765–1771. https://doi.org/10.1093/bioinformatics/btz828

Sucupira, P. H. F., Milene, S. F., Coutinho-da-Silva, M. S., Bicalho, K. A., Campi-Azevedo, A. C., Brito-de-Sousa, J. P., Peruhype-Magalhães, V., Rios, M., Konduru, K., Teixeira-Carvalho, A., Coelho-dos-Reis, J. G. A., do Valle Antonelli, L. R., de Rezende, V. B., de Melo, F. L. R., Garcia, C. C., Silva-Andrade, J. C., da Costa-Rocha, I. A., da Rocha, L. A., Silva, V. A., … Araújo, M. S. S. (2023). Serotype-Associated Immune Response and Network Immunoclusters in Children and Adults during Acute Dengue Virus Infection. *Cytokine*, *169*, 1–13. https://doi.org/10.1016/j.cyto.2023.156306

Suharto, N., Amin, M., Rini, D. P., Romdhoni, A. C., Pawanis, P. Z., & Hidayat, M. S. (2018). Hospital-and-Community-Based Surveillance of Zika and Dengue Viruses in Indonesia. *African Journal of Infectious Diseases*, *12*(1), 20–27. https://doi.org/10.21010/ajid.v12i1.4

Sun, X., Sun, M., Zhang, L., Yu, Z., Li, J., Xie, W., & Su, J. (2021). Amino Acid Substitutions in NS5 Contribute Differentially to Tembusu Virus Attenuation in Ducklings and Cell Cultures. *Viruses*, *13*(5), 1–14. https://doi.org/10.3390/v13050921

Suphatrakul, A., Posiri, P., Srisuk, N., Nantachokchawapan, R., Onnome, S., Mongkolsapaya, J., & Siridechadilok, B. (2023). Functional Analysis of Flavivirus Replicase by Deep Mutational Scanning of Dengue NS5. *BioRxiv*, *2023*. https://doi.org/10.1101/2023.03.07.531617

Susanto, N., Ratna Hidayani, W., & Subaeti, T. (2025). Differences Indicators in Clinical Epidemiology and Laboratory for Suspect Dengue Hemorrhagic Fever in Kebumen District 2023. *Jurnal Berkala Epidemiologi*, *13*(1), 49–57. https://doi.org/10.20473/jbe.v13i12025.49

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Tang, L., Zhao, Z., Zhang, L., Zhang, T., & Gao, S. (2014). Predicting the Outer/Inner Beta Strands in Protein Beta Sheets Based on the Random Forest Algorithm. *LNBI*, *8590*, 1–9.

Tay, M. Y. F., Smith, K., Ng, I. H. W., Chan, K. W. K., Zhao, Y., Ooi, E. E., Lescar, J., Luo, D., Jans, D. A., Forwood, J. K., & Vasudevan, S. G. (2016). The C-terminal 18 Amino Acid Region of Dengue Virus NS5 Regulates its Subcellular Localization and Contains a Conserved Arginine Residue Essential for Infectious Virus Production. *PLoS Pathogens*, *12*(9), 1–34. https://doi.org/10.1371/journal.ppat.1005886

Teramoto, T., Boonyasuppayakorn, S., Handley, M., Choi, K. H., & Padmanabhan, R. (2014). Substitution of NS5 N-terminal Domain of Dengue Virus Type 2 RNA with Type 4 Domain Caused Impaired Replication and Emergence of Adaptive Mutants with Enhanced Fitness. *Journal of Biological Chemistry*, *289*(32), 22385–22400. https://doi.org/10.1074/jbc.M114.584466

Tian, Y.-S., Zhou, Y., Takagi, T., Kameoka, M., & Kawashita, N. (2018). Dengue Virus and Its Inhibitors: A Brief Review. *Chem. Pharm. Bull*, *66*(3), 191–206.

Tjahjono, G., Widiyanti, P., & Nasronudin, N. (2016). Clinical Manifestation Approach of Dengue Viral Infeciton. *Indonesian Journal of Tropical and Infectious Disease*, *6*(2), 39–45.

Triwahyuni, T., Prasetia, T., & Rahmawati, R. (2021). Perbandingan Profil Hematologi antara Serotipe Dengue pada Pasien yang Terinfeksi Dengue di RSUD H. Abdul Moeloek Provinsi Lampung. *Jurnal Medika Malahayati*, *5*(3), 178–190.

Uddin, M. M., Hossain, M. T., Hossain, M. A., Ahsan, A., Shamim, K. H., Hossen, M. A., Rahman, M. S., Rahman, M. H., Ahmed, K., Bui, F. M., & Al-Zahrani, F. A. (2024). Unraveling the Potential Effects of Non-Synonymous Single Nucleotida Polymorphisms (nsSNPs) on the Protein Structure and Function of the Human SLC30A8 Gene on Type 2 Diabetes and Colorectal Cancer: An In

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Silico Approach. *Heliyon*, *10*(17), 1–21. https://doi.org/10.1016/j.heliyon.2024.e37280

Usmar, U., Maqhfirah Nurul Fitri, A., Yuliana, D., & Nainu, F. (2021). Review : Imunoterapi Penanganan Infeksi Virus. *Jurnal Mandala Pharmacon Indonesia*, *7*(1), 83–111. https://doi.org/10.35311/jmpi

Utama, I. M. S., Lukman, N., Sukmawati, D. D., Alisjahbana, B., Alam, A., Muniarti, D., Utama, I. M. G. D. L., Puspitasari, D., Kosasih, H., Laksono, I., Karyana, M., Karyanti, M. R., Hapsari, M. M. D. E. A. H., Meutia, N., Liang, C. J., Wulan, W. N., Lau, C.-Y., & Parwati, K. T. M. (2019). Dengue Viral Infection in Indonesia: Epidemiology, Diagnostic Challenges, and Mutations from an Observational Cohort Study. *PLoS Neglected Tropical Diseases*, *13*(10). https://doi.org/10.1371/journal.pntd.0007785

Utama, I. M. S., Lukman, N., Sukmawati, D. D., Alisjahbana, B., Alam, A., Murniati, D., Made Gede Dwi Lingga Utama, I., Puspitasari, D., Kosasih, H., Laksono, I., Karyana, M., Karyanti, M. R., Hapsari, M. M. D. E. A. H., Meutia, N., Jason Liang, C., Wulan, W. N., Lau, C. Y., & Parwati, K. T. M. (2019). Dengue Viral Infection in Indonesia: Epidemiology, Diagnostic Challenges, and Mutations from an Observational Cohort Study. *PLoS Neglected Tropical Diseases*, *13*(10). https://doi.org/10.1371/journal.pntd.0007785

Utgés, J. S., & Barton, G. J. (2024). Comparative evaluation of methods for the prediction of protein–ligand binding sites. *Journal of Cheminformatics*, *16*(1). https://doi.org/10.1186/s13321-024-00923-z

Vaman, R. S., Valamparampil, M. J., Somasundaran, A. K., Balakrishnan, A. J., Janardhanan, P., Rahul, A., Pilankatta, R., & Anish, T. S. (2024). Serotype-Specific Clinical Features and Spatial Distribution of Dengue in Northern Kerala, India. *Journal of Family Medicine and Primary Care*, *13*(8), 3049–3058. https://doi.org/10.4103/jfmpc.jfmpc_1937_23

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Vashisht, K., & Pandey, K. C. (2023). A Review on Future Perspectives in Targeting the RNA Capping in Dengue Virus by NS5 Methyltransferase. *Acta Scientifica Malaysia*, *7*(1), 17–22. https://doi.org/10.26480/asm.01.2023.17.22

Vazquez-Prokopec, G. M., Montgomery, B. L., Horne, P., Clennon, J. A., & Ritchie, S. A. (2017). Combining Contact Tracing with Targeted Indoor Residual Spraying Significantly Reduces Dengue Transmission. *Science Advances*, *3*, 1–9.

Waggoner, J. J., Abeynayake, J., Sahoo, M. K., Gresh, L., Tellez, Y., Gonzalez, K., Ballesteros, G., Pierro, A. M., Gaibani, P., Guo, F. P., Sambri, V., Balmaseda, A., Karunaratne, K., Harris, E., & Pinsky, B. A. (2013). Single-Reaction, Multiplex, Real-Time RT-PCR for the Detection, Quantitation, and Serotyping of Dengue Viruses. *PLoS Neglected Tropical Diseases*, *7*(4). https://doi.org/10.1371/journal.pntd.0002116

Wang, D. D., Ou-Yang, L., Xie, H., Zhu, M., & Yan, H. (2020). Predicting the Impacts of Mutations on Protein-Ligand Binding Affinity Based on Molecular Dynamics Simulations and Machine Learning Methods. *Computational and Structural Biotechnology Journal*, *18*, 439–454. https://doi.org/10.1016/j.csbj.2020.02.007

Wang, S., Wing, K., Chan, K., Jie, M., Tan, A., Flory, C., Luo, D., Lescar, J., Forwood, J. K., & Vasudevan, S. G. (2022). A Conserved Arginine in NS5 Binds Genomic 3'Stem-Loop RNA for Primer-Independent Initiation of Flavivirus RNA-Replication. *RNA*, *28*(2), 1–34.

Wang, W.-H., Urbina, A. N., Chang, M. R., Assavalapsakul, W., Lu, P.-L., Chen, Y.-H., & Wang, S.-F. (2020). Dengue Hemorrhagic Fever - A Systemic Literature Review of Current Perspectives on Pathogenesis, Prevention and Control. *Journal of Microbiology, Immunology and Infection*, *53*, 963–978.

Wanti, W., Sila, O., Irfan, I., & Sinaga, E. (2016). Transovarial Transmission and Dengue Virus Serotypes in Aedes aegypti In Kupang. *Jurnal Kesehatan Masyarakat*, *12*(1). https://doi.org/10.15294/kemas.v12i1.4993

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Wardhani, P., Yohan, B., Tanzilia, M., Sunari, E. P., Wrahatnala, B. J., Hakim, F. K. N., Rohman, A., Husada, D., Hayati, R. F., Santoso, M. S., Sievers, J. T. O., Aryati, A., & Sasmono, R. T. (2023). Genetic characterization of dengue virus 4 complete Genomes from East Java, Indonesia. *Virus Genes*, *59*(1), 36–44. https://doi.org/10.1007/s11262-022-01942-4

Waterhouse, A., Bertoni, M., Bienert, S., Studer, G., Tauriello, G., Gumienny, R., Heer, F. T., De Beer, T. A. P., Rempfer, C., Bordoli, L., Lepore, R., & Schwede, T. (2018). SWISS-MODEL: Homology modelling of protein structures and complexes. *Nucleic Acids Research*, *46*(W1), W296–W303. https://doi.org/10.1093/nar/gky427

Whitehorn, J., Nguyen, C. V. V., Khanh, L. P., Kien, D. T. H., Quyen, N. T. H., Tran, N. T. T., Hang, N. T., Truong, N. T., Hue Tai, L. T., Cam Huong, N. T., Nhon, V. T., Van Tram, T., Farrar, J., Wolbers, M., Simmons, C. P., & Wills, B. (2015). Lovastatin for the Teratment of Adult Patients with Dengue: A Randomized, Double-Blind, Placebo-Controlled Trial. *Clinical Infectious Diseases*, *62*(4), 468–476. https://doi.org/10.1093/cid/civ949

Wirajaya, G. B. M., Sutanegara, A. A. P. P. D., & Lestari, D. N. D. (2022). Variations of Dengue Shock Syndrome Cases and Their Management: Report of Three Cases. *Intisari Sains Medis*, *13*(3), 625–631. https://doi.org/10.15562/ism.v13i3.1507

World Health Organization. (n.d.). *Dengue in the South-East Asia*. World Health Organization. Retrieved August 10, 2025, from https://www.who.int/southeastasia/health-topics/dengue-and-severe-dengue

World Health Organization. (2011). *Comprehensive Guidelines for Prevention and Control of Dengue and Dengue Haemorrhagic Fever*. World Health Organization Regional Office for South-East Asia.

World Health Organization. (2024, April 23). *Dengue and Severe Dengue*. World Health Organization. https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Wu, T., Guo, Z., & Cheng, J. (2023). Atomic Protein Structure Refinement using All-Atom Graph Representations and SE(3)-Equivariant Graph Transformer. *Bioinformatics*, *39*(5), 1–8. https://doi.org/10.5281/zenodo.6944368

Xu, D., Sun, X., & Wu, S. (2025). Arginine-and Lysine-Modified Forward Osmosis Membranes with Simultaneous Enhancement of Water Flux and Antibacterial Properties: Performance and Mechanisms. *Journal of Environmental Chemical Engineering*, *13*(3), 1–14. https://doi.org/10.1016/j.jece.2025.117058

Xu, Y., Da Silva, W. L., Qian, Y., & Gray, S. M. (2018). An Aromatic Amino Acid and Associated Helix in the C-Terminus of the Potato Leafroll Virus Minor Capsid Protein Regulate Systemic Infection and Symptom Expression. *PLoS Pathogens*, *14*(11), 1–30. https://doi.org/10.1371/journal.ppat.1007451

Yamanaka, A., Mulyatno, K. C., Susilowati, H., Hendrianto, E., Ginting, A. P., Sary, D. D., Rantam, F. A., Soegijanto, S., & Konishi, E. (2011). Displacement of the Predominant Dengue Virus from Type 2 to Type 1 with a Subsequent Genotype Shift from IV to I in Surabaya, Indonesia 2008–2010. *PLoS ONE*, *6*(11), 1–8. https://doi.org/10.1371/journal.pone.0027322

Yan, Y., & Huang, S. Y. (2019). Pushing the Accuracy Limit of Shape Complementarity for Protein-Protein Docking. *BMC Bioinformatics*, *20*, 1–10. https://doi.org/10.1186/s12859-019-3270-y

Yang, J., & Feng, J. (2023). Editorial: Viruses and Immune Response in Pediatric Infection. *Frontiers in Cellular and Infection Microbiology*, *13*, 1–3. https://doi.org/10.3389/fcimb.2023.1257807

Yani, A. (2024). The Influence of Environmental Factors on the Development of Dengue Fever. *The International Science of Health Journal*, *2*(4), 116–123. https://doi.org/10.59680/ishel.v2i4.1569

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Yap, S. S. L., Nguyen-Khuong, T., Rudd, P. M., & Alonso, S. (2017). Dengue Virus Glycosylation: What Do We Know? *Frontiers in Microbiology*, *8*(JUL), 1–16. https://doi.org/10.3389/fmicb.2017.01415

Yenamandra, S. P., Koo, C., Chiang, S., Lim, H. S. J., Yeo, Z. Y., Ng, L. C., & Hapuarachchi, H. C. (2021). Evolution, Heterogeneity and Global Dispersal of Cosmopolitan Genotype of Dengue Virus Type 2. *Scientific Reports*, *11*(1), 1. https://doi.org/10.1038/s41598-021-92783-y

Yohan, B., Dhenni, R., Hayati, R. F., Yudhaputri, F. A., Denis, D., Pamai, Y. W. B., Afida, A. M., Hutagalung, I. A., Haryanto, S., Trimarsanto, H., Myint, K. S. A., & Sasmono, R. T. (2018). Whole Genome Sequencing of Indonesian Dengue Virus Isolates using Next-Generation Sequencing. *Indonesian Journal of Biotechnology*, *23*(2), 74–83. https://doi.org/10.22146/ijbiotech.38788

Yu, X., & Cheng, G. (2022). Contribution of Phylogenetics to Understanding the Evolution and Epidemiology of Dengue Virus. *Animal Models and Experimental Medicine*, *5*(5), 410–417. https://doi.org/10.1002/ame2.12283

Zahid, A., Afzaal, A., Awais, H., Mannan, T., & Habib, H. (2023). Coding Genome Sequence and Protein Sequence Analysis of Dengue Strains: In Silico Correlation. *Advancements in Life Sciences*, *10*(1), 48–53. www.als-journal.com

Zahreddine, M., Parra, B., Pierce, L., de Oliveira, D. F., Carabali, M., Charland, K., Abreu, K., Ridde, V., Lima, D. M., & Zinszer, K. (2025). High Correlation Between Detection of Dengue IgG from Dried Blood Spots and Serum using an Indirect IgG ELISA Assay: A Validation Study in Fortaleza, Brazil. *PLoS Neglected Tropical Diseases*, *2025*, 1–14. https://doi.org/10.1371/journal.pntd.0012880

Zakharov, O. S., Rudik, A. V, Filimonov, D. A., & Lagunin, A. A. (2024). Prediction of Protein Secondary Structures Based on Substructural Descriptors of Molecular Fragments. *International Journal of Molecular Sciences*, *25*(23), 1–16. https://doi.org/10.3390/ijms252312525

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Zeba, A., Sekar, K., & Ganjiwale, A. (2023). M Protein from Dengue Virus Oligomerizes to Pentameric Channel Protein: In Silico Analysis Study. *Genomics and Informatics*, *21*(3), 1–11. https://doi.org/10.5808/gi.23035

Zhang, Q., Hunke, C., Yau, Y. H., Seow, V., Lee, S., Tanner, L. B., Guan, X. L., Wenk, M. R., Fibriansah, G., Chew, P. L., Kukkaro, P., Biuković, G., Shi, P. Y., Shochat, S. G., Grüber, G., & Lok, S. M. (2012). The Stem Region of Premembrane Protein Plays an Important Role in the Virus Surface Protein Rearrangement during Dengue Maturation. *Journal of Biological Chemistry*, *287*(48), 40525–40534. https://doi.org/10.1074/jbc.M112.384446

Zhang, X., Zhang, Y., Jia, R., Wang, M., Yin, Z., & Cheng, A. (2021). Structure and Function of Capsid Protein in Flavivirus Infection and Its Applications in the Development of Vaccines and Therapeutics. *Veterinary Research*, *52*(98), 1–14. https://doi.org/10.1186/s13567-021-00966-2

Zhao, L., Li, J., Zhang, B., & Jiang, X. (2025). Combining Knowledge Distillation and Neural Networks to Predict Protein Secondary Structure. *Scientific Reports*, *15*(1), 1–13. https://doi.org/10.1038/s41598-025-17513-0

Zhao, Y., Raidas, S., Mao, Y., & Li, N. (2021). Glycine Additive Facilitates Site-Specific Glycosylation Profiling of Biopharmaceuticals by Ion-Pairing Hydrophilic Interaction Chromatography Mass Spectrometry. *Analytical and Bionanalytical Chemistry*, *413*, 1267–1277. https://doi.org/10.1007/s00216-020-03089-3/Published

Zhu, G., Liu, T., Xiao, J., Zhang, B., Song, T., Zhang, Y., Lin, L., Peng, Z., Deng, A., Ma, W., & Hao, Y. (2019). Effects of Human Mobility, Temperature and Mosquito Control on the Spatiotemporal Transmission of Dengue. *Science of the Total Environment*, *651*, 969–978. https://doi.org/10.1016/j.scitotenv.2018.09.182

Zuroidah, N., Tanzilia, M. F., Sunari, I. G. A. A. E. P., Wrahatnala, B. J., Haki, F. K. N., Aryati, Wardhani, P., Husada, D., Rohman, A., & Tarmizi, S. N. (2022). Comparison of Diagnostic Tests for Detection of Nonstructural-1(NS1)

UNIVERSITAS
GADJAH MADA
Distribusi Serotipe Virus Dengue dan Analisis Variasi Genetik NS5 sebagai Dasar Interaksi Molekuler Kandidat Obat Antiviral
Radinal Kautsar, Dr.biol.hom. Nastiti Wijayanti, S.Si., M.Si.; Prof. Dr. Dominicus Husada, dr., Sp.A(K)., Subsp.IPT
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Antigen Dengue virus using Immunochromatography and Fluorescence Immunoassay Methods. *Research Journal of Pharmacy and Technology*, *15*(4), 1494–1498. https://doi.org/10.52711/0974-360X.2022.00248