

DAFTAR PUSTAKA

- Hegde, Rahul., Battepati., Prashant M . (2010). *International Journal of Clinical Pediatric Dentistry, January-April 2010;3(1):43-50* doi: [10.5005/jp-journals-10005-1053](https://doi.org/10.5005/jp-journals-10005-1053)
- Tahira Ghaffar et al., (2018) Saudi J. Nurs. Health Care.; Vol-1, Iss-3: 204-210. Website: <http://saudijournals.com/>
- Hilton, T. J., Ferracane, J. L., Mancl, L., Baltuck, C., Barnes, C., ... Beaudry, D. (2013). Comparison of CaOH with MTA for Direct Pulp Capping. *Journal of Dental Research*, 92(7_suppl), S16–S22. doi:10.1177/0022034513484336
- Gong, V., & França, R. (2017). Nanoscale chemical surface characterization of four different types of dental pulp-capping materials. *Journal of Dentistry*, 58, 11–18. <https://doi.org/10.1016/j.jdent.2016.12.009>
- da Rosa, W. L. O., Cocco, A. R., Silva, T. M. d., Mesquita, L. C., Galarça, A. D., Silva, A. F. d., & Piva, E. (2018). Current trends and future perspectives of dental pulp capping materials: A systematic review. *Journal of Biomedical Materials Research - Part B Applied Biomaterials*, 106(3), 1358–1368. <https://doi.org/10.1002/jbm.b.33934>
- Islam, R., Islam, M. R. R., Tanaka, T., Alam, M. K., Ahmed, H. M. A., & Sano, H. (2023). Direct pulp capping procedures – Evidence and practice. *Japanese Dental Science Review*, 59, 48–61. <https://doi.org/10.1016/j.jdsr.2023.02.002>
- Meyer O. silvabaha(2003) Role of TNF- α Ilpha and cytokines in the physiopathology of rheumatoid arthritis. Therapeutic perspectives., Bull. AcadNatl. Med.
- Reyes-Carmona, J. F., Santos, A. R., Figueiredo, C. P., Felippe, M. S., Felippe, W.T., & Cordeiro, M. M. (2011). In vivo host interactions with minral trioxide aggregate and calcium hydroxide: inflammatory molecular signaling assessment. *Journal of Endodontics*, 37, 1225–1235
- Dutta, P. K., Duta, J., & Tripathi, V. S. (2004). Chitin and Chitosan: Chemistry, properties and applications. *Journal of Scientific and Industrial Research*, 63(1), 20–31.
- Rochima E. Karakterisasi Kitin dan Kitosan Asal Limbah Rajungan Cirebon Jawa Barat (2007). Buletin Teknologi Hasil Perikanan: Issue Vol. 10 No.1. <https://doi.org/10.17844/jphpi.v10i1.965>
- Sukamto, "analisis pengaruh perilaku pemimpin terhadap kinerja tenaga penjualan melalui variabel ketidakjelasan peran, kepercayaan terhadap pemimpin dan kepuasan pekerjaan (studi kasus pada pt. Bank mandiri (persero) jawa tengah," jurnal sains pemasaran indonesia (indonesian journal of marketing science), vol. 7, no. 2, pp. 169-190, apr. 2017. <https://doi.org/10.14710/jpsi.v7i2.169-190>
- Abd El-Hack, M. E., El-Saadony, M. T., Shafi, M. E., Zabermawi, N. M., Arif, M., Batiha, G. E., Khafaga, A. F., Abd El-Hakim, Y. M., & Al-Sagheer, A. A. (2020). Antimicrobial and antioxidant properties of chitosan and itsderivatives and their

- applications: A review. *International Journal of Biological Macromolecules*, 164, 2726–2744. <https://doi.org/10.1016/j.ijbiomac.2020.08.153>
- Ezoddini-Ardakani, F., Navabazam, A., Fatehi, F., Danesh-Ardekani, M., Khadem,S., & Rouhi, G. (2012). Histologic evaluation of chitosan as an accelerator of bone regeneration in microdrilled rat tibias. *Dental research journal*, 9(6), 694–699.
- Gani, A., Yulianty, R., Supiaty, S., Rusdy, M., Dwipa Asri, G., Eka Satya, D., Rahayu Feblina, A., & Achmad, H. (2022). Effectiveness of Combination of Chitosan Gel and Hydroxyapatite from Crabs Shells (*Portunus pelagicus*) Waste as Bonegraft on Periodontal Network Regeneration through IL-1 and BMP-2 Analysis. *International Journal of Biomaterials*, 2022. <https://doi.org/10.1155/2022/1817236>
- Achmad, H., Djais, A. I., Jannah, M., Carmelita, A. B., Uinarni, H., Arifin, E. M., Huldani, & Putra, A. P. (2020). Antibacterial chitosan of milkfish scales (*Chanos chanos*) on bacteria *prophyromonas gingivalis* & *aggregatibacter actinomycetemcomitans*. *Systematic Reviews in Pharmacy*, 11(6), 836–841. <https://doi.org/10.31838/srp.2020.6.121>
- Mansyur, sinta. (2022)efektivitas kombinasi kitosan sisik ikan bandeng (*chanos chanos*) sulawesi selatan dengan hidroksiapatit terhadap ekspresi bone morphogenetic protein (bmp)-2 pada tindakan socket preservation.
- Subhi, H., Reza, F., Husein, A., Al Shehadat, S. A., & Nurul, A. A. (2018). Gypsum-Based Material for Dental Pulp Capping: Effect of Chitosan and BMP-2 on Physical, Mechanical, and Cellular Properties. *International Journal of Biomaterials*, 2018. <https://doi.org/10.1155/2018/3804293>
- Osmond, M. J., Newsom, J. P., Danis, T. J., & Krebs, M. D. (2019). Rapidly curing chitosan calcium phosphate composites as dental pulp capping agents. *Transactions of the Annual Meeting of the Society for Biomaterials and the Annual International Biomaterials Symposium*, 40, 74. <https://doi.org/10.20900/rmf20190002>
- Carvalho, C., Varela, S. A. M., Marques, T. A., Knight, A., & Vicente, L. (2020). Are in vitro and in silico approaches used appropriately for animal-based major depressive disorder research? *PLoS ONE*, 15(6 June), 1–6. <https://doi.org/10.1371/journal.pone.0233954>
- Passini, E., Britton, O. J., Lu, H. R., Rohrbacher, J., Hermans, A. N., Gallosmoer, D. J., Greig, R. J. H., Bueno-Orovio, A., & Rodriguez, B. (2017). Human in silico drug trials demonstrate higher accuracy than animal models in predicting clinical pro-arrhythmic cardiotoxicity. *Frontiers in Physiology*, 8(SEP), 1–15. <https://doi.org/10.3389/fphys.2017.00668>
- Maliyahsisna, Fahrunisa Tunjung and Dr. Muhammad Chair Effendi, drg., SU., Sp.KGA. (2022) *Potensi Terpenoid Getah Linn.) Terhadap Mpro Sars-Cov-2 Sebagai Obat Kumur Antivirus Covid- 19*. Sarjana thesis, Universitas Brawijaya.

- Frengki, Saura, E.R., Rinidar. 2013. Studi interaksi kurkumin-artemisinin dan turunannya terhadap reseptor sarcoendoplasma reticulum Ca²⁺ secara in silico. *Jurnal Medika Veterinaria*, 7(2): 138-141.
- Sakaeda T, Nakamura T, Horinouchi M, Kakimoto M, Ohmoto N, Sakai T, Morita Y, Tamura T, Aoyama N, Hirai M, Kasuga M, Okumura K. MDR1 genotype-related pharmacokinetics of digoxin B. Chowbay et al. 170 60:2 Br J Clin Pharmacol after single oral administration in healthy Japanese subjects. *Pharm Res* 2001; 18: 1400–4.
- N. Frimayanti, A. Zamri, Y. Eryanti, N. Herfindo, and V. Azteria, "Docking and Molecular Dynamic Simulations Study to Search Curcumin Analogue Compounds as Potential Inhibitor Against SARS-CoV-2: A Computational Approach," *Jurnal Kimia Sains dan Aplikasi*, vol. 24, no. 3, pp. 85-90, Mar. 2021. <https://doi.org/10.14710/jksa.24.3.85-90>
- Harvey, RA., Champe, PC. (2013). Farmakologi Ulasan Bergambar. (Terjemahan: Ramdhani et al). Jakarta: EGC.
- Adiana Devi., Lasminda. (2014) Penggunaan kitosan sebagai biomaterial di kedokteran gigidentika *Dental Journal*, Vol 18, No. 2, 2014: 190-193.
- Setiajid, M.A. (2012), Analisis Dinamika Molekuler Hasil Penambatan Molekul Kompleks Sikolooksigenase-2 Dengan Beberapa Senyawa 3-fenil-2-stiril-4(3H)-kuinazolinon Tersubstitusi Sulfonamida Atau Sulfasetamida, Skripsi Program Sarjana, Universitas Indonesia, 26 – 38.
- Dubashynskaya, N. V., Raik, S. V., Dubrovskii, Y. A., Demyanova, E. V., Shcherbakova, E. S., Poshina, D. N., ... Skorik, Y. A. (2021). *Hyaluronan/Diethylaminoethyl Chitosan Polyelectrolyte Complexes as Carriers for Improved Colistin Delivery*. *International Journal of Molecular Sciences*, 22(16), 8381. doi:10.3390/ijms22168381
- Bei, Y.-Y., Yuan, Z.-Q., Zhang, L., Zhou, X.-F., Chen, W.-L., Xia, P., ... Jin, Y. (2014). *Novel self-assembled micelles based on palmitoyl-trimethyl-chitosan for efficient delivery of harmineto liver cancer*. *Expert Opin. Drug Deliv.*
- Je, J.Y., and Kim, S.K., 2006. Reactive oxygen species scavenging activity of aminoderivatized chitosan with different degree of deacetylation. *Bioorganic and Medicinal Chemistry*, 14(17), 5989–5994.
- D.-N. Ngo, Z.-J. Qian, J.-Y. Je, M.-M. Kim, and S.-K. Kim, "Aminoethyl chitooligosaccharides inhibit the activity of angiotensin converting enzyme," *Process Biochemistry*, vol. 43, no. 1, pp. 119–123, 2008.
- Meng, X., et al., 2012. Molecular weight and pH effects of aminoethyl modified chitosan on antibacterial activity in vitro. *International Journal of Biological Macromolecules*, 50(4), 918–924.
- Yang, E.-J., Kim, J.-G., Kim, J.-Y., Kim, S., Lee, N., & Hyun, C.-G. (2010). *Anti-inflammatory effect of chitosan oligosaccharides in RAW 264.7 cells*. *Open Life Sciences*, 5(1). doi: 10.2478/s11535-009-0066-5.

- Qiao, Y., Bai, X.-F., & Du, Y.-G. (2011). *Chitosan oligosaccharides protect mice from LPS challenge by attenuation of inflammation and oxidative stress.* International Immunopharmacology, 11(1), 121–127.
doi:10.1016/j.intimp.2010.10.016
- He, X., Xing, R., Liu, S., Qin, Y., Li, K., Yu, H., & Li, P. (2019). *The improved antiviral activities of amino modified chitosan derivatives on Newcastle virus.* Drug and Chemical Toxicology, 1–doi:10.1080/01480545.2019.1620264
- Klaykruayat, B., Siralermukul, K., and Srikulkit, K., 2010. Chemical modification of chitosan with cationic hyperbranched dendritic polyamidoamine and its antimicrobial activity on cotton fabric. Carbohydrate Polymers, 80(1), 197–207.
- Xiao, B., et al., 2011. Preparation and characterization of antimicrobial chitosan-N-arginine with different degrees of substitution. Carbohydrate Polymers, 83(1), 144–150.
- Wu, P., Yu, S., Liu, C., & Liu, A. (2020). *Seleno-Chitosan induces apoptosis of lung cancer cell line SPC-A-1 via Fas/FasL pathway.* Bioorganic Chemistry, 103701. doi:10.1016/j.bioorg.2020.103701
- Syahputra.,ambarsari.(2014) simulasi docking kurkumin enol, bisdemetoksikurkumin dan analognya sebagai inhibitor enzim12-lipoksgenase. Jurnal biofisika, vol.56 10, no.1; 55-67.
- Wahyuningrum, R., Wirasutisna, K. R., Elfahmi, & Wibowo, M. S. (2010). Efek Mutagenik Ekstrak Metanol Ampas Biji Jarak (Jatropha Curcas L.) Sisa Pengolahan Bahan Bakar Nabati (Biofuel). Majalah Obat Tradisional, 15(3), 89–93.
- Kriharyani, D., Sasongkowati, R., & Haryanto, E. (2020). Studi In Silico Sifat Farmakokinetik, Toksisitas, Dan Aktivitas Imunomodulator Brazilein Kayu Secang Terhadap Enzim 3- Chymotrypsin-Like Cysteine Protease Coronavirus. Journal of Indonesian Medical Laboratory and Science, 1(1), 76–90.

LAMPIRAN

1. Surat Izin Penelitian



KEMENTERIAN PENDIDIKAN, KEBUDAYAAN,
RISET, DAN TEKNOLOGI
UNIVERSITAS HASANUDDIN
FAKULTAS KEDOKTERAN GIGI
Jalan Perintis Kemerdekaan Km. 10, Makassar 90245
Telepon (0411) 586012, Faximile (0411) 584641
Laman www.unhas.ac.id Email fdhu@unhas.ac.id

Nomor : 00236/UN4.13/PT.01.04/2024
Hal : Izin Penelitian

15 Januari 2024

Yth. Dekan Fakultas Kedokteran Gigi
Universitas Hasanuddin
Makassar

Dengan hormat kami sampaikan bahwa mahasiswa Program Studi Pendidikan Dokter Gigi Spesialis (PPDGS) Konservasi Gigi Fakultas Kedokteran Gigi Universitas Hasanuddin bermaksud untuk melakukan penelitian.

Sehubungan dengan hal tersebut, mohon kiranya dapat diberikan izin penelitian kepada peneliti di bawah ini:

Nama / NIM	:	Theresia Paskaedith Lodang Hurint / J0252110064
Waktu Penelitian	:	Januari 2024 s.d. Selesai
Tempat Penelitian	:	Fakultas Kedokteran Gigi Universitas Hasanuddin
Pembimbing	:	Dr. Maria Tanumihardja, drg., Md.Sc.
Judul Penelitian	:	Studi <i>In Silico</i> Senyawa Derivat Kitosan Terhadap TNF- α , IL-1 β dan IL-1 α Sebagai Kandidat Bahan Tambahan <i>Capping Agent</i> .

Demikian permohonan kami, atas perhatian dan kerjasama yang baik diucapkan terima kasih.

a.n. Dekan,
Wakil Dekan Bidang Akademik dan Kemahasiswaan



Acing Habibie Mude, drg., Ph.D., Sp.Pros., Subsp.OGST(K).
NIP 198102072008121002
Tembusan:
Kepala Bagian Tata Usaha FKG Unhas.



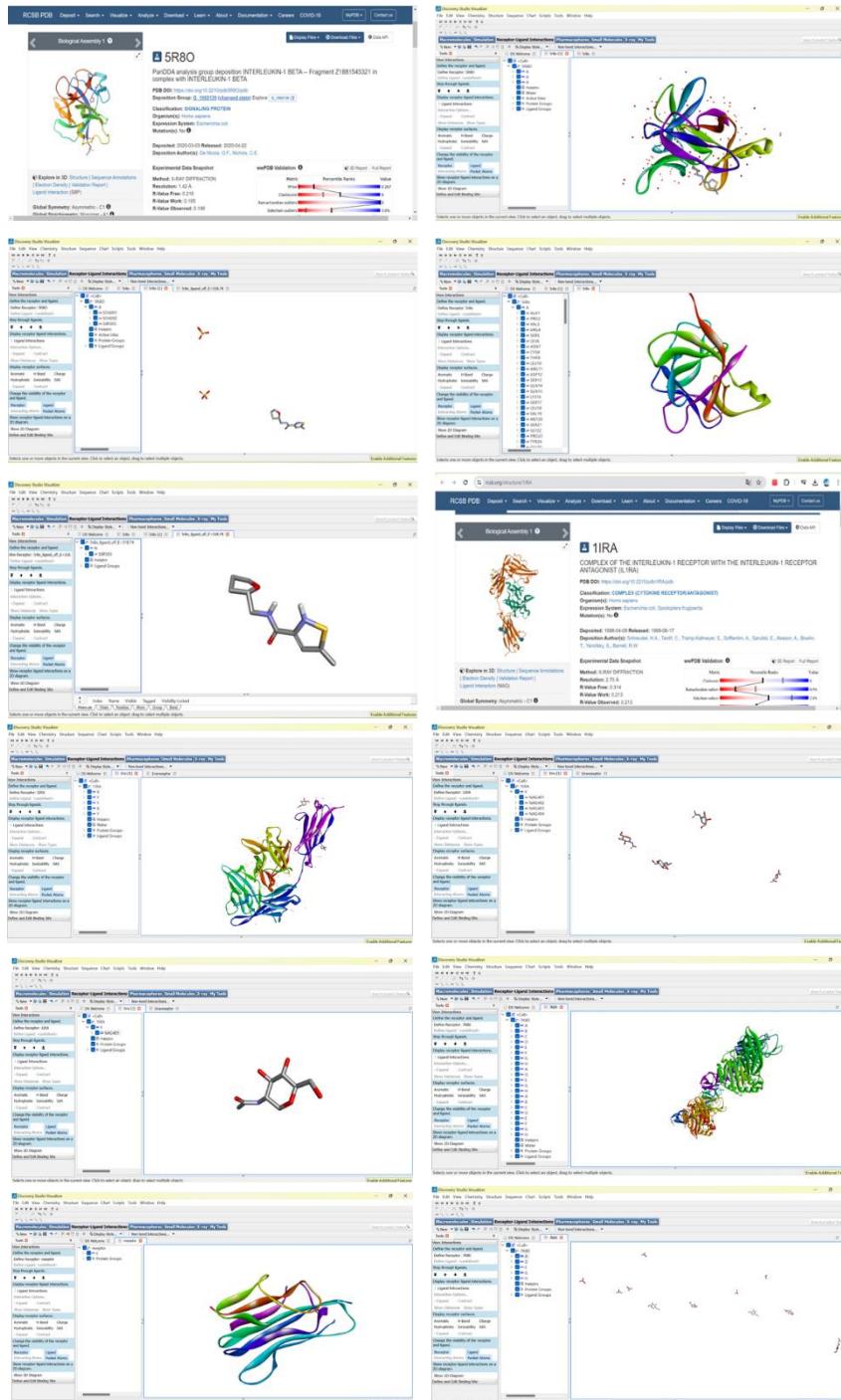
2. Surat Rekomendasi Persetujuan Komite Etik Penelitian

	KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET, DAN TEKNOLOGI UNIVERSITAS HASANUDDIN FAKULTAS KEDOKTERAN GIGI RUMAH SAKIT GIGI DAN MULUT PENDIDIKAN KOMITE ETIK PENELITIAN KESEHATAN Sekretariat : JL.Kandeia No. 5 Makassar Lantai 2, Gedung Lama RSGM Unhas Contact Person: drg. Muhammad Ikbal, Sp.Pros/Nur Aedah AR TELP. 08134297101/08114919191 		
REKOMENDASI PERSETUJUAN ETIK Nomor: 0070/PL.09/KEPK FKG-RSGM UNHAS/2024			
Tanggal: 13 Maret 2024			
Dengan ini menyatakan bahwa protokol dan dokumen yang berhubungan dengan protokol berikut ini telah mendapatkan persetujuan etik:			
No. Protokol	UH 17121085	No Protokol Sponsor	
Peneliti Utama	drg. Theresia Paskaedith Lodang Hurint	Sponsor	Pribadi
Judul Peneliti	Studi In Silico Senyawa Derivat Kitosan Terhadap Interleukin-1 Alpha (IL-1 α), Interleukin-1 \square (IL-1 \square) dan Tumor Necrosis Factor Alpha (TNF- α) sebagai Kandidat Bahan Tambahan Capping Agent		
No. Versi Protokol	1	Tanggal Versi	11 Maret 2024
No. Versi Protokol		Tanggal Versi	
Tempat Penelitian	1. Fakultas Kedokteran Gigi Unhas, 2. Fakultas Farmasi Poltekkes kemenkes Makassar		
Dokumen Lain			
Jenis Review	<input type="checkbox"/> Exempted <input checked="" type="checkbox"/> Expedited <input type="checkbox"/> Fullboard	Masa Berlaku 13 Maret 2024-13 Maret 2025	Frekuensi Review Lanjutan
Ketua Komisi Etik Penelitian	Nama: Dr. drg. Marhamah, M.Kes		Tanggal 13 Maret 2024
Sekretaris Komisi Etik Penelitian	Nama: drg. Muhammad Ikbal, Sp.Pros		Tanggal 13 Maret 2024

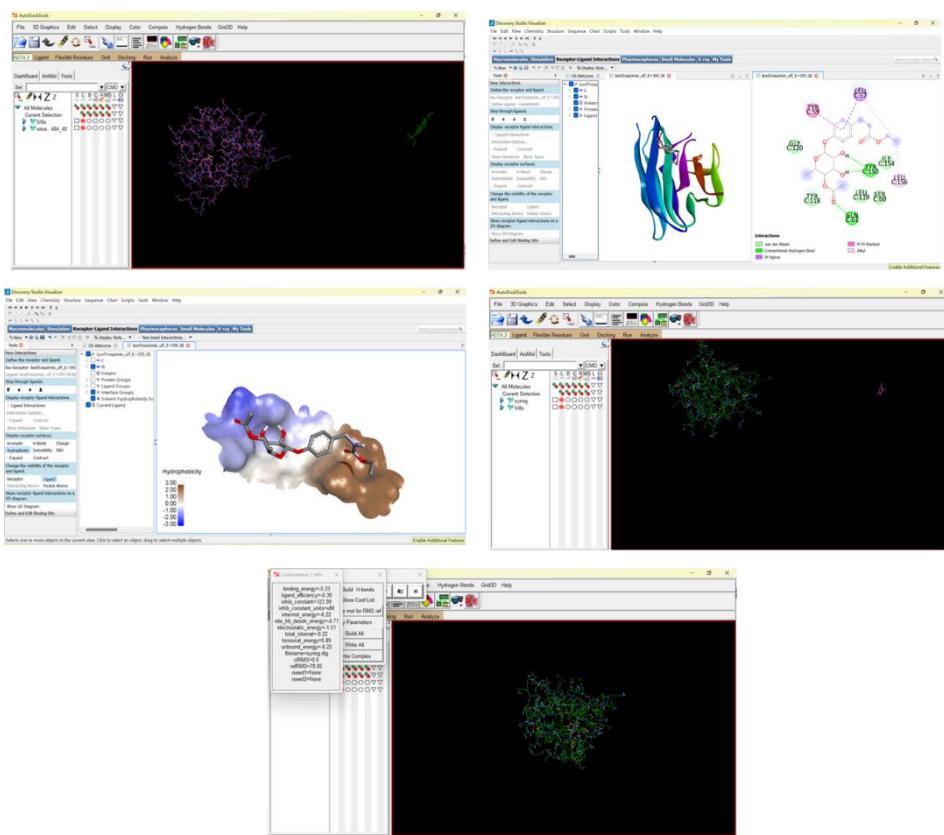
Kewajiban peneliti utama:

- Menyerahkan Amandemen Protokol untuk persetujuan sebelum diimplementasikan
- Menyerahkan laporan SAE ke Komisi Etik dalam 24 Jam dan dilengkapi dalam 7 hari dan lapor SUSAR dalam 72 jam setelah peneliti utama menerima laporan.
- Menyerahkan laporan kemajuan (*progress report*) setiap 6 bulan untuk penelitian resiko tinggi dan setiap setahun untuk penelitian resiko rendah.
- Menyajikan laporan akhir setelah penelitian berakhir.
- Melaporkan penyimpangan dari protokol yang disetujui (*protocol deviation/violation*)
- Mematuhi semua aturan yang berlaku.

3. Dokumentasi Penelitian



Prosedur penelitian



Prosedur penelitian

4. Riwayat Hidup Penulis

A. Data Pribadi

1. Nama : Theresia Paskaedith Lodang Hurint
2. TTL : Dili, 18 April 1993
3. Jenis Kelamin : Perempuan
4. Alamat : Nangahure, Kel. Hewuli, Kec Alok Barat, Sikka, NTT
5. Kewarganegaraan : Indonesia



B. Riwayat Pendidikan

1. SDN Contoh 1998-2004
2. SMP Katolik Farater Maumere 2004-2007
3. SMA Katolik syuradikara Ende 2007-2010
4. S1 (S.KG) FKG Institut Ilmu Kesehatan Bhaktiwiyata Kediri 2010-2015
5. Profesi (drg.) FKG Institut Ilmu Kesehatan Bhaktiwiyata Kediri 2015-2017
6. PPDGS Konservasi Gigi FKG Universitas Hasanuddin 2021-2024

C. Riwayat Pekerjaan

1. Pegawai Negeri Sipil (PNS) Daerah Kabupaten Sikka

D. Karya Ilmiah Terpublikasi

1. Hurint TPL, Natsir N, Dwiandhany SW, Nugroho JJ, Hikmah N, Trilaksana AC. 2023. Treatment option in immature permanent teeth with acute apical abscess a case report. Journal of Case Reports in Dental Medicine. 5(2): 42-44. DOI: 10.20956/jcrdm.v5i2.221.
2. Hurint TPL, Dwiandhany SW, Nugroho JJ, Hikmah N, Natsir N, Trilaksana AC. 2023. Restoration of endodontically treated mandibular third molar tooth with indirect bonded restoration using morphology-driven preparation technique: A case report. Journal of Case Reports in Dental Medicine. 5(2): 34-36. DOI: 10.20956/jcrdm.v5i2.218.