



1. Name : Associate Professor Dr. Mohd Mokrish Md. Ajat
2. Department : Department of Veterinary Preclinical Sciences
3. Faculty : Faculty of Veterinary Medicine
4. Field of specialization : Veterinary Biochemistry
5. Office/Phone No./Email : 03-97693419/mokrish@upm.edu.my
6. Year of starting service at the university : 17 May 2004 (Tutor DA41)
7. Date of appointment to the current position : 1 January 2025 (Associate Professor, DS14)
8. Academic qualifications

Name of School/Institution	Certificate/Qualification obtained	Year obtained
Universiteit Utrecht	Doctor of Philosophy	17/12/2015
Universiti Putra Malaysia	Master of Science (Nanobiotechnology)	16/09/2006
Universiti Putra Malaysia	Bachelor of Science with Honours (Biochemistry)	2003
Kolej MARA Kulim	Matriculation	2000
SMK Lembah Keramat	Sijil Pelajaran Malaysia	1998

9. Teaching

Undergraduate Courses	Postgraduate courses
Veterinary Biochemistry (VPP3020)	Molecular Physiology (VPM5001)
Veterinary Biochemistry (VPP3021)	Applied Animal Molecular Biology (VPM5301)
Veterinary Nutrition (VPP3130)	
Veterinary Genetics (VPP3140)	
Introduction to Veterinary Profession (VPK3910)	
Veterinary Problem Investigation (VPD4970)	
Problem Solving in Disease (VPD4971)	
Clinical Orientation (VPD3935)	
Final Year Project (VPD4999)	

10. Students' supervision activity

Level	Graduated		Ongoing	
	Main supervisor	Co-supervisor	Main supervisor	Co-supervisor
Bachelor	14	11	2	0
MSc. / MVSc.	1	6	0	0
PhD	2	9	0	2



11. Publications

(i) List of published articles in citation journal

Journal article

1. Sipin, Q., Low, S.Y., Kamil, W.N.I.W.A., Wan, K.L., Ajat, M., Kamaludeen, J., Syed-Hussain, S.S., Ahmad, N.I. and Aziz, N.A.A. (2025). In-silico and phylogenetic analysis of acetate: Succinate COATransferase (ASCT) from *Angiostrongylus malaysiensis*. *Pertanika Journal of Tropical Agricultural Science*. Vol: 48 Issue: 3 pg: 747-766
2. Kumar, P., Abubakar, A.A, Adewale, M.A., Abdul, M., Hayat, M.N., Halim, F.A., Rahman, M.M., Kaka, U., **Ajat, M.**, Goh, Y.M. and Sazili, A.Q. (2025). Effects of exposure to slaughter ambient on catecholamines, beta-endorphin, plasma enzymes, apoptotic index and shear-force of Longissimus thoracis et lumborum muscle in goats. *Journal of the Indonesian Tropical Animal Agriculture*. Vol:50 Issue: 1 pg: 1-10
3. Ilias, N., Rahman, N.A.A.A, Razali, A.R., Selvarajah, G.T., Cheng, M.F.W. and **Ajat, M.*** (2025). Evaluating palatability of lipopolysaccharide supplement in cats with and without flavoured treats. *Philippine Journal of Veterinary Medicine*. Vol: 62 Issue: 1
4. Sulaiman, S.Z.S., Umran, N.S.S., Mohamed, S., Abu, J., Ng, A.M.H., Lau, B.Y.C., Lai, K.S., Ilias, N., Lau, S.F. and **Ajat, M.*** (2024). Proteomic and morphological analysis of bone and articular cartilage changes in osteoarthritic rabbits supplemented with Edible Bird's Nest (EBN). *Malaysian Journal of Fundamental and Applied Sciences*. Vol: 20 Issue: 6 pg: 1274-1287
5. Akmal, M.N., Intan-Shameha, A.R., Mansor, R., Ideris, A., Abu Bakar, M.Z. and **Ajat, M.** (2024). Edible Bird's Nest Soup (EBNS) serves as anti-obesity and antilipemic after 6-wees of supplementation in high-fat diet (HFD)-Fed rats. *Sains Malaysiana*. Vol: 53 Issue 11 pg: 3545-3553
6. Kumar, P., Abubakar, A.A, Adewale, M.A., Hayat, M.N., Halim, F.A., Rahman, M.M., Kaka, U., **Ajat, M.**, Goh, Y.M. and Sazili, A.Q. (2024). Behavioural, physiological, and hormonal responses during pre-slaughter handling in goats: a comparison between trained and untrained handlers. *Animal Bioscience*. Vol:37 Issue: 11 pg: 2000-2007
7. Agina, O.A., Shaari, M.R., Isa, N.M.M, **Ajat, M.**, Zamri-Saad, M. and Hamzah, H. (2024). Identification of novel bovine leukocyte antigen alleles and association of BoLA-DRB3.2*020:02:01 with resistance to Theileria orientalis infection in crossbred Kedah-Kelantan cattle: a pilot study. *Tropical Animal Health and Production*. Vol: 56 Issue: 8 Article number 277
8. Kumar, P., Abubakar, A.A, Adewale, M.A., Hayat, M.N., Adamu, G., Kaka, U., **Ajat, M.**, Goh, Y.M. and Sazili, A.Q. (2024). Electroencephalogram , creatine kinase, and lactate dehydrogenase responses during preslaughter handling in goats handled by trained and untrained handlers. *Journal of the Indonesian Tropical Animal Agriculture*. Vol:49 Issue: 3 pg: 215-223
9. Maslizan, M., Haris, M.S., Ajat, M., Md Jamil, S.N.A., Azhar, S.C., Zahid, N.I., and Mat Azmi, I.D. (2024). Non-lamellar lyotropic liquid crystalline nanoparticles as nanocarriers for enhanced drug encapsulation of atorvastatin calcium and protoanthocyanidins. *Chemistry and Physics of Lipids*. Vol: 260 Article number 105377
10. Ilias, N., Saidin, F., Ahmad, N.I., Waheed, M., Nor, M.W.M. and **Ajat, M.***. (2024). The impact of Covid-19 on human-pet relationships in Malaysia and Indonesia: A public sentiment analysis. *Archives of Veterinary Medicine*. Vol: 17 Issue: 2 pg: 127-146
11. Sadiq, M.B., Ramanoon, S.Z., Mansor, R., Mossadeq, W.M.S., Syed-Hussain, S.S., Yimer, N., Kaka, U., **Ajat, M.** and Abdullah, J.F.F. (2024). Potential biomarkers for lameness and claw lesions in dairy cows: A scoping review. *Journal of Dairy Research*. Vol: 28 pg: 1-9
12. Agina, O.A., Shaari, M.R., Isa, N.M.M, **Ajat, M.**, Zamri-Saad, M. and Hamzah, H. (2023). Differential responses of monocyte-derived macrophages from Theileria orientalis infected carrier cattle to Pastuerella multocida B:2 infection and latex beads: A preliminary study. *Research in Veterinary Science*. Vol: 165 Article number 105073
13. Ahmad, R.R., Chen, H.C., Rozanaliza, R., Michelle, F.W.C., Adila, M.J.,Pei-Shue, J.T. and **Mokrish, A.***. (2023). Preparation and Characterization of Gellan Gum Hydrogel as Therapeutic Protein Delivery for Wound Healing. *Malaysian Journal of Fundamental and Applied Sciences*. Vol: 19 pg: 885-891
14. Mohammad Sabri, A.R., Khor, K.H., Siti,K.B., Lau, S.F., Mazlina, M.,, Mohd Azri, R., **Ajat, M.M.M.** and Mohd Akmal, M.N. (2023). TaqMan real-time PCR for detection of pathogenic Leptospira spp. in canine clinical samples. *Journal of Veterinary Research*. Vol: 67 Issue: 2 pg: 187-195
15. Low, S.Y., Lau, S.F., Ahmad, N.I., Sharma, R.S.K., Rosli, M.Z., Mohd-Taib, F.S., **Ajat, M.M.M.**, Kamaludeen, J., Syed Hussain, S.S., Wan, K.L., Salleh, A. and Aziz, N.A.A. (2023). A cross-sectional study of *Angiostrongylus malaysiensis* in rats and gastropod hosts from recreational parks in Kuala Lumpur, Malaysia: Detection, risk factors and pathology. *Zoonoses and Public Health*. Vol: 70 Issue: 7 pg: 636-646
16. Nazhan, I., Rocky, V.R., Gayathri, T.S., Intan, D.M.A. and **Mokrish, A.*** (2023). Structural complexity and physical mechanism of self-assembled lipid as nanocarriers: A review. *Asia-Pacific Journal of Molecular Biology and Biotechnology*. Vol: 31 Issue: 2 pg: 26-35
17. Abu Bakar, N., Wan Ibrahim, W.N., ;Zulkifli, A.R., Saleh Hodin, N.A., Kim, T.Y., Ling, Y.S., **Md. Ajat, M.M.**, Shaari, K., Shohaimi, S. and Nasruddin, N.S. (2023). Embryonic mercury exposure in zebrafish: Alteration of metabolites and gene expression, related to visual and behavioral impairments. *Ecotoxicology and Environmental Safety*. Vol: 256 Article number 114862
18. Kumar, P., Ahmed, M.A., Abubakar, A.A, Hayat, M.N., Kaka, U., **Ajat, M.**, Goh, Y.M. and Sazili, A.Q. (2023). Electroencephalogram and Physiological Responses as Affected by Slaughter Empathy in Goats. *Animals*. Vol: 13 Issue: 6 Article number 1100
19. Kumar, P., Ahmed, M.A., Abubakar, A.A, Hayat, M.N., Kaka, U., **Ajat, M.**, Goh, Y.M. and Sazili, A.Q. (2023). Improving animal welfare status and meat quality through assessment of stress biomarkers: A critical review. *Meat Science*. Vol: 197 Article number 109048
20. Salleh, F., Goh, Y.M., Lau, S.F., Rani, P.A.M.A., Radzi, R., Mazlan, M., Alashraf, A.R., Goh, S.A., Mohidin, T.B.M, Akmal, M.N., Ilias, A.N. and **Ajat, M.*** (2022). Elucidating Hepatic lipidosis in Stray Cats Through Serum Biochemistry, Liver Histopathology and Liver RNA Expression of PPAR-δ and PPAR-γ. *Sains Malaysiana*. Vol: 51 Issue: 7 pg:1957-1967
21. Sahabi, K., Selvarajah, G.T., **Mokrish, A.**, Rasedee, A. and Kqueen, C.Y. (2022). Development and molecular characterization of doxorubicin-resistant canine mammary gland tumour cells. *Journal of Applied Animal Research*. Vol: 50 Issue: 1 pg: 125-145
22. Ilias, N., Zaki, A.H.H., Junaidi, AH.A., Fong, L.S., Saufi, I. and **Ajat, M.*** (2022). Palatability assessment of prescribed diets on domestic shorthair cats. *Veterinary World*. Vol: 15 Issue: 3 pg: 640-646
23. Sulaiman, S.Z.S., Tan, W.M., Radzi, R., Shafie, I.N.F., **Ajat, M.**, Mansor, R., Mohamed, S., Ng, A.M.H. and Lau, S.F. (2022). Synovial fluid proteome profile of surgical versus chemical induced osteoarthritis in rabbits. *PeerJ*. Vol: 10 Article number e12897
24. Sahabi, K., Selvarajah, G.T., **Mokrish, A.**, Rasedee, A. and Kqueen, C.Y. (2022). Development and molecular characterization of doxorubicin-resistant canine mammary gland tumour cell. *Journal of Applied Animal Research*. Vol: 50 Issue: 1 pg: 125-145

25. Jaafar, A.M., Hasnu, N., Zainal, Z., Masarudin, M.J., **Ajat, M.M.M.**, Aung, M.M., and Rayung, M. (2021). Preparation, characterisation and antibacterial activity of carvacrol encapsulated in gellan gum hydrogel. *Polymers*. Vol: 13 Issue: 23 Article number 4153
26. Sulaiman, S.Z.S., Tan, W.M., Radzi, R., Shafie, I.N.F., **Ajat, M.**, Mansor, R., Mohamed, S., Ng, A.M.H. and Lau, S.F. (2021). Comparison of bone and articular cartilage changes in osteoarthritis: a micro-computed tomography and histological study of surgically and chemically induced osteoarthritic rabbit models. *Journal of Orthopaedic Surgery and Research*. Vol: 16 Issue: 1 Article number 663
27. Agina, O.A., Shaari, M.R., Isa, N.M.M, **Ajat, M.**, Zamri-Saad, M., Mazlan, M., Muhamad, A.S., Kassim, A.A., Ha, L.C., Rusli, F.H., Masaud, D. and Hamzah, H. (2021). Molecular detection of Theileria species, Anaplasma species, Candidatus Mycoplasma haemobos, Trypanosoma evansi and first evidence of Theileria sinensis-associated bovine anaemia in crossbred Kedah-Kelantan x Brahman cattle. *BMC Veterinary Research*. Vol: 17 Issue:1 Article number 246
28. Tan, W.M., Lau, S.F., Sulaiman, S.Z.S., Umrans, N.S.S., **Ajat, M.**, Mansor, R., Abd-Rani, P.A.M., Shafie, I.N.F., Ng, A.M.H., and Rahmad, N. (2021). Trichloroacetic Acid/Acetone Precipitation Method to Optimize Canine Synovial Fluid for One and Two-Dimensional Gel Electrophoresis Studies. *Sains Malaysiana*. Vol: 50 Issue: 11 pg: 3297-3302
29. Ilias, A.N., Ismail, I.S., Hamzah, H., Mohidin, T.B.M., Idris, M.F. and **Ajat, M.*** (2021). An insight on the future therapeutic application potential of Stevia rebaudiana Bertoni for atherosclerosis and cardiovascular diseases. *Biomedicine and Pharmacotherapy*. Vol: 143 Article number 112207
30. Ahmed, H., **Ajat, M.**, Mahmood, R.I., Mansor, R., Razak, I.S.A., Al-Obaidi, J.R., Razali, N., Jaji, A.Z., Danmaigoro, A. and Bakar, M.Z.A. (2021). LC-MS/MS proteomic study of MCF-7 cell treated with dox and dox-loaded calcium carbonate nanoparticles revealed changes in proteins related to glycolysis, actin signalling, and energy metabolism. *Biology*. Vol: 10 Issue: 9 Article number 909
31. Chemmalar, S., Intan-Shameha, A.R., Abdullah, S.A.C., Razak, N.A.A., Yusof, L.M., **Ajat, M.**, Gowthaman, N.S.K. and Bakar, M.Z.A. (2021). Synthesis and characterization of gefitinib and paclitaxel mono and dual drug-loaded blood cockle shells (Anadara granosa)-derived aragonite caco3 nanoparticles. *Nanomaterials*. Vol: 11 Issue: 8 Article number 1988
32. Agina, O.A., Cheah, K.T., Sayuti, N.S.A., Shaari, M.R., Isa, N.M.M, **Ajat, M.**, Zamri-Saad, M., Mazlan, M. and Hamzah, H. (2021). High granulocyte-macrophage colony stimulating factor to interleukin 10 ratio and marked antioxidant enzyme activities predominate in symptomatic cattle naturally infected with candidatus Mycoplasma haemobos, Theileria orientalis, Theileria sinensis and Trypanosoma evansi. *Animals*. Vol: 11 Issue:8 Article number 2235
33. Yang, S.K., Yusoff, K., **Ajat, M.**, Yap, W.S., Lim, S.H.E. and Lai, K.S. (2021). Antimicrobial activity and mode of action of terpene linalyl anthranilate against carbapenemase-producing Klebsiella pneumoniae. *Journal of Pharmaceutical Analysis*. Vol: 11 Issue: 2 pg: 210-219
34. Yang, S.K., Yusoff, K., **Ajat, M.**, Wee, C.Y., Yap, P.S.X., Lim, S.H.E. and Lai, K.S. (2021). Combinatorial antimicrobial efficacy and mechanism of linalool against clinically relevant klebsiella pneumoniae. *Frontiers In Microbiology*. Vol: 12 Article number 635016
35. Ilias, A.N., Ismail, I.S., Hamzah, H., Mohidin, T.B.M., Idris, M.F. and **Ajat, M.*** (2021). Rebaudioside A enhances cholesterol uptake in HepG2 cells via suppression of HMGCR expression. *Reports of Biochemistry and Molecular Biology*. Vol: 10 Issue: 3 pg: 401-411
36. Hong, X. **Ajat, M.***, Fakurazi, S., Noor, A.M. and Ismail, I.S. (2021). Anti-inflammatory evaluation of Scurula ferruginea (jack) danser parasitizing on Tecoma stans (L.) H.B.K. in LPS/IFN-gamma-induced RAW264.7. *Journal of Ethnopharmacology*. Vol: 268 Article number 113647
37. Akmal, M.N., Intan-Shameha, A.R., Mansor, R., Ideris, A., Omar, A.R., Abu, J., Idris, M.F. and **Ajat, M.*** (2020). High-dose Edible Bird's Nest Extract (EBN) upregulates LDL-R via suppression of HMGCR gene expression in HepG2 cell lines. *Sains Malaysiana*. Vol: 49 Issue 10 pg: 2433-2442
38. Agina, O.A., Shaari, M.R., Isa, N.M.M, **Ajat, M.**, Zamri-Saad, M. and Hamzah, H. (2020). Clinical pathology, immunopathology and advanced vaccine technology in bovine theileriosis: A review. *Pathogens*. Vol: 9 Issue 9 pg: 1-22
39. Moo, C.L., Yang, S.K., Yusoff, K., **Ajat, M.**, Thomas, W., Abushelaibi, A., Lim, Swee.H.E. and Lai, K.S. (2020). Mechanisms of antimicrobial resistance (AMR) and alternative approaches to overcome AMR. *Current Drug Discovery Technologies*. Vol: 17 Issue: 4 pg: 430-447
40. Ibiyeye, K.M., Abu Bakar, Z.Z., Nurdin, N. and **Ajat, M.** (2020). Combine drug delivery of thymoquinone-doxorubicin by cockle shell derived pH-sensitive aragonite CaCO₃ nanoparticles. *Nanoscience & Nanotechnology-Asia*. Vol: 10 Issue 4 pg: 518-533
41. Ilias, A.N., Hamzah, H., Ismail, I.S. and **Ajat, M.*** (2020). Stevia: limiting cholesterol synthesis in Hep-G2 cells. *Asia Pacific Journal of Molecular Biology and Biotechnology*. Vol: 28 Issue 1 pg: 110-119
42. Moo, C.L., Yang, S.K., **Ajat, M.**, Thomas, W., Abushelaibi, A., Lim, S.H.E. and Lai, K.S. (2020). Mechanism of antimicrobial resistance (AMR) and alternative approaches to overcome AMR. *Current Drug Discovery*. Vol: 17 Issue: 4 pg: 430-447
43. Alashraf, A.R., Lau, S.F., Khairani-Bejo, S., Khor, K.H., **Ajat, M.**, Radzi, R., Roslan, M.A. and Rahman, M.S.A. (2020). First report of pathogenic Leptospira spp. Isolated from urine and kidneys of naturally infected cats. *PLoS ONE*. Vol: 15 Issue 3 e0230048
44. Chan, W.Y., Selvarajah, G.T., **Ajat, M.**, Suzuki, R. and Tsukui, T. (2019). The detection of house dust mite Dermatophagoides farina, Der f 2 and Zen-1 allergen-specific immunoglobulin E antibodies in dogs with atopic Dermatitis in Malaysia. *Veterinary Immunology and Immunopathology*. Vol: 212 pg: 43-49
45. Yang, S.K., Yusoff, K., **Ajat, M.**, Thomas, W., Abushelaibi, A., Akseer, R., Lim, S.H.E. and Lai, K.S. (2019). Disruption of KPC-producing Klebsiella pneumoniae membrane via induction of oxidative stress by cinnamon bark (Cinnamomum verum J. Presl) essential oil. *PLoS ONE*. Vol: 14 Issue 4 e0214326
46. Zulkifli, D.A., Mansor, R., **Md Ajat, M.M.**, Abas, F., Ideris, A. and Abu, J. (2019). Differentiation of Malaysian farmed and commercialized edible bird's nests through nutritional composition analysis. *Pertanika Journal of Tropical Agricultural Science*. Vol: 42 Issue 3 pg: 871-881
47. Hamidu, A., **Mokrish, A.**, Mansor, R., Razak, I.S.A., Danmaigoro, A. and Jaji, A.Z. (2019). Modified methods of nanoparticles synthesis in pH-sensitive nano-carriers production for doxorubicin delivery on MCF-7 breast cancer cell line. *International Journal of Nanomedicine*. Vol: 14 pg: 3615-3627
48. Peter, I.D., Haron, A.W., Jesse, F.F.A, **Ajat, M.**, Wen Han, M.H., Fitri, W.N., Yahaya, M.S. and Alamaary, M.S.M. (2018). Opportunities and challenges associated with fecal progesterone metabolite analysis. *Veterinary World*. Vol: 11 Issue 10 pg: 1466-1472
49. Akmal, M.N., Intan-Shameha, A.R., **Ajat, M.**, Mansor, R., Zuki, A.B.Z. and Ideris, A. (2018). Edible Bird's Nest (EBN) supplementation ameliorates the progression of hepatic changes and atherosclerosis in hypercholesterolaemic-induced rats. *Malaysian Journal of Microscopy*. Vol: 4 Issue 1 pg: 103-114
50. Tan, W.M., Lau, S.F., **Ajat, M.**, Mansor, R., Abd Rani, P.A.M. and Rahmad, N.B. (2017). Proteomic analysis of synovial fluid obtained from a dog diagnosed with idiopathic immune-mediated polyarthritis. *Topics in Companion Animal Medicine*. Article in Press
51. **Ajat, M.***, Molenaar, M., Brouwers, J.F.H.M, Vaandrager, A.B., Houweling, M. and Helms, J.B. (2017). Hepatic stellate cells retain the capacity to synthesize retinyl esters and to store neutral lipids in small lipid droplets in the absence of LRAT. *Biochimica et Biophysica Acta – Molecular and Cell Biology of Lipids*. Vol: 1862 Issue 2 pg: 176-187
52. Kosni, N.N., Ganti, N., Noor, M., Razak, I., **Ajat, M.** and Omar, A. (2016). Expression of complement C5a receptor and the viability of 4T1 tumor cells following agonist-antagonist treatment. *Journal of Cancer Research and Therapeutics*. Vol: 12 pg: 590-596



53. Norhaifa, G., Nashreq, K.N., Kamarudin, N.H., Bachek, N.F., **Ajat, M.M.**, Hafandi, A., Selvarajah, G.T. and Hezmee, M.N.M. (2016). Expression of C5a and its Receptor in Canine Spontaneous Tumors: A preliminary Finding. *Pertanika Journal of Science and Technology*. Vol: 24 Issue: 1 pg: 527-538
54. Shafie, N.I., Samsulrizal, N., Sopian, N.A., Rajion, M.A., Meng, G.Y., **Ajat, M.M.M.** and Ahmad, H. (2015). Qualitative phytochemical screening and GC-MS profiling of azadirachta excelsa leaf extract. *Malaysian Applied Biology*. Vol: 44 Issue: 3 pg: 87-92
55. Sopian, N.F.A., **Ajat, M.**, Shafie, N.I., Noor, M.H.M., Ebrahimi, M., Rajion, M.A., Meng, G.Y. and Ahmad, H. (2015). Does short-term dietary omega-3 fatty acid supplementation influence brain hippocampus gene expression of zinc transporter-3?. *International Journal of Molecular Sciences*. Vol: 16 Issue 7 pg: 15800-15810
56. N. Testerink, **M. Ajat**, M. Houweling, J. Bouwers, V.V. Pully, H.J. van Manen, C. Otto, J.B. Helms and A.B. Vaandrager (2012). Replacement of Retinyl Esters by Polyunsaturated Triacylglycerol Species in Lipid Droplets of Hepatic Stellate Cells during Activation. *PLoS ONE*. Vol: 7 Issue 4 e34945
57. **Md. Ajat, M.M.***, Yusoff, K. and Hussein, M.Z. Synthesis of glutamate-zinc-aluminium-layered double hydroxide nanobiocomposites and cell viability study (2008). *Current Nanoscience*. Vol: 4 Issue 4 pg: 391 - 396

(ii) Chapter list in book

Type	Title
Book	1. EXCEL (Experiential Learning and Competency-Based Education Landscape) Playbook (2021). Mohd Mokrish Md. Ajat. E ISBN: 978-967-2828-15-0 2. SULAM (Service Learning – Malaysia University for Society) Playbook (2019). Mohd Mokrish Md. Ajat. ISBN: 978-967-14585-6-3 3. Retinol Metabolism in Hepatic Stellate Cells: A New Vision. (2015). Mohd Mokrish Md Ajat. ISBN: 978-90-393-6453-6
Chapter in book	Chapter 6: Communication During Outbreak. (2017) One Health Manual: On Handling Zoonotic Disease Outbreaks in Malaysia. ISBN: 978-967-960-416-0

13. International and university recognition

	Award	Authority	Level	Year
Academic	Gold Medal KNOVASI	Kongres & Pertandingan Inovasi Pengajian & Pembelajaran UKM	National	2020
	Gold Medal STEM Teaching Innovation Award	Malaysia Technology Expo (MTE)	International	2019
	MAB UNESCO Young Scientists Award (the first recipient from Malaysia)	MAB UNESCO Paris	International	2016
	Silver Medalist	Biotechnology Asia Exhibition PWTC	International	2006
	Silver Medalist, UPM Research and Development Exhibition	Research Management Center (RMC), UPM	University	2005
Non-academic	Travel Award	SEAOHUN (USAID)	International	2018
	Travel Award	SEAOHUN (USAID)	International	2017
	Scholarship (Travel grant)	Keystone Symposia, Colorado, USA	International	2010
	Young Scientist Participant at the Lindau Nobel Laureate Meeting (Represent Academy of Sciences Malaysia)	Council of Lindau Nobel Laureate Meetings, Germany	International	2007