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ABOUT

Dr Muhamad Noor Alfarizal Kamarudin is a research fellow at Brain Research Institute Monash Sunway (BRIMS), Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia. He is undertaking research on with special interest to unravel the novel and intriguing role of RFamides as therapeutic targets in Glioblastoma multiforme. Additionally, his research interest also lies on the complex regulation of inflammation in neurodegenerative diseases.

He completed his Bachelor Degree (Biochemistry, Hons) from University of Malaya (UM) and pursued his Masters studies of which he successfully converted into a doctorate program (UM, 2012) with specialization in molecular biology, neuroimmunology, neuroprotection, cancer biology and natural products. His PhD thesis focuses on the modulation of molecular signaling in neuroinflammation with special attention to cytokines and chemokines where he identified a potential novel role of CCL21/exodus in neuronal differentiation and key regulator of microglia activation. Through this, he developed an immense interest and in-depth knowledge on the modulation of neuroinflammation, particularly innate immunity in neurons and glia cells in neuroprotection, neuritogenesis and anti-inflammatory.

Upon completing his PhD (2016), he obtained a postdoctoral researcher position under a three way collaboration between UM, Taibah University of Medina and Lincoln College University on Glioblastoma multiforme (GBM) project. He is also an active reviewer for several journals such as Journal of Ethnopharmacology and Journal of Functional Food.

Qualifications

- Doctor of Philosophy (Biochemistry), University of Malaya
- Bachelor of Science (Biochemistry, University of Malaya – Best Thesis Award, University of Malaya
- Associate Diploma (Instrument Studio Teaching), International Music of Exam Board, Australia.

RESEARCH EXPERTISE

- Cancer biology – Gliomas & Glioblastoma multiforme
- Molecular Biology
- Neuroimmunology & Neuroprotection
- Molecular signal transduction – Protein Signaling
- Nutraceuticals

RESEARCH EXPERIENCE & EMPLOYMENT

Oct 2017 – present	Research Fellow, Brain Research Institute Monash Sunway (BRIMS), Jeffrey Cheah School of Medicine, Monash University Malaysia.
2016 – 2017	Post-doctorate, Lincoln University College
2014 – 2016	Research Assistant, Biomolecular Research Group (University of Malaya)
2010 – 2013	Research Assistant, Biomolecular Research Group (University of Malaya)

AWARDS

- Best Thesis Award & Amersham Biosciences Prize by Malaysia Society of Biochemistry and Molecular Biology (MSBMB), Malaysia.
- 1st Prize Oral Presenter at InPRAS Conference UM 2014.
- 1st Prize Poster Presenter at World Congress on Healthy Ageing 2012
- Best Poster Presentation, 39th Annual Malaysian Society for Biochemistry and Molecular Biology Conference, 2014, (INTERNATIONAL)
- Silver Medal Winner for Poster Presentation (Biochemistry & Physiology), 19th Biological Sciences Graduate Congress, National University of Singapore, 2014 (International).
- Silver Medal Winner for Poster Presentation (Biochemistry & Physiology), 18th Biological Sciences Graduate Congress, University of Malaya, 2014.

- Poster Winner - 26th Inter Varsity Biochemistry Seminar, 26th Inter Varsity Biochemistry Seminar & Malaysian Society for Biochemistry and Molecular Biology, 2015, (NATIONAL)
- Poster Winner (Two Undergraduate Students) - 24th Inter Varsity Biochemistry Seminar, 24th Inter Varsity Biochemistry Seminar,Malaysian Society for Biochemistry and Molecular Biology, 2013

He has been involved and hold the key role in obtaining various research grant such as High Impact Research (HIR) UM, Fundamental Research Grant Scheme (MoHE – Best FRGS Project Award 2014) and University Malaya Research Grant (UMRG).

RESEARCH INTERESTS

My main research aspiration is to develop novel target in human gliomas management that will tackle the issue of chemoresistant and tumor recurrence which ultimately will improve the prognosis among patients with different tumor status and background. In doing so, I believe that the cardinal focus should be on multimodal mechanistic pathways by using natural products and the modulation of alternative neuroendocrine system. I envision the bright future of human gliomas management through their great potentiality as neo-adjuvants and/or chemotherapeutics while being cost-effective with marginal side-effects would lead to a more affordable treatment in the current setting of gliomas healthcare.

Current Projects:

The modulation of neuroendocrine and their alternative pathways as target sites in high grade gliomas.

Lentinan and 6-shogaol as chemosensitizer agent of temozolomide in human glioblastoma multiforme.

RESEARCH PUBLICATIONS

Peer reviewed Journal Papers:

Chan, C. K., Tan, L. T. H., Andy, S. N., Kamarudin, M. N. A., Goh, B. H., & Kadir, H. A. (2017). Anti-neuroinflammatory Activity of Elephantopus scaber L. via Activation of Nrf2/HO-1 Signaling and Inhibition of p38 MAPK Pathway in LPS-Induced Microglia BV-2 Cells. Frontiers in Pharmacology, 8, 397.

Sheikh, B. Y., Sarker, M. M. R., Kamarudin, M. N. A., & Mohan, G. (2017). Antiproliferative and apoptosis inducing effects of citral via p53 and ROS-induced mitochondrial-mediated apoptosis in human colorectal HCT116 and HT29 cell lines. Biomedicine & Pharmacotherapy, 96, 834-846.

Kamarudin, M. N. A., Sarker, M. M. R., Kadir, H. A., & Ming, L. C. (2017). Ethnopharmacological uses, phytochemistry, biological activities, and therapeutic applications of Clinacanthus nutans (Burm. f.) Lindau: A comprehensive review. Journal of Ethnopharmacology.

Sheikh, B. Y., Sarker, M. M. R., Kamarudin, M. N. A., & Ismail, A. (2017). Prophetic medicine as potential functional food elements in the intervention of cancer: A review. Biomedicine & Pharmacotherapy, 95, 614-648.

Supriady, H., Kamarudin, M. N. A., Chan, C. K., Goh, B. H., & Kadir, H. A. (2015). SMEAF attenuates the production of pro-inflammatory mediators through the inactivation of Akt-dependent NF-κB, p38 and ERK1/2 pathways in LPS-stimulated BV-2 microglial cells. Journal of Functional Foods, 17, 434-448.

Syed Hussein, S. S., Kamarudin, M. N. A., & Abdul Kadir, H. (2015). (+)-Catechin Attenuates NF-κB Activation Through Regulation of Akt, MAPK, and AMPK Signaling Pathways in LPS-Induced BV-2 Microglial Cells. The American Journal of Chinese Medicine, 43(05), 927-952

Lo, J. Y., Kamarudin, M. N. A., Hamdi, O. A. A., Awang, K., & Kadir, H. A. (2015). Curcumenol isolated from Curcuma zedoaria suppresses Akt-mediated NF-κB activation and p38 MAPK signaling pathway in LPS-stimulated BV-2 microglial cells. Food & function, 6(11), 3550-3559.

Hamdi, O. A. A., Ye, L. J., Kamarudin, M. N. A., Hazni, H., Paydar, M., Looi, C. Y., ... & Awang, K. (2015). Neuroprotective and Antioxidant Constituents from Curcuma zedoaria Rhizomes. Records of Natural Products, 9(3), 349.

Moghadamtousi, S. Z., Kamarudin, M. N. A., Chan, C. K., Goh, B. H., & Kadir, H. A. (2014). Phytochemistry and biology of Loranthus parasiticus Merr, a commonly used herbal medicine. The American journal of Chinese medicine, 42(01), 23-35.

Kamarudin, M. N. A., Raflee, N. A. M., Hussein, S. S. S., Lo, J. Y., Supriady, H., & Kadir, H. A. (2014). (R)-(+)-α-Lipoic acid protected NG108-15 cells against H2O2-induced cell death through PI3K-Akt/GSK-3β pathway and suppression of NF-κβ-cytokines. Drug design, development and therapy, 8, 1765.

Goh, B. H., Chan, C. K., Kamarudin, M. N. A., & Kadir, H. A. (2014). Swietenia macrophylla King induces mitochondrial-mediated apoptosis through p53 upregulation in HCT116 colorectal carcinoma cells. Journal of ethnopharmacology, 153(2), 375-385.

Chan, G., Kamarudin, M. N. A., Wong, D. Z. H., Ismail, N. H., Abdul Latif, F., Hasan, A., ... & Abdul Kadir, H. (2012). Mitigation of H2O2-induced mitochondrial-mediated apoptosis in NG108-15 cells by novel mesuagenin C from Mesua kunstleri (King) kosterm. Evidence-Based Complementary and Alternative Medicine, 2012.

Chan, C. K., Goh, B. H., Kamarudin, M. N. A., & Kadir, H. A. (2012). Aqueous fraction of Nephelium ramboutan-ake rind induces mitochondrial-mediated apoptosis in HT-29 human colorectal adenocarcinoma cells. Molecules, 17(6), 6633-6657.

Journal Papers in Review:

Kamarudin, M. N. A., Chan, G., Awang, K. & Kadir, H. A. (2018). Mesuagenin c mitigated LPS-mediated neuro-glia inflammation through modulation of PI3K-Akt/GSK-3β signaling pathway and CCL21 inhibition. Toxicology Letters (In Review)

Sheikh, B. Y., Kamarudin, M. N. A., Sarker, M. M. R., & Mohan, G. D.M. (2016). Chrysin inhibited cell proliferation and induced ROS-mediated mitochondrial-mediated apoptosis in human glioblastoma mulfitforme T98G cells. Frontiers in Pharmacology (In Review)

Journal Papers in Preparation:

Kamarudin, M. N. A. & Parhar, I. S. (2018). The emerging therapeutic potential of anti-psychotics drugs in the management of human gliomas. (Review Article, in preparation for Neuro-oncology).

Kamarudin, M. N. A., Parhar, I. S., & Sarker, M. M. R. (2018). Is metformin effective for the treatment of colorectal cancer? A review on its molecular mechanism, pre-clinical and clinical aspects. (Oncotarget).

Sheikh, B. Y., Kamarudin, M. N. A., Parhar, I. S., Sarker, M. M. R., & Mohan, G. D.M. (2016). Oleic acid induces growth inhibition and ROS-mediated mitochondrial-mediated apoptosis in Ca Ski cells. (Prostaglandins, Leukotrienes and Essential Fatty Acids).

Proceeding/Conference Abstracts:

Mesuagenin C attenuated LPS-stimulated BV-2 and NG108-15 cells by modulating NF-κB, CCL21 and cytokines through PI3K- Akt/GSK-3β. FEBS EMBO 2014, Palais des Congrès in Paris, France, August 30-September 4, 2014. Special Issue: FEBS EMBO 2014 Conference, *FEBS Journal*, 281(s1), 1(823).

Protective effects of (R)-(+)-α-Lipoic Acid against MPP+-stimulated microglia cells and toxicity in dopaminergic SH-SY5Y cells through PI3K-Akt/GSK- 3β pathway. FEBS EMBO 2014, Palais des Congrès in Paris, France, August 30-September 4, 2014. Special Issue: FEBS EMBO 2014 Conference, *FEBS Journal*, 281(s1), 1(823).

Catechin supressed LPS-induced neuroinflammation in BV-2, C6 and NG108-15 cells by modulating CCL21 through PI3K-Akt. *Journal of the Neurological Sciences*, 333, e337. XXI World Congress of Neurology held at Reed Messe Wien GmbH Congress Center, Vienna, Austria, September 21-26, 2013.

α-Lipoic acid protects against LPS-induced BV-2 activation and MPTP- induced toxicity in SH-SY5Y neuronal cells. *Journal of the Neurological Sciences*, 333, e338. XXI World Congress

of Neurology held at Reed Messe Wien GmbH Congress Center, Vienna, Austria, September 21-26, 2013.

Mesuagenin C mitigated LPS-induced neuroinflammation in BV-2 and NG108-15 cells through pMTOR-PI3K-Akt and CCL21 downregulation. *Journal of the Neurological Sciences*, 333, e349. XXI World Congress of Neurology held at Reed Messe Wien GmbH Congress Center, Vienna, Austria, September 21-26, 2013. 2013.

Conference Presentation:

Oral paper presentation

- Mesuagenin c suppresses microglia inflammation and improves neuronal survival by modulating NF-Kb, cytokines and chemokines through PI3K- Akt/GSK-3β. International Post-Graduate Seminar University of Malaya 2014.
- Neuroprotective and neuritogenic molecular mechanisms of novel mesuagenin C from Mesua kunstleri (King) Kosterm in NG108-15 cells. Symposium on Natural Products and Medicinal Chemistry (NPMC), 17th Malaysian Chemical Congress (17MCC), October 15- October 17, 2012, Putra World Trade Centre, Kuala Lumpur, Malaysia.
- Neuroprotective and neuritogenic molecular mechanisms of mesuagenin C from *Mesua kunstleri* through CCL21 regulation in NG108-15 cells. International Conference on Molecular Biology and Biochemistry, WASET. May 28 – Jun 1, Chiba, Tokyo, Japan.

Poster presentation:

- Neuroprotection and neuritogenesis effects of Mesuagenin C from *Mesua kunstleri* in NG108-15 cells. The 1st World Congress on Healthy Ageing 2012, 19th to 22nd March 2012 at Kuala Lumpur Convention Centre.
- α-Lipoic acid mitigated H_2O_2-induced mitochondrial-mediated apoptosis in NG108-15 cells through PI3K-AKT pathway. 24th Intervarsity Biochemistry Seminar, 11 May 2013 to 11 May 2013, Taylor's University College & Malaysian Society of Biochemistry and Molecular Biology (MSBMB).
- *Swietenia macrophylla* ethyl acetate fraction suppressed LPS- induced neuroinflammation in BV-2 cells through PI3K/Akt and MAPK pathways. 39th Annual Conference of The Malaysian Society for Biochemistry & Molecular Biology, 25th-26th June 2014, Sama-Sama Hotel, KLIA, Sepang, Malaysia.
- Mesuagenin C attenuated LPS-stimulated BV-2 and NG108-15 cells by modulating NF-κB, CCL21 and cytokines through PI3K- Akt/GSK-3β. FEBS EMBO 2014, Palais

des Congrès in Paris, France, August 30-September 4, 2014. Special Issue: FEBS EMBO 2014 Conference, *FEBS Journal*, 281(s1), 1(823).

- Protective effects of (R)-(+)-α-Lipoic Acid against MPP+-stimulated microglia cells and toxicity in dopaminergic SH-SY5Y cells through PI3K-Akt/GSK- 3β pathway. FEBS EMBO 2014, Palais des Congrès in Paris, France, August 30-September 4, 2014. Special Issue: FEBS EMBO 2014 Conference, *FEBS Journal*, 281(s1), 1(823).
- Catechin supressed LPS-induced neuroinflammation in BV-2, C6 and NG108-15 cells by modulating CCL21 through PI3K-Akt. *Journal of the Neurological Sciences*, 333, e337. XXI World Congress of Neurology held at Reed Messe Wien GmbH Congress Center, Vienna, Austria, September 21-26, 2013.
- α-Lipoic acid protects against LPS-induced BV-2 activation and MPTP- induced toxicity in SH-SY5Y neuronal cells. *Journal of the Neurological Sciences*, 333, e338. XXI World Congress of Neurology held at Reed Messe Wien GmbH Congress Center, Vienna, Austria, September 21-26, 2013.
- Mesuagenin C mitigated LPS-induced neuroinflammation in BV-2 and NG108-15 cells through pMTOR-PI3K-Akt and CCL21 downregulation. *Journal of the Neurological Sciences*, 333, e349. XXI World Congress of Neurology held at Reed Messe Wien GmbH Congress Center, Vienna, Austria, September 21-26, 2013. 2013.
- Curcumenol from curcuma zedoaria suppresses neuroinflammation induced by LPS in BV-2 neuronal cell model. 18th Biological Sciences Graduate Congress, 06 Jan 2014 to 08 Jan 2014, Faculty of Science, University of Malaya.
- Catechin from Loranthus parasiticus (L.) Merr attenuated LPS- induced neuroinflammation in BV-2 cells. 38th The Malaysian Society for Biochemistry & Molecular Biology Annual Conference, 28 Aug 2013 to 29 Aug 2013, The Malaysian Society for Biochemistry & Molecular Biology (MSBMB), (National(+)-Catechin Attenuates NF-κB Activation Through Regulation of Akt, MAPK, and AMPK Signaling Pathways in LPS-Induced BV-2 Microglial Cells. 19th Biological Sciences Graduate Congress, 12 Dec 2014 to 14 Dec 2014, Department of Biological Sciences in National University of Singapore (International).

RESEARCH GRANTS

- IPPP – PostGraduate Research Fund (UM, 2012-2015). Molecular Mechanisms Of NF-κβ-CCL21 Regulation By Mesuagenin C-Induced Neutritogenesis In NG108-15 Cells.

- IPPP – PostGraduate Research Fund (UM, 2011-2013). Studies on the Aquilaria sp. (Agarwood) and its chemical constituents on age-related disease and its possible neuroprotective mechanisms on human neuroblastoma (SH-SY5Y)

- Fundamental Research Grant Scheme (FRGS): Investigation On CCL21-NF-κB Regulation By Catechin From *Loranthus Parasiticus* in *In Vitro* And *In Vivo* Alzheimer's

Models. **This is an award grant as for best FRGS Project 2014**. Responsible for the write-up of this grant, the management of the grant and project execution.

- High Impact Research (HIR) Project: Novel NF-κB - Chemokines Regulatory Mechanisms By Selected Phytochemicals on Neuronal Models.

- UMRG Programme Grant - The effect of vermicomposting on the enhancement of selected medicinal plants and its therapeutic potential by nanotechnology (The evaluation of normal soil and vermicompost grown *Clinacanthus nutans* and *Elephantopus scaber* and their liposomal extracts against LPS-stimulated microglia cells).

THESIS

PhD Thesis (2012 - 2016)
Title of Thesis: (R)-(+)-α-lipoc acid and mesuagenin c-induced regulation of NF-κB, cytokines and chemokines via PI3K-AKT/GSK-3β and ERK1/2 in *in vitro* neuronal models.
Short description: The investigation on the protective and neuritogenic effects of the natural products in neuronal models (neurons, microglia and neuron-glia) in regulating innate immunity by PI3K-AKT/GSK-3β and ERK1/2. The work discovered the possible novel role CCL21 in neurite outgrowth and differentiation.

Master (2011- 2012, Converted to Ph.D)
Title of Thesis: Mesuagenin c mediated neuroprotective and neuritogenic in neuronal models through cytokines and chemokine via regulation of NF-κB.

Bachelor (2010)
Title of Thesis: Structural-Activity Analysis of Indolic Gallic Acid Hydrazones Derivatives on Human Breast Adenocarcinoma Cell Line (MCF-7) and Human Colon Adenocarcinoma Cell Line (HCT-119)
This thesis has been conferred with Best Thesis Award & Amersham Biosciences Award by the Malaysia Society of Biochemistry and Molecular Biology (MSBMB).

Personal Interests:

- Orchestra conducting - Principal Conductor for Alam Shah Wind Orchestra with various National and International Awards.