

NOR HASMALIANA BINTI ABDUL MANAS

Motivated academician and researcher, aims to utilize my skills and abilities in area of education and research to the fullest enhancement of the institution and society.



PROFESSIONAL BODY

- **The Institution of Chemical Engineers**
(100204348) Associate member
- **Board of Engineers Malaysia**
(104239A) Chemical
- **Malaysian Society for Biochemistry and Molecular Biology**
(OM-2019-024) Ordinary member



ADMINISTRATION

Program Coordinator
Master of Engineering (Bioprocess)



RESEARCH



H-index



Grants



Publication



Supervision



Industrial
Collaboration



Intellectual
Property Right



CONTACT



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Kedah, Malaysia



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Scopus

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EDUCATION

2016

Doctor of Philosophy (Bioprocess Engineering)

Reaction control and protein engineering of *Bacillus lehensis* G1 maltogenic amylase for higher malto-oligosaccharide synthesis
(Universiti Teknologi Malaysia, Skudai, Johor)

2009

Bachelor Degree of Engineering (Chemical-Bioprocess)

(Universiti Teknologi Malaysia, Skudai, Johor)
CGPA : 3.69/4.00

2005

Foundation Year of Science

UTM-MARA Fast-Track Programme
(Universiti Teknologi Malaysia, Skudai, Johor)
CGPA : 3.69/4.00



WORKING EXPERIENCES

2018 -
present

FACULTY OF ENGINEERING, UNIVERSITI TEKNOLOGI MALAYSIA

Senior Lecturer

Department of Bioprocess and Polymer Engineering,
School of Chemical & Energy Engineering, Faculty
of Engineering, Universiti Teknologi Malaysia,
Johor.

2016 -
2017

FACULTY OF ENGINEERING, UNIVERSITI MALAYSIA SARAWAK

Lecturer

Chemical Engineering and Energy Sustainability
Department, Universiti Malaysia Sarawak, Sarawak.

2016

GENETIC ENGINEERING LABORATORY, UNIVERSITI TEKNOLOGI MALAYSIA

Research officer

Research in protein engineering of maltogenic amylase
to improve thermostability involving rational design of
the protein structure, in-silico site-directed mutagenesis
and molecular dynamic simulation.

2009 -
2010

GENETIC ENGINEERING LABORATORY, UNIVERSITI TEKNOLOGI MALAYSIA

Research assistant

Research on cloning and expression of Na⁺/H⁺ antiporter
from alkaliphilic *Bacillus lehensis* G1 in *Escherichia coli*
host system for cell survival in alkaline environment.



AWARDS AND FELLOWSHIP

- Bronze Medal for International Research and Innovation Symposium and Exposition 2020 (RISE 2020).
- Research Fellow of Institute of Bioproduct Development, Universiti Teknologi Malaysia (2020-now)
- Bronze medal for Virtual International Greentech & Eco-products Exhibition & Conference Malaysia 2020 (IGEM 2020)
- First Place of Research Poster Competition, Optimization of Maltogenic Amylase Immobilization In Sodium Alginate Beads and Chitosan Alginate Beads, International Conference on Biosciences And Medical Engineering (ICBME) 2021.
- Anugerah Kecemerlangan Fakulti Kejuruteraan, Universiti Teknologi Malaysia (2020).
- Young Scientist Program award (YSP 2019) from Federation of Asian and Oceanian Biochemist & Molecular Biologist (FAOBMB) in conjunction with 27th FAOBMB & 44th MSBMB Conference 2019.
- Bronze medal for UNIMAS Innovative and Technology Exposition (2017).
- National Science Fellowship (NSF) by Ministry of Science and Technology Malaysia (MOSTI) (2011 - 2013).
- First class honours in Bachelor Degree of Engineering (Chemical - Bioprocess), Universiti Teknologi Malaysia (2009).
- Dean Award for achieving CGPA 3.69, in conjunction with the 43rd convocation, Universiti Teknologi Malaysia (2009).



TEACHING

- Thermodynamics
- Chemical Engineering Thermodynamics
- Separation Processes
- Heat and Mass Transfer
- Chemical Reaction Process
- Statics
- Molecular Biology and Genetic Engineering
- Microbiology
- Research Methodology
- Instrumentation Process
- Engineering Drawing



TRAININGS

- **BIOCON ACADEMY**
Faculty Development Program (July 2019)
Two-weeks program to expose the biotechnology teachers to emerging industry-specific technologies of Biocon Limited, Bangalore, India.
- **CENTRE FOR APPLIED LEARNING AND MULTIMEDIA, UNIVERSITI MALAYSIA SARAWAK**
Postgraduate Diploma in Higher Education Teaching & Learning (July 2017- December 2017)
Training on teaching and learning for higher education to enhance personal competence as university educator.
- **FACULTY OF MEDICINE, NURSING AND HEALTH SCIENCES, MONASH UNIVERSITY, AUSTRALIA**
Research attachment (July – December 2011)
Research attachment in a collaboration project between UTM, Malaysia Genome Institute and Monash University Australia. The project involved enzyme refolding, protein purification, prediction of protein secondary structure from circular dichroism spectra, protein crystallization, protein crystal screening and crystal diffraction using x-ray crystallography.
- **KILANG GULA FELDA PERLIS, MALAYSIA**
Trainee engineer and chemist (June 2008 – July 2008)
Optimized the production of sugar by analyzing dirty sugar to be reprocessed. Dirty sugar caused by broken packaging can be reprocessed after series of 'cleaning' thus increasing the sugar productivity.



INTELLECTUAL PROPERTY RIGHT

- RapiTreat Beads M2 (Patent Submitted, 2019)
Method of malto-oligosaccharides enzymatic production using maltogenic amylase (Copyright no. IP/CR/2019/0080).
- Bio-Lime Process of Eggshell Powder (ESP)
- Uncarbonized, Carbonized and Decarbonized ESP (Copyright no. IP/CR/2019/0301).
- Two-stage pretreatment of kenaf by peracetic acid and calcium hydroxide (Copyright no. IP/CR/2019/0060).



RESEARCH HIGHLIGHTS

- **Biotechnology and enzyme technology**
 - Enzyme immobilization for improved enzyme function and stability.
 - Mutagenesis and protein engineering of enzyme for product specificity.
 - Enzyme technology in biopharmaceutical and food manufacturing for prebiotics and functional foods productions.
 - Formulation of prebiotic-fortified fruit juice for functional food production.
- **Bioprocess Engineering**
 - Bioseparation of enzyme from crude bacterial extract for protein purification using various bioseparation techniques (affinity chromatography, size exclusion, ion exchange).
 - Kinetics of enzyme reaction for free and immobilized enzymes.
 - Diffusion studies of substrate for immobilized enzyme.
 - Optimization of spray drying for powdered fruit juice formulation fortified with prebiotic.
- **Bioremediation**
 - Integrated wastewater treatment system for targeted removal of recalcitrant aromatic hydrocarbons by microbial degradation, enzymatic degradation and adsorption onto cyclodextrin-functionalized biomaterial.
 - Kinetic studies of microbial and enzymatic degradation.
 - Diffusion and adsorption kinetic studies on cyclodextrin-functionalized biomaterial



RESEARCH GRANTS

Project leader

- On-the-go wellness booster: Pineapple powder fortified with prebiotic, 2021-2022, Contract Research Grant, RM15,000, by Sateera Sdn. Bhd.
- Diffusion study of enzymes cascade immobilisation in biomimetic microcapsule and kinetic of hydrolysis for malto-oligosaccharides production, 2020-2023, RM132,000, Fundamental Research Grant Scheme
- Integrated pollutant-targeted wastewater treatment using cyclodextrin-functionalized rice husk biochar, 2020-2022, RM 250,000, Malaysian Research University Network Young Researchers Grant Scheme
- Pineapple MD2 Propagation Through High Technology
- Quartering and Studies On High Nutritional Values And Prebiotic Properties Of The Produced Fruits, 2020-2022, RM120,000, Contract Research with Aladdin Pine Sdn. Bhd.
- Kinetic and transport mechanism of beta-cyclodextrin-functionalized cellulose nanofiber for adsorption of heterocyclic aromatic hydrocarbons, 2019-2021, RM 30,000, Research University Grant Tier 2
- Development of organic porous material from pineapple waste as a support for enzyme adsorption and applications in biocatalyst, 2019-2021, RM 30,000, Research University Grant Tier 2
- Investigation and improvement of maltogenic amylase thermostability, 2018-2019, RM 20,000, Potential Academic Staff Grant (Research University Grant of UTM)
- Investigation on kinetic and efficiency of heterocyclic aromatic compounds biotransformation by immobilized *Thalassospira profundimaris*, 2017-2020, RM 187,800, funded by Fundamental Research Grant Scheme (FRGS)
- Immobilization of *Thalassospira profundimaris* M02 for improved biotransformation of heterocyclic aromatic compounds for enhanced marine water-treatment system, 2017-2018, RM 25,000, funded by Small Grant Scheme, UNIMAS. **Completed.**

Project Member

- Extraction of Collagen Bioactive Ingredients from Jellyfish for cosmeceutical application, 2021-2022, Contract Research Grant, RM50,000, by MM Cosmetic Sdn. Bhd.
- Identification of Polyethylene Plastic Degrading Microbes from Local Municipal Solid Waste Landfill in Malaysia, 2020-2023, RM 121,800, Fundamental Research Grant Scheme (FRGS)
- Mechanistic study and kinetics of co-immobilized *Candida rugosa* lipase for one-pot esterification-transesterification of waste cooking oil to biodiesel, 2020-2023, RM 115,900, Fundamental Research Grant Scheme (FRGS)
- Development of Porous Organic Material from Pineapple Waste as a Support for Enzyme Adsorption and Applications in Biocatalyst, 2019-2022, RM 30,000, Research University Grant Tier 2.
- Growth Kinetics Investigation of *Volvariella volvacea* in Electrospun Nanofibrous Mats, 2019-2022, RM 115,250, Fundamental Research Grant Scheme (FRGS)
- Synergistic Enzymatic Reaction For Maltooligosaccharides (Mos) Synthesis From Starch, 2019-2022, RM 150,000, HICOE Research Grant
- Ozone Pretreatment of Agricultural Waste for the Enhancement of Oligosaccharides Yield by Enzymatic Hydrolysis, 2020-2022, RM 70,000, UTM Fundamental Research
- Investigation on intermolecular interaction and reaction kinetic of immobilized cyclodextrin gluconotransferase by protein surface modification, 2019-2022, RM133,800, funded by Fundamental Research Grant Scheme (FRGS)
- Immobilization and optimization of whole cell biocatalyst for xylitol synthesis, 2018-2021, RM 90,000, UTM Transdisciplinary Research Grant
- Pretreatment and hydrolysis of biomass wastes into edible sugars, 2018-2020, RM 45,000, UTM Transdisciplinary Research Grant
- Evaluation of microwave pretreatment of pineapple waste for delignification process, 2018-2019, RM 20,000, Potential Academic Staff Grant (Research University Grant of UTM)
- Synthesis and development of prebiotics from pineapple waste, 2018-2021, RM 90,000, National Grant (Research University Grant of UTM)
- Removal of heavy metal from plating industries wastewater by coagulation-flocculation using sago waste, 2016-2017, RM 23,400, funded by Small Grant Scheme, UNIMAS **Completed**.
- Characterization and analysis on effect of crossed-linked enzyme aggregates and immobilization on nanomaterial of maltogenic amylase from *Bacillus lehensis* G1 on its stability and biocatalysis efficiency, 2016-2019, RM 117,200, funded by FRGS



PUBLICATIONS

INDEXED-JOURNAL

- NKM Firdaus Kumar, CC Meng, **NH Abdul Manas**, RA Ahmad, SFZM Fuzi, RA Rahman, RM Illias (2022) Immobilization of maltogenic amylase in alginate-chitosan beads for improved enzyme retention and stability. *Malaysian Journal of Fundamental and Applied Sciences*. 18(1): 43-51. (WoS-indexed)
- MK Awasthi, NIW Azelee, ANM Ramli, SA Rashid, **NH Abdul Manas**, DJ Dailin, RM Illias, R Rajagopal, SW Chang, Z Zhang, B Ravindran (2022) Microbial biotechnology approaches for conversion of pineapple waste in to emerging source of healthy food for sustainable environment. *International Journal of Food Microbiology*. 109714 (IF 5.277, Q1)
- S Veeramalai, NN Ramlee, HI Mahdi, **NH Abdul Manas**, ANM Ramli, RM Illias, NIW Azelee (2022) Development of organic porous material from pineapple waste as a support for enzyme and dye adsorption. *Industrial Crops and Products*. 181: 114823. (IF 5.645, Q1)
- N Nordin, RM Illias, **NH Abdul Manas**, ANM Ramli, R Selvasembian, NIW Azelee, F Rajagopal, A Thirupathi, SW Chang, B Ravindran (2022) Highly sustainable cascade pretreatment of low-pressure steam heating and organic acid on pineapple waste biomass for efficient delignification. *Fuel*. 321: 124061. (IF 6.609, Q1)
- NALN Ashikin, SFZM Fuzi, SAA Manaf, **NH Abdul-Manas**, SM Shaarani, M Nawati, RM Illias (2022) Optimization production and characterization of engineered thermostable xylanase excretion and cell viability of immobilized *E. coli* using statistical analysis. *Arabian Journal of Chemistry*. 103803. (Q2, IF 5.165, WoS indexed)
- SAA Manaf, SFZM Fuzi, KO Low, G Hegde, **NH Abdul-Manas**, RM Illias, KS Chia (2021) Carbon nanomaterial properties help to enhance xylanase production from recombinant *Kluyveromyces lactis* through a cell immobilization method. *Applied Microbiology and Biotechnology*. 105(21): 8531-8544 (Q1, IF 4.813, WoS indexed)
- ANM Ramli, HA Hamid, FH Zulkifli, N Zamri, P Bhuyar, **NH Abdul-Manas** (2021) Physicochemical properties and tenderness analysis of bovine meat using proteolytic enzymes extracted from pineapple (*Ananas comosus*) and jackfruit (*Artocarpus heterophyllus*) by-products. *Journal of Food Processing and Preservation*. 45(11): e15939 (Q3, IF 2.190, WoS indexed)
- NN Ramlee, RM Illias, S Toemen, **NH Abdul-Manas**, NIW Azelee (2021) Esterification of a waste cooking oil using metal-hybrid catalysts for chemoenzymatic reactions. *Materials Today: Proceedings*. 47: 1280-1286. (Scopus indexed)
- IM Maliki, **NH Abdul-Manas**, SA Ahmad and A Zulkharnain (2021) Expression, Purification and Characterization of Extradiol Dioxygenase CarBb Involved in Carbazole Degradation Pathway. *Malaysian Journal of Biochemistry & Molecular Biology*. 1: 77-42 (Scopus-Indexed)
- IM Maliki, **NH Abdul-Manas**, SA Ahmad, H Fuse, N Ramírez-Moreno, A Zulkharnain (2021) Removal of heterocyclic compound carbazole using cell immobilization of *Thalassospira profundimaris* strain M02. *Revista Mexicana De Ingeniería Química*. 20(1):413-422. (Q3, IF 1.139, WoS indexed)
- **NH Abdul-Manas**, LY Chong, YM Tesfamariam, A Zulkharnain, H Mahmud, DSA Mahmud, SFZM Fuzi, NIW Azelee (2020) Effects of oil substrate supplementation on production of prodigiosin by *Serratia nematodiphila* for dye-sensitized solar cell. *Journal of Biotechnology*. (Q2, IF 3.503, WoS indexed)
- RA Ahmad, NR Jaafar, **NH Abdul-Manas**, NIW Azelee, Rosli Md Illias, NN Nawawi (2020) Bioconversion of starch to malto-oligosaccharides (MOS) by the reaction of maltogenic amylase. *Jurnal Teknologi*. (IF 0.41, Scopus indexed)
- SAA Manaf, SFZM Fuzi, **NH Abdul-Manas**, RM Illias, KO Low, G Hegde, RC Man, NIW Azelee, HM Matias-Peralta (2020) Emergence of nanomaterials as potential immobilization supports for whole cell biocatalysts and cell toxicity effects. *Biotechnology and applied biochemistry* (Q4, IF 1.638, WoS indexed)
- AF Azaddin, RA Rahman, M Jusoh, J Jaafar, N Ngadi, **NH Abdul-Manas** (2020) entrapment of free cells within electrospun nanofibers: mini review on parameters influencing nanofibers characteristics and cells viability. *Jurnal Teknologi*. 82(6): 39-47. (IF 0.41, Scopus-indexed)
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- JLC Hui, MNAM Drus, R Baini, **NH Abdul-Manas**, A Zulkharnain (2020). Optimization of Immobilization Media of *Thalassospira Profundimaris*: Diffusion and Strength Studies. *International Journal of Recent Technology and Engineering*. 8: 311-316 (Scopus indexed)
- NIW Azelee, H El-Enshasy, DJ Dailin, **NH Abdul-Manas**, RA Malek, MA Mokhter, N Salamun, RA Rahman (2020) Antimicrobial disinfectants and sanitizers: An effective tool for breaking the circle of pandemic disease. *Asian Journal of Agriculture and Biology*. 8(3): 348-367. (Scopus indexed)
- NZ Nordin, AR Rashidi, DJ Dailin, RA Malek, NIW Azelee, **NH Abdul-Manas**, S Selvamani, DNA Zaidel, RAA Alsaheb, D Sukmawati, H El-Enshasy (2020) Xanthan Biopolymer in Pharmaceutical and Cosmeceutical Applications: Critical Review. *Bioscience Research*. 17(1): 205-220. (IF 0.737, Scopus indexed)
- NN Nawawi, Z Hashim, **NH Abdul-Manas**, NIW Azelee, RM Illias (2019) A porous-cross linked enzyme aggregates of maltogenic amylase from *Bacillus lehensis G1*: Robust biocatalyst with improved stability and substrate diffusion, *International Journal of Biological Macromolecules* (Q1, WoS indexed)
- DJ Dailin, LZMI Low, RA Malek, NIW Azelee, **NH Abdul-Manas**, HC Keat, D Sukmawat, HA El-Enshasy (2019) Pullulan, a biopolymer with potential applications in pharmaceutical and cosmeceutical: A review. *Bioscience Research*. (WoS indexed)
- H Pagarra, RA Rahman, Rachmawaty, **NH Abdul-Manas** (2019) Screening of factors influencing exopolysaccharide Production by *Aspergillus niger* ATCC 120120 using two-level fractional Factorial design. *Jurnal Teknologi*. (IF 0.41, Scopus indexed)
- DJ Dailin, **NH Abdul-Manas**, NIW Azelee, S Selvamani, HA El-Enshasy (2019) Review on probiotic potential in human health, aquaculture and animal feed. *International Journal of Scientific & Technology Research*. (Scopus indexed)
- **NH Abdul-Manas**, MNAM Drus, A Zulkharnain, JLC Hui, NIW Azelee, DJ Dailin (2019) Transport phenomena of carbazole biodegradation by immobilized *Thalassospira profundimaris* cell and mechanical properties, *AIP Conference Proceeding* (Scopus indexed).
- NIW Azelee, SAM Adnan, **NH Abdul-Manas**, DJ Dailin, ANM Ramli, RM Illias (2019) Assessment of microwave-assisted pretreatments for enhancing pineapple waste delignification. *AIP Conference Proceeding* (Scopus indexed).
- ANM Ramli, **NH Abdul-Manas**, AAA Hamid, HA Hamid, RM Illias (2018). Comparative structural analysis of fruit and stem bromelain from *Ananas comosus*. *Food Chemistry*. Volume 266, page 183–191 (Q1, IF 4.946, WoS indexed)
- **NH Abdul-Manas**, RM Illias, NM Mahadi (2018). Strategy in manipulating transglycosylation activity of glycosyl hydrolase for oligosaccharide production. *Critical Reviews in Biotechnology*. Volume 38, No 2, page 272-293 (Q1, IF 7.510, WoS indexed)
- H Ahmatau, S Mohamaddan, E Warren, M Yusuf, AA Alias, **NH Abdul-Manas**, K Kipli. (2018) Analysis of Gate Poly Delaying in SOI Wafer. *Journal of Telecommunication, Electronic and Computer Engineering*. 10: 1-12. (Scopus indexed)
- **NH Abdul-Manas**, FDA Bakar, RM Illias (2016) Computational docking, molecular dynamics simulation and subsite structure analysis of a maltogenic amylase from *Bacillus lehensis G1* provide insights into substrate and product specificity. *Journal of Molecular Graphics and Modelling*, Volume 67, Pages 1–13. (Q2, IF 1.722, WoS indexed)
- **NH Abdul-Manas**, MA Jonet, AMA Murad, NM Mahadi, RM Illias (2015) Modulation of transglycosylation and improved malto-oligosaccharide synthesis by protein engineering of maltogenic amylase from *Bacillus lehensis G1*. *Process Biochemistry*, 50(10): 1572-1580. (Q1, IF 2.529, WoS indexed)
- **NH Abdul-Manas**, S Pachelles, NM Mahadi and RM Illias (2014). The characterisation of an alkali-stable maltogenic amylase from *Bacillus lehensis G1* and improved malto-oligosaccharide production by hydrolysis suppression. *PLoS ONE*. 9(9): e106481. (Q1, IF 3.057, WoS indexed)



PUBLICATIONS

NON-INDEXED JOURNAL AND CONFERENCE PROCEEDINGS

- N Nordin, RM Illias, **NH Abdul-Manas**, ANM Ramli, NIW Azelee (2020) Efficient Delignification of Pineapple Waste by Low-Pressure Steam Heating Pre-Treatment. *Third International Conference on Separation Technology 2020 Proceedings (ICoST 2020)* in *Advances in Engineering Research*. 10-16. Atlantis Press.
- NAM Shah, **NH Abdul-Manas** (2020) Effect of beta-cyclodextrin and citric acid concentration on functionalization of cellulose nanofiber for the removal of palmitic acid. *8th International Graduate Conference On Engineering, Science And Humanities*. Universiti Teknologi Malaysia. 65-68
- NIW Azelee, ANM Ramli, **NH Abdul-Manas**, N Salamun, RC Man, EE Hesham (2019) Glycerol in food, cosmetics, and pharmaceutical industries: Basics and new applications. *International Journal of Science and Research*. 8: 553-558.
- **NH Abdul-Manas**, RM Illias, NIW Azelee, RA Rahman (2019) Improvement of maltogenic amylase transglycosylation activity by reaction equilibrium control and protein engineering approach. *Young Scientist Program 2019*, Kuala Lumpur.
- **NH Abdul-Manas**, RM Illias, NIW Azelee, RA Rahman (2019) Improvement of maltogenic amylase transglycosylation activity by reaction equilibrium control and protein engineering approach. *27th FAOBMB and 44th MSBMB Conference 2019*, Kuala Lumpur.
- DJ Dailin, **NH Abdul-Manas**, NIW Azelee, J Eyahmalaya, SA Yahaya, RA Malek, V Siwapiragam, D Sukmawati, H El-Enshasy (2018). Current and Future Applications of Phytases in Poultry Industry: A Critical Review. *Journal of Advances in VetBio Science and Techniques*, 3(3), 65-74.
- Illias RM, **NH Abdul-Manas**, Hashim Z (2019) Preparation and characterization of highly stable and substrate diffusible cross-linked enzyme aggregates of maltogenic amylase from *Bacillus lehensis G1*. *3rd International Conference on Molecular Biology and Biotechnology 2019 (ICMBB 2019)*.
- HA El-Enshasy, DJ Dailin, **NH Abdul-Manas**, NIW Azelee, RA Malek, LZMI Low (2019) Optimization of pullulan production by *Aureobasidium pullulans* using response surface methodology. *6th International Biotechnology Symposium*.
- NIW Azelee, Rosli Bin Md. Illias, **NH Abdul-Manas**, DJ Dailin (2018). Pineapple waste: an emerging solution for healthy and sustainable food. *International conference on probiotics and food sustainability 2018*. Johor Bahru, Johor.
- IM Maliki, Linting E, **NH Abdul-Manas**, CN Hipolito, A Zulkharnain (2018). Isolation of beneficial bacteria for heterocyclic hydrocarbon compounds removal from mariculture environment. *International conference on beneficial microbes 2018*, Kuching, Sarawak.
- **NH Abdul-Manas**, LY Chong, A Zulkharnain (2017). Effects of Oil Substrate Supplementation on Production of Prodigiosin By *Serratia Marcescens* for Dye Sensitized Solar Cell. *6th Conference on Emerging Energy and Process Technology 2017 (CONCEPT 2017)*. November 27th - 28th 2017, Johor Bahru, Malaysia.

- **NH Abdul-Manas**, S Pachelles, NM Mahadi, RM Illias (2013) A Novel Hydrolysis Pattern of a High Maltotriose Producing Maltogenic Amylase from *Bacillus lehensis* G1. Kolokium Biologi Struktur Ke-V. 3 June 2013. Melaka, Malaysia.
- **NH Abdul-Manas**, AMA Murad, NM Mahadi, RM Illias (2010). Enhancement of Solubility in *Escherichia coli* and Characterization of Cold-Adapted α -Amylase from *Leucosporidium antarcticum* PI12. Zamalah Graduate Colloquium. 15 July 2010. Skudai, Malaysia.
- **NH Abdul-Manas**, RM Illias, NA Jemaon, NM Mahadi, A Rabu (2010). Expression and Functional Studies of Na⁺/H⁺ Antiporter from Alkaliphilic *Bacillus lehensis* G1. 11th Symposium of Malaysian Society of Applied Biology. 13 – 15 June 2010. Kelantan, Malaysia.
- RM Illias, **NH Abdul-Manas**, MA Jonet, AMA Murad (2016). Improvement of transglycosylation activity of *Bacillus lehensis* G1 maltogenic amylase for higher malto-oligosaccharide synthesis. The 7th AFOB Regional Symposium 2016. January 28-30, 2016. Hue City, Vietnam.
- **NH Abdul-Manas**, RM Illias (2015). Structural Interpretation for Hydrolysis and Transglycosylation Characteristics of Maltogenic Amylase from *Bacillus lehensis* G1. The 20th Biological Sciences Graduate Congress (20th BSGC). December 9-11, 2015. Bangkok, Thailand.
- RM Illias, GK Mau, **NH Abdul-Manas**. (2014). Structural insight into the catalytic site of multifunctional starch degrading enzymes. The 2nd International Symposium and Workshop on Functional Genomics and Structural Biology. 21 – 24 January 2014. Selangor, Malaysia.
- **NH Abdul-Manas**, S Pachelles, AMA Murad, NM Mahadi, RM Illias (2013) High Maltotriose-Producing Maltogenic Amylase from *Bacillus lehensis* G1 and Preliminary Investigation on its Multifunctionality. International Congress of the Malaysian Society for Microbiology (ICMSM2013). 12 – 15 December 2013. Langkawi, Malaysia.
- **NH Abdul-Manas**, RM Illias, NA Jemaon, NM Mahadi, A Rabu (2010) Transformation of Na⁺/H⁺ Antiporter Gene from Alkaliphilic *Bacillus lehensis* G1 Increases Salt Tolerance to *Escherichia coli*. 3rd International Conference Southeast Asian Natural Resources and Environmental Management (SANREM 2010). 3 – 5 August 2010. Sabah, Malaysia.

BOOK CHAPTERS

- NIW Azelee, **NH Abdul Manas**, SZ Hanapi, SHM Sarip, RA Malek, HA El-Enshasy, DJ Dailin and MF Ngah (2022) Removal of pesticides from water and wastewater by agricultural biomass-based adsorbents in Pesticides Remediation Technologies from Water and Wastewater, pg 365 – 384. Elsevier, Netherlands.
- ANM Ramli, PK Hong, **NH Abdul-Manas**, NIW Azelee (2022) An overview of enzyme technology used in food industry in Value-Addition in Food Products and Processing Through Enzyme Technology (pg 333-345). Academic Press (United States)
- N Zainol, H Yaakob, NEAA Rahim, **NH Abdul-Manas**, NA Karim, DNA Zaidel (2022) Rheological Stability, Enzyme Activity, and Incorporation of Pseudocereal Powder as an Alternative Ingredient in Health-Related Food in Pseudocereals. IntechOpen (United Kingdom)
- **NH Abdul-Manas**, MKHA Wahab, NIW Azelee, RM Illias (2021) Enzymatic Reaction for Oligosaccharides Production in Probiotics, the Natural Microbiota in Living Organisms: Fundamentals and Applications (pg 197-226). CRC Press (United Kingdom)
- NIW Azelee, **NH Abdul-Manas**, RC Man, MA Mokhter, N Salamun, SM Shaarani, F Mohamad, Z Edis (2021) Challenges and Potential Applications of Plant and Microbial-Based Biosurfactant in Cosmetic Formulations in Microbial Surfactants: Volume I: Production and Applications (pg 174). CRC Press (United Kingdom)
- NIW Azelee, **NH Abdul-Manas**, DJ Dailin, R Malek, N Moloi, J Gallagher, A Winters, OM Leng, HAE Enshasy (2021) Mushroom Bioactive Ingredients in Cosmetic Industries in Advances in Macrofungi (pg 207-229). CRC Press (United Kingdom)
- **NH Abdul-Manas**, RM Illias (2020) Altering reaction specificity of multi-functional carbohydrate enzyme through reaction control and protein engineering in current techniques in protein sciences. Penerbit UTM, Johor Bahru, Malaysia. 101-123
- NIW Azelee, **NH Abdul-Manas**, DJ Dailin, ANM Ramli, SM Shaarani (2020) Biological treatment of agro-industrial waste in Valorisation of Agro-industrial Residues–Volume I: Biological Approaches. Springer, Cham.
- NI Nashiruddin, **NH Abdul-Manas**, RA Rahman, NIW Azelee, DJ Dailin, SM Shaarani (2020) Pretreatment and Enzymatic Hydrolysis of Lignocellulosic Biomass for Reducing Sugar Production in Valorisation of Agro-industrial Residues–Volume II: Non-Biological Approaches. 1-27. Springer, Cham.



RESEARCH PRODUCT EXHIBITION

- Waste2Wealth: Polishing adsorbent (RHB-CD), Virtual International Greentech & Eco-products Exhibition & Conference Malaysia 2020 (IGEM 2020)
- RapiTreat Beads M2 for pollution treatment, 21st Industrial Art and Technology Exhibition (INATEX 2019)
- Immobilization of *Thalassospira profundimaris* M02 for improved biotransformation of heterocyclic aromatic compounds, UNIMAS Innovative and Technology Exposition (2017)



SUPERVISION STUDENTS

Name Title	Nurul Elia Atiqa binti Abu Rahim Immobilization of Cyclodextrin-glucanotransferase on Rice Husk Biochar for Cyclodextrin Production
Degree Status	Doctor of Philosophy (Bioprocess Engineering) Main-supervisor, on-going
Name Title	Norhidayah Kumar binti Firdaus Kumar Maltogenic amylase and cyclodextrin glucanotransferase co-immobilization for malto-oligosaccharides synthesis
Degree Status	Master of Bioprocess Engineering Main-supervisor, on-going
Name Title	Farah 'Atiah binti Nazaruddin Micropropagation and evaluation of nutritional properties of pineapple md2
Degree Status	Master of Bioprocess Engineering Main-supervisor, on-going
Name Title	Nurul Aqilah binti Mohd Shah Beta- cyclodextrin as a new approach for treatment of industrial oleochemical wastewater
Degree Status	Master of Bioprocess Engineering Main-supervisor, graduated (2019)
Name Title	Intan Mariana binti Maliki Immobilization of Thalassospira profundimaris M02 for improved biotransformation of heterocyclic aromatic compounds for enhanced marine water-treatment system
Degree Status	Master of Engineering (Chemical) Main-supervisor, graduated (2019).
Name Title	Noor Namirah binti Nawawi Characterization and effect of immobilization on hydrolysis and transglycosylation activity of maltogenic amylase from Bacillus lehensis G1
Degree Status	Doctor of Philosophy (Bioprocess Engineering) Co-supervisor, graduated (2020).
Name Title	Norhamiza binti Mohamad Sukri Bioconversion and analysis of glucose to xylitol by immobilized Escherichia coli whole cell biocatalyst
Degree Status	Doctor of Philosophy (Bioprocess Engineering) Co-supervisor, on-going
Name Title	Norhafiza binti Nordin A Cascade Pre-Treatment of Low-Pressure Steam Heating And Organic Acid on Pineapple Wastes for Fermentable Sugar Production
Degree Status	Master of Philosophy (Bioprocess Engineering) Co-supervisor, graduated (2022)
Name Title	Nor Farahiyah Binti Aman Nor Understanding the microencapsulation of virgin coconut oil using double emulsification methods
Degree Status	Doctor of Philosophy (Bioprocess Engineering) Co-supervisor, on-going



ADMINISTRATIVE DUTIES / COMMITTEE MEMBER

- **Secretary** for Organizing Committee of The 1st International Conference on Challenges in Sustainable Utilization and Management of Bioresources 2022 (SUMBio 22).
- **Section Editor** for Journal of Bioprocessing and Biomass Technology, Penerbit UTM (2022 – now).
- **Coordinator** for Curriculum Review for Master in Bioprocess Engineering, School of Chemical and Energy Engineering, Faculty of Engineering, UTM (2020 – now).
- **Coordinator** for MQA Compliance Audit for Master in Bioprocess Engineering, School of Chemical and Energy Engineering, Faculty of Engineering, UTM (2022).
- **Committee** for the Engineering Accreditation Audit for Bachelor Degree of Bioprocess Engineering, School of Chemical and Energy Engineering, Faculty of Engineering, UTM (2020-now).
- **Academic Committee** Board of Study, Bioprocess and Polymer Engineering Programme, Faculty of Engineering, Universiti Teknologi Malaysia (2018-now).
- **Programme Coordinator** of Master of Engineering (Bioprocess) (Taught Course and Research) (Mixed-Mode), School of Chemical & Energy Engineering, Universiti Teknologi Malaysia (2018-now).
- **Technical committee** of Institutional Biosafety, Universiti Teknologi Malaysia (2018-now).
- **Committee** Board of Study for Chemical Engineering (Bioprocess and Polymer) programme, Universiti Teknologi Malaysia (2018-now).
- **Task force committee** for Bioprocess Engineering accreditation (course file auditor), Faculty of Chemical & Energy Engineering, Universiti Teknologi Malaysia (2018-now).
- **Academic Advisor** of Chemical Engineering (Bioprocess) students, Universiti Teknologi Malaysia (2018-now).
- **Committee** of The International Conference on Probiotics and Food Sustainability 2018, Universiti Teknologi Malaysia, with income generation of RM 20,555.00.
- **Editor** of Faculty of Chemical & Energy Engineering 2017 Annual Report, Universiti Teknologi Malaysia (2018).
- **Managing Editor** for Journal of Applied Science & Process Engineering (JASPE) (2016-2017).
- **Committee member** for International UNIMAS STEM Engineering Conference (2017).
- **Coordinator** of Accreditation Unit, Department of Chemical Engineering and Energy Sustainability, Faculty of Engineering, Universiti Malaysia Sarawak (2017).
- **Course file auditor** for Department of Chemical Engineering and Energy Sustainability, Faculty of Engineering, Universiti Malaysia Sarawak (2017).
- **Coordinator** of Final Year Project course for Chemical Engineering Program, Faculty of Engineering, Universiti Malaysia Sarawak (2016-2017).
- **Coordinator** of Engineering Drawing and Instrumentation Process courses for Chemical Engineering Program, Faculty of Engineering, Universiti Malaysia Sarawak (2016-2017).
- **Committee member** of Quality Management Unit, Faculty of Engineering, Universiti Malaysia Sarawak (2016).
- **Rapporteur committee** for the Malaysia Council of Engineering Deans (MCED) 73th workshop (2016).

- **Committee** for the case study of Collegiality & Commonality among Public Universities, continuation from the 73th Malaysia Council of Engineering Deans (MCED) workshop and meeting (2016)
- **Fellow** of Sakura College, Universiti Malaysia Sarawak (2016-2017).
Secretary for Organizing Committee of The 1st International Conference on Challenges in Sustainable Utilization and Management of Bioresources 2022 (SUMBio 22).
- **Section Editor** for Journal of Bioprocessing and Biomass Technology, Penerbit UTM (2022 – now).
- **Coordinator** for Curriculum Review for Master in Bioprocess Engineering, School of Chemical and Energy Engineering, Faculty of Engineering, UTM (2020 – now).
- **Coordinator** for MQA Compliance Audit for Master in Bioprocess Engineering, School of Chemical and Energy Engineering, Faculty of Engineering, UTM (2022).
- **Committee** for the Engineering Accreditation Audit for Bachelor Degree of Bioprocess Engineering, School of Chemical and Energy Engineering, Faculty of Engineering, UTM (2020-now).



TECHNICAL EVALUATOR

- Reviewer for Materials, MDPI Open Access Journals.
- Reviewer for Journal of Fungi, MDPI Open Access Journals.
- Reviewer for Journal of Cleaner Production, Elsevier
- Reviewer for Jurnal Teknologi, Penerbit UTM
- Reviewer for Beverages, MDPI
- Reviewer for Malaysian Journal of Fundamental and Applied Sciences, Penerbit UTM
- Reviewer for Journal of Food Science, John Wiley & Sons
- Chairman assistant for Doctor of Philosophy vivs voce, Universiti Teknologi Malaysia
- Panel Examiners for Final Examination Paper Moderation, Universiti Teknologi Malaysia
- Internal Examiner for Final Year Plant Design Presentation, Universiti Teknologi Malaysia
- Internal Examiner for Final Year Project Presentation, Universiti Teknologi Malaysia
- Reviewer for International UNIMAS STEM Engineering Conference, Universiti Teknologi Malaysia
- Panel for evaluation of Final Year Project and Plant Design, Universiti Teknologi Malaysia
- Jury for International Undergraduate Poster Competition, Universiti Teknologi Malaysia
- Jury for Smart Consumer Campaign Exhibition, Smart Consumer Campaign - Reviewer for Journal of Cleaner Production, Elsevier
- Reviewer for Jurnal Teknologi, Penerbit UTM
- Reviewer for Beverages, MDPI
- Reviewer for Malaysian Journal of Fundamental and Applied Sciences, Penerbit UTM
- Reviewer for Journal of Food Science, John Wiley & Sons
- Chairman assistant for Doctor of Philosophy vivs voce, Universiti Teknologi Malaysia
- Panel Examiners for Final Examination Paper Moderation, Universiti Teknologi Malaysia
- Internal Examiner for Final Year Plant Design Presentation, Universiti Teknologi Malaysia
- Internal Examiner for Final Year Project Presentation, Universiti Teknologi Malaysia
- Reviewer for International UNIMAS STEM Engineering Conference, Universiti Teknologi Malaysia
- Panel for evaluation of Final Year Project and Plant Design, Universiti Teknologi Malaysia
- Jury for International Undergraduate Poster Competition, Universiti Teknologi Malaysia
- Jury for Smart Consumer Campaign Exhibition, Smart Consumer Campaign



CONFERENCES, SEMINARS & TRAININGS

- **Speaker** on Functional Food and Food Industry: New Consumer Insight, in the Institute of Bioproduct Development Free Webinar Series, Universiti Teknologi Malaysia, 5th May 2021.
- **Invited speaker** at Cenviro Sdn Bhd Technical Forum, 16th January 2020.
- **Tutor** for Industrial Biotechnology Workshop: Application of Biochemistry/Microbiology Research from Laboratory to Market, in collaboration between Institute of Bioproduct Development, UTM with King Saud University, July 14th –August 3rd, 2019, Johor Bahru, Malaysia.
International participant of **Faculty Development Program, Biocon Academy, India**. 1 – 12 July 2019, Bangalore, India.
- Participated in the 6th Conference on Emerging Energy and Process Technology 2017 (CONCEPT 2017) as oral presenter. November 27th - 28th 2017, Johor Bahru, Malaysia.
- Participated in the 20th Biological Sciences Graduate Congress as an **oral presenter** at Chulalongkorn University, Bangkok, Thailand (2015).
Attended advanced AKTAPrime Protein Purification Workshop, Universiti Teknologi Malaysia (2013).
- Participated in the International Congress of the Malaysian Society for Microbiology 2013 as an **oral presenter** (High Maltotriose-Producing Maltogenic Amylase from *Bacillus lehensis* G1 and Preliminary Investigation on its Multifunctionality).
- Attended Practical Python for Biologist Workshop, Universiti Teknologi Malaysia (2012).
- Participated in Zamalah Graduate Colloquium 2010 as an **oral presenter**, Universiti Teknologi Malaysia (Enhancement of Solubility in *Escherichia coli* and Characterization of Cold-Adapted α -Amylase From *Leucosporidium antarcticum* PI12).
- Participated in the 3rd International Conference Southeast Asian Natural Resources and Environmental Management 2010 as an oral presenter (Transformation of Na⁺/H⁺ Antiporter Gene from Alkaliphilic *Bacillus lehensis* G1 Increases Salt Tolerance to *Escherichia coli*).
- Participated in the 11th Symposium of Malaysian Society of Applied Biology 2010 as an oral presenter (Expression and Functional Studies of Na⁺/H⁺ Antiporter from Alkaliphilic *Bacillus lehensis* G1).
- Attended AktaPrime Protein Purification Training, Universiti Teknologi Malaysia (2010).
- Participated in ISO 9001:2008 Quality Management System Seminar, Universiti Teknologi Malaysia (2009).
- Attended International BioMalaysia Conference 2008, Kuala Lumpur, Malaysia.
- Attended a short course on Introduction to Bioinformatics: a Primer for Non-Biologist (2007).i



SKILLS AND PROFICIENCIES

- Six years of experience in various scientific disciplines including molecular biology (PCR, cloning and expression in bacteria system), genetic engineering (engineered constructs and site-directed mutagenesis), biochemistry (enzyme assays and protein purification), protein engineering (modification of protein's structure and rational design), carbohydrate synthesis using enzyme and computational biology (homology modeling and protein docking).
- Exceptional skills in using high-performance liquid chromatography (HPLC) system for sugar analysis, AKTAPrime and AKTAPurifier system for protein purification involving affinity, ion-exchange and size exclusion chromatography and thin layer chromatography (TLC) for sugar separation.
- Built a three-dimensional protein model by homology modeling using MODELLER program and viewed protein structures and analysis using PyMOL.
- Performed protein-substrate docking using AutoDock and AutoDock Vina to obtain enzyme-substrate complexes for analysis of substrate binding and active site structure.
- Skilled in basic molecular dynamic simulation using Gromacs for determination of protein structure or protein-ligand complex structure stability.
- Solved engineering problems using Polymath, designing Process Flow Diagram and performing mass & energy balance for unit operation using SuperPro, developed engineering drawing using Qcad, and performed process control by Matlab and HYSYS.
- Good working knowledge of basic linux and SigmaPlot for data analysis.



OTHER CONTRIBUTIONS

- **Committee member** of Jawatankuasa Kebajikan dan Rekreasi Staf, School of Chemical and Energy Engineering, Faculty of Engineering, UTM (2021 – now)
- **Facilitator** Pilot Plant Day 2018 & 2019, School of Chemical & Energy Engineering, Universiti Teknologi Malaysia.
- **Volunteer** for Free Market 2.0 organized by Language Academy, Universiti Teknologi Malaysia (2018)
- **Volley Ball Player** at FKT Sport Carnival 2018, Faculty of Chemical & Energy Engineering, Universiti Teknologi Malaysia. (Bronze medal winner)

- **Student advisor**, Department of Chemical Engineering and Energy Sustainability, Faculty of Engineering, UNIMAS (2016 - 2017).
- **Advisor** for Sakura College Student Representative Committee (2016 - 2017).
- **Advisor** for intercollege student's activities (Poster Design Workshop, Photography Shoot Out, Traditional Sports, Color-Zumba, Zombie Run, Konvensyen Wanita Anggun and Who's at Fault) (2016 - 2017).
- **Advisor** for college student's activities (Sakura Sports Day, Roll and Spin, Jom Relaks ke Bako and Dearself) (2016 - 2017)
- **Jury** for Chemical Got Talent, Chemical Engineering and Energy Sustainability Student Society (2017) Volunteer for IM4U
- **Volunteer** Malaysia Mersing under Universiti Teknologi Malaysia (2015).
- **Volunteer** for 'Shopping Raya' for Rumah Anak Yatim Ar-rayyan, under Program Rakyat JB, Johor Bahru (2015 and 2016).
- **Committee** for Global Outreach Program to Bandung, Indonesia (2014) under Genetic Engineering Laboratory team.
- **Volunteer** for 'Program Bantuan Untuk Orang Asli Johor' under Kolej Tun Fatimah, Universiti Teknologi Malaysia (2012).
- **Participated** in the Workshop on Effective Public Speaking Skills, Universiti Teknologi Malaysia (2009).
- **Attended** National Comparative Religion Conference (2007).
- **Facilitated** 60 first year students in Kem Motivasi 'Melangkah Dunia Baru' under Bioprocess Student Society (2007).
- **Published poster** for promotion and publicity of Program Ihya' Ramadhan seminar under Kelab Iqra' UTM (2006).



PERSONAL PARTICULARS

Date of Birth	02 September 1988
Gender	Female
Place of Birth	Taiping, Perak, Malaysia
Nationality	Malaysia
Passport No.	A22677389
Marital Status	Married
Spoken/Written	Malay & English (excellent), Arabic (rudimentary)



REFEREES

Associate Professor Dr. Dayang Norulfairuz Abang Zaidel,
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