



## CURRICULUM VITAE

A. BUTIR-BUTIR PERIBADI ( <i>Personal Details</i> )			
Nama Penuh ( <i>Full Name</i> )	Mohd Rafein Zakaria		Gelaran ( <i>Title</i> ): Assoc. Prof. Dr.
No. MyKad / No. Pasport ( <i>Mykad No. / Passport No.</i> )	Warganegara ( <i>Citizenship</i> ) Malaysia	Bangsa ( <i>Race</i> ) Malay	Jantina ( <i>Gender</i> ) Male
Jawatan ( <i>Designation</i> )	Associate Professor	Tarikh Lahir ( <i>Date of Birth</i> )	17 Feb 1981

Alamat Semasa ( <i>Current Address</i> )	Jabatan/Fakulti ( <i>Department/Faculty</i> )	E-mel dan URL ( <i>E-mail Address and URL</i> )
Laman Bakawali Kota Seriemas 71800 Nilai Negeri Sembilan  Tel:	Department Bioprocess Technology Faculty of biotechnology and Biomolecular Sciences, 43400 UPM Serdang Selangor  Tel: 03-8947-1946 Fax:	E-mail: mohdrafein@upm.edu.my  URL: <a href="http://profile.upm.edu.my/mohdrafein/profile.html">http://profile.upm.edu.my/mohdrafein/profile.html</a>  No. of publications: <b>33</b> h- Index SCOPUS (Citations): <b>13 (437)</b> h- Index Google Citations: <b>13 (585)</b>  <b>Area of expertise:</b> Biomass treatment and utilization, wastewater treatment, polyhydroxyalkanoates, biosurfactants.

B. KELAYAKAN AKADEMIK ( <i>Academic Qualification</i> )			
Nama Sijil / Kelayakan ( <i>Certificate / Qualification obtained</i> )	Nama Sekolah Institusi ( <i>Name of School / Institution</i> )	Tahun ( <i>Year obtained</i> )	Bidang pengkhususan ( <i>Area of Specialization</i> )
PhD	UPM	2012	Environmental Biotechnology
MSc	UPM	2008	Environmental Biotechnology
Bachelor	UPM	2003	Biotechnology

<b>C. KEMAHIRAN BAHASA</b> ( <i>Language Proficiency</i> )					
Bahasa / <i>Language</i>	Lemah <i>Poor (1)</i>	Sederhana <i>Moderate (2)</i>	Baik <i>Good (3)</i>	Amat Baik <i>Very good (4)</i>	Cemerlang <i>Excellent (5)</i>
English				/	
Bahasa Melayu					/

<b>D. PENGALAMAN SAINTIFIK DAN PENGKHUSUSAN</b> ( <i>Scientific experience and Specialisation</i> )				
<i>Organization</i>	<i>Position</i>	<i>Start Date</i>	<i>End Date</i>	<i>Expertise</i>
Elsevier	Reviewer for Chemical Engineering Science	2017	-	Wastewater treatment, biohydrogen, biomethane, fermentation
Elsevier	Reviewer for Journal of Environmental Management	2017	-	Applied Microbiology, Biological Conversion, Environmental Management
ScholarOne (American Chemical Society)	Reviewer for Industrial & Engineering Chemistry Research	2017	-	Biomass Pretreatment, Saccharification, Fermentation, Green chemistry
Elsevier	Reviewer for Industrial Crops and Products	2016	-	Biomass, Hydrothermal process, Enzymolysis, Ball Milling, Disk Milling, Biochemicals
Taylor & Francis	Reviewer for Critical Reviews in Food Science and Nutrition	2016	-	Biomass, Hydrothermal process, Enzymolysis, Ball Milling, Disk Milling, Biochemicals
Elsevier	Reviewer for International Journal of Hydrogen Energy	2016	-	Biomass, Enzymolysis, Biofuels, Biogas, Biohydrogen, Biochemicals
Springer	Reviewer for Applied Biochemistry and Biotechnology	2015	-	Biomass, Enzymolysis, Biofuels, Biogas, Biohydrogen, Biochemicals
Springer	Reviewer for Annals of Microbiology	2015	2015	Bioplastics, Biopolymers, Polyhydroxyalkanoates, Fermentation
Elsevier	Reviewer for Bioresource Technology	2015	-	Biomass, Hydrothermal process, Enzymolysis, Biofuels, Biochemicals
BioMed Central	Reviewer for Biotechnology for	2015	-	Biomass, Hydrothermal process, Enzymolysis,

	Biofuels			Biofuels
Elsevier	Reviewer for Energy Conversion and Management	2015	2015	Biomass, Hydrothermal process, Ball Milling
ACS Publications	Reviewer for Environmental Science & Technology	2014	2014	Environmental Biotechnology, Biomass, Hydrothermal process
Elsevier	Reviewer for Applied Energy	2014	2014	Environmental Biotechnology, Biomass, Hydrothermal process
NC State University	Reviewer for Bioresources	2014	-	Environmental Biotechnology, Biomass, Hydrothermal process
Elsevier	Reviewer for Micron Journal	2010	2010	Environmental Biotechnology, Biopolymer

#### E. APPOINTMENTS (*Lantikan*)

##### i) INTERNATIONAL

Majikan / Employer	Jawatan / Designation	Jabatan / Department	Tarikh lantikan / Start Date	Tarikh tamat / Date Ended
National Institute of Advanced Industrial Science and Technology, Japan	Post-Doctoral Researcher	Biomass Refinery Research Center (Separation Team)	17-07-2013	30 June 2015
AFOB Asian Congress of Biotechnology 2015, Istana Hotel	Committee	Department of Bioprocess Technology	2014	2014

##### ii) NATIONAL

Ministry of Human Resource (MOHR) – Handling of biohazard and medical	Panel	Development of National Occupational Skills Standard (NOSS) document for the Department of Skills Development (DSD)	2016	2016
Seminar on Bioreactor Operation and Fermentation Data Analyses	Committee	Department of Bioprocess Technology	2016	2016
SIRIM Berhad	Research Associate	Industrial Biotechnology	Oct 2011	Jan 2012

Vivantis Technologies Sdn Bhd	Project Manager	Life Sciences/ Wastewater treatment	Feb 2006	Feb 2007
<b>III) UNIVERSITY/FACULTY/DEPARTMENT</b>				
Universiti Putra Malaysia	Committee, Grant Evaluation and Monitoring-Faculty level	Faculty of Biotechnology and Biomolecular Sciences	1 Mar 2019	31 Dec 2020
Universiti Putra Malaysia	Associate Professor	Department of Bioprocess Technology	2 Jan 2019	Present
Universiti Putra Malaysia	Committee, Research and Postgraduate studies	Faculty of Biotechnology and Biomolecular Sciences	2 Jan	31 Dec 2020
Institute of Tropical Forestry and Forest Products (INTROP), UPM	Head of Program	Biopolymer and Derivatives	1 Dec 2018	1 Dec 2019
Universiti Putra Malaysia	Senior Lecturer	Department of Bioprocess Technology	2 April 2012	31 Dec 2018
Universiti Putra Malaysia	Research Assistant	Department of Bioprocess Technology	Mar 2007	Sep 2011
Universiti Putra Malaysia	Research Assistant	Department of Bioprocess Technology	2003	2006
International Symposium on Applied Engineering and Sciences, 2017 UPM	Poster judge	Department of Bioprocess Technology	2017	2017
International Biotechnology Competition & Exhibition (IBCEX) 2017	Poster judge	UTM, Skudai Johor	2017	2017
Wood and Biofiber International Conference	Committee	INTROP, UPM	2017	2017
3U1i Program with Indah Water Konsortium	Committee	Department of Bioprocess Technology	2017	2018
Malaysian Society for Microbiology	Poster judge	Environmental Microbiology Poster Session	2016	2016
Industrial Linkages and Community	Committee	Department of Bioprocess Technology	2016	Present
Internship Program- Undergraduate students	Committee	Department of Bioprocess Technology	2016	Present

AFOB Asian Congress of Biotechnology 2015 Istana Hotel	Committee	Department of Bioprocess Technology	2015	2015
Institute of Tropical Forestry and Forest Products (INTROP), UPM	Research Associate	Biopolymer and Derivatives	2015	Present
Academic Program Evaluation for Bachelor of Microbiology	Committee		2012	2014
Biomagnetic Day	Chairman	Department of Bioprocess Technology	2015	2015
Faculty Research Book	Committee	Department of Bioprocess Technology	2013	2014
Faculty Promotion and Publicity	Committee	Department of Bioprocess Technology	2013	2014
Biomagnetic Day	Committee	Department of Bioprocess Technology	2012	Present
Undergraduate seminar / proposal and final report evaluator	Member	Department of Bioprocess	2012	Present
Postgraduate seminar / proposal and final report evaluator	Member	Department of Bioprocess	2012	Present

#### F. ANUGERAH DAN HADIAH *(Honours and Awards)*

<i>Name of awards</i>	<i>Title</i>	<i>Award Authority</i>	<i>Award Type</i>	<i>Year</i>
<i>Non-Academic Awards</i>	Award for High Impact Project-Industrial and Community Linkages	CiRNeT-UPM	CiRNeT-UPM	2018
<i>Non-Academic Awards</i>	Excellent Service Award	Anugerah Perkhidmatan Cemerlang 2017, Dewan Besar, UPM	UPM	2018
<i>Non-Academic Awards</i>	Incentive Journal Publication 2016	RMC-UPM Research Appreciation Ceremony-	RMC-UPM	2017
<i>Non-Academic Awards</i>	Excellent Service Award	Anugerah Perkhidmatan Cemerlang 2015, Dewan Besar, UPM	UPM	2016
<i>Non-Academic Awards</i>	University Research Award - Category: Publishing Journal 2015	Pameran reka cipta, penyelidikan dan inovasi (PRPI) 2016, UPM	UPM	2016
<i>Non-Academic Awards</i>	GOLD Medal, ITEX 2011	Malaysian Invention and Design Society (MINDS)	International	2011

<i>Non-Academic Awards</i>	GOLD Medal at PRPI, UPM 2010	Pameran reka cipta, penyelidikan dan inovasi (PRPI) 2009, UPM	UPM	2010
<i>Non-Academic Awards</i>	BRONZE Medal, PECIALTA 2009	PECIPTA, KLCC, Malaysia	National	2009
<i>Non-Academic Awards</i>	2 GOLD medals at PRPI, UPM	(PRPI) 2009, UPM	UPM	2009
<i>Academic Awards</i>	Scholarship (MOHE)	Ministry of Higher Education, Malaysia	National	2009-2012
<i>Non-Academic Awards</i>	BRONZE Medal, Best Poster	Seminar on Biomass for Biofuels and Value-Added By-Products.The Saujana, Kuala Lumpur.	International	2009
<i>Awards of Merit</i>				

**G. SENARAI PENERBITAN (Sila masukan nama pengarang, tajuk, nama jurnal, jilid, muka surat dan tahun diterbitkan) (List of publications – author (s), title, journal, volume, page and year published)**

<b>Journals</b>	<p><b>* Corresponding author</b></p> <p>33- Mohammed Abdillah Ahmad Farid, <u>Mohd Rafein Zakaria*</u>, Mohd Ali Hassan, Izzudin Ibrahim, Mohd Hafif Samsudin, Mohd Ridzuan Othman, Ahmad Amiruddin Mohd Ali, Yoshihito Shirai. A holistic approach for palm oil mill effluent treatment by incorporating anaerobic-aerobic-wetland sequential system and convective sludge dryer via rotary drum. Accepted in Chemical Engineering Journal. Nov 2018. (IF 6.735)</p> <p>32- Liana Noor Megashah, Hidayah Ariffin, <u>Mohd Rafein Zakaria</u> and Mohd Ali Hassan. 2018. Multi-step pretreatment as an eco-efficient pretreatment method for the production of cellulose nanofiber from oil palm empty fruit bunch. <i>AsPac J. Mol. Biol. Biotechnol.</i> 2018 Vol. 26 (2): 1-8 (Scopus)</p> <p>31- Nurhajirah Mohamed Biran, Mohd Zulkhairi Mohd Yusoff, Toshinari Maeda, <u>Mohd Rafein Zakaria</u>, Lian-Ngit Yee, Mohd Ali Hassan. Triple knockout of frdC gltA and pta genes enhanced PHA production in <i>Escherichia coli</i>. <i>AsPac J. Mol. Biol. Biotechnol.</i> 2018 Vol. 26 (1): 11-18 (Scopus)</p> <p>30- Muhammad Azman Zakaria, Mohd Zulkhairi Mohd Yusoff, <u>Mohd Rafein Zakaria</u>, Mohd Ali Hassan, Thomas K. Wood, Toshinari Maeda. 2018. Pseudogene product YqjG is important for pflB expression and biohydrogen production in <i>Escherichia coli</i> BW25113. <i>3 Biotech</i>, 8:435 (IF 1.497)</p> <p>29- Liana Noor Megashah, Hidayah Ariffin, <u>Mohd Rafein Zakaria</u> and Mohd Ali Hassan. 2018. Properties of Cellulose Extract from Different Types of Oil Palm Biomass. <i>IOP Conf. Ser.: Mater. Sci. Eng.</i> 368 012049 (Scopus)</p> <p>28- Liana Noor Megashah, Hidayah Ariffin, <u>Mohd Rafein Zakaria</u> and Yoshito Ando 2018. Characteristics of cellulose from oil palm mesocarp fibres extracted by multi-step pretreatment methods. <i>IOP Conf. Ser.: Mater. Sci. Eng.</i> 368 012001 (Scopus)</p>
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27- Siti Jamilah Hanim Mohd Yusof, Ahmad Muhaimin Roslan, K N Ibrahim, Syarifah Sopliah Syed Abdullah, Mohd Rafein Zakaria, Mohd Ali Hassan and Yoshihito Shirai. 2018. Environmental performance of bioethanol production from oil palm frond petiole sugars in an integrated palm biomass biorefinery. *IOP Conf. Ser.: Mater. Sci. Eng.* 368 012004 (Scopus)

26- Pretreatment of Oil Palm Biomass for Fermentable Sugars Production. 2018. Nur Fatin Athirah Ahmad Rizal, Mohamad Faizal Ibrahim, Mohd Rafein Zakaria, Suraini Abd-Aziz, Lai Yee Phang, Mohd Ali Hassan. *Molecules*, 23, 1310. (IF 2.861)

25- Norlailiza Ahmad, Mohd Rafein Zakaria\*, Mohd Zulkhairi Mohd Yusoff, Shinji Fujimoto, Hiroyuki Inoue, Hidayah Ariffin, Mohd Ali Hassan 2018. Subcritical H<sub>2</sub>O-CO<sub>2</sub> pretreatment of oil palm mesocarp fiber for xylooligosaccharide and glucose production. *Molecules*, 23, 1310. (IF 2.861)

24- Nur Fatin Athirah Ahmad Rizal, Mohamad Faizal Ibrahim, Mohd Rafein Zakaria, Ezyana Kamal Bahrin, Suraini Abd-Aziz, Mohd Ali Hassan. 2018. Combination of superheated steam with laccase pretreatment together with size reduction to enhance enzymatic hydrolysis of oil palm biomass. *Molecules*. 23 (4),811 (IF 2.861)

23- Mohammed Abdillah Ahmad Farid, Mohd Ali Hassan, Yun Hin Taufiq-Yap, Yoshihito Shirai, Mohd Rafein Zakaria\*. 2017. Utilization of biomass-derived bioadsorbent in purification of biodiesel produced from waste cooking oil. *Journal of Cleaner Production*. 165,262-272 (IF 5.715)

22- Azam Fikri Taifor, Mohd Rafein Zakaria\*, Mohd Zulkhairi Mohd Yusoff, Toshinari Maeda, Mohd Ali Hassan, Yoshihito Shirai. 2017. Elucidating substrate utilization in biohydrogen production from palm oil mill effluent by *Escherichia coli*. *International Journal of Hydrogen Energy*. 42, 5812-5819 (IF 3.205)

21- Zulnaim Dzulkurnain, Mohd Ali Hassan, Mohd Rafein Zakaria, Puteri Edaroyati Megat Wahab, Muhamad Yusuf Hassan, Yoshihito Shirai. 2017. Co-composting of municipal sewage sludge and landscaping waste - a pilot scale study. *Waste and Biomass Valorization*. 8, 695-705 (IF 0.915)

20- Izzudin Ibrahim, Suraini Abd-Aziz, Yoshihito Shirai, Yoshito Andou, Mohd Ridzuan Othman, Ahmad Amiruddin Mohd Ali, Mohd Rafein Zakaria. 2017. Reduction of residual pollutants from biologically treated palm oil mill effluent final discharge by steam activated bioadsorbent from oil palm biomass. *Journal of Cleaner Production*. 141, 122-127 (IF 4.959)

19- Mohd Rafein Zakaria\*, Satoshi Hirata, Shinji Fujimoto, Izzudin Ibrahim, Mohd Ali Hassan. 2016. Soluble inhibitors generated during hydrothermal pretreatment of oil palm mesocarp fiber suppressed the catalytic activity of *Acremonium* cellulase. *Bioresource Technology*. 200, 541-547. (IF 4.902)

18- Mohd Rafein Zakaria\*, Satoshi Hirata, Shinji Fujimoto, Mohd Ali Hassan. 2015. Combined pretreatment with hot compressed water and wet disk milling opened up oil palm biomass structures resulting in enhanced enzymatic digestibility. *Bioresource Technology*. 193, 128-134. (IF 5.039)

- 17- Mohd Rafein Zakaria\*, Mohd Nor Faiz Norraahim, Satoshi Hirata, Mohd Ali Hassan. 2015. Hydrothermal and wet disk milling pretreatment for high conversion of biosugars from oil palm mesocarp fiber. *Bioresource Technology*. 181, 263-269. (IF 5.039)
- 16- Mohd Rafein Zakaria\*, Satoshi Hirata, Mohd Ali Hassan. 2015. Hydrothermal pretreatment enhanced enzymatic hydrolysis and glucose production from oil palm biomass. *Bioresource Technology*. 176, 142-148. (IF 5.039)
- 15- Faiqah Abd-Rahim, Helmi Wasoh, Mohd Rafein Zakaria, Arbakariya Ariff, Rizal Kapri, Nazaruddin Ramli, Liew Siew-Ling. 2014. Production of high yield sugars from *Kappaphycus alvarezii* using combined methods of chemical and enzymatic hydrolysis. *Food Hydrocolloids*. 42, 309-315. (IF 4.280)
- 14- Mohd Rafein Zakaria\*, Satoshi Hirata, Mohd Ali Hassan. 2014. Combined pretreatment using alkaline hydrothermal and ball milling to enhance enzymatic hydrolysis of oil palm mesocarp fiber. *Bioresource Technology*. 169, 236–243. (IF 5.039)
- 13- Mohd Rafein Zakaria\*, Shinji Fujimoto, Satoshi Hirata, Mohd Ali Hassan. 2014. Ball Milling Pretreatment of Oil Palm Biomass for Enhancing Enzymatic Hydrolysis. *Applied Biochemistry and Biotechnology*. 173; 7. (IF 1.687)
- 12- Mohd Rafein Zakaria\*, Hidayah Ariffin, Suraini Abd-Aziz, Mohd Ali Hassan, Yoshihito Shirai. 2013. Improved properties of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) produced by *Comamonas* sp. EB172 utilizing volatile fatty acids by regulating the nitrogen source. *BioMed Research International*. 1-8. (IF 2.706)
- 11- Nordiyana Nordin, Mohd Rafein Zakaria, Mohd Izuan Effendi Halmi, Arbakariya B. Ariff, Ruzniza Mohd Zawawi, Helmi Wasoh. 2013. Isolation and screening of high efficiency biosurfactant-producing bacteria *Pseudomonas* sp. *Journal of Biochemistry, Microbiology and Biotechnology*. 1, 25-31. (NCIJ)
- 10- Nur Haziqah Aniyah Salihan, Arbakariya Ariff, Mohd Rafein Zakaria, Suraini Abd\_Aziz, Md Noor Abd Wahab, Helmi Wasoh. 2013. Performance of B-glucosidase produced by *Ganoderma lucidum* using waste substrate as carbon source. *Journal of Biochemistry, Microbiology and Biotechnology*, 1, 17-24. (NCIJ)
- 9- Mior Ahmad Khushairi Mohd Zahari, Mohd Rafein Zakaria, Hidayah Ariffin, Mohd Nooriznan Mokhtar, Jailani Salihon, Yoshihito Shirai, Mohd Ali Hassan. 2012. Renewable Sugars from Oil Palm Frond Juice as an Alternative Novel Fermentation Feedstock for Value-Added Products. *Bioresource Technology*. 110, 566-571. (IF 5.039)
- 8- Noor Azman Mohd Johar, Mohd Ali Hassan, Mohd Rafein Zakaria, Phang Lai Yee, Yoshihito Shirai. 2012. Evaluation of factors affecting polyhydroxyalkanoates production by *Comamonas* sp. EB172 using central



	<p>composite design. <i>Malaysian Journal of Microbiology</i>, 8, 184-190. (Scopus)</p> <p>7- Yee Lian Ngit, Tabassum Mumtaz, Mitra Mohammadi, Phang Lai Yee, Yoshito Ando, Raha Abdul Rahim, Sudesh Kumar, Mohd Ali Hassan, Hidayah Ariffin, <u>Mohd Rafein Zakaria</u>*. 2012. Polyhydroxyalkanoate synthesis by recombinant <i>Escherichia coli</i> JM109 expressing PHA biosynthesis genes from <i>Comamonas</i> sp. EB172. <i>Journal of Microbial and Biochemical Technology</i>. 4: 103-110. (IF 2.16)</p> <p>6- Mohd Firwance Basri, Shahrakbah Yacob, Mohd Ali Hassan, Yoshihito Shirai, Minato Wakisaka, <u>Mohd Rafein Zakaria</u>, Phang Lai Yee. 2010. Improved Biogas Production from Palm Oil Mill Effluent by a Scaled-down Anaerobic Treatment Process. <i>World Journal of Microbiology and Biotechnology</i>, 26: 505-514. (IF 1.353)</p> <p>5- <u>Mohd Rafein Zakaria</u>, Meisam Tabatabaei, Farinazleen Mohamed Ghazali, Suraini Abd-Aziz, Yoshihito Shirai, Mohd Ali Hassan. 2010. Polyhydroxyalkanoate production from anaerobically treated palm oil mill effluent by new bacterial strain <i>Comamonas</i> sp. EB172. <i>World Journal of Microbiology and Biotechnology</i>. 26: 767- 774. (IF 1.353)</p> <p>4- <u>Mohd Rafein Zakaria</u>, Hidayah Ariffin, Noor Azman Mohd Johar, Suraini Abd_Aziz, Haruo Nishida, Yoshihito Shirai, Mohd Ali Hassan. 2010. Biosynthesis and characterization of Poly(3-hydroxybutyrate-co-3-hydroxyvalerate) copolymer from wild type <i>Comamonas</i> sp. EB172. <i>Polymer Degradation and Stability</i>. 95: 1382- 1386. (IF 2.633)</p> <p>3- Meisam Tabatabaei, <u>Mohd Rafein Zakaria</u>, Raha Abdul Rahim, Andre-Denis G. Wright, Yoshihito Shirai, Norhani Abdullah, Mehdi Shamsara, Kenji Sakai, Mohd Ali Hassan. 2010. Comparative Study of Methods for Extraction and Purification of Environmental DNA from Wastewater Sludge. <i>African Journal of Biotechnology</i>. 31:4926-4937. (IF 0.511)</p> <p>2- Alawi Sulaiman, <u>Mohd Rafein Zakaria</u>, Mohd Ali Hassan, Yoshihito Shirai, Zainuri Busu. 2009. Co-digestion of palm oil mill effluent and refined glycerin wash water for chemical oxygen demand removal and methane production. <i>American Journal of Environmental Sciences</i>. 5: 639-646. (NCIJ)</p> <p>1- <u>Mohd Rafein Zakaria</u>, Suraini Abd-Aziz, Hidayah Ariffin, Nor `Aini Abdul Rahman, Phang Lai Yee and Mohd Ali Hassan. 2008. <i>Comamonas</i> sp. EB172 isolated from digester treating palm oil mill effluent as potential polyhydroxyalkanoate (PHA) producer. <i>African Journal of Biotechnology</i>. 7: 4118-4121 (IF 0.511)</p>
<b>Books/Monographs</b>	
<b>Chapter in book</b>	
<b>Proceedings</b>	<p>30. Mohd Rafein Zakaria, Shobanah Menon Baskaran. Valorization of biodiesel side stream waste glycerol for biosurfactant production by <i>Pseudomonas aeruginosa</i> WG. 6<sup>th</sup> International Symposium on Applied Engineering and Sciences, (SAES). KYUTECH, Tobata Campus, Japan. 15-16 December 2018.</p> <p>29. Liana Noor Megashah, Hidayah Ariffin, Mohd Rafein Zakaria, Yoshito Ando. Isolation of cellulose from oil palm empty fruit bunch by multi-step,</p>

	<p>totally chlorine free treatment method for cellulose nanofibril production. 6<sup>th</sup> International Symposium on Applied Engineering and Sciences, (SAES). KYUTECH, Tobata Campus, Japan. 15-16 December 2018.</p> <p>28- Liana Noor Megashah, Hidayah Ariffin, Mohd Rafein Zakaria, Yoshito Ando. Effect of pretreatment concatenation on the characteristics of nanocellulose. Wood and Biofiber International Conference 2017 (WOBIC2017). Bangi-Putrajaya Hotel, Malaysia. 21-23 November 2017.</p> <p>27- Khairiatul Nabilah-Jansar, Mohd Rafein Zakaria, Ahmad Muhaimin Roslan, Mohd Ali Hassan. Lignocellulosic composition of mixed oil palm biomass after hydrothermal pretreatment. Wood and Biofiber International Conference 2017 (WOBIC2017). Bangi-Putrajaya Hotel, Malaysia. 21-23 November 2017.</p> <p>26- Mohd Rafein Zakaria, Satoshi Hirata, Mohd Ali Hassan. Combined pretreatment of hot compressed water and wet disk milling for nanofibrillation of oil palm biomass. Wood and Biofiber International Conference 2017 (WOBIC2017). Bangi-Putrajaya Hotel, Malaysia. 21-23 November 2017.</p> <p>25- Norlailiza Ahmad, Mohd Rafein Zakaria, Hidayah Ariffin, Mohd Ali Hassan. Subcritical water-carbon dioxide pretreatment of oil palm mesocarp fiber for xylooligosaccharides and glucose production. Wood and Biofiber International Conference 2017 (WOBIC2017). Bangi-Putrajaya Hotel, Malaysia. 21-23 November 2017.</p> <p>24- Siti Jamilah Hanim Mohd Yusof, Ahmad Muhaimin Roslan, Khairul Nadiah Ibrahim, Sharifah Sopliah Syed Abdullah, Mohd Rafein Zakaria, Mohd Ali Hassan, Yoshihito Shirai. Life cycle assessment for bioethanol production from oil palm frond in an oil palm based biorefinery. Wood and Biofiber International Conference 2017 (WOBIC2017). Bangi-Putrajaya Hotel, Malaysia. 21-23 November 2017.</p> <p>23- Nur Aina Natasha Mohd Asmadi, Mohd Rafein Zakaria, Izzatul Syazana Ismail, Fatini Arisah. Feasibility of palm oil mill effluent sludge oil as cheaper carbon sources in biosurfactant production. 5<sup>th</sup> International Symposium on Applied Engineering and Sciences, (SAES). UPM, Malaysia. 14-15 November 2017.</p> <p>22- Nur Fatin Athirah Ahmad Rizal, Mohamad Faizal Ibrahim, Mohd Rafein Mohd Zakaria, Suraini Abd-Aziz, Ezyana Kamal Bahrin, Mohd Ali Hassan. Combination of superheated steam with laccase pretreatment together with size reduction to enhance enzymatic hydrolysis of oil palm biomass. 5<sup>th</sup> International Symposium on Applied Engineering and Sciences, (SAES). UPM, Malaysia. 14-15 November 2017.</p> <p>21- Liana Noor Megashah, Hidayah Ariffin, Mohd Rafein Zakaria, Yoshito Ando. Multiple stage Pretreatment affecting the properties of nanocellulose from oil palm frond. 5<sup>th</sup> International Symposium on Applied Engineering and Sciences, (SAES). UPM, Malaysia. 14-15 November 2017.</p> <p>20- Khairiatul Nabilah-Jansar, Mohd Rafein Zakaria, Ahmad Muhaimin Roslan, Mohd Ali Hassan. Hydrothermal pretreatment of mixed oil palm biomass. 5<sup>th</sup> International Symposium on Applied Engineering and Sciences, (SAES). UPM, Malaysia. 14-15 November 2017.</p>
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	<p>19- Yuya Hashiguchi, Mohd Rafein Zakaria, Toshinari Maeda, Mohd Zulkhairi Mohd Yusoff, Mohd Ali Hassan. Toxicity identification evaluation of palm oil mill effluent final discharge in Malaysia. 5<sup>th</sup> International Symposium on Applied Engineering and Sciences, (SAES). UPM, Malaysia. 14-15 November 2017.</p> <p>18- Mohd Rafein Zakaria, Satoshi Hirata, Shinji Fujimoto, Mohd Ali Hassan. Effect of lignin and phenolic inhibitors on biosugars conversion. UPM-Chulalongkorn University. Biotechnology of Biomass Utilization for ASEAN Development. Thailand. 5-8 September 2016.</p> <p>17- Mohd Rafein Zakaria, Satoshi Hirata, Shinji Fujimoto, Mohd Ali Hassan. Factors affecting high glucose recovery from pretreatment of oil palm biomass. UPM-Sejong Symposium, Sejong University, Korea. 10-17 April 2016.</p> <p>16- Mohd Rafein Zakaria, Satoshi Hirata, Shinji Fujimoto, Mohd Ali Hassan. Recent pretreatment of oil palm biomass for high recovery of xylose and glucose. Asian Congress on Biotechnology, Istana Hotel, Kuala Lumpur, Malaysia. 15-19 Nov 2015.</p> <p>15- Mohd Rafein Zakaria, Satoshi Hirata, Mohd Ali Hassan. Soluble inhibitors from hydrothermal pretreatment of oil palm mesocarp fiber suppress the catalytic activity of Acremonium cellulose. Asian Congress on Biotechnology, Istana Hotel, Kuala Lumpur, Malaysia. 15-19 Nov 2015.</p> <p>14- Yuya Hashiguchi, Mohd Rafein Zakaria, Toshinari Maeda, Mohd Zulkhairi Mohd Yusoff, Mohd Ali Hassan. Improvement of conventional POME treatment system for environmental sustainability. Asian Congress on Biotechnology, Istana Hotel, Kuala Lumpur, Malaysia. 15-19 Nov 2015.</p> <p>13- Muhammad Azman Zakaria, Marahaini Mokhtar, Mohd Zulkhairi Mohd Yusoff, Mohd Ali Hassan, Mohd Rafein Zakaria and Toshinari Maeda. Absent of Pseudogene yqiG in Esherichia coli has influenced hydrogen production. Asian Congress on Biotechnology, Istana Hotel, Kuala Lumpur, Malaysia. 15-19 Nov 2015.</p> <p>12- Zulnaim Dzulkurnain, Mohd Hafif Shamsudin, Mohd Rafein Zakaria, Puteri Edaroyati Megat Wahab, Yoshihito Shirai, Mohd Ali Hassan. Co-Composting of municipal sewage sludge and landscaping wastes by pilot scale system. Asian Congress on Biotechnology, Istana Hotel, Kuala Lumpur, Malaysia. 15-19 Nov 2015.</p> <p>11- Mohd Rafein Zakaria, Satoshi Hirata, Mohd Ali Hassan. Combined pretreatment of hot compressed water and wet disk milling unraveled oil palm biomass structures and enhanced enzymatic digestibility. 23<sup>rd</sup> European Biomass Conference and Exhibition (EUBCE), Messe Wien Exhibition &amp; Congress Center, Messeplatz 1, 1021 Wien, Austria. 1-4 June 2015.</p> <p>10- Mohd Rafein Zakaria, Satoshi Hirata, Shinji Fujimoto, Mohd Ali Hassan. Pretreatment of oil palm biomass for high xylose and glucose recovery. 2<sup>nd</sup> International Symposium on Applied Engineering and Sciences (SAES2014) Kyushu Institute of Technology, Fukuoka, Japan. 20<sup>th</sup> – 21<sup>st</sup> Dec. 2014</p>
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	<p>9- Muhammad Azman Zakaria, Mohd Zulkhairi Mohd yusoff, Lian Ngit Yee, Mohd Ali Hassan, Mohd Rafein Zakaria, T. Maeda, T. K. Wood. yqiG pseudogene of Escherichia coli related to hydrogen production. 2<sup>nd</sup> International Symposium on Applied Engineering and Sciences (SAES2014) Kyushu Institute of Technology, Fukuoka, Japan. 20<sup>th</sup> – 21<sup>th</sup> Dec. 2014</p> <p>8- Mohd Rafein Zakaria, Satoshi Hirata, Mohd Ali Hassan. Pretreatment and bioconversion of oil palm biomass-from waste to biochemical and biomaterial. Society for Biotechnology, Japan (SBJ), Sapporo Convention Center, Hokkaido from September 9 to 11, 2014.</p> <p>7- Mohd Rafein Zakaria, Satoshi Hirata, Mohd Ali Hassan. Combined pretreatment using alkaline hydrothermal and ball milling to enhance enzymatic hydrolysis of oil palm mesocarp fiber. Biomass Refinery Research Center Symposium, Tokyo, Japan. 8 September 2014.</p> <p>6- Mohd Nor Faiz Norrahim, Mohd Rafein Zakaria, Satoshi Hirata, Mohd Ali Hassan. Combining superheated steam and wet disk milling pretreatments of oil palm biomass to improve the enzyme digestibility and sugar yield Biomass Refinery Research Center Symposium, Tokyo, Japan. 8 September 2014.</p> <p>5- Nurhajirah Mohamed Biran, Mohd Rafein Zakaria, Mohd Zulkhairi Mohd Yusoff, Toshinari Maeda, Yoshihito Shirai and Mohd Ali Hassan. Enhanced production of polyhydroxyalkanoates (PHA) by inactivation of PHA depolymerase gene in Comamonas sp. EB172. AFOB Regional Symposium, Kuala Lumpur. 2014</p> <p>4- Akbar Ciptanto, Mohd Zulkhairi Mohd Yusoff, Mohd Rafein Zakaria, Toshinari Maeda and Mohd Ali Hassan. Biohydrogen production from palm oil mill effluent using anaerobic microflora under thermophilic condition. AFOB Regional Symposium, Kuala Lumpur. 2014</p> <p>3- Zulnaim Dzulkurnain, Muhamad Yusuf Hasan, Mohd Hafif Shamsudin, Siti Suliza Salamat, Mohd Rafein Zakaria and Mohd Ali Hassan. Compost performance of municipal sewage sludge and landscaping wastes by windrow system process. AFOB Regional Symposium, Kuala Lumpur. 2014</p> <p>2- Mohd Rafein Zakaria, Shinji Fujimoto, Satoshi Hirata, Mohd Ali Hassan, Yoshihito Shirai. Ball milling pretreatment of oil palm biomass for enhancing enzymatic hydrolysis. AFOB Regional Symposium, Kuala Lumpur. 2014</p> <p>1- Hidayah Ariffin, Mohd Rafein Zakaria, Wan Md Zin Wan Yunus, Yoshihito Shirai, Haruo Nishida and Mohd Ali Hassan. 2011. Enhanced Utilization of Polyhydroxyalkanoates by Improving the Physical Properties via Different Fermentation Strategy and Blending with Other Bio-based Materials. Asian Congress on Biotechnology 2011 (ACB 2011).</p>
<p><i>Other publications/ patents/Trademark/ Copyright</i></p>	<ol style="list-style-type: none"> <li>1. <b>PCT/MY2009/000143</b>) Tabatabaei M, <b>Zakaria MR</b>, Raha AR, Hassan MA and Shirai Y. X3; Rapid Method for Direct Extraction of PCR-compatible DNA from Environmental Samples. <b>Patent pending. Member</b></li> <li>2. <b>PCT/MY2010/000004</b>) <b>Zakaria MR</b>, Suraini AA, Farinazleen MG, and Hassan MA. <i>Comamonas putranensis</i> sp. nov., a novel poly(<math>\beta</math>-hydroxyalkanoates) producer isolated from digester -treated palm oil mill effluent. <b>Patent pending. Member</b></li> <li>3. <b>PI2011004440</b> Hassan MA, Ariffin H, Zahari MAKM, <b>Zakaria MR</b>, Mokhtar</li> </ol>

	<p>MN, Salihon J, Shirai Y. Utilization of renewable sugars from all palm frond juice for value added products. <b>Patent pending. Member</b></p> <p>4. Biofertilizer pellets from sewage sludge for soil and plant nutrients (New:BioPellens)-<b>TRADEMARK: Filed. Member</b></p> <p>5. Standard operating procedure for composting of oil palm biomass and palm oil mill effluent sludge. <b>COPYRIGHT: Filed. Member</b></p>
<b>Computer software</b>	

<b>H. PROJEK PENYELIDIKAN TERKINI dan TERDAHULU</b> (Current and Past Research Project)					
<b>Consultancy</b>					
<b>Project No.</b>	<b>Project Title</b>	<b>Role</b>	<b>Year</b>	<b>Source of fund</b>	<b>Status</b>
UPMCS-	Research on future of renewable energy and palm oil industry in Malaysia	<b>Member</b> (RM 140,000)	Jun 2018- Mar 2019	Mitsubishi Heavy Industries Asia Pasific	In-progress
UPMCS-	Collaborative research on the use of hydrothermal carbonization technology for treatment of oil palm biomass to be used in composting: part 1 - preliminary study	<b>Member</b> (RM 140,000)	Nov 2018- Mar 2019	Mitsubishi Heavy Industries Asia Pasific	In-progress
UPMCS-802	Research study on BRIS soil for maize plantation	<b>Leader</b> (RM 17,400)	Jan- Apr 2018	SB Sinergi Sdn Bhd	Completed
	Research Study on the Acceleration of Composting Process from Spent Rice Husk with Chicken Mnure	<b>Member</b>	Feb 2018	Novozymes	
	Nanocellulose from tropical biomass	<b>Member</b> (RM 300,000)	Jan 2017- Dec 2019	Consultation	In-progress
UPMCS	Survey on municipal solid waste composition, utilization and management in selected cities in Malaysia".	<b>Member</b> (RM 152,000)	Sept 2017- Mar 2018	Mitsubishi Heavy Industries Asia Pasific	Completed
UPMCS-757	Start-up and batch operations of co-composting of treated palm oil mill effluent sludge and empty fruit bunch at semi-commercial plant	<b>Leader</b> (RM 190,000)	Sep 2017- Mar 2018	TDM Plantations Sdn. Bhd	Completed
UPMCS	Torrefaction of oil palm biomass for alternative fuel	<b>Leader</b> (RM 152,000)	2017- April 2018	Consultation (Mitsubishi Heavy	Completed

				Industries Asia Pasific)	
UPMCS	Research Study on Biofertilizer Pellets for Landscape Plants to support CJ Bio Malaysia's application to Department of Environment for Special Management of Scheduled Waste (SW204 & SW411).	<b>Member</b> (RM 250,000)	2016 (6 months)	CJ Bio Malaysia Sdn. Bhd	Completed
UPMCS	Research study on the effectiveness of biofertilizer pellets for landscape plants	<b>Member</b> (RM 200,000)	2015 (2 years)	Indah Water Konsortium	Completed
UPMCS	Co-composting of landscaping wastes and domestic sewage sludge in pilot scale windrow and 10 m <sup>3</sup> bioreactor systems.	<b>Member</b> (RM 120,000)	2012 (2 years)	Indah Water Konsortium	Completed
<b>Grants</b>					
<b>Project No.</b>	<b>Project Title</b>	<b>Role</b>	<b>Year</b>	<b>Source of fund</b>	<b>Status</b>
	Utilization of municipal solid waste for green energy in Universiti Putra Malaysia	<b>Member</b>	Nov 2017- Oct 2020	SWCorp	In-progress
GP	Characterization of Biosugars Produced from Saccharification of Napier Grass Supplied with POME Final Discharge for the Production of Biochemical	<b>Member</b> (RM 46,000)	Nov 2017- Nov 2019	Geran Putra, UPM	In-progress
9602100	Feasibility of oil palm empty fruit bunch-pressed oil and plam oil mill effluent sludge oil as cheaper carbon sources for biosurfactant production.	<b>Leader</b> (RM 25,000)	Feb 2018- Feb 2019 (1 year)	Geran Putra IPS, UPM	Completed
9553700	Valorization of waste cooking oil and biodiesel side streams glycerine for sustainable production of biosurfactants by	<b>Leader</b> (RM 94,000)	Sep 2017- Sep 2019	Geran Putra Berimpak	In-progress

	Pseudomonas aeruginosa strains				
9502300	Elucidating xylooligosachharides formation from oil palm mesocarp fiber by hydrothermal pretreatment	<b>Leader</b> (RM 20,000)	2016-2017	Geran Putra IPS, UPM	Completed
9487800	Unravel biohydrogen production from palm oil mill effluent (POME) via anaerobic fermentation by E. coli BW25113	<b>Leader</b> (RM 20,000)	2016-2017	Geran Putra IPS, UPM	Completed
SATREPS	Promotion of green economy with palm oil industry for biodiversity conservation in Malaysia	<b>Member</b> (RM 2,980,000)	Sep 2014-Sep 2018	JSPS,JICA,KPT	Completed
9385700	Isolation and characterization of a transposon mutant of <i>Comamonas</i> sp. EB172 enhancing the production of polyhydroxyalkanoic acid	<b>Leader</b> (RM 30,000)	2012 (1 year)	RUGS-UPM	Completed

#### I. ID PUBLISHING *(Publishing ID)*

	<b>Author ID</b>	<b>Name</b>
Scopus	55346979800	Zakaria, Mohd Rafein
ORC ID	<a href="http://orcid.org/0000-0002-2698-615X">http://orcid.org/0000-0002-2698-615X</a>	Zakaria, Mohd Rafein

#### J. RANGKAIAN SOSIAL *(Social Networking)*

<i>LinkedIn</i>	<a href="https://www.linkedin.com/nhome/?trk=">https://www.linkedin.com/nhome/?trk=</a>
<i>Researchgate</i>	<a href="https://www.researchgate.net/profile/Mohd_Rafein_Zakaria2">https://www.researchgate.net/profile/Mohd_Rafein_Zakaria2</a>
<i>Google Scholar</i>	<a href="https://scholar.google.com/citations?user=GkwQf5UAAAAJ&amp;hl=en">https://scholar.google.com/citations?user=GkwQf5UAAAAJ&amp;hl=en</a>
<i>Website url</i>	<a href="http://profile.upm.edu.my/mohdrafein">http://profile.upm.edu.my/mohdrafein</a>

#### K. SUPERVISION OF STUDENTS

<b>PHD</b>			
<i>Name</i>	<i>Role</i>	<i>Project Title</i>	<i>Status</i>
1-Yuya Hashiguchi-	Chairman	Toxicity identification evaluation of palm oil mill effluent final discharge and its effect on aquatic organisms	On-going
2-Siti Jamilah Hanim Mohd Yusof	Member	Development of biorefinery process for the production of bioethanol from oil palm frond.	On-going.

3-Fatini Mat Arisah	Chairman	Removal of heavy metals by <i>Pseudomonas aeruginosa</i>	On-going
4-Liana Nor Megashah	Member	Non-chlorinated cellulose nanofiber production from oil palm biomass.	On-going
<b>MSc</b>			
1-Nordiyana Nordin.	Member	Characterization and production of biosurfactant by isolated <i>Pseudomonas aeruginosa</i> RS6.	Completed-2015
2-Nur Haziqah Aniyah Salihan	Member	Performance of B-glucosidase produced by <i>Ganoderma lucidum</i> using waste substrate as a carbon source.	Completed-2015
3-Zulnaim Dzulkurnain	Member	Co-composting of municipal sewage sludge and landscaping waste by pilot scale system and the application of compost to an ornamental plant.	Completed-2017
4-Nurhajirah Mohamed Biran	Member	Construction of knock-outs mutants of <i>Escherichia coli</i> BW25113 for improved polyhydroxyalkanoates production.	Completed-2018
5-Muhammad Azman Zakaria	Member	Pseudogene product YqiG is important for pflB expression and biohydrogen production in <i>Escherichia coli</i> BW25113.	Completed-2018
6-Azam Fikri Taifor-	Chairman	Application of metabolic engineered <i>Escherichia coli</i> strains to enhance biohydrogen production from palm oil mill effluent	Completed-2018
7-Norlailiza Ahmad	Chairman	Subcritical H <sub>2</sub> O-CO <sub>2</sub> pretreatment of oil palm mesocarp fiber for xylooligosaccharide and biosugars production.	Completed-2018
8-Izzatul Syazana Ismail	Chairman	Production of biosurfactant from waste cooking oil by <i>Pseudomonas aeruginosa</i> RW9.	On-going
9-Khairiatul Nabilah Jansar-	Member	Production of glucose from oil palm biomass using hydrothermal pretreatment.	Completed-2018.
10-Nur Fatin Athirah Ahmad Rizal	Member	Effect of physic-chemical and biological pretreatment of oil palm biomass for fermentable sugars production.	Completed-2018
11.Nur Aina Natasha	Chairman	Production and characterization of a biosurfactant produced by <i>Pseudomonas aeruginosa</i> from sludge oil and pressed empty fruit bunch.	On-going
12.Shobanah Menon Baskaran	Chairman	Production and characterization of a biosurfactant produced by <i>Pseudomonas aeruginosa</i> from biodiesel side stream glycerine.	On-going
<b>Undergraduate</b>			



1- Nur Idayu Zahari	Chairman	Isolation and characterization of lipase-producing bacteria.	Completed-2013
2-Fairuzana Jaafar	Chairman	Screening, isolation and characterization of protease producing microorganisms.	Completed-2013
3-Khyruz Tasyriq Abu Samah	Chairman	Extraction, production and optimization of rhamnose from Pomelo peel.	Completed-2013
4-Nor Salwa Alhana Ahmad Fozi	Chairman	Isolation and screening of hemicellulose degrading bacteria.	Completed-2016
5-Nurul Hidayah Jamaluddin	Chairman	Isolation and screening of cellulose-degrading bacteria.	Completed-2016
6-Pang Lih Min	Chairman	Optimization of rhamnolipid production by <i>Pseudomonas aeruginosa</i> RW9 using waste frying oil.	Completed-2017
7-Abdullah Hadi Ahmad Suhairun	Chairman	Identification of cellulase and hemicellulase producing bacteria	Completed-2017
8-Nur Farzana Izzati Mohd Jaslina	Chairman	Optimization of biosurfactant production from waste glycerine by <i>Pseudomonas aeruginosa</i> RS6.	Completed-2017
9-Diah Erninda Idris	Chairman	Biosurfactant production by <i>Pseudomonas aeruginosa</i> RS6 using waste glycerol as a substrate.	Completed-2018
10-Nur Alya Syafinaz Mohd Nasir.	Chairman	Antibacterial properties of biosurfactant produced by <i>Pseudomonas aeruginosa</i> RW9 against <i>Pantoea ananatis</i> .	On-going
11-Ahmad Syafiq Mukhlis Ahmad Sabri.	Chairman	Antimicrobial potential of rhamnolipids produced by <i>Pseudomonas aeruginosa</i> RS6 against <i>Pantoea stewartii</i> .	On-going
<b>Internship students</b>			
1-Nalahyini Kumar. BSc (Biotechnology) (Hons.) Manipal International University (MIU), No 1, MIU Boulevard, 71800, Putra Nilai, Negeri Sembilan Darul Khusus. <b>13<sup>th</sup>February 2017 till 21<sup>st</sup> April 2017</b> (10 weeks).			
2-Anuja Selvadurai. BSc (Biotechnology) (Hons.) Manipal International University (MIU), No 1, MIU Boulevard, 71800, Putra Nilai, Negeri Sembilan Darul Khusus. <b>29<sup>th</sup> January 2018 till 6<sup>th</sup> April 2018</b> (10 weeks).			
3-Divieya Nadrraja BSc (Biotechnology) (Hons.) Manipal International University (MIU), No 1, MIU Boulevard, 71800, Putra Nilai, Negeri Sembilan Darul Khusus. <b>29<sup>th</sup> January 2018 till 6<sup>th</sup> April 2018</b> (10 weeks).			

#### L. Professional Societies

	Author ID
1.	Member- Malaysia Society for Microbiology- <b>National</b> . Since 2014-
2.	Member- Japanese Society for Biotechnology- <b>International</b> . Since 2014-
3.	Member- Asian Federation of Biotechnology- <b>International</b> . Since 2014-
4.	Member Persatuan Pegawai Akademik Universiti Putra Malaysia. <b>National</b> . Since 2015

