SYSTEMS BIOLOGY INSIDER

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INBIOSIS RESEARCH & INNOVATION

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Inspiring Future Biotechnology with Biological Big Data
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Mengilham Harapan, Mencipta Masa Depan • *Inspiring Futures, Nurturing Possibilities*

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EDITORIAL

Letter from the Editor

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Dr. Low Chen Fei

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Greetings,

Congratulations to the editorial colleagues for the successful publication of the first volume of INBIOSIS research bulletin, SYSTEMS BIOLOGY INSIDER. A heartfelt thank you for all the efforts that editorial colleagues have made for the success of this publication. The editorial would also like to extend the sincere gratitude and appreciation for the hard work and dedication provided by all INBIOSIS members.

Systems Biology Insider dedicates to introduce the research that is being conducted at the Institute of Systems Biology (INBIOSIS), Universiti Kebangsaan Malaysia. It reports scientific research and publications; awards and achievements of research fellows, as well as postgraduate researchers; research themes and teams of INBIOSIS; last but not least, the curricular and co-curricular activities at INBIOSIS.

Systems Biology Insider will introduce different platforms of INBIOSIS research and findings to the scientific communities, societies and stakeholders beyond the university.

Once again, I congratulate the editorial committee of this bulletin, and wish that Systems Biology Insider continues to succeed.

Many thanks

Dr. Low Chen Fei
Chief Editor
Senior Lecturer / Research fellow
Institute of Systems Biology
Universiti Kebangsaan Malaysia

Contents

INSTITUTE OF
SYSTEMS BIOLOGY

Systems biology spearheads the advancement of high-throughput molecular biology research in producing piles of omics data. This has brought biological research to the next level of data-intensive science and contributes to the big data scenario. This marriage of biology and computer science integrated with other disciplines such as statistics, mathematics, physics and chemistry helps us to better understand the complexity of biological phenomenon. In conjunction with this, systems biology comprises big data biology, network biology, and new branches of modern biology. These advancements facilitate systems-level understanding of cell and its components towards holistic understanding on the organisms at various levels of functions and mechanisms. Consequently, it is vital for the validation purposes that computational approaches be combined with laboratory experiments. However, this is currently challenging as analysing big molecular data and complex enormous biological networks still require human interpretation.

INBIOSIS aims to undertake these tasks with multidisciplinary academics and technical experts working on omics platforms along with strategic partnerships with the industry locally and internationally. Our multidisciplinary and collaborative ethos aim to provide excellent environment making findings from basic science useful for practical applications.

INBIOSIS pledges to provide the ultimate environment to encourage scientific collaboration that stretches across disciplines, agencies and geographical borders. We encourage intellectual freedoms that we believe will inspire a collective drive to achieve excellence. Furthermore we aim to contribute to the society via knowledge and technology transfer and educating the next generation of scientists.

INBIOSIS strives to undertake cutting edge systems biology approach to unravel biological processes and networks that lead to exciting molecular discovery. The key planks of our work include research into biodiversity discovery, food security, human well being and sustainable products which are in line with UKM chosen SDGs namely SDG 2 (Zero Hunger), SDG 3 (Good Health and Well Being), SDG 14 (Life Below Water) and SDG 15 (Life on Land). Our fundamental scientific discoveries and technologies will enable new lines of research that advance our understanding of molecular mechanisms and hopefully to enable innovations in other sectors.

Assoc. Prof. Dr. Zeti Azura Mohamed Hussein
Director

DISCOVERER

Multi-omics techniques have driven biology into data-intensive science and contributes to big data scenario. Omics techniques provide a more holistic molecular perspective of biological systems compared to traditional approaches. However, due to their heterogeneity and complexity, integrating multi-omics data remains an ongoing challenge. As a result, current omics analytical tools and experimental designs neither allow complete comparisons nor intelligent integration across multi-omics disciplines.

My research focuses on the development of discovery tools for the holistic understanding of biological systems. Such tools promote the generation of new interesting hypothesis and the revelation of new insights. In addition, my group aims to develop a knowledge-based systematic method that integrates reliable human interpretation on the complex data that is vital for real world applications such as in agriculture and medicine.
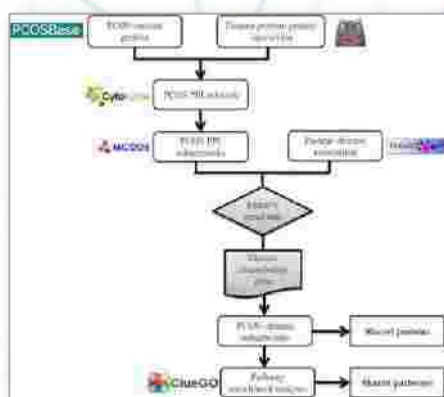
Framework of the computational method used to elucidate the association of PCOS with other diseases

The effectiveness of our method was demonstrated in exploring the pathobiology of Polycystic Ovarian Syndrome, a hormonal disorder that affects women's fertility in their reproductive years. Until now, its cause remains unknown due to its heterogenic symptoms. We observed PCOS associations with other diseases based on the interactions of shared genes and proteins which form the basis for diseases comorbidity. We also investigated the relationships between two distinct types of interaction networks: the metabolic pathway map and the protein-protein interaction network.

Using specialised algorithm to analyse protein-protein interaction obtained from our own database PCOSBase, we identified highly connected regions in the PCOS network that explain the association between PCOS and many other diseases. Prior to this, most of these diseases which include migraine, schizophrenia, depressive disorder, prostate cancer along with thirteen other diseases were never clinically reported to be linked to PCOS. This breakthrough can be used to suggest and improve diagnosis, prevention and treatment of PCOS. The potential of our method is far reaching in ways that it is not only applicable in identifying links amongst a wide range of diseases but also for other omics-based research that requires data integration and network biology.

ASSOC. PROF. DR. ZETI AZURA MOHAMED HUSSEIN

Director,
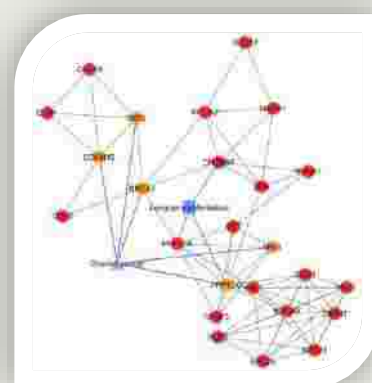
Institute of Systems Biology (INBIOSIS)

Universiti Kebangsaan Malaysia, Malaysia

AP Dr. Zeti obtained her PhD in Bioinformatics in 2004 from The University of Edinburgh, Scotland, U.K. She was an elected exco for Asia Pacific Bioinformatics Network (APBioNet) from 2007-2010 and representing Malaysia in several bioinformatics consortiums. She is currently an advisory board member of the Malaysia Bioinformatics Network (MyBioinfoNet). She joined INBIOSIS as a fellow since 2005 and was appointed as the Head of Centre for Bioinformatics Research beginning May 2008 to May 2016. She was appointed as the first Deputy Director of INBIOSIS in June 2016 and in July 2019 she became the 3rd Director of INBIOSIS.

PCOS-disease subnetwork. This subnetwork showed shared proteins and shared pathway (long-term potentiation) between PCOS and ovarian cancer. Different coloring of nodes and lines represents PCOS-related proteins (red), shared proteins (orange), PCOS-disease interaction (blue), and protein-pathway interactions (green). Shape of nodes denotes PCOS-related proteins (circle), disease (triangle), and pathway (square).

ASSOC. PROF. DR. SYARUL NATAQAIN BAHARUM

Deputy Director,

Institute of Systems Biology (INBIOSIS)

Universiti Kebangsaan Malaysia, Malaysia

AP Dr. Syarul Nataqain was awarded a PhD by the Universiti Putra Malaysia in 2006. She was hired as a senior lecturer at Universiti Selangor (UNISEL) from 2006 to 2007. She then joined INBIOSIS, UKM in 2008 and was appointed as the Head of Quality Assurance from 2008 to 2015. In 2016, she took on the position of Head of Centre for Genome and Analysis Technology and Centre for Plant Biotechnology, INBIOSIS. During her three-year tenure in this role, the centre has gained recognition, ties strong partnerships with international universities and industries and involves into well-known analytical service provider. In 2017, she was promoted to Associate Professor and most recently she has been appointed as the Deputy Director of INBIOSIS.

DISCOVERER

Upon joining INBIOSIS in 2008, Associate Professor Dr. Syarul Nataqain Baharum has developed and received her intensive training in the field of metabolomics at the University of Sheffield, United Kingdom. As a pioneer in Metabolomics field in Malaysia, Associate Professor Dr. Syarul Nataqain Baharum research is focused on the new insight of analytical and biological perspectives of the metabolomics in the field of systems biology, in particularly on the understanding of secondary metabolite production in local herbal plants as well as fluxomics studies of *Lactococcus lactis*. Previously she has developed and received her intensive training in the field of metabolomics at the University of Sheffield, United Kingdom under supervision of Prof. Dr. Michael Burrell and Prof. Dr. William Paul Quick. In metabolomics research, pipeline of analytical tools and multivariate analysis using principal component analysis (PCA) is essential for the dynamic high throughput analysis of plant and microbial metabolite profiling. This frontier analysis which includes mathematical modelling has provided glimpse of cellular biology and fingerprint of functional network in her lab model organisms.

Associate Professor Dr. Syarul Nataqain Baharum's contribution in the field of metabolomics has been recognized with over 70 peer-reviewed indexed articles in international journals and more than 40 local and international conference proceedings in aquaculture, microbiology and metabolomics. Her h-index is 11 with more than 570 citations. She also played a leading role as Malaysia representative in Asia-Oceania Metabolomics Forum (AOMF). Her works have been awarded prestigious awards including Bio-Innovation Awards, 2011 and Selangor My Innovation Award, 2014. She also was awarded as Visiting Lecturer at Chulalongkorn University, Thailand in 2017. She also engaged in collaborative partnership with industry such as FGV Sdn. Bhd., AAR Sdn. Bhd., Leave a Nest Malaysia Sdn. Bhd. and Orchid Life Sdn. Bhd. to take further steps toward product commercialization.

Dr Sarahani with Assoc. Prof. Altaf-Ul-Amin

NAIST lab.

With the famous landmark in Nara

SHARING SESSION
RESEARCH ATTACHMENT AT NAIST, JAPAN

Dr Sarahani Harun
Jan 15 - Feb 4, 2019

My 3-weeks research attachment was supported by JASSO (Japan Student Services Organization). The main objective of JASSO is to promote international mutual understanding that will contribute to the next generation by creating a relevant environment for those who are studying in higher education institutions. During this attachment, I worked closely with Assoc. Prof. Altaf-Ul-Amin who is one of the researchers in the Computational Systems Biology Laboratory at NAIST. The laboratory had developed a clustering algorithm (DPClus) that can extract highly connected clusters from the biological network.

My project entitled "Exploring potential glucosinolate genes using DPClus" aims to find possible genes that may contribute to the production of glucosinolate from coexpression network. This network was analysed using DPClus. At the end of the attachment, I was able to produce a research paper entitled "Identifying potential glucosinolate genes based on clustering approach and expression data in Arabidopsis thaliana" to be submitted to Plant Cell Reports Journal. This visit also allowed me to join the weekly meetings with the lab members. During the second week of my research attachment, I presented my studies. Furthermore, this trip also exposed me to the Japanese cuisine and several attractions in Osaka, such as the Universal Studios Japan and Dotonbori. This unforgettable experience is certainly beneficial for my career advancement

Nor Afiqah Aleng (PhD)
Feb 26 – Mar 12, 2019

With the research collaboration between INBIOSIS and NAIST, I got the opportunity to have a research attachment in Computational Systems Biology Lab, NAIST for two weeks from 26 February until 12 March 2019. During the attachment, I was fully-sponsored by Japan Student Services Organization (JASSO), which is an organization under the Ministry of Education, Culture, Sport, Science and Technology (Monbukagakusho). This research attachment was hosted by Prof. Dr. Shigehiko Kanaya and Assoc. Prof. Dr. Altaf-Ul-Amin.

We worked on the project entitled "Polycystic ovarian syndrome (PCOS) novel proteins and significant pathways identified using graph clustering approach". In this project, we predicted novel associations between proteins and pathways in PCOS using a graph clustering approach in PCOS using graph clustering approach by integrating information such as PCOS-protein association and protein-protein interaction (PPI) data. This information was obtained during my PhD project, under the supervision of Assoc. Prof. Dr. Zeti Azura Mohamed Hussein. We adopted a graph-based clustering algorithm that was developed by Assoc. Prof. Dr. Md. Altaf-Ul-Amin and his team, known as DPClusO to generate PCOS PPI clusters.

We evaluated the statistical significance of the identified clusters using several statistical analyses. Using this approach, we successfully predicted 138 novel PCOS-related proteins with 61.5% reliability that were matched in the context of previously published literature related to PCOS. We also managed to identify significant pathways including androgen and leptin signalling pathways, which these pathways play roles in hyperandrogenism and insulin resistance; which are among the PCOS criteria. This research attachment is invaluable for me as I can learn and improve my skills to write a program in R. I also learned several statistical analyses from Assoc. Prof. Dr. Md. Altaf-Ul-Amin's team. Furthermore, this attachment exposed me to Japanese work and research culture. It is one of my unforgettable experiences during my PhD journey. This research attachment developed my skills and knowledge in network biology.

With Prof. Dr. Shigehiko Kanaya and Assoc. Prof. Dr. Md. Altaf-Ul-Amin

Lab meeting in NIG, Japan

Sweet memories in NIG, Japan

RESEARCH ATTACHMENT AT NIG, JAPAN

Ili Nadhirah (PhD)
Aug 30 - Sep 20, 2019

I have never thought of having an international research collaboration with a world-renowned institution such as National Institute of Genetics (NIG), Japan. Normally one would expect these types of opportunities only come after obtaining their Ph.D. degrees or working for sometimes in research. Yet the NIG-Joint grant (2A2019) awarded to my supervisor allowed me to have a research attachment there for three weeks. NIG is established in 1949, which hosts the DNA Data Bank of Japan (DDBJ), akin to the National Centre for Biotechnology Information (NCBI) in the USA and European Bioinformatics Institute (EBI).

The main aim of this attachment is to learn the use of automated software for the curation and identification of metabolites from mangosteen fruit at different ripening stages (Stages 0, 2 and 6) based on liquid chromatography-mass spectrometry (LC-MS) analysis. I was fortunate to be under the guidance of Prof. Dr. Masanori Arita and his group members. In brief, MS-Dial software (automated curation) was used to annotate the LC-MS data and compared with manually curated metabolites from ProfileAnalysis with Metlin and Metfrag database search. Several metabolites (22 compounds) were similarly identified from both approaches but there are also other compounds identified uniquely between the two methods. Although

manual curation identified more compounds with more flexibility in compound selection, it was more time-consuming than the automated curation. Hence, this attachment allowed me to utilise the automated software beneficial for metabolomics study at INBIOSIS.

Group photo with Prof Arita's lab members on the rooftop of DDBJ building with Mount Fuji as a backdrop.

During my three-week visit, I had the chance to participate in Prof. Arita's monthly group meeting twice, which not only enriched my research experience but also encouraged further discussion with other NIG researchers, such as Dr. Nozomu Sakurai and Ipputa Tada to strengthen an on-going collaborative project as well as learning about other projects by students under Prof. Arita too. Additionally, I also get the opportunity to interact with other NIG resident outside of Prof. Arita's group. During the first week of my visit, I was invited to attend a "Plant Informatics Study Groups" hosted at NIG despite most of the presentations was conducted in Japanese. I was introduced by Prof. Arita to several researchers who work on plant metabolomics, thus expanding my research network. On

my second week, I attended the "Annual Progress Presentation" whereby all the students at NIG presented their progress to all NIG fellows. It was amazing to learn about diverse fields of research and students' dedication in presenting their works in English, which is a foreign language for the local people in Japan. It was at this event that I realised the importance of effective communication at an international stage.

NIG was generous in encouraging me to bring my small family for this attachment visit. They have made easy for me and my family during our stay here and my kids were happy during their stay too. The nature surrounding NIG and the small town Mishima was breath-taking. NIG supports and encourages a friendly working environment by providing a playroom for family with kids within the main NIG building. This is a lifetime experience and I am very grateful to have the opportunity to have such exposure at such an early stage of my career.

Spotlight

MS ISO/IEC 17025:2017 Accreditation
The Standard Test Method of GC-MS: Qualitative analysis of amino and organic acids

Our Gas Chromatography Mass Spectrometry (GC-MS) laboratory is accredited in accordance to MS ISO/IEC 17025:2017 since May 2016. We are the pioneer for qualitative analysis of amino and organic acids in Malaysia.

We are committed in providing and ensuring the highest quality and standard of analysis for the research and development (R&D) activities.

List of Publication

1. Wan Mohd Aizat, Mazlan, O., Azizan, K.A., Baharum, S.N. & Normah, M.N. 2019. Metabolomics of mangosteen seed development and germination revealed concerted metabolic changes towards primary metabolism and seed defense. *8th Kuala Lumpur International Agriculture, Forestry and Plantation Conference* (KLIAFP8). 15 – 16 July 2019. Bangi Resort Hotel, Bangi, Malaysia.

2. Mamat, S.F., Baharum, S.N., Azizan, K.A., Normah, M.N. & Wan Mohd Aizat. 2019. Analysis of the metabolite changes during *Garcinia mangostana* Linn. (Mangosteen) ripening using metabolomics approach. *3rd International Conference on Molecular Biology and Biotechnology 2019 (ICMBB2019)*. 24-25th April 2019, UCSI Kuala Lumpur.

3. Basar, N., Elias, H.S., Othman, A., Baharum, S.N. & Azizan, K.A. 2019. Isolation, structure elucidation of lupeol, sterol group and chemical profiling of *Fortunella polyandra* leaves using UPLC Q-TOF/MS. *The 32nd International Conference of Analytical Sciences 2019*. 14-16 August 2019, Thistle Port Dickson Resort.

4. Mazlan, O., Wan Mohd Aizat, Aziz Zuddin, N.S., Baharum, S.N. & Normah, M.N. 2019. Metabolite profiling of mangosteen seed germination highlights metabolic changes related to carbon utilization and seed protection. *Scientia Horticulturae* 243 (2019) 226– 234.

5. Mamat, S.F., Azizan, K.A., Baharum, S.N., Normah, M.N. & Wan Mohd Aizat. 2018. Metabolomics analysis of mangosteen (*Garcinia mangostana* Linn.) fruit pericarp using different extraction methods and GC-MS. *Plant Omics Journal* 11(02):89-97

6. Mazlan, O., Wan Mohd Aizat, Baharum, S.N., Azizan, K.A. & Normah, M.N. 2018. Metabolomics analysis of developing *Garcinia mangostana* seed reveals modulated levels of sugars, organic acids and phenylpropanoid compounds. Scientia Horticulturae 233 (2018) 323–330.

7. Kamalrul Azlan Azizan, Syahmi Afiq Mustaza. 2018. GC-MS based Metabolomics Workshop Workbook. ISBN 978-983-44317-9-2.

8. Wan Mohd Aizat, Mamat, S.F., Azizan, K.A., Baharum, S.N. & Normah, M.N. 2018. Metabolite profiling of mangosteen *Garcinia mangostana* Linn. pericarp, aril and seed tissues using GC-MS based metabolomics approach. *3rd AMDI International Biohealth Sciences Conference (IBSC)* 2018, 18 - 20 January 2018, Riverside Majestic Hotel, Kuching, Sarawak. pg. 8.
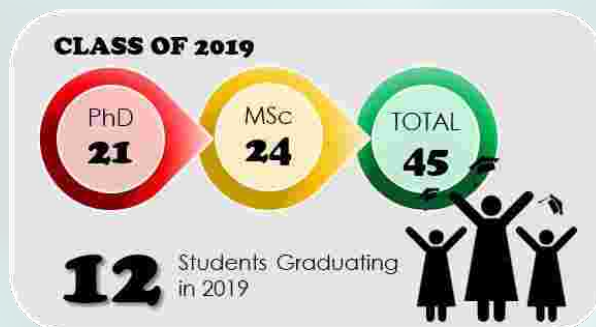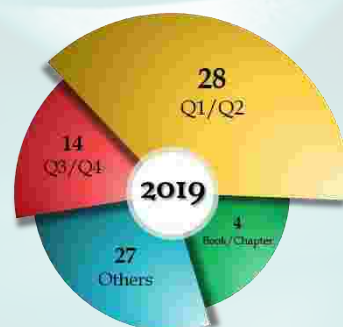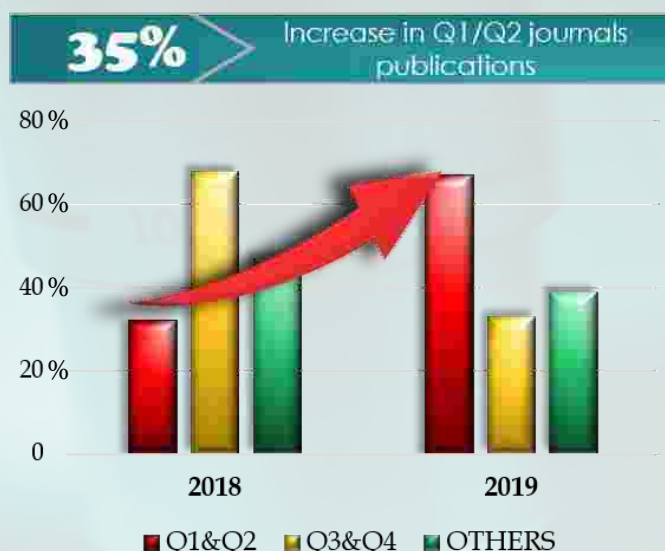
Tahniah

PENGIKTIRAFAN SIJIL AKREDITASI
MS ISO/IEC 17025:2017
ANALISIS KUALITATIF ASID AMINO DAN ASID ORGANIK

MAKMAL KIMIA ANALISIS
INSTITUT BIOLOGI SISTEM (INBIOSIS)

Syabas kumpulan ISO INBIOSIS!

Q1 Publications of INBIOSIS/Jan-Sept 2019

1   Mazlan, O., Wan Mohd Aizat, Aziz Zuddin, N.S., Baharum, S.N. & Normah, M.N.,2019, Metabolite profiling of mangosteen seed germination highlights metabolic changes related to carbon utilization and seed protection, Scientia Horticulturae 243 (2019) 226–234

2   Chong, C. & Low, C.F.,2019, Synthetic antibody: Prospects in aquaculture biosecurity, Fish and Shellfish Immunology 86 (2019) 361–367

3   Mac Aogáin, M., Tiew, P.Y., Lim, A.Y.H., Low, T.B., Tan, G.L., Hassan, T., Ong, T.H., Pang, S.L., Lee, Z.Y., Gwee, X.W. and Martinus, C., 2019. Distinct "immunoallertypes" of disease and high frequencies of sensitization in non–cystic fibrosis bronchiectasis. American journal of respiratory and critical care medicine, 199(7), pp.842-853.

4   Tan, C.S., Md Isa, N., Ismail, I. & Zainal, Z.,2019, Agarwood Induction: Current Developments and Future Perspectives, Frontiers in Plant Science 10: 122

5   Pang, S.L., Ho, K.L., Waterman, J., Rambo, R.P., The, A.H., Mathavan, I., Harris, G., Beis, K,, Say, Y.H., Anusha, M.S., Sio, Y.Y., Chew, F.T. & Ng C.L.,2019, Crystal structure and epitope analysis of house dust mite allergen Der f 21,Scientific Reports (2019) 9:4933. https://doi.org/10.1038/s41598-019-40879-x

6   Mat-Sharani, S. & Raih, M.F.,2019, Computational discovery and annotation of conserved small open reading frames in fungal genomes ,BMC Bioinformatics 2019, 19(Suppl 13):551

7   Harun, S., Abdullah-Zawawi, M-R., A-Rahman, M.R.A., Nor Muhammad, N.A. & Mohamed-Hussein, Z-A.,2019, SuCComBase: a manually curated repository of plant sulfur-containing compounds, Database, 1–9. doi:10.1093/database/baz021

8   Pichitpunpong, C., Thongkorn, S., Kanlayaprasit, S., Yuwattana, W., Plaingam, W., Sangsuthum, S., Aizat, W.M., Baharum, S.N., Tencomnao, T., Hu, V.W. & Sarachana, T.,2019, Phenotypic subgrouping and multi-omics analyses reveal reduced diazepam-binding inhibitor (DBI) protein levels in autism spectrum disorder with severe language impairment, PLoS ONE 14(3):e0214198.

9   Tomlinson, K.R., Pablo-Rodriguez, J.L., Bunawan, H., Nanyiti, S., Green, P., Miller, J., Alicai, T., Seal, S.E., Bailey, A.M. & Foster, G.D.,2019, Cassava brown streak virus Ham1 protein hydrolyses mutagenic nucleotides and is a necrosis determinant, Molecular Plant Pathology DOI: 10.1111/mpp.12813

10 Wan Mohd Aizat, Ahmad-Hashim, F.H. & Syed Jaafar, S.N. ,2019, Valorization of mangosteen, ''The Queen of Fruits," and new advances in postharvest and in food and engineering applications: A review,Journal of Advanced Research 20, 61–70

11 Rahnamaie-Tajadod, R., Goh, H-H. & Normah, M.N.,2019, Methyl jasmonate-induced compositional changes of volatile organic compounds in Polygonum minus leaves, Journal of Plant Physiology 240, 152994

12 M.S.M. Yusop, R. Ersoy, M.A. Akbar, M.F.M Saad, H.H. Goh, S.N. Baharum, H. Bunawan,2019, First report of Bougainvillea chlorotic vein-banding virus causing chlorosis and vein banding of Bougainvillea spectabilis in Malaysia, Plant Disease https://doi.org/10.1094/PDIS-02-19-0292-PDN

13 A. Samad, A.F., Rahnamaie-Tajadod, R., Muhammad Sajad, Jani, J., Abdul Murad, A.M., Normah, M.N. & Ismail, I.,2019, Regulation of terpenoid biosynthesis by miRNA in Persicaria minor induced by Fusarium oxysporum, BMC Genomics, 20:586 https://doi.org/10.1186/s12864-019-5954-0

14 Ab Ghani, N.S., Ramlan, E.I. and Firdaus-Raih, M., 2019. Drug ReposER: a web server for predicting similar amino acid arrangements to known drug binding interfaces for potential drug repositioning. Nucleic acids research, 47(W1), pp.W350-W356.

15 Goh, H-H., Abu Bakar, S., Kamal Azlan, N.D., Zainal, Z. & Normah, M.N., 2019, Transcriptional reprogramming during Garcinia-type recalcitrant seed germination of Garcinia mangostana, Scientia Horticulturae 257, 108727

16 Yuswan, M.H., Aizat, W.M., Desa, M.N.M., Hashim, A.M., Rahim, N.A., Mustafa, S., Mohamed, R. and Lamasudin, D.U., 2019. Improved gel-enhanced liquid chromatography-mass spectrometry by chemometrics for halal proteomics. Chemometrics and Intelligent Laboratory Systems, 192, p.103825.

35% Increase in Q1/Q2 journals publications

2018   2019

■ Q1&Q2   ■ Q3&Q4   ■ OTHERS

2019
28 Q1/Q2
14 Q3/Q4
4 Book/Chapter
27 Others

CLASS OF 2019
PhD 21   MSc 24   TOTAL 45
12 Students Graduating in 2019

RESEARCH GRANTS
2019: RM 3,924,126.00
2018: RM 2,639,158.00
+RM 1.28M

Research Collaborators

●Universiti Putra Malaysia ●FGV ●Universiti Malaysia Terengganu ●SimeDarby
●National University of Singapore ●MARDI ●Chulalongkorn University ●University of Malaya ●MPOB
●Brandenburg University of Technology Cottbus-Senftenberg ●Boustead Plantations Berhad ●Malaysia Genome Institute
●Revongen Corporation ●Universiti Selangor ●Jabatan Perikanan Malaysia ●Saitama University ●Nara Institute of Science and Technology
●Universiti Teknologi Malaysia ●University of Tsukuba ●AA Resources ●Universitas Halu Oleo ●Tokyo University of Science
●Universiti Malaysia Sabah ●Malaysian Cocoa Board ●Japan National Institute of Genetics ●OrchidLife
●National Institute of Advanced Industrial Science and Technology ●RIKEN PSC

HALL OF FAME

Congratulations on the appointments!

INBIOSIS is honored to share the good news and wishes to congratulate the newly appointed fellow academicians in INBIOSIS directorate board. INBIOSIS is also honored by the appointment of Assoc. Prof. Dr. Goh Hoe Han as the Lab Manager. Congratulations on your new role and wish you every success in your new duties.

Congratulations on the publication achievements in the top 10% journals. Statistics of INBIOSIS publication shows a **35% increment in Q1/2 journals publication in 2019** (January-September) compared to previous year of 2018.

15th ANNIVERSARY

INBIOSIS will be celebrating its 15 year old birthday on 24th March 2020.

In conjunction to INBIOSIS 15th anniversary, series of activities and events will be held in 2020, stay tuned!
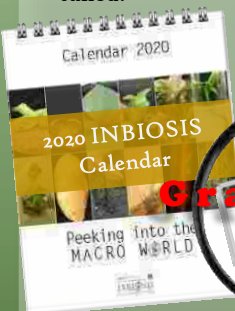
New year is around the corner, plan your new year activities with INBIOSIS 15th anniversary premium calendar, featuring eye-catching and fascinating science photos of research at INBIOSIS!

Calendar 2020

2020 INBIOSIS Calendar

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Congratulations to the grant recipients; International collaboration fund and NVIDIA data science GPU grant award.

We would also like to extend our congratulations to INBIOSIS fellows who were awarded with respective research fund in 2019:

- Fundamental Research Grant Scheme (FRGS):
    1. Assoc. Prof. Dr. Zeti Azura Mohamed Hussein
    2. Assoc. Prof. Dr. Goh Hoe Han
    3. Dr. Ng Chyan Leong
    4. Dr. Low Chen Fei
    5. Dr. Ahmad Bazli Ramzi
    6. Dr. Maizom Hassan
    7. Dr. Hamidun Bunawan

- Geran Universiti Penyelidikan (GUP):
    1. Dr. Ahmad Bazli Ramzi

- Yayasan Penyelidikan Antartika Sultan Mizan:
    1. Dr. Ahmad Bazli Ramzi

All in all, fellow academicians of INBIOSIS have been awarded with research funding from various research grant providers that sum up a **cumulative amount of over one million MYR in 2019**.

2019 CALENDAR

DATE	ACTIVITIES
15 Jan 2019	ROSH audit
22 Jan 2019	Building Construction Benchmarking Visit to Eseri UniSZA
19-21 Feb 2019	Bioinformatics Series Workshop 2019
20 Feb 2019	INBIOSIS Seminar Series 45 : Dr Robert Thangjam
28 Feb 2019	UKM Vice Chancellor visit to INBIOSIS
7 Mar 2019	Professor Emeritus Appreciation Ceremony: Professor Emeritus Dr. Normah Mohd Noor
12 Mar 2019	Villa International High School Maldives visit to INBIOSIS
25 Apr 2019	INBIOSIS Folk's Sports & Ihya Ramadhan
3 May 2019	Yaasin Recitation Event for Ramadhan 1440H
17-20 Jun 2019	Scientific Writing Workshop 1/2019
3 Jul 2019	INBIOSIS Aidilfitri Celebration
8-12 Jul 2019	Scientific Writing Workshop 2/2019
23-24 Jul 2019	Research Progress Report Seminar
7 Aug 2019	Visit from Centre of Research Laboratory(CRL) UM to INBIOSIS
14 Aug 2019	Audit Prestasi Akademik (APA) Visit to INBIOSIS
3-7 Sep 2019	Scientific Writing Workshop 3/2019
20 Sep 2019	Visit from BauBau Polytechnique to INBIOSIS
1 Oct 2019	Kempen Kesedaran Keselamatan Kimia (4K) UKM Visit to INBIOSIS
9 Oct 2019	Briefing: Strategy to improve MyRA Score
15 Oct 2019	INBIOSIS Laboratory Safety Workshop 2019
22-24 Oct 2019	Research Workshop 2019
29-31 Oct 2019	Scientific Writing Workshop 4/2019
1 Nov 2019	Robing ceremony of INBIOSIS graduates
3-5 Dec 2019	INBIOSIS Workshop 2019: Bioinformatics II – Structural Bioinformatics

2020 highlights

Asian Regional Conference on Systems Biology 2020
2-4 Mar 2020

15 Years Celebration of INBIOSIS
to be announced

ARCSB 2020

ASIAN REGIONAL CONFERENCE ON SYSTEMS BIOLOGY

Inspiring Future Biotechnology with Biological Big Data

2 - 4 March 2020 | Ombak Villa, Langkawi, Malaysia

INBIOSIS
INSTITUTE OF SYSTEMS BIOLOGY

ARCSB 2020 @Langkawi

Ombak Villa

KEYNOTE
Prof. Harvey Millar
University Western Australia

PLENARY
(Biotechnology Application in Biodiversity)
Prof. Tohge Takayuki
NAIST, Japan

PLENARY
(Food Security)
Dr. Melina Ong Abdullah
MPOB, Malaysia

PLENARY
(Sustainable Bio-Product)
Prof. Rosli Md Illias
Universiti Teknologi Malaysia

PLENARY
(Enriching Wellbeing and Healthcare)
Dr. Viroj Boonyaratanakornkit
Chulalongkorn University, Thailand

Co-organize with

Fees	Local	Local
	Early Birds (Before 31st Oct 2019)	Normal (After 31st Oct 2019)
Student	RM 500	RM 600
Academic	RM 800	RM 1000
Non-Academic	RM 1000	RM 1200

Fees	International	International
	Early Birds (Before 31st Oct 2019)	Normal (After 31st Oct 2019)
Student	USD 250	USD 300
Academic	USD 400	USD 500
Non-Academic	USD 600	USD 700

Group Registration Fees (3 pax and above)	
Student	RM 400 per person
Academic	RM 700 per person
Non-Academic	RM 900 per person

Contact Us

SECRETARIAT (ARCSB 2020)
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