

THE THIRD BIOPROCESSING & BIOMANUFACTURING SYMPOSIUM (BBS) 2019

“Think Ideas, Talk Innovation, Transform
Industries”

9-10th April 2019

Swiss Garden Beach Resort,
Lumut, Perak
Malaysia



Preface

The Third Bioprocessing and Biomanufacturing Symposium (BBS) 2019 was held at Swiss Garden Beach Resort, Lumut Perak on 9-10th April 2019 organized by Bioprocess Technology Division, School of Industrial Technology, Universiti Sains Malaysia and Bioprocessing and Biomanufacturing Research Center, Universiti Putra Malaysia (UPM) and Department of Bioprocess Technology, Faculty of Biotechnology and Biomolecular Sciences, UPM. This is a biennial conference series that bringing together most of the bioprocess researchers, academics and professionals from all in the country.

Bioprocessing technology is growing in significance and highly relevant in the context of exploring new knowledge and integration of various interdiscipline to generate new innovation in various field such as bio-therapeutic, environmental management and sustainable bioprocess development.

This symposium provides a unique platform for leading experts and researchers from academic and industry sector to promote the exchange of information, ideas and intellectual to catapult trans-disciplinary research, collaborations and networking among experts in various areas of bioprocessing and biomanufacturing technology, particularly with the advancement of the various fermentation instruments and development of new method or approach which enable us to produce a wide range of value added products.

The symposium comprised of 25 highly informative technical papers that comprehensively cover latest finding of the sub-themes such as fermentation technology, biomanufacturing of biological cells and metabolite, enzyme and microbial bioprocessing, downstream processing technology and product biochemistry. On this occasion, a total of 4 distinguished plenary speaker from academia and industry had delivered their outstanding research and sharing the current scenario in bioprocessing and biomanufacturing industry.

Lastly, we sincerely hope that this BBS2019 is a significant step forward in the effort to improve and overcome the current challenges in the bioprocessing and biomanufacturing. Finally the board of editors would like to thank all the reviewers contribution to improve the quality of the papers by providing constructive comment and suggestions. On the other hand, we would like to thank the authors who has devoted a substantial amount of work to make this high quality BBS2019 proceeding success.

Dr. Mohd Asyraf Kassim

Chairman

The Third Bioprocessing and Biomanufacturing Symposium (BBS) 2019

Committee Member

Advisor: Prof Dr. Arbakariya Arif
Assoc. Prof. Dr. Rosma Ahmad
Prof. Dr. Norli Ismail

Chairman: Dr Mohd Asyraf Kassim

Vice-Chairman: Dr. Mohd Shamzi Mohamed

Secretary: Dr. Mohamad Hafizi Abu Bakar

Assistant Secretary: Pn. Juliana Jaafar

Finance/ Sponsorship: Dr. Tan Joo Shun
Mr. Sobri Mohd Akhir

Treasurer: Dr Lee Chee Keong

Assistant Treasurer: Mdm Liyana Ithnin

Scientific: Dr. Mohamad Hafizi Abu Bakar
Dr. Murni Halim
Dr. Zetty Norhana Balia Yusoff
Dr. Siti Efliza Ashari
Dr. Nur Adeel Yasid
Assoc. Prof. Dr. Nor'Aini Abdul Rahman
Dr. Fazlie Wong Faizal Wong
Dr. Mohd Ezuan Khayat

Publicity/ICT: Dr Noor Aziah Serri
Ms Wan Zafira Ezza Wan Zakaria
Dr. Mohamad Zulfazli Mohd Sobri
Dr. Helmi Wasoh

Assistant Publicity/ICT: En. Muhammad Khairi Abd Aziz
Technical and Transportation: Dr. Muaz Mohd Zaini Makhtar
Dr. Husnul Azan Tajaruddin

Postgraduate Students
Social and Protocol: Prof. Liong Min Tze
Dr Siti Baidurah Yusoff
Prof. Dr. Rosfarizan Mohamad

Editorial Board

Editors	Dr Mohd Asyraf Kassim
	Dr. Mohd Shamzi Mohamed
Section Editors	Dr. Mohamad Hafizi Abu Bakar
	Dr. Murni Halim
	Dr. Noor Aziah Serri
Technical Editor	Ms Ramizah Kamaruddin

Peer review statement

All papers published in this volume of IOP Conference Series: Materials Science and Engineering have been peer reviewed through processes administered by the proceedings Editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a proceedings journal published by IOP Publishing.

Conference Photographs





