

Program Handbook and Abstracts

IMBC 2013



10TH INTERNATIONAL MARINE BIOTECHNOLOGY CONFERENCE

BRISBANE
• AUSTRALIA 2013 •

*Genome to phenome:
understanding to
sustainable use*

11-15 November 2013

Brisbane Convention & Exhibition Centre

INTERNATIONAL MARINE BIOTECHNOLOGY CONFERENCE

10TH TRIENNIAL CONFERENCE

IMBC 2013

*PROGRAM AND ABSTRACT
HANDBOOK*



11 - 15 November 2013

Brisbane Convention and Exhibition Centre
Queensland, Australia

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Please Note: **Daily Timetables** - Tuesday - Friday are printed on coloured paper for ease of finding.
Posters, sorted by Presenter Last Name, giving a quick way to find the poster number. are on pp 37-39.
 All posters are listed with full title and authors on pages 29-36.
 A quick reference to Presenters (alpha by last name) with details of the day, time, session, room and title of each presentation are printed on A3 sheets and displayed on the Notice Board near the Registration Office.

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PRESIDENT'S WELCOME MESSAGE

Dear Friends and Colleagues,

It is my great pleasure to welcome you to the 10th International Marine Biotechnology Conference at Brisbane.

Since the first IMBC in 1989 in Tokyo, we had successive conferences in various countries – the United States in 1991, Norway in 1994, Italy in 1997, Australia in 2000, Japan in 2003, Canada in 2005, Israel in 2007 and China in 2010. All these conferences were remarkable boosters to Marine Biotechnology research, and this IMBC2013 will also serve as another significant milestone in the history of this research area.



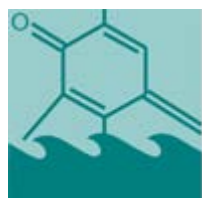
Year by year, the Marine Biotechnology research has been more focused on, and expected to contribute to solving the global issues such as climate changes and energy problems, and to realize the sustainable society as soon as possible. The ocean is a mother of all living creatures, and a treasure box of resources and potentiality. We can see many miracles in the Ocean, and we need to use it appropriately for the earth and humanity, saving the beautiful environment, and co-existing each other.

Of course, it requires huge efforts from broad range of perspectives and multidisciplinary approaches beyond countries and any kind of frameworks, so this international conference is a great opportunities to exchange cutting-edge information, new research findings and innovations. Moreover, many distinguished lectures that the top scientists provide us and many workshops and sessions organized by world-leading researchers will encourage young promising scientists. I wish you all the participants can have a fruitful time, and get something to accelerate your research further.

Finally, I would like to appreciate all the effort of Symposium Chairs and the staffs, the members of the International Program Committee and National Organizing Committee, and many supporting organizations that make this conference successful.

Thank you again for joining us.

Tadashi Matsunaga



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by MDPI

PROCEEDINGS OF THE 10TH INTERNATIONAL MARINE BIOTECHNOLOGY CONFERENCE

Proceedings of IMBC2013 will be published in a Special Issue of *Marine Drugs* (impact factor 3.85), ***Advances and New Perspectives in Marine Biotechnology***.

We cordially invite all presenters at IMBC2013 to submit a comprehensive/mini review, an original research article or a short communication to this Special Issue.

Please go to the special IMBC2013 web page for instructions on how to prepare and submit your manuscript (http://www.mdpi.com/journal/marinedrugs/special_issues/marine-biotechnology).

Marine Drugs will defray publication costs for a number of the submitted manuscripts.

DEADLINE FOR MANUSCRIPT SUBMISSIONS: 31 JANUARY 2014

Special Issue Editors

Prof. Bernie Degnan

School of Biological Sciences, The University of Queensland, Brisbane, Queensland 4072, Australia

Mr Pabulo Henrique Rampelotto

Interdisciplinary Center for Biotechnology Research, Federal University of Pampa, Antônio Trilha Avenue, P.O.Box 1847, 97300-000, São Gabriel – RS, Brazil

Dr Paul Long

Institute of Pharmaceutical Science & Department of Chemistry, King's College London, Franklin-Wilkins Building, 150 Stamford Street, London SE1 9NH, United Kingdom

WELCOME FROM CHAIRS OF ORGANISING COMMITTEE



Welcome to Brisbane and the 10th International Marine Biotechnology Conference. This is the latest in a series of highly successful meetings that date back to 1989, when the first IMBC was held in Tokyo, Japan. Since then IMBCs have been held in seven countries on three continents. This meeting marks its return to Australia; the 5th IMBC was in Townsville, Queensland.

The International Marine Biotechnology Conferences are widely recognised as the world's premier conferences in marine biotechnology. This year, as in the past, there is extensive and wide-sweeping participation and support from both the private and public sectors. The 10th IMBC has nearly 300 delegates from over 20 countries participating.

As the "Century of Biology" begins to bear fruit, through the translation of predictive biological understanding into applications that enhance the human condition and maintain biodiversity, the almost infinite potential of marine biological resources will be unlocked.

The theme of the 10th IMBC is *Genome to phenome: understanding to sustainable use*. This summarises the world's opportunity to profit from and protect our oceans. Already marine biotechnology has delivered products for medicine, food, biofuels, nanomaterials, and bioremediation.

The 10th IMBC will include a wide range of Plenary and Keynote Speakers. These will allow delegates to experience cutting-edge developments from around the world – our invited speakers come from all continents on Earth. As in the past, this year's IMBC features the most recent development in the field of marine biotechnology, including recent advances in algal biofuels and bioenergy, marine genomics and metagenomics, aquaculture reproductive technologies, microbial-based technologies and small molecule applications.

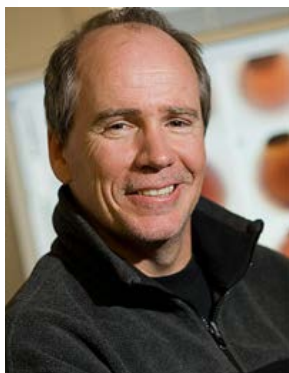
Of course 10th IMBC would struggle to happen at all without the generous support from a wide range of Australian and international agencies and institutes. Our sponsors are listed in the program. Please take time to find out more about them. We are fully appreciative of all they have done to make the 10th IMBC a highly successful meeting – thank you.

Finally, before, during and after the meeting take some time to explore Brisbane, Queensland and Australia. Brisbane remains one of Australia's most desirable cities. Surrounding it is an amazing range of natural settings, including world famous beaches, ancient rainforests, coral reefs and the outback.

On behalf of the National Organising Committee, we thank you for attending the 10th International Marine Biotechnology Conference. We hope that you find the meeting as exciting and stimulating as we hope it will be.

Best wishes

Bernie Degnan, Director of 10th International Marine Biotechnology Conference and co-Chair of the National Organising Committee



Professor Joe Baker
AO, OBE, FTSE, FRACI,
C.Chem.

Joe Baker, co-Chair of
the National Organising
Committee



INTERNATIONAL MARINE BIOTECHNOLOGY COMMITTEES

NATIONAL ORGANISING COMMITTEE

Co-Chairs **Bernie Degnan** (co-Chair) (The University of Queensland): marine genomics
 Joe Baker (co-Chair) (Consultant)

Members

Andy Barnes (The University of Queensland): aquaculture – immunology, vaccine development
Chris Battershill (The University of Waikato, New Zealand): marine chemistry and microbes
Kirsten Benkendorff (Southern Cross University): natural product chemistry and biology
Michael Borowitzka (Murdoch University): algal biotechnologies
Rocky de Nys (James Cook University): natural products, biofouling, biofuels
Abigail Elizur (University of the Sunshine Coast): biomineralization; Aquaculture – reproductive molecular biology
Peer Schenk (University of Queensland): microalgal biotechnology and bioenergy
Melony Sellars (CSIRO Marine & Atmospheric Research) aquaculture – transgenics
Torsten Thomas (The University of New South Wales): marine microbes and metagenomics
Robyn Williams (Australian Broadcasting Corporation) science journalist and communicator
Wei Zhang (Flinders University): bioprocessing and marine bioproducts



INTERNATIONAL PROGRAM COMMITTEE

Nobuhiro Fusetani (Japan): marine pharmacology (Chair)

Members

Peter Alestrom (Norway): genomics and model organisms
Takashi Aoki (Japan): disease, omics, aquaculture
Joe Baker (Australia): bioactives, policy, etc.
Chris Battershill (New Zealand): sponge, aquaculture
Roberto Berlinck (Brazil): bioactives, bioproducts
Xiguang Chen (China): biomaterials
Mike Hall (Australia): aquaculture
Russell Hill (United States): biodiversity conservation and drug discovery
San-Jin Kim (Korea): microbiology, extremophiles, biocatalysts
Song Qin (China): algal biotechnology
Haruko Takeyama (Japan): microbiology, metagenomics
John van der Meer (Canada): algal biotechnology, aquaculture
Shugo Watabe (Japan): genomics, molecular biology, biomineralization
Rene Wijffels (Netherlands): biofuels, microalgae, etc.
Yonathan Zohar (USA): aquaculture

IMBA BOARD MEMBERS

Prof. Tadashi Matsunaga, President, Japan
Prof. Werner Müller, Vice-President, Germany
Prof. Russell Hill, Secretary-Treasurer, USA
Prof. Jan Olafsen, Immed Past President, Norway
Prof. Bernie Degnan, Conference Director, Australia
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Prof. Vernon Coyne, South Africa
Prof. Nobuhiro Fusetani, Japan
Prof. Se-Kwon Kim, Korea
Dr. S. Raghu Kumar, India
Dr. Hanzhi Lin, China
Prof. Song Qin, China
Dr John van der Meer, Canada
Dr Joy Watts, United Kingdom
Prof. Yonathan Zohar, USA



VENUE AND CONFERENCE STRUCTURE

REGISTRATION

The Registration Office will be located on the Boulevard Level and will be staffed from 1500 - 1730 on Monday 11th and - 0815 - 1700 Tuesday - Thursday and 0815 -1330 Friday.

NAME BADGES

Delegates are requested to wear their name badge at all times during the conference. This badge is also your ticket to included functions.

PRESENTATION UPLOADS – ARBOUR LEVEL SPEAKERS PREPARATION ROOM

All presentations are to be loaded onto the Convention Centre laptop computers in Speakers Prep in advance - you cannot use your own laptop. Please ensure that you take your CD / USB to the Speakers Prep area to be loaded well before your session (preferably the day before). While you can check that the presentation works after uploading, there is no computer availability for major changes to be done. Please do not leave your upload until the last moment.

| | | |
|---------------------------|-----------------------|--------------------|
| NOTE Opening Hours | Monday 11th | 1500 - 1730 |
| | Tuesday 12th | 0800 - 1600 |
| | Wednesday 13th | 0800 - 1600 |
| | Thursday 14th | 0800 - 1600 |
| | Friday 15th | 0800 - 1100 |

CONFERENCE STRUCTURE

For session details, refer to the Timetable pages (printed in colour)

Each morning in the Boulevard Auditorium is a plenary session which includes the plenary speakers for that day. After morning tea, concurrent sessions will commence in the breakout rooms and continue throughout the day.

Most talks in the concurrent sessions in the breakout rooms are 20 minutes (15 minute presentations with 5 minutes for questions). Every effort will be made by the chairpersons to keep to the allotted times, allowing delegates to move between rooms and presentations. If you are a presenter, please assist the program by keeping your talk within the allotted timeframe.

The scientific program finishes at 1315 on Friday, with the last 15 minutes in the Boulevard Auditorium with conference closing statements.

POSTERS

Posters will be on display for the entire conference in the Boulevard Foyer, where lunch and morning/afternoon teas will be served. The Poster Cocktail Session will be held on Tuesday evening from 1730 - 2000. Poster presenters will be standing with their posters during this session to answer any questions. Student posters will be judged during this Poster Session. A selection of canapés and drinks will be served.

EXHIBITION BOOTH DISPLAYS

Exhibition booth displays from our sponsors and exhibitors will be in the Boulevard Foyer for the duration of the conference and can be accessed throughout the conference, Tuesday to Friday. All refreshments will be served in this area during the conference to enable maximum time for delegates to meet Exhibition Stand holders and study the Posters. Exhibitors have put in enormous cost and effort to exhibit to the marine biotechnology audience. Please make them feel welcome.

CONFERENCE DRESS CODE

Dress for the conference is business-casual comfortable clothing. Ties and jackets are not necessary. Dress for the Conference Dinner on Thursday 11 July is smart casual.

MESSAGES

Please check the notice board by the Conference Secretariat regularly for messages.
During conference hours: Secretariat Telephone is: 0400 358 302

PUBLIC TRANSPORT, TAXIS, ATM AND BANKING

Please check with the Convention Centre Reception on the Ground Level.

PLENARY SPEAKERS

The committee is pleased to present plenary speakers at **IMBC 2013 Genome to phenome: understanding to sustainable use**, a wonderful mix of the finest researchers in marine biotechnology.

PROFESSOR ASAO FUJIYAMA

Comparative Genomics Laboratory, National Institute of Genetics, Yata 1111, Mishima, Shizuoka 411-8540, JAPAN

Toward understanding marine lifestyles using new-generation sequencing and genomic technologies: Red alga *Pyropia yezoensis* and other case studies



I have been involved in genome research since the beginning of International Human Genome Project dated back to the year 1990. Thirteen years later, and after the so called completion of the human genome, I shifted my research interest to comparative genomics; to begin with, we sequenced particular chromosomes of chimpanzee and found that the difference among human and chimp is about 1.8%.

Genomics is not only a key technology for any field of life sciences but provides us the insight of organisms with which we are working. It is needless to say that aquatic life is quite complex and full of secrets, for example, we recently published coelacanth genome and found that two coelacanth species, Tanzanian and Indonesian, are quite similar in terms of genomic differences. We are currently analyzing genome of red agar which has complex symbiosis dependent life.

PROFESSOR WILLIAM (BILL) GERWICK

Distinguished Professor of Oceanography and Pharmaceutical Sciences, Scripps Institution of Oceanography and Skaggs School of Pharmacy and Pharmaceutical Sciences, University of California San Diego, La Jolla, CA 92093

Integrating genomics and biosynthesis to discover new classes of bioactive secondary metabolites from marine cyanobacteria



Dr Gerwick received a B.S. in Biochemistry from the University of California Davis in 1976, and a Ph.D. in Oceanography from the Scripps Institution of Oceanography, University of California San Diego, in 1981 where he worked with Bill Fenical. He held a postdoctoral position in the area of natural product biosynthesis with Steven Gould in the School of Pharmacy at the University of Connecticut, was Assistant Professor of Chemistry at the University of Puerto Rico, Rio Piedras (1983-84) and then advanced through the ranks to become Full Professor in 1992 at the College of Pharmacy, Oregon State University. In 2005 he returned to La Jolla to hold a joint professorship at Scripps Institution of Oceanography and the Skaggs School of Pharmacy and Pharmaceutical Sciences, University of California San Diego.

His work has focused on the characterization of the unique natural products of marine algae and cyanobacteria, their biological activities of use to biomedicine, and the pathways of their biosynthesis. This latter area has expanded into genomic characterization of cyanobacteria, the molecular evolution of natural product pathways, heterologous expression of cyanobacterial pathways in other prokaryotes, and studies of the mechanistic chemistry of natural products biosynthesis.

PROFESSOR BEN HANKAMER

University of Queensland, Institute for Molecular Bioscience

Towards High-Efficiency Microalgae Biofuel Systems



In 2002, Ben moved from Imperial College London to take up his position as a Principle Investigator at The University of Queensland's Institute for Molecular Bioscience. Ben has focused on the development of environmentally friendly high-efficiency microalgae biofuel production systems. In 2006, he established and directs the Solar Biofuels Consortium which now includes 8 international teams, ~100 researchers and ~10 industry partners. In 2009, Ben was awarded the prestigious Eisenhower Fellowship, awarded to individuals identified as international leaders in areas of energy technology and supply. In 2013, Ben was also awarded the Discovery of Outstanding Researcher Award from the Australian Research Council.

Over the past 10 years, Ben Hankamer has focused on the development of environmentally friendly high-efficiency biofuel production systems. This area represents a rapidly expanding biotechnology.

His specialisation is in the structural biology of the photosynthetic machinery, which drives the conversion of solar energy into chemical energy (fuels) and has published extensively on the water splitting Photosystem II complex, its light harvesting antenna system and V-type ATPase (Nature, Nature Structural Biology, TIBS, PNAS). Using this knowledge of the photosynthetic machinery, he embarked on the targeted engineering of the green alga *Chlamydomonas reinhardtii* for high-efficiency biofuel production. To facilitate the development of high efficiency biofuel systems, he founded the Solar Biofuels Consortium which he now directs. The consortium includes eight international teams and conducts economic analysis, bio-discovery, marine biology, structural biology, molecular biology, microbiology, genomics, metabolomics, culture optimisation and bioreactor scale up within a coordinated research program of parallel research streams.

PLENARY SPEAKERS

PROFESSOR UTE HENTSCHEL

Dept of Botany II, Julius-von-Sachs-Institute for Biological Sciences, University of Wuerzburg, 97082 Wuerzburg, Germany

Microbial diversity, function and biotechnological potential of marine sponges



Professor Ute Hentschel obtained her Ph.D. degree in marine biology at Scripps Institution of Oceanography, La Jolla, USA and performed her postdoctoral research in infection biology. Since 2008, she is full professor at the Julius-von-Sachs Institute for Biological Sciences at the University of Würzburg, Germany. Dr Hentschel has published over 109 publications and 3 patents. Her research interests include host-microbe interactions, with special focus on diversity, function and biotechnological potential of marine sponges and their microbial consortia. In 2008, she was awarded the Recognition Award of Marine Biotechnology (Springer).

Current projects include:

- Omics (metagenomics, single cell genomics, metatranscriptomics) of the sponge microbiome

- Unravelling patterns of global microbial biodiversity in sponges
- Investigations on sponge diseases
- Novel anti-infectives discovery from marine-sponge associated actinomycetes

PROFESSOR RON QUINN

Eskitis Institute for Cell and Molecular Therapies, Griffith University, Nathan Qld 4111

The Future for, and the challenges of, commercializing Marine Bioactives



Professor Quinn obtained his PhD from the University of New South Wales (Australia) in 1970. Following post-doctoral research at Arizona State University, University of Hawaii, and ANU, he joined the Roche Research Institute of Marine Pharmacology in Sydney (1974 – 1981). He joined Griffith University in 1982 and is the Foundation Director of the Eskitis Institute for Cell and Molecular Therapies at Griffith University. He is the author of over 170 publications and patents. His research concentrates on the use of molecules as tools to understand interactions in biological systems and to build concepts around molecular recognition.

His research has concentrated on:

1. Biodiscovery involving high throughput screening against molecular and cellular targets, isolation and structure elucidation of bioactive natural products
2. Design and synthesis of receptor ligands in the adenosine area, enzyme inhibitors of protein phosphatase 1 and 2A and Factor XIa
3. Understanding of natural product recognition for biosynthetic enzymes and correlation with therapeutic targets as a rational approach to drug discovery, and
4. Developing concepts of biological structure space embedded in natural product scaffolds.

The current direction of his research is to transform approaches to the discovery of new bioactive molecules from nature. He has developed a front-loading of physicochemical properties of constituents of extracts and is using an understanding of biological structure space to discover new biologically relevant molecules. Through funding from the Gates Grand Challenge Exploratory grant, he is developing a novel approach to study latent stages of malaria using natural product fragments.

PROFESSOR AMIR SAGI

Department of Life Sciences and the National Institute for Biotechnology, The Negev Ben Gurion University, P.O. Box 653, Beer Sheva 84105, Israel

Insulin-like androgenic hormones and monosex culture of prawns: The first implementation of RNA-interference in aquaculture



Research interests of Professor Sagi include: Genes and gene products in comparative and applied endocrinology: Regulation of sexual differentiation, reproduction, growth and calcium mobilization in marine and freshwater invertebrates; Crustacean models are employed in his laboratory for the study of genes and gene products related to processes of sexual differentiation and skeletal bio-mineralization. In particular, study of the endocrine regulation by steroids and insulin-like androgenic gland factors of sexual differentiation, gonad maturation, growth, molt and the related processes of calcium mobilization and bio-mineralization. Control of the above events have been enabling the development of biotechnological tools for crop improvement via crustacean monosex culturing, soft shell-based products as well as for human food additives and drugs.

Professor Sagi is Past President, International Society for Invertebrate Reproduction and Development (ISIRD) and holds the Lily and Sidney Oelbaum Chair in Applied Biochemistry. He is also a Member of the National Institute for Biotechnology in the Negev (NIBN), co- Founder of Amorphical Ltd and Enzootic Ltd, and Former dean of the Faculty of Natural Sciences.

PLENARY & KEYNOTE SPEAKERS

PROFESSOR ANCHALEE TASSANAKAJON



Shrimp Molecular Biology and Genomics Laboratory, Department of Biochemistry, Faculty of Science, Chulalongkorn University, Bangkok 10330 Thailand

How does the immune system of shrimps fight against pathogens

Prof. Anchalee Tassanakajon is a pioneer in shrimp genome research. Her work focuses on applying genome information to study the immune system of shrimp. She and her research team have successfully identified several immune-related genes in the commercially important black tiger shrimp, *Penaeus monodon*, by principally Expressed Sequence Tag (EST) analysis and also other related approaches including differential and suppression subtraction hybridization analysis. The functions of some of these genes have been further characterized to unveil the important immune mechanisms in shrimp.

PROFESSOR WERNER E.G. MÜLLER

INCOMING IMBA PRESIDENT - CONFERENCE DINNER ADDRESS



University Medical Center of the Johannes Gutenberg University Mainz

- . distinguished Professor at the University Medical Center of Mainz, Germany,
- . awardee of a prestigious ERC Advance Grant,
- . coordinator of the EU Integrated Project “BlueGenics”,
- . recipient of the prestigious Friendship Award of China,
- . senator of the “Akademie gemeinnütziger Wissenschaften zu Erfurt (Germany)”,
- . member of the “Croatian Academy of Science and Arts”,
- . more than 20 patents and 1100 publications with a scientific research impact h-index of 61

KEYNOTE SPEAKERS AND SESSIONS



Borowitzka, Michael (Murdoch University)

Marine Algal Oleomics: New Development of Biofuel Production Research and Technology

Monday, Auditorium

Physiology and metabolism of lipid production by marine and halotolerant microalgae



Chavez-Crooker, Pamela (Aquamarina SA)

Microbial Bioresources

Tuesday Boulevard 1

Bioleaching of conventional and non conventional materials: new approaches



Abigail Elizur (University of the Sunshine Coast)

Reproductive Technologies in Aquaculture

Wednesday, Boulevard 2

Reproductive technologies in aquaculture



Fang, Xiaodong (BGI Tech Solutions Co. Limited, Guangdong)

Genomics

Friday Auditorium

View from oyster genome: The opportunity and challenge for aquatic organism genome study

KEYNOTE SPEAKERS AND SESSIONS



Do-Hung Kang

Algal Fuels & Bioenergy

Wednesday, Auditorium

A mini review on algae biofuel in Korea



Kim, Se Kwon (Pukyong National University, Marine Bio-Process Research Center, Busan)

Marine Bioresources

Tuesday, Boulevard 1

Investigation and development of bioactive substances from marine organisms



Müller, Werner (University Medical Center of the Johannes Gutenberg University Minz)

Genomics

Thursday, Boulevard 1

Sustainable Oceans – our Treasure in the Past and in the Future: The power of marine genomics



Nichols, Peter (CSIRO Marine and Atmospheric Research)

Nutraceuticals & Functional Foods

Friday, Boulevard 2

A Journey from Marine Genes to New Sustainable Land Plant Sources of Long-chain Omega-3 Oils



Prinsep, Michele (University of Waikato, New Zealand)

Marine Natural Products

Thursday, Auditorium

Trends in Marine Natural Products Research-A New Zealand Perspective



Qin, Song (Yantai Institute of Coastal Zone Research, CAS)

Marine Natural Products

Thursday, Boulevard 2

Algal Biotechnology: reshaping the coasts



Schenk, Peer (University of Queensland)

Algal Production and Biotechnology

Thursday, Boulevard 2

Development of low-cost high-efficiency algae energy farms

THANK YOU TO OUR SPONSORS

Sponsor support is essential to support marine biotechnology conferences, and the sponsorship of the below organisations is very much appreciated. The Organising Committee would like to thank each of these organisations for their generous contribution to our IMBC2013 conference.

The International Marine Biotechnology Conferences provide the opportunity for interaction between scientists, technologists, industry and policy-makers, and heighten national and international awareness of the role of marine biotechnologies in the sustainable development of marine bioindustries and the protection of the marine environment.

IMBC 2013 Sponsors

University of the Sunshine Coast has supported as a Bronze Sponsor. Their Exhibition Stand is hosted by staff from the Genecology laboratory.

The University of Queensland has supported as a Bronze Sponsor. Their Exhibition Stand is hosted by staff from the Centre for Marine Studies.

CSIRO sponsored the Welcome Function on Monday evening. Dr Sue Blackburn will speak on behalf of CSIRO during the evening.

Office of Naval Resources Global contributed by way of a Grant.

Maryland Sea Grant Program supported travel for graduate students to attend from the United States.

BGI Tech and **QUT ife** have Exhibition Stands.

Japanese Science and Technology Agency supported keynotes for the Oleomics symposium.

On behalf of the International Marine Biotechnology Association and the organisers of IMBC 2013, we thank all sponsors for their support.



TIMETABLE - WEDNESDAY (AUDITORIUM AND BOULEVARD 1)

| | | |
|-------|---|---|
| Time | Wednesday, 13th November 2013 | |
| 8:00 | Auditorium and Boulevard 1 - full day timetable | |
| | Registration (Boulevard Foyer) | |
| | Boulevard Auditorium - Plenary Addresses | |
| 8:55 | <i>Chair: Russell Hill</i> | |
| 9:00 | Introduction and announcements | |
| 9:45 | Plenary Address: Ute Hentschel Humeida (University of Wuerzburg, Germany) <i>Microbial diversity, function and biotechnological potential of marine sponges</i> | |
| 10:30 | Plenary Address: Amir Sagi (The Negev Ben Gurion University, Israel) <i>Insulin-like androgenic hormones and monosex culture of prawns: The first implementation of RNA-interference in aquaculture</i> | |
| | Morning Tea | |
| | Boulevard Auditorium | Boulevard 1 |
| | Algal Fuels & Bioenergy | Microbial Symbionts |
| | <i>Chair: Susan Blackburn</i> | <i>Chair: Ute Hentschel Humeida</i> |
| 10:50 | Keynote: de Nys, Rocky - Renewable fuels from macroalgae: revising the paradigm for algal fuels | Keynote: Zhang, Wei - Novel approach to decipher interactions between marine sponges and their microbial symbionts/pathogens |
| 11:20 | Paul, Nicholas - Selection of robust and high productivity marine macroalgae for renewable fuels | Zhukova, Natalia - Exceptional Lipids in Nudibranch Mollusks: Evolution, Diets, Symbionts and Biosynthesis |
| 11:40 | Roberts, David - Biochar from marine macroalgae and their waste streams: yields, characteristics and uses | Vincente, Jan - Diversity and functionality of microbial symbionts associated with a two sponge symbioses in the Caribbean |
| 12:00 | Powell, Ryan - Merging Metabolism and Power: Development of a Novel Photobioelectric Device Driven by Photosynthesis and Respiration | Zhang, Fan - Characterizing the role of diazotrophs in the symbiotic microbial community associated with two marine sponges |
| 12:20 | Packer, Michael - Growing algae and cyanobacteria: photobioreactor technology for product optimisation at the Cawthron Institute | Keren, Ray - Arsenic tolerant sponge-associated bacteria of the Red Sea Theonella swinhoei and their implication for water remediation |
| 12:40 | Lunch | |
| | Algal Fuels & Bioenergy | Microbial Bioresources |
| | <i>Chair: Rocky de Nys</i> | <i>Chair: Chris Battershill</i> |
| 13:30 | Keynote: Kang, Do-Hung - A mini review on algae biofuel in Korea | Keynote: Zhang, Jiquan - An efficient <i>E. coli</i> secretory expression system to produce recombinant chitin-degrading related enzymes |
| 14:00 | Blackburn, Susan - Developing Australian Native Microalgae for Algal Biofuels and Bioproducts | Li, Fuli - Untapped Bacterial community Enriched from Coastal Marine Sediment under Anaerobic and Thermophilic Conditions |
| 14:20 | Puri, Munish - Exploring Australian marine biodiversity for producing next generation of biofuels | Rajasabapathy, Raju - Bacterial diversity, a comparison between the hydro-thermal vent and the non-vent region of Espalamaca |
| 14:40 | Wang, Guangyi - Production biofuels and bioproducts using marine microalgae isolated from the coastal waters of China | Eythorsdottir, Arnheidur - Isolation of antimicrobial marine bacteria from sub-arctic hydrothermal sites |
| 15:00 | Jeon, Seon-Mi - Biomass Evaluation of a Novel Green Microalga Chlamydomonas sp. KIOST-1 for Biofuel Production Isolated from Korea | Lee, Youngdeuk - Molecular cloning, overexpression and purification of a novel laminarinase from Mesoflavibacter zeaxanthinifaciens S86 |
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| | Algal Biotechnology | Microbiotechniques |
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| 15:40 | Suhartono, Maggy Thenawidjaja - Study of Proteins that Catalyze Silica formation and Polyunsaturated Fatty Acid synthesis in Marine Diatom (<i>Chaetoceros gracilis</i>) | Sonkar, Shailendra Pratap - Metabolic engineering of Polyunsaturated fatty acid biosynthetic pathway in Yeast |
| 16:00 | Ye, Bo-Ram - Seasonal variations on organic and inorganic components of <i>Ulva pertusa</i> with environmental factors in Jeju, Korea | Jain, Deepti - Production, purification and characterization of halothermotolerant solvent stable lipase and its application in ester synthesis |
| 16:20 | Reddy, Amelia - Characterisation of the effect stress on nitrogen metabolism in the commercially important agarophyte <i>Gracilaria gracilis</i> | Hu, Xiaoke - Bioremediation Of Crude Oil Using Indigenous Marine Bacteria |
| 16:40 | Rengasamy, Ragupathirajakannan - Phenolic derivatives from South African kelps: pharmacological screening and in silico approaches towards new functional foods | Delpin, Marina - Seagrass restoration using hessian: silane coating of hessian reduces <i>Escherichia coli</i> attachment and fouling by marine bacteria |
| 17:00 | Gupta, Vishal - Development and characterization of interspecific somatic hybrids through protoplast fusion between <i>Ulva fasciata</i> Delie (x) <i>U. reticulata</i> Forskal | |
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Paramylon production by fed-batch cultivation of *Euglena gracilis* using waste in food industry [Poster]

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Euglena gracilis accumulates remarkable amount of beta-1,3-glucan, called paramylon, in the cells. It has been recently shown that the introduction of acyl chains into paramylon molecules gave thermoplasticity to paramylon. However, for the utilization of paramylon as a raw material of thermoplastics, development of an efficient mass production method of paramylon at a low cost is required. In the present study, the waste in food industry, such as waste beer, was utilized as cheap organic carbon source for the heterotrophic cultivation of *Euglena*. The heterotrophic cultivation of *Euglena* in the medium that yeast extract and vitamins B1 and B12 were added into waste beer gave a rapid growth and high density of *Euglena* cells same as that in the medium containing glucose as a sole carbon source. Moreover, fed-batch cultivation of *Euglena* using waste beer resulted in the efficient heterotrophic cultivation in quite high density. The *Euglena* cells that obtained by the fed-batch cultivation in high density were rich in paramylon and seemed to be suitable for raw material of thermoplastics. As a result, the fed-batch cultivation of *Euglena* using waste in food industry made an efficient paramylon production in high density and a practical production of valuables, such as bio-plastics, possible.

Study of Proteins that Catalyze Silica formation and Polyunsaturated Fatty Acid synthesis in Marine Diatom *Chaetoceros gracilis*)

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Silica polymers and polyunsaturated fatty acid (PUFA) are valuable substances due to their benefits for food and health industry. They are abundantly produced by diatom. The mechanism of their synthesis is controlled by several proteins. The aim of this research was to study the proteins involved in silica and PUFAs formation in *Chaetoceros gracilis*. Research methods include analysis of growth, cellular content of protein and lipid as well as fatty acid composition during growth. Protein characteristics were conducted by two-dimensional electrophoresis to estimate the molecular weight and isoelectric point. Proteins were identified by bioinformatic study. The cellular content of proteins, lipids and fatty acids were influenced by the growth phase. There were five silica proteins detected from siliceous cell wall of this diatom. Silicic acid transport proteins which are active in the transport of silicic acid for silica synthesis was also identified during exponential to death growth phase. Eleven proteins involved in synthesis of PUFAs were identified, these included three microsomal desaturase proteins ($\Delta 9$ DES, $\Delta 6$ DES, ELO $\Delta 6$, prekursor ω -6 DES, prekursor ω -3 DES, spingolipid $\Delta 8$ DES, $\Delta 12$ DES, $\Delta 4$ DES, microsomal $\Delta 4$ DES, microsomal ω -6 DES and microsomal $\Delta 6$ DES).

Regulation of glycaemia with the application of recombinant CHH1 and its polyclonal antiserum in *Penaeus monodon*.

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Crustacean hyperglycaemic hormone (CHH) family neuropeptides have been in the research limelight for the past two decades due to their importance in the regulation of glycaemia, moulting and gonad development in crustaceans. Under natural conditions, the low levels of the CHH neuropeptide and the structural similarity of the three CHH family neuropeptides limit their purification directly from the animal. In this study, we carried out sequence analysis and homology modelling of CHH1 hormone gene, isolated the mature region of the CHH1 gene, constructed the recombinant translation expression vector (pET32a⁺-PmCHH1) and produced the recombinant protein in *E.coli* (BL21 (DE3) pLysS). The translation expression vector construct (pET32a⁺-PmCHH1) was successfully built for the production of recombinant CHH1 protein (rCHH1-29.47 kDa). rCHH1 produced a hyperglycaemic effect when experimentally injected into adult *Penaeus monodon* similar to that of the eyestalk extract. Polyclonal antibody (anti-rCHH1) was developed in mice for the purified recombinant CHH1 protein. A hypoglycaemic effect was induced by the polyclonal antiserum when injected into adult *P.monodon*, observed by 50% and 94.76 % reduction in glucose and CHH1 hormone level. Therefore, rCHH1 and its antibody could be useful tools to better understand the endocrine mechanisms regulating hyperglycaemia and reproduction in *P. monodon*.