

ComBio  
2011

# Research and recreation amid the reef and rainforests

Cairns Convention Centre  25 to 29 September 2011

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## Plenary Lectures

Confirmed plenary speakers as this time are:

-  **Nenad Ban** Swiss Federal Institute of Technology (ETH), Zurich, Switzerland
-  **Michael Breitenbach** Department of Cell Biology, University of Salzburg, Austria
-  **Hans Clevers** Hubrecht Institute, Utrecht, The Netherlands
-  **Dave Drubin** University of California, Berkeley, USA
-  **Margaret Fuller** Stanford University, USA
-  **Julian Hibberd** University of Cambridge, UK
-  **Stephen Kowalczykowski** University of California, Davis, USA
-  **Hartmut Luecke** University of California, Irvine, USA
-  **Hiroshi Ohno** Riken, Japan
-  **Michael Parker** St Vincent's Institute, Melbourne, Australia **Lemberg Medal Lecture**
-  **Stuart Pitson** Institute of Medical & Veterinary Science, Adelaide, Australia **Merck Research Excellence Medal Lecture**
-  **Howard Riezman** University of Geneva, Switzerland
-  **Andrej Šali** University of California, San Francisco, USA
-  **Matt Scott** Stanford University, Palo Alto, USA
-  **Lawren Sack** University of California, Los Angeles, USA
-  **Natalie Strynadka** University of British Columbia, Vancouver, Canada
-  **David Teplow** University of California, Los Angeles, USA
-  **Roger Tsien** University of California, San Diego, USA **Nobel Prize**

### KEY DATES

**End of Earlybird  
Registration**  
24 June, 2011

**Deadline for Abstracts**  
24 June, 2011

**Guaranteed Hotel  
Reservation Deadline**  
25 July, 2011

**ComBio2011**  
25-29 September, 2011



## Chemistry 2008

- ★ **Carroll P. Vance** United States Department of Agriculture, USA
- ★ **Susanne von Caemerer** Australian National University, Canberra, Australia **J.G. Wood Lecture**

## ASBMB MEDALLIST SPEAKERS

### ASBMB Lemberg Medallist: Michael Parker



Professor Michael Parker is Deputy Director of St Vincent's Institute of Medical Research in Melbourne where he is Head of the Biota Structural Biology Laboratory and the ACRF Rational Drug Discovery Facility. He is an Australian Research Council Federation Fellow and a Professorial Fellow at the Bio21 Institute, University of Melbourne. Michael carried out his undergraduate work in chemistry at the Australian National University where he learnt protein NMR. After obtaining his DPhil in protein crystallography at Oxford University, Michael took up the post of staff scientist at the European Molecular Biology Laboratory, Germany. In 1991, Michael returned to Australia as a Wellcome Trust Senior Research Fellow to re-establish a protein crystallography laboratory at St Vincent's. The work of Michael's laboratory is internationally recognised with the determination of nearly 100 crystal structures including those of membrane-associated proteins, detoxifying enzymes and protein kinases. This has provided insights into a number of diseases such as cancer, bacterial and viral infections, and neurological diseases such as Alzheimer's disease. He has published over 200 papers and his work has been recognised with numerous awards including the 1999 Australian Academy of Science Gottschalk Medal and the 2004 ASBMB GE Healthcare Bio-Sciences Award. He was elected a Fellow of the AAS in 2010.

### ASBMB Merck Research Excellence Medallist: Stuart Pitson



Stuart Pitson is an NHMRC Senior Research Fellow at the Centre for Cancer Biology (CCB), SA Pathology, and an Affiliate Associate Professor of the School of Molecular and Biomedical Science, University of Adelaide. He heads a laboratory that studies sphingolipid-mediated cell signalling and sphingosine kinases, particularly in relation to cancer, inflammation and wound healing. Stuart obtained his undergraduate degree from La Trobe University, Bendigo, supervised by Professor Robert Seviour and Dr Barbara McDougall. He undertook his PhD in the same group examining fungal  $\beta$ -glucan degrading enzymes. Stuart undertook a postdoctoral stay at Wageningen University, Netherlands, where he used NMR and HPLC techniques to define the catalytic mechanisms and action patterns of several enzymes important in food processing. He returned to Australia to work with A/Professor George Mendz, UNSW, where he applied his NMR skills to examine the tricarboxylic acid cycle of *Helicobacter pylori*. In 1998, Stuart took up a position with Dr Binks Wattenberg in the Hanson Centre for Cancer Research, working in the then emerging field of sphingolipid signalling. He established his own laboratory in the same location (now CCB) in 2003. Stuart has published over 75 publications, sits on the Editorial Board of the Journal of Biological Chemistry and the Editorial Advisory Panel of the Biochemical Journal, and is Chair of

## INTERNATIONAL PLENARY SPEAKERS

### Nenad Ban



Nenad Ban was born in Zagreb, Croatia, and was educated at the University of Zagreb. He obtained his PhD degree in the Department of Biochemistry, University of California, Riverside (1990-1994) where his research focused on structural immunology and virology. He completed postdoctoral work in the Department of Molecular Biophysics and Biochemistry at Yale University where he spearheaded the X-ray crystallographic structure determination of the large ribosomal subunit, a 1.5 MDa ribonucleoprotein

complex, and determined its atomic structure in 2000 as part of the group in the laboratory of Thomas Steitz. In 2000, Nenad was appointed Assistant Professor of structural molecular biology at the ETH Zurich (Swiss Federal Institute of Technology), becoming full Professor in 2007. The main goal of the research in his laboratory is to study structure and function of large cellular assemblies using a combination of crystallographic, electron microscopic and biochemical experiments. Nenad is a member of EMBO and the German Academy of Sciences and the recipient of several prizes and awards including the Roessler Prize (ETH Zurich), Latsis Prize (Latsis Foundation), Friedrich Miescher Prize (Swiss Society for Biochemistry) and AAAS Newcomb Cleveland Prize.

### Michael Breitenbach



Michael Breitenbach obtained his PhD in 1972 under O. Hoffmann-Ostenhof in the Department of General Biochemistry, University of Vienna, Austria. In 1982, he received the Max Kade Fellowship to perform postdoctoral studies with Ben Hall (Seattle) and Kelly Tatchell (Philadelphia). He was Assistant Professor of Biochemistry, Vienna University 1972-1986, and Assistant Professor of Genetics, Vienna University 1986-1991. Since 1991, he has been a Professor of Molecular Genetics at the University of Salzburg, Austria. Professor

Breitenbach has been involved in the identification of allergens in pollen and, more recently, has identified markers of oxidative stress and apoptosis in yeast. He is currently involved in determining how the metabolic activity of a cell controls proliferation and death. In 2011, Professor Breitenbach was elected an American Association for the Advancement of Science Fellow. He is a member of the FEMS Yeast Research and Experimental Gerontology editorial boards. Professor Breitenbach has organised seven international meetings and congresses and has published about 175 peer-reviewed publications.

### Hans Clevers

Hans Clevers obtained his MD degree in 1984 and his PhD degree in 1985 from the University Utrecht, the Netherlands. His postdoctoral work (1986-1989) was done with Cox Terhorst at the Dana-Farber Cancer Institute of the Harvard University, Boston, USA.



From 1991-2002, Hans was Professor in Immunology at the University Utrecht and, since 2002, Professor in Molecular Genetics. Since 2002, he has been Director of the Hubrecht Institute in Utrecht. Hans has been a member of the Royal Netherlands Academy of Arts and Sciences since 2000 and is the recipient of several awards, including the Dutch Spinoza Award in 2001, the Swiss Louis Jeantet Prize in 2004, the Memorial Sloan-Kettering Katharine Berkan Judd Award in 2005, the Israeli Rabbi Shai Shacknai Memorial Prize in 2006, the Dutch Josephine Nefkens Prize for Cancer Research and the German Meyenburg Cancer Research Award in 2008, the Dutch Cancer Society Award in 2009 and the United European Gastroenterology Federation (UEGF) Research Prize in 2010. He obtained an ERC Advanced Investigator grant in 2008. He is Chevalier de la Legion d'Honneur since 2005.

### David Drubin



David Drubin completed an undergraduate degree in biochemistry at the University of California, Berkeley, and received his PhD in 1985 working with Marc Kirschner at UCSF. His postdoctoral studies were performed from 1985 through 1988 in the laboratory of David Botstein at MIT. During his postdoc, he began to study the actin cytoskeleton of budding yeast. He joined the faculty at the University of California, Berkeley, in 1988. He has served as Head of the Molecular and Cell Biology Department's graduate program and as Head of the Division of Cell and Developmental Biology. He was elected a member of the American Academy of Arts and Sciences and Editor-in-Chief of *Molecular Biology of the Cell* in 2010. He is a member of the editorial boards of *Journal of Cell Biology*, *Molecular Biology of the Cell*, *Trends in Cell Biology*, *FASEB Journal* and *Molecular Microbiology*, as well as Cytoskeleton Section Head for Faculty of 1000 online journal. Today, his research focuses on the actin cytoskeleton and endocytic trafficking in budding yeast and in mammalian cells.

### Margaret Fuller



Margaret Fuller is a Professor of Developmental Biology and Genetics at Stanford University School of Medicine and Reed-Hodgkins Professor of Human Biology. Margaret received a BA in Physics from Brandeis University, a PhD in Microbiology from MIT and did her postdoctoral research in Developmental Genetics at Indiana University. Dr Fuller's laboratory investigates the mechanisms that control self-renewal, proliferation and differentiation in adult stem cell lineages. Her recent research has focused on how the microenvironment of the niche instructs cells to maintain stem cell identity and how stem cells orient toward their attachment to the niche to program asymmetric cell division. She also investigates how transit amplifying cells switch from proliferation to differentiation and the gene regulatory mechanisms that turn on cell type specific transcription programs for terminal differentiation

in stem cell lineages.

## Bin Han



Professor Bin Han obtained his bachelor degree in Biology from Anhui Normal University in 1985, Masters degree in Biology from Guangxi Agricultural College in 1988, and PhD degree in Molecular Genetics from the British John Innes Centre in 1992. Between 1992 and 1998, he was a postdoctoral student at the University of Cambridge, Plant Science Department. In 1998, he returned to China and serves as a Director of the National Center for Gene Research, Chinese Academy of Sciences (CAS). From 2002, he has also served as a

Vice Director of the Institute of Plant Physiology and Ecology, Shanghai Institutes for Biological Sciences, CAS. In 2008, he was appointed Vice Director of Beijing Institute of Genomics, CAS. Professor Han focuses on rice genome sequencing and re-sequencing, comparative genome analysis of rice subspecies, and rice functional genomics. His laboratory has successfully sequenced and analysed *Oryza sativa japonica* chromosome 4, rice genome-wide association studies (GWAS), high-throughput genotyping by whole-genome resequencing, construction of japonica fine physical maps, and rice chromosome 4 specific DNA chips and its expression profiling which were published in *Nature*, *Nature Genetics*, *Genome Research* and *Plant Cell*, respectively. His laboratory continues to develop whole genome-wide high-throughput genotype identification platform of rice various subspecies and corresponding systemic comparative transcriptome analysis, and GWAS in other plants.

## Julian Hibberd



Julian Hibberd is a fellow of Emmanuel College at the University of Cambridge. He gained his first degree in 1991 and a PhD in 1994, both at the University of Bangor, UK. In 2008, he was named by *Nature* as one of 'Five crop researchers who could change the world' for his research that is attempting to replace C3 carbon fixation in rice with C4 carbon fixation. This would greatly increase the efficiency of photosynthesis and create a rice cultivar which could 'have 50% more yield' which 'would impact billions of people'. His research

focuses on the evolution of the C4 pathway and the role of proteins in C3 plants before they are recruited into C4 photosynthesis. Although C4 photosynthesis appears complex, it has evolved over 60 times independently from species that use C3 photosynthesis. C4 crops yield about 50% more than C3 crops. His work has used C3 species to understand the role and regulation of genes and proteins that are recruited into the C4 pathway. He has developed *Cleome gynandra*, the most closely related C4 species to *Arabidopsis*, as a model, and is using deep sequencing of con-generic C3 and C4 pairs to uncover patterns of gene expression associated with C4 photosynthesis. He also works with maize, rice and wheat.

## Stephen Kowalczykowski

Dr Stephen Kowalczykowski received his PhD in chemistry and biochemistry with Dr Jacinto Steinhardt at Georgetown University. His postdoctoral training was with Dr Peter von Hippel at the University of Oregon. Dr



Kowalczykowski started his independent faculty career in 1981 at Northwestern University Medical School where he was promoted to Associate Professor. In 1991, he relocated to the University of California at Davis with the rank of Full Professor. He subsequently served as the Chair of Microbiology and the Director of the Center for Genetics and Development; currently, he is a Distinguished Professor of Microbiology and of Molecular and Cell Biology. Dr Kowalczykowski's honours include election to the National Academy of Sciences (2007), American Academy of Arts and Sciences (2005), American Academy of Microbiology (2003) and American Association for the Advancement of Science (2001), and an NIH merit award (2000). He also serves on the editorial board of several academic journals and has co-organised over a dozen conferences. Dr Kowalczykowski's research programs focus on the molecular mechanisms of recombinational DNA repair; the biochemical mechanism of DNA helicases; and single-molecule biophysical analysis of protein-nucleic acid interactions. The single-molecule approach permits visualisation of DNA repair enzyme in real time, and has proved novel insights into the behaviour of such enzymes.

## Hartmut Luecke



Hartmut 'Hudel' Luecke (born in Göttingen, Germany) is a structural biologist with an emphasis on membrane proteins and structure-based drug discovery. He received his BS from Heidelberg University (Physics, Chemistry and Computer Science), his PhD from Rice University in 1990 (Macromolecular Crystallography) and performed postdoctoral work with Robert Huber at the Max Planck Institute of Biochemistry in Martinsried. He spent the next three years at the Stanford Synchrotron as a Structural Biologist before joining the faculty at the University of California, Irvine, in 1996, where he is Professor of Biochemistry, Biophysics and Computer Science. He is also the founding director of the UC Irvine Center for Biomembrane Systems.

## Hiroshi Ohno



Born in Tokyo, Professor Hiroshi Ohno obtained his MD from the School of Medicine, Chiba University, in 1987 and his PhD from Chiba University in 1991. After completing his PhD, he was a research fellow in the Division of Molecular Genetics, Center for Biomedical Science, Chiba University, a visiting research fellow at the NIH, USA, between 1994 and 1997 and then was appointed Professor, Division of Molecular Membrane Biology, Cancer Research Institute, Kanazawa University, Kanazawa, Japan in 1999. In 2004, Hiroshi was appointed to his present position as Team Leader, Laboratory for Epithelial Immunobiology, Research Center for Allergy and Immunology, RIKEN, Yokohama, Japan. Hiroshi's interests lie in mucosal immunology, especially the differentiation and function of M cells. M cells are a subset of intestinal epithelial cells residing scattered in the area of epithelium covering the gut-associated lymphoid follicles and are specialised for mucosal antigen uptake. He is also interested in the gut ecosystem, where commensal microbiota have a huge impact on the host physiology and pathology. His group is establishing

multi-omics-based approaches to comprehensively understand the host-intestinal microbiota cross-communication.

## Howard Riezman



Howard Riezman received a Bachelor of Arts degree (1975) from Washington University in St Louis and his PhD in Botany from the University of Wisconsin-Madison (1980). He then completed a postdoctoral fellowship at the Biozentrum of the University of Basel. In 1983, he started his independent laboratory at the ISREC in Lausanne. He moved back to the Biozentrum as full Professor (1988) and then moved to the Biochemistry Department of the University of Geneva (2002). He continues working on membrane trafficking, but has changed the emphasis of his research to the understanding of the metabolism and function of membrane lipids. His work has uncovered roles for actin, ubiquitination, sterols and sphingolipids in the endocytic pathway and has contributed to our understanding of the mechanism of the synthesis and intracellular trafficking of GPI-anchored proteins. His recent work on lipids has led to novel insights into sterol and sphingolipid functions. Howard was elected member of EMBO in 1997 and has served as department chairman in both Basel and Geneva. He has served on the Research Council of the Swiss National Science Foundation (SNSF) for eight years and is a member of the SNSF Foundation Council. He is Director of a Swiss National Centre for Competence in Research in Chemical Biology.

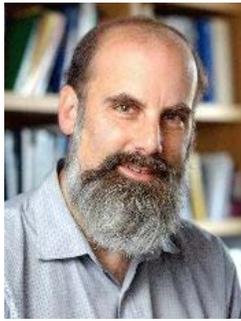
## Andrej Šali



Andrej Šali was born in Kranj, Slovenia, and is a computational structural biologist. He received his BS from the University of Ljubljana, his PhD from Birkbeck College, University of London, 1991 (working with Tom Blundell) and did postdoctoral work at Harvard University (working with Martin Karplus). He joined the faculty of the Rockefeller University in 1995, following his postdoctoral research at Harvard University. Since 2003, he has been the Professor and Vice Chair of the Department of Bioengineering and Therapeutic Sciences as well as the Scientific Director of the California Institute for Quantitative Biosciences at University of California, San Francisco. He also serves as an editor for the journal *Structure*. He uses computation grounded in the laws of physics and evolution to study the structure and function of proteins. For example, he developed comparative protein structure modelling by satisfaction of spatial restraints, implemented in the program MODELLER, and integrative structure determination of macromolecular assemblies, implemented in the program IMP. In July 2006, the magazine *Business 2.0* ranked Šali and Stephen Maurer together at 41st place among '50 Who Matter Now'.

## Matthew Scott

Matthew Scott is Professor of Developmental Biology, Genetics and Bioengineering at Stanford University School of Medicine and Investigator at the Howard Hughes Medical Institute. He graduated with a BS in biology from MIT in 1975 and a PhD in biology in 1980. He is a member of the National Academy of Sciences and the American Academy of Arts and Sciences and a Past President of the Society for Developmental Biology.



He is known for his work in developmental biology and genetics, particularly in areas of cell-cell signaling and homeobox genes and for discovering the roles of developmental regulators in cancer. Dr Scott teaches cell and developmental biology to undergraduate students, development and disease mechanisms to medical students and developmental biology to graduate students at Stanford University.

## Lawren Sack



Lawren Sack obtained his BSc (1995) at McGill University, Canada, and his PhD (2001) at Cambridge University. He completed a postdoctoral fellowship (2001-2003) at Harvard University before joining the faculty at University of Hawaii (2003-2007). He has been at University of California, Los Angeles, since 2007. Dr Sack has authored over 60 papers developing new mechanistic understanding of leaf function and its implications for plant and vegetation system ecology. Dr Sack has worked collaboratively in studies across vegetation zones and plant lineages, including on mosses, cycads, ferns and diverse flowering plants, using adaptive radiations as 'natural experiments'. Dr Sack has co-founded large forest plots in Hawaii to relate physiology to landscape-scale responses. Dr Sack's discoveries include the rapid light response of leaf hydraulic conductance, the functional consequences of variation across species in leaf venation architecture, the adaptive importance of hydraulics traits, new applications of leaf design to paleobiology, and differences in the ecohydrology of water use of native versus invasive species. Dr Sack is editor of four journals including the online journal PrometheusWiki of which he is a co-founder, and was awarded the first Achievements in Diversity Award of the Ecological Society of America.

## Natalie Strynadka



Natalie Strynadka is a Professor in the Department of Biochemistry and Molecular Biology at the University of British Columbia in Vancouver, Canada. Dr Strynadka received her PhD in structural biology in 1990 from the University of Alberta, where she conducted postdoctoral research in the Departments of Biochemistry and of Microbiology until being given the position of research fellow in 1995. She has been named a Medical Research Council of Canada Scholar, a Canadian Institute of Health Research Scientist, a Burroughs Wellcome New Investigator in the Pharmacological Sciences, a Michael Smith Foundation for Health Research Senior Scholar, and a UBC Distinguished University Scholar. She has also received the CFI New Opportunities Award, Merck Frosst Prize, UBC Killiam Research Prize and Steacie Prize. She is a fellow of the Royal Society of Canada. Natalie uses X-ray crystallography and other biophysical analysis tools to study the structure and function of proteins that play key roles in antibiotic resistance and bacterial pathogenicity. Her goal is to design novel

antibiotics.

## David Teplow



David Teplow received BA degrees in Biochemistry (1974) and in Bacteriology and Immunology (1975) at the University of California at Berkeley and his MS (1977) and PhD (1981) degrees from the University of Washington. After a postdoc at Caltech in Pasadena, he was a faculty member in the Departments of Neurology at Brigham and Women's Hospital and Harvard Medical School (1991-2005). He joined the faculty at UCLA in 2005, where he is a Professor in Residence in the Department of Neurology, a member of the Molecular

Biology Institute and the Brain Research Institute, and Director of the Biopolymer Laboratory. Dr Teplow is a leader in the areas of the structural biology of amyloid proteins and the biophysics of amyloid assembly. His laboratory seeks to understand and treat neurodegenerative disorders linked to pathologic protein folding. Dr Teplow has employed an interdisciplinary strategy comprising *in vivo*, *in vitro*, *in vacuo* and *in silico* approaches. The long-term goal is to discover the key factors controlling production of neurotoxic assemblies and to target these factors in strategies for drug development. Dr Teplow sits on the editorial boards of *Journal of Biological Chemistry*, *Amyloid: The Journal of Protein Folding Disorders*, *Current Chemical Biology* and *Yemeni Journal of Science*.

## Roger Tsien



Roger Tsien received his AB from Harvard College (1972) and his PhD from the University of Cambridge (1977) where he remained as a Research Fellow until 1981. He then moved to the University of California, Berkeley, eventually becoming Professor. In 1989 he moved to the University of California, San Diego, where he is an investigator of the Howard Hughes Medical Institute and Professor in the Departments of Pharmacology and of Chemistry and Biochemistry. His honours include the Searle Scholar Award (1983),

Artois-Baillet-Latour Health Prize (1995), Gairdner Foundation International Award (1995), Award for Creative Invention from the American Chemical Society (2002), Heineken Prize in Biochemistry and Biophysics (2002), Wolf Prize in Medicine (with Robert Weinberg, 2004), Rosenstiel Award (2006), and E.B. Wilson Medal of the American Society for Cell Biology (with M. Chalfie, 2008). Dr Tsien was awarded the Nobel Prize for Chemistry in 2008 for the discovery and development of the green fluorescent protein. He is a member of the National Academy of Sciences and the Royal Society. Dr Tsien is best known for designing and building molecules that report or perturb signal transduction inside living cells. These molecules, created by organic synthesis or by engineering naturally fluorescent proteins, have enabled many new insights into a broad array of intracellular signaling mechanisms.

## Carroll P. Vance

Carroll Vance completed a BS at East Tennessee State University and a PhD at Ohio State University. He is a Research Leader within the Department of Agronomy and Plant Genetics at the University of Minnesota. He has been involved in legume N<sub>2</sub> fixation, N and C metabolism and plant-microbe interaction research for



more than 30 years. He was the first to isolate and characterise AS, AAT, PEPC, NADH-GOGAT and MDH from legume nodules, produce antibodies to the proteins, and isolate the genes. Through studies of ineffective nodules, he established the paradigm that root nodule formation is analogous to a highly controlled disease process. He collaborated in the development of alfalfa germplasm incapable of N<sub>2</sub> fixation and nodulation that has been shared with over 100 laboratories. His more recent work on P-stress induced cluster roots in white lupin has been instrumental in defining how plants adapt to P-stress. His laboratory has demonstrated a close link between P-deficiency induced genes in roots and their regulation by plant sugars. Most recently, Vance has been an international leader in the functional genomics of symbiotic nitrogen fixation and root responses to P-deficiency. His project has sequenced some 70,000 ESTs from *Medicago*, *Lupinus* and *Phaseolus* and characterised the whole genome transcript expression response in these species.



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