EMBO Gold Medallists meet in Singapore for scientific symposium

Feature EMBO Member Mike Jetten has been searching for anaerobic bacteria to help improve the environment and health

News Instituto Gulbenkian de Ciência offers germ-free mice for scientific research

Tara Oceans Expedition unveils scientific results

EMBO Members 2015
Meet the scientist interviews

Interview Emmanuelle Charpentier

www.embo.org
EMBO Gold Medallists meet in Singapore

The EMBO Gold Medallist Symposium 2015 took place at the Biopolis in Singapore over three days from 11–13 May. More than 450 scientists and researchers converged on the Matrix Building’s Breakthrough & Discovery Theatrette to hear talks from previous winners of the EMBO Gold Medal. The event was jointly organized by LKCMedicine and A*STAR.

LCMedicine Vice-Dean for Research Professor Philip Ingham FRS and Maria Leptin, Director of EMBO, welcomed participants to the event. “By bringing together experts from a wide range of scientific disciplines, the symposium’s programme breaks away from the traditional thematic approach,” said Ingham in his opening remarks. He also highlighted that the meeting was a great opportunity for students to hear first hand from the medallists about the challenges they have faced on the way to making their discoveries. “We are about to hear talks from scientists who have made outstanding contributions to the life sciences and I am excited to learn about the progress they have made in their research,” said Leptin. She also outlined EMBO’s path toward international cooperation and scientific exchange in the life sciences and the importance of the organization’s relationship with Singapore as a role model for further activities (see box: Promoting scientific exchange).

The EMBO Gold Medal award was started almost 30 years ago and acknowledges young scientists for their outstanding contributions to the life sciences. The event featured scientific talks from Gold Medallists from the last four decades, including a presentation from the 1990 Gold Medal winner Professor Erwin Wagner from the Spanish National Cancer Research Centre (CNIO). Wagner is currently Director of the newly founded BBVA Foundation – CNIO Cancer Cell Biology Programme as well as Head of the Genes, Development and Disease Group at the CNIO. Professor Wagner spoke on the first day of the meeting about the transcription factor AP-1, a protein complex that is involved in processes as diverse as inflammation, metabolism and cancer. In his presentation, he demonstrated the biomedical relevance of powerful mouse genetic models for common human diseases, spanning the inflammatory skin disease psoriasis, to bone health, and cancer cachexia, a complex wasting disease that affects the majority of individuals with end stage cancer.
Professor Paolo Sassone-Corsi, who also spoke at the first Gold Medallist Symposium that was held in 2009, was one of the speakers on the second day. Director of the Centre for Epigenetics and Metabolism at the School of Medicine at the University of California, Irvine, Professor Sassone-Corsi discussed his work on elucidating the relationship between epigenetics, circadian rhythms and metabolism. One of the major interests of his research group is looking at how the mechanisms of signal transduction are able to modulate nuclear functions and, in particular, gene expression, chromatin remodeling and epigenetic control.

Plant research was also part of the agenda for the symposium. Jiří Friml from the Institute of Science & Technology in Austria received the EMBO Gold Medal in 2012 for defining how the plant hormone auxin functions to regulate plant development. He picked up on this theme in his talk on the third day which described the mechanisms of polarity and patterning that plants use to control plant growth and development.

Other speakers included 1995 Gold Medal winner Professor Richard Treisman from The Francis Crick Institute, who talked about recent progress in understanding the dynamics of the cytoskeleton, specifically changes to G-actin, and the regulation of transcription; 2001 Gold Medallist Professor Matthew Freeman from the University of Oxford, who talked about the control of signalling between cells by rhomboid-like proteins; and the 2014 Gold Medal winner Associate Professor Sophie Martin from the University of Lausanne. Martin has been working for the past 15 years to understand cellular polarity, in particular the way in which the spatial organization of cells contributes to cell size and cell division. Her recent award acknowledged work to understand the molecular events that define the organization and development of the cell.

Presentations by EMBO Gold Medallists were interspersed by talks from former and current EMBO Young Investigators, including A*STAR Institute of Molecular & Cell Biology Research Director Professor Robert Robinson, A*STAR Institute of Medical Biology Senior Principal Investigator Associate Professor Bruno Reversade and A*STAR Singapore Immunology Network Senior Principal Investigator Assistant Professor Florent Ghinoux.

Reversade discussed his work on the discovery of a gene responsible for a self-healing skin cancer that they had recently found in a Tunisian family. “Over five generations, 27 family members have been affected by this gene, leading to the conclusion that self-healing cancers can be hereditary. Because this gene functions in immunity, we anticipate that it could be harnessed for cancer immunotherapy.”

The meeting concluded with remarks from LKCMedicine Dean Professor James Best, He emphasized that with its research-intensive parent universities from the United Kingdom and Singapore, it is fitting that LKCMedicine provides a bridge between activities in Europe and Singapore and that it is co-sponsor of the EMBO Gold Medallist Symposium. “These past few days, we have been very privileged to hear from some of Europe’s and the world’s outstanding life scientists,” he said. “They shared their discoveries and their passion for science. While it’s been under the umbrella of molecular biology, I think there’s been great variety in the presentations, some great links between the talks, and considerable insight into disease processes.”

Promoting scientific exchange

The Government of Singapore, the European Molecular Biology Organization (EMBO) and its intergovernmental funding body, the European Molecular Biology Conference (EMBC), recently signed a Cooperation Agreement to strengthen scientific interaction and collaborative research between Singapore and Europe. This milestone agreement marks the first time a non-European nation has become an EMBC Associate Member State.

“Our cooperation agreement with Singapore is a great example of what can be achieved to meet the needs of our joint communities. Indeed it is a role model for the type of successful collaboration that we are trying to spread to other parts of the globe,” remarked Maria Leptin, Director of EMBO.

Mr Lim Chuan Poh, Chairman of the Agency for Science, Technology and Research (A*STAR), who signed the agreement on behalf of the Singapore Government, said, “Singapore has benefitted greatly from the partnership with one of Europe’s foremost organizations in the life sciences. We are excited to continue the momentum of our collaborations and drive more impactful and innovative healthcare outcomes together with Europe as the first non-European EMBC Associate Member State.”

The agreement allows Singapore scientists to participate in EMBO training programmes and activities. It also provides support for EMBO workshops and lectures to take place in Singapore. “Cooperation between researchers should not be constrained by national or international borders,” said Leptin. “Science depends on building and nurturing a diverse international community and we want to be global in our outlook. EMBO sees the cross-country cooperation that has allowed it to be successful in Europe as a platform for further international cooperation.”
What is your most significant scientific contribution?

My laboratory has contributed to two scientific areas. Our work has helped shape our understanding of how a key cell cycle transition, the mitosis to G1 transition, is regulated and how it is integrated with cell cycle events such as spindle position and anaphase onset. My group also provided some of the foundation for understanding how aneuploidy – an incorrect karyotype and a cause of numerous human diseases, foremost cancer – affects cells.

Why is yeast still the right organism?

When addressing a question in budding yeast, the single rate-limiting factor is your brain. You can do any experiment on yeast and do it with great precision. So why use any other more limiting system? If you can ask the question in yeast you should do so. There is no better system.

You often highlight the basic nature of your research. How does it relate to the applied aspects?

I consider myself a curiosity-driven scientist. I am interested in basic questions in biology. Our work on aneuploidy has of course led to implications for cancer and raised the possibility of developing new therapeutic interventions, for example drugs that target the aneuploid state of cancer cells. However, I am hoping that others will pursue the more applied avenues. My passion is figuring out how things work.

Do science and serendipity go hand in hand?

Yes. This is at least my experience. Sometimes you just stumble on things. The trick is to realize that you discovered something important and not just that you went down a rabbit hole. This takes intuition and instinct, which, in my opinion, are key characteristics of a good scientist.

Is it easier for a female scientist to work in the United States?

I do not know whether it is easier. Science is hard for everyone everywhere. However, one thing is certain: More is done in the United States to promote women in science and to support them so that they can succeed. Much more is also done to recruit women into visible leadership positions, which is of course very important to encourage young women to pursue a career in science.

What is the biggest challenge you have faced in your career?

Trying to find the right balance between work and family. When I was starting my lab, I knew the methods we were developing for studying retroviruses should also be useful for coated vesicles and was looking for potential collaborators. Hans-Georg-Kräusslich, our partner in research on HIV-1, introduced me to Felix Wieland with whom we started to work on COPI vesicles. Marko Kalksenen joined EMBL as a group leader about the same time as me, and we soon realized it would be fun to work together. Our joint topic is clathrin-mediated endocytosis.

What do you enjoy most about being a team leader?

I like the excitement of seeing new data and trying to work out what it tells us. Also discussions with interesting colleagues representing diverse points of view and having the freedom to follow interesting directions.

And the least?

The time spent on all of the things that are not research, but that need to be done to keep research moving – grant administration, timesheets for EC grants, and budgeting spring to mind.

At 37 you are the youngest EMBO Member elected this year. You were also one of the youngest group leaders when you joined EMBL in 2006. What did you do right in your career?

I was in the right field at the right time. EMBL was looking for someone in the cryo-electron microscopy area, and at the time there were perhaps not so many of us. The methods I had been working on during my PhD put me in a good position to start on “structural cell biology,” which fit well into the EMBL environment. From my experience as a PhD student, I knew how much could be found out by optimizing new technologies towards important applications. In the end, I think the most important factor in our laboratory’s success is the people behind it: great students, postdocs and collaborators.

How and when did you first become interested in the structures of viruses?

I joined a four-year Structural Biology D.Phil. programme in Oxford where we spent the first year working in two different laboratories before deciding where we would do our thesis work. One of the group leaders I worked for was Stephen Fuller, who co-pioneered studying virus structure by cryo-electron microscopy. I worked on cryo-electron microscopy of retroviruses and enjoyed both the biology and the method. Retroviruses seem simple at first glance. One of the reviews at the time was entitled HIV-1: fifteen proteins and an RNA, which describes it very well. Yet they compress a lot of function in those few proteins. They also undergo some spectacular structural changes during their lifecycles. Cryo-electron microscopy is very direct and visual – you take a picture and see something. Moreover, with image analysis much more information can be obtained. In the end, it was an easy decision to join Stephen’s group. My present laboratory is still doing cryo-electron microscopy of retroviruses.

The importance of networking?

When I was starting my lab, I knew the methods we were developing for studying retroviruses should also be useful for coated vesicles and was looking for potential collaborators. Hans-Georg-Kräusslich, our partner in research on HIV-1, introduced me to Felix Wieland with whom we started to work on COPI vesicles. Marko Kalksenen joined EMBL as a group leader about the same time as me, and we soon realized it would be fun to work together. Our joint topic is clathrin-mediated endocytosis.

What do you enjoy most about being a team leader?

I like the excitement of seeing new data and trying to work out what it tells us. Also discussions with interesting colleagues representing diverse points of view and having the freedom to follow interesting directions.
What are the big questions you work on?

My laboratory is focused on studying human breast cancer. We are looking for answers to several questions: What is the extent of intertumoral heterogeneity? In other words, how many different molecular subtypes of breast cancer exist? We also want to know if intratumoral heterogeneity is distinct across the different breast cancer subtypes? Are different breast cancer subtypes ‘forests’ of similar clonal phylogenetic trees? Can we develop tractable models to study the biology and to develop novel therapies for each of the breast cancer subtypes?

What inspired you to move into breast cancer research?

I was determined to study cancer as a problem using the ultimate model – human cancer. I decided to focus on breast cancer because of its significant burden – one in eight women in Europe will develop it in their lifetime – and also because of its fascinating clinical and biological heterogeneity.

What is the one big achievement you would like to accomplish?

To make cancer control a reality. The problem should be tractable since we know its essence: cancer is a genetic disease. Our studies have shown that breast cancer is a constellation of several distinct molecular diseases with subtype-specific drivers.

Will diagnostic tests for breast cancer soon become fast and cheap enough for widespread use?

That is one of the great motivations for our work. The fact that healthcare is free at the point of delivery makes me very optimistic that the not-for-profit NHS in the United Kingdom will make it possible to develop such tests, validate them and make them widely available.

You have lived in the United Kingdom for almost twenty years. Do you still follow scientific developments in Portugal?

Certainly. Although I have been away for 27 years, I can say that Portuguese science has improved exponentially in the past fifteen years. I am delighted for example that two other Portuguese scientists in Portugal were elected in 2015 to EMBO this year. I was on the scientific advisory board of the Institute of Molecular Pathology and Immunology of the University of Porto for ten years. I am now Chair of the Scientific Advisory Council of the Institute for Molecular Medicine in Lisbon.

What type of scientist and team leader are you?

I am a clinical scientist driven by scientific curiosity: I want to help patients. I try to bring the best out of each of the members of my team. To me it is a privilege to work with young scientists who are motivated by the pleasure of scientific discovery.
**EMBO Members for 2015**

Fifty-eight life scientists were elected to EMBO membership last May. Fifty of the scientists reside in Europe and neighbouring countries; eight Associate Members were elected from China, Japan, New Zealand and the United States. The latest scientists to join EMBO come from 19 different countries and include 18 female scientists recognized for their contributions to life science research. The EMBO Membership currently comprises more than 1700 life scientists.

<table>
<thead>
<tr>
<th>EMBO Members</th>
<th>DE</th>
<th>Amparo Acker-Palmer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Detlev Arendt</td>
</tr>
<tr>
<td></td>
<td>FR</td>
<td>Jean-Louis Bessereau</td>
</tr>
<tr>
<td></td>
<td>PT</td>
<td>Monica Bettencourt-Dias</td>
</tr>
<tr>
<td></td>
<td>DE</td>
<td>Ralph Bock</td>
</tr>
<tr>
<td></td>
<td>PL</td>
<td>Magdalena Boguta</td>
</tr>
<tr>
<td></td>
<td>DE</td>
<td>John Briggs</td>
</tr>
<tr>
<td></td>
<td>GB</td>
<td>Simon Bullock</td>
</tr>
<tr>
<td></td>
<td>CH</td>
<td>Dirk Bumann</td>
</tr>
<tr>
<td></td>
<td>GB</td>
<td>Carlos Caldas</td>
</tr>
<tr>
<td></td>
<td>FR</td>
<td>Laurent Duret</td>
</tr>
<tr>
<td></td>
<td>FR</td>
<td>Sandrine Etienne-Manneville</td>
</tr>
<tr>
<td></td>
<td>IL</td>
<td>Ehud Gazit</td>
</tr>
<tr>
<td></td>
<td>GR</td>
<td>Vassilis G. Gorgoulis</td>
</tr>
<tr>
<td></td>
<td>NL</td>
<td>Joost Gribnau</td>
</tr>
<tr>
<td></td>
<td>GB</td>
<td>John Hardy</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>Thomas Heleday</td>
</tr>
<tr>
<td></td>
<td>IT</td>
<td>Emilio Hirsch</td>
</tr>
<tr>
<td></td>
<td>GB</td>
<td>Philipp Holliger</td>
</tr>
<tr>
<td></td>
<td>NL</td>
<td>Casper Hoogenraad</td>
</tr>
<tr>
<td></td>
<td>DE</td>
<td>Veit Hornung</td>
</tr>
<tr>
<td></td>
<td>FI</td>
<td>Johanna Ivaska</td>
</tr>
<tr>
<td></td>
<td>GB</td>
<td>Sophian Kamoun</td>
</tr>
<tr>
<td></td>
<td>GB</td>
<td>Susan M. Lea</td>
</tr>
<tr>
<td></td>
<td>GB</td>
<td>Alison Lloyd</td>
</tr>
<tr>
<td></td>
<td>DE</td>
<td>Jan Lohmann</td>
</tr>
<tr>
<td></td>
<td>AT</td>
<td>Javier Martinez</td>
</tr>
<tr>
<td></td>
<td>CH</td>
<td>Jean-Claude Martinou</td>
</tr>
</tbody>
</table>

| EMBO Associate Members | GR | Rebecca Matsas |
|                       | ES | Pura Muñoz-Cánoves |
|                       | DE | Georg Nagel |
|                       | AT | Magnus Nordborg |
|                       | GB | Duncan T. Odom |
|                       | GB | Sharon Peacock |
|                       | CH | Lucas Pelkmans |
|                       | GB | Luca Pellegrini |
|                       | FR | Graça Raposo-Benedetti |
|                       | IL | Eran Segal |
|                       | DE | Ralf Sommer |
|                       | AT | Alexander Stark |
|                       | IL | Amos Tanay |
|                       | GB | Simon Tavare |
|                       | CH | Nicolas Thomi |
|                       | FR | Maria Elena Torres Padilla |
|                       | PT | Henrique Veiga-Fernandes |
|                       | FR | Danièle Werck-Reichhart |
|                       | GB | Anne E. Willis |
|                       | CH | Mihaela Zavolan |
|                       | FR | Chiara Zurzolo |

**Upcoming deadlines**

**EMBO Courses, Workshops and Conferences**
- 1 August
- 14 August
- The EMBO Meeting 2015
- online registration
- 19 August

**The EMBO Meeting 2015**
- late abstract submission
- 29 July
- EMBO Keynote Lectures
- 1 October
- Nominations 2016
- Women in Science Award
- 15 October

**Events**

**EMBO Members**

- Immunotherapy@Brisbane, Brisbane, Australia | 24–26 November
  - EMBO Member Frank Gannon is organizing the meeting Immunotherapy@Brisbane from 24-26 November in Brisbane, Australia. The conference features talks from several EMBO Members and focuses on clinical application and novel immunotherapeutics for cancer, infectious diseases, autoimmune disorders and other diseases.
  - More information can be found at www.conference.qimrberghofer.edu.au/page/Immunotherapy/

**Events**

**EMBO Long-Term Fellowships**
- 14 August

**The EMBO Meeting 2015**
- online registration
- 19 August

**EMBO Members who joined the ranks of the Royal Society in the UK and the US National Academy of Sciences this year:**

**New Royal Society Fellows and Foreign Members:**
- Stephen Brown
- Jane Clarke
- Stephen Cusack
- Michael Häusser
- Jane Langdale
- Gero Miesenböck
- Ketan Patel
- Bryan M. Turner
- Frank Uhlmann

**Foreign Members:**
- Li Jiayang
- Susan Lindquist

**New Members and Foreign Associates of the National Academy of Sciences:**

**Foreign Associates:**
- Jean-Laurent Casanova
- Reinhard Jahn
- Jonathan Jones
- Satyajit Mayor
- Nahum Sonenberg
- Jan Svoboda

**Upcoming deadlines**

**EMBO Courses, Workshops and Conferences**
- 1 August
- 14 August
- The EMBO Meeting 2015
- online registration
- 19 August

**The EMBO Meeting 2015**
- late abstract submission
- 29 July
- EMBO Keynote Lectures
- 1 October
- Nominations 2016
- Women in Science Award
- 15 October

**Events**

**EMBO Members**

- Immunotherapy@Brisbane, Brisbane, Australia | 24–26 November
  - EMBO Member Frank Gannon is organizing the meeting Immunotherapy@Brisbane from 24-26 November in Brisbane, Australia. The conference features talks from several EMBO Members and focuses on clinical application and novel immunotherapeutics for cancer, infectious diseases, autoimmune disorders and other diseases.
  - More information can be found at www.conference.qimrberghofer.edu.au/page/Immunotherapy/

**Organelle Crosstalk in Membrane Dynamics and Cell Signalling**
- Edinburgh | 26–29 October 2015
  - EMBO Young Investigator Maya Schuldiner is co-organizing the conference Organelle Crosstalk in Membrane Dynamics and Cell Signalling to be held in Edinburgh, 26-29 October 2015. This conference is of particular interest to cell biologists and will attract a broad audience with interests in cell signalling, membrane trafficking pathways, and the control of organelle dynamics – their size, shape, composition, function, and biogenesis.
  - For additional information go to www.biochemistry.org/Events/tabid/379/ItemID/2538/View/ConferenceDefault.aspx
EMBO Member **MIKE JETTEN** of Radboud University, Nijmegen, The Netherlands has spent his career looking for difficult-to-find bacteria. His quest has helped find ways to deliver benefits to the environment. His long-term goal is to build sustainable economies based around applications arising from newly discovered anaerobic microorganisms. Microbes that can survive without oxygen can play important roles in applied science and can even be used to trap or neutralize greenhouse gases.

In the course of 2014, several of the young scientists of the Department of Microbiology at Radboud University were awarded prestigious personal grants. Dr. Boran Kartal received an ERC Starting Grant to investigate new more sustainable wastewater treatment systems. Dr. Laura van Niftrik was awarded a Volkswagen seed grant to establish a genetic system for anammox planctomycetes and Dr. Sebastian Luecker received a Veni grant to investigate the biochemistry of nitrite-oxidizing bacteria. Ph.D. students Muriel van Teeseling and Olivia Rasigrat were awarded with Frye international mobility stipendia. Senior staff of the group have also been very successful, Dr. Huub Op den Camp was awarded an ERC Advanced Grant to study the microbiology of acid volcano systems.

The preparations for a new international Master’s program in microbiology that will start on 1 September 2015 are in full swing. The programme combines the educational efforts of both environmental and medical microbiologists of Radboud University (www.ru.nl/masters/microbiology). It will be the first microbiology Master’s program in The Netherlands to continue the excellent tradition established by the Dutch School of Microbiology that befits the motto of Martinus W. Beijerinck: “Fortunate those that are starting now.”

Professor Jetten was elected to the membership of EMBO in 2014.

In the 1990s, Mike Jetten and his colleague Mark van Loosdrecht from TU Delft discovered anammox, anaerobic ammonium-oxidizing bacteria that convert ammonium directly to nitrogen without the need for oxygen. These bacteria are now used worldwide in compact installations that provide a low-energy system for purifying wastewater without the generation of greenhouse gas emissions. In December 2013, Jetten and fellow collaborators from TU Delft, Wageningen University and the Royal Netherlands Institute for Sea Research (NIOZ) received a Euros 22.9 million Gravitation grant from the Dutch Ministry of Education, Culture and Science. The funds have been used to establish The Soehngen Institute for Anaerobic Microbiology (SIAM), a research institute to identify new anaerobic microorganisms with characteristics that will benefit the environment and health. The centre for excellence investigates greenhouse gas production and consumption, studies the gut microbiome to improve the health of host organisms, and is looking to establish more sustainable production processes for biochemicals in open systems. To accommodate the research of SIAM, a new bioreactor laboratory was built at Radboud University. The new laboratory contains 12 new state-of-the-art bioreactor systems to investigate anaerobic ammonium and methane-oxidizing bacteria.

The research at the new centre is already generating results. Recent highlights of the group include the isolation of a prokaryotic organelle from the anammox bacteria. Proteomic analysis showed that all proteins for the production and conversion of the rocket fuel hydrazine are located in this organelle and stable isotope assays showed that the organelle can make dinitrogen gas from ammonium and nitrite. In addition, the major S-layer protein of anammox bacteria was isolated and characterized. Furthermore, by excellent scientific sleuthing it was discovered that anammox bacteria after all do contain peptidoglycan in the cell wall. In collaboration with geoscientists from Utrecht University, the iron-dependent anaerobic oxidation of methane was observed in sediments of the Bothnian Sea, and subsequent batch incubations with stable isotope confirmed this activity in the laboratory.

REFERENCES
Tara Oceans Expedition unveils scientific results

The Tara Oceans consortium just published five scientific papers in the journal *Science* revealing the initial wave of scientific results from the first six years of the project. The findings show the extraordinary diversity of plankton in the world’s oceans, uncover many of the interactions between these organisms, and reveal how plankton impact and are influenced by the environment. This publication is accompanied by two editorials by Eric Karsenti and colleagues in EMBO’s journal *Molecular Systems Biology* that describe the history of the project and reveal some of the challenges of translating such a vast amount of data into knowledge.

The special issue of *Science* devoted to Tara Oceans includes five publications that unveil the vast amount of scientific data arising from a project that grasped the attention and imagination of both the scientists and the public. The sequencing of almost a billion genetic barcodes, short genetic sequences that help identify organisms, have revealed more than 150,000 new genetic taxa of plankton, a number that far surpasses previous expectations. The scientists also determined the “interactome” of the plankton living in the world’s oceans – the more or less complete set of interactions between bacteria, viruses and planktonic eukaryotes.

Two papers revealed the global patterns and ecological drivers of oceans’ planktonic communities as well as an oceanic “cold wash cycle” that appears to limit the number of species that manage to cross from the Indian Ocean into the South Atlantic. Temperature seems to be a crucial factor in influencing the distribution of plankton in the different parts of the world’s oceans.

The high prevalence of parasites within this ecosystem was one of the significant findings of this hidden world. For the first time, scientists now have a picture of the structure and function of much of the global ocean microbiome, which may have implications for the study of climate change.

No formal funding mechanism

Although the project is delivering results, securing funding has been a considerable challenge. The transformation of Karsenti’s initial idea into the large-scale Tara Oceans project was only made possible thanks to funders willing to take the risk of backing a self-organized community of researchers. “We had no success with finding funding from conventional sources including the European Commission. Our initiative was deemed outside the usual boundaries of funded scientific research,” says Karsenti. The interdisciplinary nature of the project proved to be a serious barrier to many sources of funding. First, if the project did make it to a stage where it was considered for funding, it was difficult to find reviewers with a suitable set of expertise and understanding of large-scale projects of this type. Second, despite a broad consensus that interdisciplinary need is for innovation and discovery, there is an acute shortage of efficient mechanisms to fund such projects.

The scientists involved in the project eventually found the solution to the funding gap. They were able to build a consortium of financial support through their own institutions and also received funding from private companies and organizations including Agnès b and Fondation Veolia. Financial support for the data analysis part of the project was eventually secured from the French “Investissements d’avenir” funding programme.

Overall, Tara Oceans sampled plankton at more than 210 sites and at multiple layers of depth in all the major oceanic regions. The scientific sampling followed protocols developed to capture the entire morphogenetic complexity of the plankton community across several orders of size (from 0.02 μm to a few mm), together with an extensive range of physicochemical parameters. Sampling typically lasted 60 hours per station. The 35,000 samples collected form the basis for extensive processing and data integration on land.

“The Tara Oceans project emerged from an early romantic idea I had in 2000: organizing a sailing expedition in the wake of Darwin’s voyage aboard the Beagle to popularize biology,” said Eric Karsenti, Director of the Tara Oceans project and Senior Group Leader at EMBL, in his editorial in *Molecular Systems Biology*. “Fifteen years after what was initially a wild dream, a treasure trove of incredibly exciting data is revealed to the scientific community.”

The research articles in *Science* describe the first foundational resources from the project (based on a first data “freeze” from 579 samples at 75 stations) and their initial analyses, illustrating several aspects of the Tara Oceans’ ecosystem biology approach. The project provides unique resources for several scientific disciplines. According to EMBO Member Peer Bork, Scientific Coordinator of Tara Oceans and Senior Scientist at EMBL: “the rich publicly available resources are likely to stimulate a wealth of research in laboratories way beyond the Tara Oceans consortium.”

The project has clearly delivered results that far exceed expectations. “No one could have predicted the wealth of information that we would uncover when we took the first few nautical miles of our journey,” says EMBO Member Chris Bowler, Scientific Coordinator of Tara Oceans, working at the Institut de Biologie de l’École Normale Supérieure in Paris. “We hope that what we have achieved may also serve as a model for other large-scale projects in the future.”

REFERENCES
Germ-free mice for European scientists

The laboratory mouse is the most commonly used mammal for human biology and disease research. Most animal house facilities in Europe raise mice under specific pathogen-free (SPF) conditions where animals are maintained in the absence of pathogens defined by the Federation of European Laboratory Animal Science Associations (FELASA). Few specialized facilities can generate and raise germ-free (axenic) mice that are devoid of any non-viral microorganism. As a member of the European Mouse mutant Archive (EMMA) – a repository that stores and distributes mouse mutant strains – the Instituto Gulbenkian de Ciência (IGC) offers to the scientific community a service of “axenization” that provides germ-free mice for specific research purposes. As part of this service, the IGC recently implemented a gnotobiology suite where germ-free mice can be infected with specific pathogens or elements of the microbiota.

In the last decade, the demand for axenic and gnotobiotic mice has risen considerably to support studies of the symbiotic interactions between the host and its microbiota. Scientists and many of the wider public are increasingly aware that disruptions in these interactions may have great impact on health. For instance, manipulation of the mouse microbiota has been crucial to discriminate between autoimmunity and inflammatory responses of the immune system linked to disease, to investigate host-commensal interactions during tissue regeneration, or to study how metabolic disorders or even behaviour are influenced by the composition of the microbiota. “Access to germ-free mice allows a completely new range of experiments to answer some long-standing scientific questions,” says Jonathan Howard, EMBO Member and director of the IGC. “The IGC is providing a service open to the scientific community and that should boost research.” Axenic mutant lines are available upon request for the biomedical research community in Europe. The IGC also offers to host scientists for short visits to carry out analysis of the germ-free mice using its technological platforms.

Last March, the research community interested in the complex relationship between the host and its microbiota gathered at the IGC to participate in the workshop “Mouse Microbiota: Genotype-Phenotype Control And Technological Challenges.” This event also addressed the infrastructure needs and experimental strategies required for the development of this thriving research field. Jocelyne Demengeot, director of the EMMA-Portugal node and scientific coordinator of the IGC vivarium says: “It is fascinating to witness the impact novel technologies are having on the revival of gnotobiology, a century old science that is now a central concern in many domains of biology.”

For further information: www.igc.gulbenkian.pt/pages/facilities.php/A=116__collection=article www.infrafrontier.eu/resources-and-services/axenic-service

Phosphatase inhibitor prevents protein-misfolding diseases

Scientists led by EMBO Member ANNE BERTOLOTTI of the MRC Laboratory of Molecular Biology in Cambridge have modified a medicine for high blood pressure into one that might tame misfolded protein diseases. The findings were published in the 10 April issue of Science.

The new molecule, called Sephin1, countered the effects of aggregating proteins in mouse models of how different types of protein-misfolding diseases such as amyotrophic lateral sclerosis and Charcot-Marie-Tooth disease. It might also work for other neurodegenerative disorders, suggests Anne Bertolotti. Moreover, Sephin1 did this by selectively inhibiting dephosphorylation of a translation factor. This was thought to be extremely challenging because phosphatases have so many substrates. In conjunction with their previous report published in Science in 2011 (Tsaytler et al., 2011), the group has provided significant evidence that targeting R15A phosphatase activity could be relevant to restore cell proteostasis.

“We have studied the cellular defence system against misfolded proteins for many years hoping that one day we could exploit these pathways for therapeutic purpose. What we have shown in mice now might ultimately benefit human health,” says Bertolotti, senior author of the study. Bertolotti was elected an EMBO Member in 2013. In 2004, she was selected as an EMBO Young Investigator and received an EMBO long Term Fellowship from 1998 – 2000, which allowed her to take up a postdoctoral position in David Ron’s team at the New York University Medical Center. “EMBO has been with me from the start,” says the French scientist. “It is through the Young Investigator network that I heard about an opening at the Laboratory of Molecular Biology – a great move which allowed me to continue to explore the unexplored.”

Preventing proteostasis diseases by selective inhibition of a phosphatase regulatory subunit

doi: 10.1126/science.aaa4484.
EMBO Workshops are original meetings that provide scientists from different fields with an opportunity to discuss common themes and exchange interdisciplinary results. Ana Losada (Spanish National Cancer Research Centre; CNIO), Christian Häring (EMBL, Heidelberg), Tatsuya Hirano (RIKEN), and Jan-Michael Peters (IMP) arranged this intensive exchange of research results and ideas. The scientific workshop, jointly organised by the IMP and EMBO, attracted some of the world’s leading experts on SMC proteins to the IMP at the Vienna Biocenter.

Proteins of the SMC (Structural Maintenance of Chromosomes) family are one of the most fundamental classes of chromosomal organizers and are found in all organisms, from bacteria to humans. They are involved in a wide variety of chromosomal processes, including cell division, DNA repair and gene regulation. The talks and discussions spanned the entire spectrum from basic research to future therapeutic concepts for human medicine.

SMC proteins play crucial roles in the function of all life forms – from yeast to humans. The fact that they are widespread also means that there are serious consequences when they do not function properly. Defects in SMC proteins have been linked to human developmental syndromes and mutations in SMC proteins are frequently observed in certain types of cancer. Life scientists from the fields of structural biology to human genetics are therefore interested in understanding how SMC proteins work and their link to human disease.

The first SMC complexes were identified and described about 20 years ago. EMBO Member Kim Nasmyth, the institute’s director from 1997 to 2006, carried out pioneering research at the IMP in Vienna. Together with Doug Koshland in the United States, he discovered the cohesin-complex in the yeast *Saccharomyces cerevisiae*. EMBO Member Jan-Michael Peters, scientific director of the IMP since 2013, has been studying cohesin in human cells for many years. This long-standing focus makes the IMP an ideal meeting-point for leading experts in the area of SMC proteins.

Around 140 researchers – from New Zealand to Canada – attended the workshop at the IMP. The guests included EMBO Member Kim Nasmyth (University of Oxford), Doug Koshland (University of California, Berkeley), EMBO Associate Member Mitsuhiro Yanagida (Okinawa Institute of Science and Technology), EMBO Member Frank Uhlmann (Crick Institute, London), EMBO Member Jan Lowe (MRC Lab of Molecular Biology, Cambridge), EMBO Member David Sherratt (Department of Biochemistry, University of Oxford), Barbara Meyer (Berkeley), EMBO Associate Member Yoshinori Watanabe (University of Tokyo), Katsu Shirahige (University of Tokyo), Xiaolan Zhao (Memorial Sloan Kettering Cancer Center, New York), and Tatsuya Hirano (RIKEN Institute, Japan).

The IMP in Vienna is a basic biomedical research institute largely sponsored by Boehringer Ingelheim. With over 200 scientists from 35 nations, the IMP is committed to scientific discovery of fundamental molecular and cellular mechanisms underlying complex biological phenomena. Research areas include cell and molecular biology, neurobiology, disease mechanisms and computational biology. The IMP is a founding member of the Vienna Biocenter.
**EMBO EVENTS | JULY 2015 – OCTOBER 2016**

**Workshops**

- **Cell and developmental systems**
  - CH-Arolla, 18–22 August 2015
- **Cell cycle**
  - HU-Budapest, 4–7 September 2015
- **Mitochondria, apoptosis and cancer**
  - MAC 2015
- **DNA topoisomerases, DNA topology and human health**
  - CH-Ascona, 13–17 September 2015
- **Molecular mechanisms of muscle growth and wasting in health and disease**
  - DE-Munich, 14–17 September 2015
- **Mitochondrial DNA and neurodegeneration**
  - ES-Sitges, 23–25 September 2015
- **Stem cell mechanobiology in development and disease**
  - IT-Capri, 18–21 October 2015
- **Cell division: Molecular machineries and cancer targeted therapies**
  - ES-Baiona, 19–21 October 2015
- **Telomeric chromatin and telomere fragility**
  - SG-Singapore, 7–10 December 2015
- **Protein synthesis and translational control**
  - DE-Heidelberg, 9–13 September 2015
- **Ubiquitin and ubiquitin-like modifiers: From molecular mechanisms to human diseases**
  - HR-Cavtat, 14–18 September 2015
- **Signalling in plant development**
  - CZ-Prague, 13–17 September 2015
- **Polarized proteins: From molecules to humans**
  - FR-Paris, 29–30 September 2015
- **The DNA damage response in cell physiology and disease**
  - GR-Cape Sounio, 5–9 October 2015
- **Exploring the genomic complexity and diversity of eukaryotes**
  - ES-Sant Feliu de Guixols, 17–20 October 2015
- **Neural development**
  - TW-Ijaar, 4–8 December 2015
- **From host genomes to microbiome: Immunity in the genomic era**
  - IL-Rehovot, 14–16 February 2016
- **Visualizing biological data (VIZBI 2016)**
  - DE-Heidelberg, 9–11 March 2016
- **Imaging the brain**
  - PL-Warsaw, 18–21 May 2016
- **Cellular signalling and cancer therapy**
  - HR-Cavtat, 27–31 May 2016
- **Gene transcription in yeast: From chromatin to RNA and back**
  - ES-Sant Feliu de Guixols, 11–16 June 2016
- **The biochemistry and chemistry of biocatalysis: From understanding to medical exploitation**
  - PL-Pilsudski, 4–8 October 2015

**Conferences**

- **Ribosome synthesis**
  - BE-Brussels, 19–23 August 2015
- **Aquatic microbial ecology**
  - SE-Uppsala, 23–28 August 2015
- **Meiosis**
  - UK-Oxford, 30 August–4 September 2015
- **Physics of cells: From molecules to systems (PhysCell 2015)**
  - DE-Bad Staffeinstein, 10 August–4 September 2015
- **Autophagy signalling and proliferation in health and disease**
  - IT-Cavtat, 9–12 September 2015
- **Cell therapy today: Achievements, hopes and hype**
  - UK-Manchester, 9–12 September 2015

For complete and up-to-date list of EMBO events please go to [events.embo.org](http://events.embo.org)

ORGANIZERS: APPLY NOW FOR:

- **2016 funding for courses, workshops and conferences by 1 August 2015**

Keynote lectures given by EMBO members at major international scientific meetings in 2015 by

- **1 February, 1 June and 3 October**

For further information see: [www.embo.org/funding-awards/courses-workshops](http://www.embo.org/funding-awards/courses-workshops)

©2015 EMBO
Excellence is a choice

The French microbiologist EMMANUELLE CHARPENTIER is a pioneer of CRISPR-Cas9 technology, a prize-winning tool for gene editing. Viewed as a revolution in biology, it is already used in a wide variety of applications in laboratories worldwide. Professor Charpentier will present her research at the upcoming EMBO | EMBL Science and Society Conference in November. In an interview with EMBOencounters she speaks about her life-changing discovery and what it is like to suddenly step into the full public spotlight.

How has your life changed after your breakthrough discovery in 2012?

Over the last two years, the research of my laboratory has been awarded with a number of prizes. I am quite amazed by the strong and fast support received from the scientific community for our achievements on CRISPR-Cas9. This all happened while I was establishing my new laboratory in Germany. The change of environment helped me keep my feet on the ground because I needed to deal with substantial activities around my integration in the new institution, such as administrative and logistic issues and recruitment to establish a new team. The prizes surely highlight the fundamental nature of our research that has been translated at dazzling speed into biomedical and biotechnology applications on a large-scale. This is a critical message to convey to the governmental and funding organizations that, once again, it all comes down to basic science: the investigation of new mechanisms, the basis for the development of novel therapeutic strategies or biotechnologies.

Were you aware at that time that this is a game-changing method?

I understood very quickly that if CRISPR-Cas was to be exploited as a tool for genome silencing and engineering, then the CRISPR-Cas9 system would provide the best opportunities for application – because it is the simplest of the CRISPR-Cas systems existing in bacteria. This was later confirmed by seminal experiments done with my student Krzysztof Chylinski showing that the enzyme Cas9 just needs a duplex of RNA to cleave DNA. I had even predicted early on that the system could be harnessed to treat human genetic disorders, which the Swiss-based company CRISPR Therapeutics that I cofounded together with Rodger Novak and Shaun Foy now focuses on.

How do you define scientific success?

To me scientific success can be measured on different levels. Surely, ultimate success is linked to an unexpected finding that can result in a scientific breakthrough: to be able to identify a high-impact biological mechanism, not only a purely theoretical one but one that opens up new applications on a global scale. Scientific success can also be measured by activities around science per se, which most scientists also focus on: successful contribution to teaching, the transmission of knowledge and science, training and mentoring of younger scientists, promoting of a field of research.

Do you think the technique will soon become faster and cheaper to be performed on a wide medical scale?

Yes. There are already signs of progress. Scientists either buy the chips sold by some companies or they order cost-free the plasmids that provide the components of the system (protein and RNA). Then they only need to design the RNA molecule that is part of the CRISPR-Cas9 component to create the tool. It is already cheap and this is why it has spread so quickly to research benches all over the world. A small lab running with limited funds can apply the system. CRISPR-Cas9 gene editing has become very democratic.

You are popular with the media. Do you enjoy standing in the limelight?

This is not a natural exercise for a scientist. However, I feel that CRISPR-Cas9 is an excellent example of a scientific breakthrough originating from pure basic science to highlight to the public and media: blue sky research. There are no old or obsolete topics – one can discover interesting findings in many fields of research. The main focus of the research in my laboratory is to understand molecular and cellular mechanisms of regulation in human host-bacterial pathogen interactions that could ultimately be exploited for the development of novel therapeutic strategies for the treatment of infectious diseases. My initial interest in the CRISPR-Cas9 story was to study small RNA-mediated mechanisms relevant to the virulence and adaptation of the human pathogen Streptococcus pyogenes. It is a wonderful feeling to have highlighted a mechanism that has such a broad range of applications in biomedicine.

Are there any things that you would have done differently if you had a second chance?

I wish that better support would be provided to scientists in Europe with regard to intellectual property issues and the potential commercial applications of research. The US is very active in the field of intellectual property and commercial benefits of discoveries.

Was it challenging to start thinking about funding? You managed to collect 18.5 million euros to found CRISPR Therapeutics.

This was a matter of gathering the right team around me. I was just lucky to know Rodger Novak and Shaun Foy, who have long-term experience and expertise in the biotech, pharma and venture capital world. We cofounded CRISPR Therapeutics, which has raised 89 million Euros in series A and B financing rounds. The operations of the company are now located in London and Cambridge, Massachusetts. I do not have an operational role in the company but advise on the science.

What will be your topic at the EMBO | EMBL Science & Society Conference?

I will explain the principle of CRISPR-Cas9 to the audience, and present recent developments and applications of the technology, including potential therapies. I will also highlight some ethical concerns that were recently raised with respect to germ line modifications. In these regards, it is critical that the public, scientists, clinicians, developers and ethical specialists understand the technology and appreciate its great benefits for biotechnology and medicine.

16th EMBO | EMBL Science and Society Conference Emerging biotechnologies: Hype, hope, and hard reality

DE-Heidelberg | 5 – 6 November 2015 | A. Bendiscioli
http://events.embo.org/science-society-conference/
Genomic Medicine in Australia

The GARVAN INSTITUTE OF MEDICAL RESEARCH in Sydney is one of the first institutes in the world to acquire DNA sequencing machines that can sequence a whole genome for a cost less than US$ 1000. The sequencing capabilities are part of its Kinghorn Centre for Clinical Genomics, a facility established in 2012 to further the use of genomic information in research and patient care.

The Garvan Institute announced the acquisition of the HiSeqX Ten sequencing platform early last year, a genome sequencing system that allows the centre to sequence up to 18,000 whole human genomes per year.

“I believe we have reached a tipping point where genome sequencing has become achievable on a population scale,” says EMBO Associate Member John Mattick, Executive Director of the Garvan Institute. “Just over a decade ago, it cost over a billion dollars to sequence the first human genome. Illumina’s new system makes it possible to address the pressing clinical needs of the thousands of people in Australia with genetic diseases and the tens of thousands diagnosed with cancer each year.”

Clinical genomics is a rapidly evolving field focused on the use of genome sequencing information in patient diagnosis and treatment. In 2012, The Garvan established the Kinghorn Centre for Clinical Genomics as an Australian research and sequencing centre to deliver and interpret genome sequences for research and clinical use. Mattick believes this initiative must be at a national level and involve international partners due to the need of massive global databases to support the interpretation of the data. In May 2014, the Centre became a genomics node of BioPlatforms Australia, a research infrastructure organization that helps to expand access to breakthrough technologies. The Garvan has partnered with BioPlatform facilities AGRF (Australian Genome Research Facility) and the Ramaciotti Centre for Genomics to streamline access to whole genome sequencing for Australian researchers.

Researchers at the Kinghorn Centre for Clinical Genomics are investigating cancer and monogenic diseases, as well as complex diseases such as diabetes, osteoporosis and immune-related diseases. The Centre acts to integrate and translate genomic research into the clinic, in partnership with clinician researchers around the country and beyond.

“My expectation is that genomic sequencing will become widely available for personal health management in the near future,” says Mattick. “With the advice of a physician, we should see improvements in avoiding adverse drug reactions, progress in understanding and reducing the risk of diseases like diabetes, stroke and other conditions. We are in the early stages of the transformation of medicine from the art of crisis management to the science of good health.”

Great questions in life sciences

What can we learn about ourselves by sequencing our genomes? How do intricate structures emerge in living cells? Is it possible to visualize electrical signals in an intact brain? These and other fascinating questions are explored by top researchers in a series of videos called GREAT QUESTIONS IN LIFE SCIENCES. The series offers a unique glimpse into cutting edge research at the intersection of physics, computation, and biology.

Great Questions is part of a large library of videos produced by iBiology (www.ibiology.org), an educational project that records talks from the world’s leading biologists and makes them freely available online. The videos aim to offer deeper insights into the process of research and make science and scientists accessible to audiences around the world, particularly people who would otherwise have limited opportunities to see talks from renowned scientists. iBiology has produced 350 videos to date, with over 150 of the talks subtitled in English and more than 50 with Spanish subtitles. So far viewers from over 170 countries and territories have visited the portal.

iBiology videos target a broad audience, from undergraduate to graduate students and postdoctoral researchers, and the topics range from cell biology to neuroscience to evolution (see also article in EMBOencounters issue 26). In addition to research lectures, the video collection also features talks that highlight the human side of research and offer resources for teaching science in the classroom.

The portal is making a concerted effort to feature more European scientists. Earlier this year, iBiology released a research talk by EMBO Member Pascale Cossart. In the three-part video series, the French biologist begins with an overview of microbiology and then focuses on the bacterium Listeria monocytogenes, a food-borne, intracellular pathogen. She explains how Listeria enters epithelial cells, moves around inside them, and spreads between cells. In her final talk, Cossart reviews the many cellular processes impacted during infection with Listeria.

Cossart’s talks were recorded at the European Molecular Biology Laboratory (EMBL) as part of a collaboration between EMBL, EMBO and iBiology. In June 2015, videos for a synthetic biology course were recorded at EMBL Photolab and will be posted online later in the year. This helps expand the collection of international speakers and helps EMBO disseminate research being done by its members and colleagues.
Ways to a good – Publications from the EMBO Community

EMBO MEMBERS, YOUNG INVESTIGATORS & FELLOWS

Cell-intrinsic adaptation of lipid composition to local crowding drives social behavior
Howard Riezman (EMBO Member), Mathieu Frechin (EMBO Fellow) and colleagues
Nature 25 May 2015 doi:10.1038/nature14429

Selective, rapid and optically switchable regulation of protein function in live mammalian cells
Jason Chin (EMBO Member), Yu-Hsuan Tsai (EMBO Fellow) and colleagues

The microRNA-200 family regulates pancreatic beta cell survival in type 2 diabetes
Markus Stoffel (EMBO Member), Bengt-Fredrik Belgardt, Kahan Ahmed (EMBO Fellows) and colleagues

“A Cold Spring Harbor in Europe,” EURATOM, UNESCO and the Foundation of EMBO
Francesco Cassata

Histone H3.3 is required for endogenous retroviral element silencing in embryonic stem cells
Simon J Elsässer (EMBO Fellow) and colleagues
Nature 14 May 2015 doi:10.1038/nature14345

Structures of actin-like ParM filaments show architecture of plasmid-segregating spindles
Jan Lowe (EMBO Member), Tanmay A. M. Bharat (EMBO Fellow) and colleagues
Nature 12 April 2015 doi:10.1038/nature14356

ATP synthase promotes germ cell differentiation independent of oxidative phosphorylation
Ruth Lehmann (EMBO Associate Member), Felipe K. Teixeira (EMBO Fellow) and colleagues
Nature Cell Biology 27 April 2015 doi:10.1038/hh.165

Preventing protostasis diseases by selective inhibition of a phosphatase regulatory subunit
Anne Bertolotti (EMBO Member) and colleagues
Science 10 April 2015 doi:10.1126/science.aac4484

Activity of defined mushroom body output neurons underlies learned olfactory behavior in Drosophila
Scott Waddell (EMBO Member) and colleagues
Neuron 19 April 2015 http://dx.doi.org/10.1016/j.neuron.2015.03.025

MAD2L2 controls DNA repair at telomeres and DNA breaks by inhibiting S’ end resection
Jacqueline J.L. Jacobs (EMBO Young Investigator) and colleagues
Nature 23 March 2015 doi:10.1038/nature14136

Pharmacological inhibition of PI3K reduces adiposity and metabolic syndrome in obese mice and rhesus monkeys
Manuel Serrano and colleagues
Cell Metabolism 2015 doi:10.1016/j.cmet.2015.02.017

Quantitative gene profiling of long noncoding RNAs with targeted RNA sequencing
John S Mattick (EMBO Associate Member) and colleagues
Nature Methods 9 March 2015 doi:10.1038/nmeth.3321

A vitamin D receptor selectively activated by gemini analogs reveals ligand dependent and independent effects
Davide Metzger and colleagues

RESEARCH HIGHLIGHTS – AWARDS

Awards of excellence
EMBO MEMBERS

InBev-Baillet Latour Health Prize
Bruce M Spiegelman of the Dana-Farber Cancer Institute and Harvard Medical School Center for Life Sciences, Boston, United States was awarded the InBev-Baillet Latour Health Prize for his work in the field of metabolic disorders, the theme of the prize for 2015. He was recognized for original contributions relating to the differentiation and function of adipose tissue and its role in pathophysiology. This annual prize worth 250,000 Euros is the most important international science award in Belgium. The theme of the prize for 2016 will be infectious diseases.

NAS Award for Scientific Reviewing
Thomas D. Pollard of Yale University received the 2015 NAS Award for Scientific Reviewing from the US National Academy of Sciences. The award was established in 1979 “to recognize authors, whose reviews have synthesized extensive and difficult material, rendering the course of scientific thought.” Pollard was awarded for his reviews describing the molecular mechanisms of actin and cell motility.

The chromatin remodeler Brg1
Thomas D. Pollard

Canada Gairdner International Award
Michael Hall from the Biozentrum, University of Basel, has been awarded the Canada Gairdner International Award 2015. The award recognizes his discovery of the protein kinase TOR – Target of Rapamycin – and its role as a key regulator of cell growth. The prize is endowed with 100,000 Canadian dollars.

Liliane Bettencourt Prize for Life Sciences
Scott Waddell has received the Liliane Bettencourt Prize for Life Sciences 2014. Each year, the Bettencourt-Schueller Foundation awards the prize to a young researcher under 45, recognized in the scientific community for the quality of his or her international publications. Since 1997, 19 researchers have received this prize.

Distinguished Women in Chemistry or Chemical Engineering Award
Lucia Banci of the University of Florence, Italy, received this award from the International Union of Pure and Applied Chemistry. The prize was created in 2011 to acknowledge and promote the work of women chemists/chemical engineers worldwide. This year, twelve awardees have been selected.

Australian Academy of Health and Medical Sciences
Frank Gannon has been elected a fellow of the Australian Academy of Health and Medical Sciences this year. The academy was established in June 2014 with 15 initial fellows and council members. This year, 116 new fellows from institutions all around Australia joined the organization.

Prix Galien Greece
George Kollias of the Medical School of Athens has been awarded the Galien Scientific Research Award for his contributions towards the development of biological anti-TNF therapies for rheumatoid arthritis and the discovery of novel disease pathways in animal models of chronic inflammation and autoimmunity.

Royal Society of Edinburgh Ian Chambers of the University of Edinburgh was elected Fellow of the Royal Society of Edinburgh.

Ernst W. Bertner Memorial Award
John Mattick was awarded the 2014 University of Texas MD Anderson Cancer Center Ernst W. Bertner Memorial Award for Distinguished Contributions to Cancer Research.

EMBO YOUNG INVESTIGATORS

Philip Leverhulme Prize
Thomas Richards of the University of Exeter was awarded the Philip Leverhulme Prize in Biological Sciences worth 100,000 British Pounds. The Leverhulme Trust awards the prizes in recognition of researchers at an early stage of their career whose work has already had a significant international impact, and whose future research career is exceptionally promising. Richards wants to use his award to develop new approaches to link genome data with methods to understand how microbial cells function in their environment.

Congratulations to EMBO Members, Young Investigators and Installation Grantees who received the Consolidator Grants awards by the European Research Council for 2014. The full list of names can be found at http://erc.europa.eu/sites/default/files/documents/file/erc_2014_cog_results_is.pdf

Next issue EMBOencounters

The next EMBOencounters issue – Autumn 2015 – will be dispatched in October 2015. Please send your suggestions, contributions and news to communications@embo.org by 14 September.
EMERGING BIOTECHNOLOGIES
HYPE, HOPE and HARD REALITY

5–6 NOVEMBER 2015
EMBL ATC, Heidelberg, Germany

THURSDAY 5
Biotechnologies and human health
Governance
Ethics
Safety and regulatory issues

FRIDAY 6
Things you can make with biotechnologies
Biotechnologies and the environment

SPEAKERS, CHAIRS & PANELLISTS
Keynote speaker
Emmanuelle Charpentier FR
Bernadette Bensaude-Vincent FR
Christopher Coenen DE
Paolo De Coppi UK
Victor de Lorenzo ES
Kieron Flanagan UK
Maureen McKelvey SE
Luigi Naldini IT
Carsten Nowak DE
Anne Osbourn UK
Sven Panke CH
Dirk Stemmering NL
Joyce Tait UK
Simon Warner UK
Siobhán Yeats DE

Registration fee €40
Students €20

events.embo.org
/science-society-conference