

Mirror neurons enhance human understanding

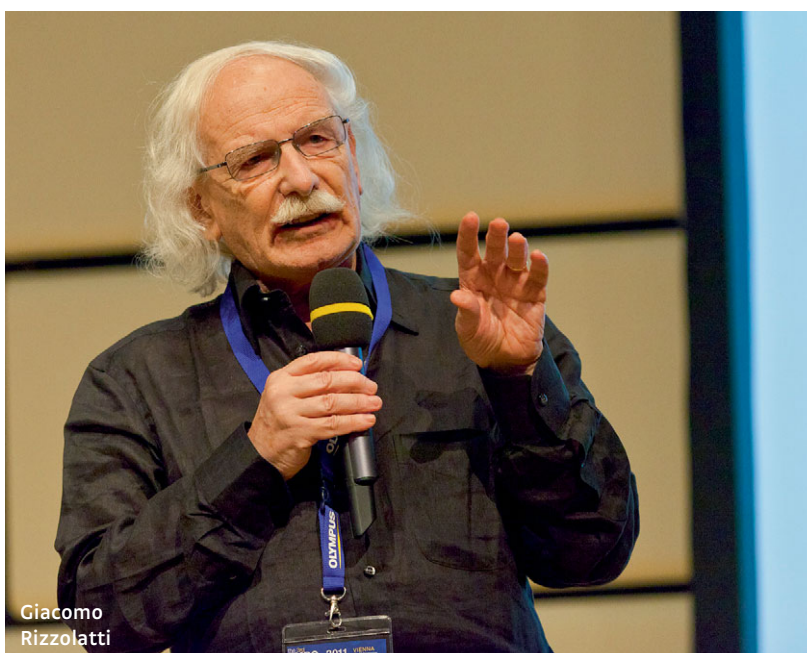
Giacomo Rizzolatti at *The EMBO Meeting 2011*

► *Giacomo Rizzolatti* is careful to point out that there was no *eureka!* moment in the discovery of mirror neurons. Rather, the professor of Human Physiology says the story is one of chance observation followed by healthy skepticism and careful research. His work with his team at the University of Parma, Italy over the past decade has demonstrated the remarkable function and importance of these unusual components of the brain.

As he explained during his special lecture at *The EMBO Meeting 2011*, mirror neurons fire whenever you perform an action with a goal: you pick up a glass to drink, for example. Even more remarkably, when you watch someone else performing the same action, your own neurons fire; you have a “copy of the action inside yourself” and this allows you to understand implicitly what the other person is doing. Your brain mirrors their behaviour.

The function of mirror neurons is distinct from that of motor neurons, which fire whenever you move a muscle, regardless of the action you are performing. Mirror neurons fire not because of movement, but because of the purpose of that movement—the action as a whole. Rizzolatti treated the audience to some videos of the research that led to this insight: monkeys undertook or watched simple grasping tasks while their mirror neurons buzzed with activity. When the demonstrator only pretended to grasp an object, the monkey also understood this and its mirror neurons remained silent.

Rizzolatti has been studying autistic children, who can reason what another person is



Giacomo Rizzolatti

Photos by Rainer Mirau Photography | Austria

doing, but have no mirror neuron response to the actions or emotional responses of others. This means that they have to think all the time and command their body to respond or take action. There is no built in copy of stock behaviours. This clearly has important implications for understanding autistic-spectrum disorders.

Much remains to be discovered about the role of mirror neurons in allowing humans to understand one another. Rizzolatti suggested that mirror neurons may have driven language development, as they allow two people to share an understanding of an activity. For example, we would still know implicitly what someone else is doing when they drink water, even if we had no word to describe their behaviour. Inventing simple words for those actions may have been the first steps towards verbal communication.

BY SAM CADDICK

See *The EMBO Meeting* YouTube channel for a clip from Giacomo Rizzolatti's talk and an interview with him:

www.youtube.com/user/embomeeting

HIGHLIGHTS

The EMBO Meeting 2011

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Farewell to Jan Taplick

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Nobel Laureates named

Congratulations to EMBO Member **Jules A. Hoffmann** and EMBO Associate Member **Bruce A. Beutler**, awarded the Nobel Prize in Physiology or Medicine 2011 for their discoveries concerning the activation of innate immunity. They share the prize with **Ralph M. Steinman** for his discovery of the dendritic cell and its role in adaptive immunity. See page 16 for more awards of excellence.

Protein-based mechanisms of inheritance

Susan Lindquist's keynote lecture at *The EMBO Meeting 2011*

It is not only DNA that passes on traits to the next generation, but cellular proteins too, the 2010 US National Medal for Science award winner *Susan Lindquist* told participants at *The EMBO Meeting 2011* in her keynote lecture in Vienna.

Lindquist, who is a Howard Hughes Medical Institute Investigator and Professor of Biology at MIT, told *The EMBO Meeting* that she focuses on two mechanisms by which cells pass on environmentally acquired traits. One is prions which, through their protein folding mechanism, provide immediately inherited new traits. The other is Hsp90, a protein chaperone that has a capacity to influence the expression of new traits that have to be assimilated through additional genetic changes.

"Both of these work on the fact that protein homeostasis – the ability of proteins to fold and find their correct folds – is a very



difficult thing inside a living cell," Lindquist said. "The proteins have to find their shapes in the crazy, ridiculous environment of the living cell."

If proteins do not get their folds right, they are useless or can even do a great deal

of harm. She described how kinetic energy in the cell makes protein folding difficult and that cell homeostasis can tip easily towards disaster. This leads to protein folding diseases such as Alzheimer's and cystic fibrosis.

Lindquist found that the chaperone Hsp90 potentiates and buffers the effects of genetic variation, fuelling evolutionary mechanisms as diverse as malignant transformation and the emergence of drug resistance. Her work has established the molecular basis for protein-based mechanisms of inheritance.

See *The EMBO Meeting* YouTube channel for a clip from Susan Lindquist's talk and an interview with her:

www.youtube.com/user/embomeeting

www.youtube.com/user/embomeeting



Evan Eichler

element activity and aggressive processes for DNA removal. None of this change is randomly distributed in either genome location or lineage of occurrence. These dynamic processes create a hyperevolving genome that is dramatically resistant to functional change, with some notable exceptions.

Paul Rainey described experiments using bacterial populations in which bet-hedging types evolved during the course of selection. Drawing upon findings from genetics and genome resequencing, he outlined the series of mutations (and their phenotypic effects) that underpinned the emergence of the bet hedging types.

Michael Stratton told the audience how recent efforts to sequence a wide range of cancer genomes are helping to generate catalogues of somatic mutations that have a role in cancer development. Stratton's lab, along with others around the globe, is using this genomic information to improve our understanding of cancer.

From bacteria to humans

Genome evolution at *The EMBO Meeting 2011*

The plenary session on genome evolution in organisms from bacteria to humans took place on Sunday at *The EMBO Meeting*. The session covered genome evolution over large time scales, as well as the genomic alterations behind the development of cancer in a single person.

Session chair *Jane Langdale* introduced the speakers, all working on genomes in different organisms. "We're in a position now that we have enough sequencing data on genomes to start making some exciting comparisons between them," she said.

First at the podium was *Evan Eichler*, who showed that the structural variation of the genome is an important aspect in our understanding of human disease and evolution. He talked about the genome-wide discovery, analysis and distribution of copy-number and structural variants within the normal human population with a particular emphasis on resolving these events at the single basepair level.

Jeff Bennetzen said that flowering plant genomes change rapidly due to frequent polyploidy, recurrent bouts of transposable



Jeffrey Bennetzen

Microbes are everywhere

Host & Microbes at *The EMBO Meeting 2011*



Photo by Rainer Mirau Photography / Austria

After the welcome and opening address, *The EMBO Meeting 2011* kicked off on Saturday night with the plenary lecture session on *Hosts & Microbes*. Session chair *Pascal Cossart* emphasized the fundamental importance of microbes, not only as cloning tools or protein production factories in molecular biology laboratories, but as organisms where many crucial cellular processes were identi-

fied. “Microbes are everywhere and we now start to recognize their contribution as essential microbiota,” she said.

First up was *Paul Schulze-Lefert*, who discussed the structure and composition of the *Arabidopsis* microbiome in the rhizosphere as well as inside the root, which is determined by the soil type and host genotype.

Lucy Shapiro talked next about how a simple bacterial cell can function as a living system. She illustrated this with the spatial and systemic regulation of the asymmetric cell division of *Caulobacter* and presented evidence for an intricate, conserved regulatory network in these cells.

Bonnie Bassler discussed her research into quorum sensing in bacteria. Quorum sensing

is a process regulated by cell density and results in a ‘group decision’ that can control a range of behaviours from biofilm formation to pathogenicity. Quorum sensing can be manipulated to control bacterial pathogenicity.

Brett Finlay then showed that intestinal microbiota not only change their composition during diarrhea, but that the pre-existing bacteria also affect host susceptibility to the disease. He described how this was not only true for enteric diseases, but also for asthma.

BY ANNEKE FUNK

See *The EMBO Meeting* YouTube channel for a clip from Bonnie Bassler’s talk and an interview with her:

www.youtube.com/user/embomeeting

Fruit flies, roundworms and rats

Brain & Behaviour at *The EMBO Meeting 2011*

In his keynote lecture at *The EMBO Meeting*, Nobel Laureate *Richard Axel*, from the Howard Hughes Medical Institute and Department of Neuroscience at New York’s Columbia Medical Center, presented a brief insight into his research on olfaction. The study of the olfactory system provides insights into the nature of sensory representations and their influence on behaviour. Axel’s team use two model species, the mouse and the fruit fly, to explore the pathways of odour perception and recently performed *in vivo* optical imaging of responses at the next stage of olfactory processing – the piriform cortex and the amygdala.

In the *Brain & Behaviour* plenary session, *Cori Bargmann* from Rockefeller University, New York, talked about the social behaviour, chemical communication and microevolution of the roundworm *C. elegans*. Her research shows that stressful environments induce aggregation behaviour in *C. elegans*, making them flock and work together. Bargmann discussed the genetic pathways that control this social behaviour and revealed how fixed circuits generate flexible behaviours.

Florian Engert from the Harvard University’s Department of Molecular and Cellular Biology, presented a spectacular swim simulator that enables paralyzed zebrafish larva to navigate a virtual environment. The experiment, designed to study adaptive motor learning in the fish, monitors neural activity in the brain in response to various stimuli. Measurements performed with electrodes placed at the head and the tail detect behavioural changes in real time.

David Anderson from the Howard Hughes Medical Institute in Pasadena talked about the genetic dissection of emotion circuits in mice and flies, with the goal of finding model systems to study the evolution of emotion. His group is interested in the aggression organization of circuitry in the brain and the anatomical location of neurons that mediate attack behaviour. The group discovered that the ventrolateral portion of the hypothalamus’s ventromedial nucleus is important in attempting to map aggression.

Edvard Moser of the Norwegian University of Science and Technology, Trondheim, presented his work on the transition dynamics

of hippocampal memory retrieval and general principles of neural network computation in the mammalian cortex. Working with a ‘teleportation’ protocol, Moser found that there is evidence of multiple maps of place cells in a rat’s hippocampus. He showed that instantaneous transformation of spatial context generates competitive flickering between preformed memory representations in hippocampal cell ensembles. Moser and his team have also discovered that there are two types of cells involved in the process of spatial cognition: the place cells in the hippocampus and the grid cells in the entorhinal cortex. The patterns of activity of grid cells are thought to encode a map and to measure the spatial environment.

BY EVA-MARIA GRUBER

Science Writer

Having a PhD is not enough

Career Day at The EMBO Meeting 2011

► Saturday was Career Day at *The EMBO Meeting*, offering a mix of workshops, lunches and mentoring sessions for young scientists to learn about the variety of options available to them both in and outside academia. *EMBOencounters* gathered impressions on the success of Career Day from students and mentors.

Barbara Janssens, mentor *Job Applications* workshop: “The participants were very interactive and encouraging. They especially enjoyed the mock interviews and applications and getting feedback on their own CVs.”

Sebastian Wienerroither, attendee *Pursuing an Academic Career* lunch: “This was really worth my time. I got some new ideas for how and with whom to discuss my current research and also how to choose the best journal in which to publish. To me, getting these sorts of insights from established group leaders who are leaders in their fields is invaluable.”

Sam Caddick, mentor *Making Science Make Sense* workshop: “It was great to see so many scientists interested in communicating their research to the public and making what they do relevant to society. If the attendees of my workshop were representative of the quality of young scientists, the future is in safe hands. They were thoughtful, enthusiastic and very smart!”



Natascha Bushati, attendee *Job Applications* workshop: “*Barbara Janssens* and *Gerlind Wallon* both did a great job in giving useful advice, such as to always have an up-to-date CV (you never know when someone might ask for it), to network in an intelligent manner (know who has the power to hire you – it won’t be HR!), and stand out from the crowd by being involved in relevant extracurricular activities (as everyone applying for the job will have a PhD – that’s not enough).”

Rayna Stamboliyska, attendee *Expanding Career Options* lunch: “I was wondering whether a career in academia would suit me. After attending the *Expanding Career Options* lunch, my horizons widened. If you don’t know what exists beyond academia, you

should definitely attend the *Expanding Career Options* lunch: it is defined by open-minded people with great expertise and many curious PhDs. I learnt a lot in a very short time and now I can approach a job search with serenity.”

Freddie Frischknecht, mentor *Pursuing an Academic Career* lunch: “The atmosphere was great. On one hand there were students who had not given much thought to careers and on the other, those who really craved answers. I told them to network, meet scientists and try to learn as much as possible during their PhD. It is vital that they figure out what interests them.”



Photos by Rainer Mirau Photography / Austria

Facts & figures

The EMBO Meeting 2011 in numbers

3,550 muesli bars consumed

2,587 litres of water drunk

2,084 Facebook “likes”

1,183 pears consumed

1,200 attendees

628 accepted abstracts

379 attendees at conference party

55 countries represented

50 exhibiting companies

30 sponsors

2 corporate partners



Smile, you're on YouTube

Film crew at *The EMBO Meeting 2011*



Photo by Rainer Mirau Photography / Austria

While bloggers in their blue T-shirts are a familiar sight now at *The EMBO Meeting*, what was new to attendees this year was a film crew in action for all four days of the conference. Working to a tight schedule, they filmed, edited and uploaded videos to the conference's YouTube channel – all within 24 hours of filming.

Katja Linssen of EMBO Communications was the producer behind the short clips. She and *Stefanie Trambow's* film crew, all from Berlin, filmed and edited 11 separate clips during the course of the conference.

She says the process was exhausting but exhilarating. "It was very hard work, but the film crew were extremely professional. It

made it all worth it to see the film clips loaded on the YouTube channel just a few hours after we finished filming."

Rafael Bento, science blogger and PhD at University of São Paulo says the videos gave a real taste of *The EMBO Meeting*, with its characteristic variety. "I couldn't go this year, but the videos inspired me to try to attend the next conference."

See www.the-embo-meeting.org for a round-up of all the videos made during *The EMBO Meeting* and our YouTube channel (www.youtube.com/user/embomeeting) for additional videos.

the4th
EMBO
meeting

The EMBO Meeting 2012 takes place in Nice from 22–25 September. Follow our website for regular updates on speakers, the programme and events.



Photo by Rainer Mirau Photography / Austria

The Natural History Museum, Vienna, sparkles at *The EMBO Meeting* conference party

PRACTICAL COURSES

Imaging infection: From single molecules to animals
ZA-Pretoria, 2–13 November 2011

Computational structural biology: From data to structure to function
UK-Hinxton, 14–18 November 2011

Single-cell gene expression analysis
DE-Heidelberg, 19–23 March 2012

Advanced optical microscopy
UK-Plymouth, 21–31 March 2012

Computational structural biology: From data to structure to function
UK-Hinxton, 16–20 April 2012

Mass spectrometry and proteomics
DK-Odense, 18–25 April 2012

Analysis of small non-coding RNAs: From massively parallel sequencing to in-situ hybridization, from discovery to validation
DE-Heidelberg, 21–27 April 2012

Computational molecular evolution
GR-Heraklion, 29 April–10 May 2012

Bioinformatics and comparative genomes analyses
IT-Napoli, 7–19 May 2012

Biomolecular simulation
FR-Paris, 18–24 May 2012

The structural characterization of macromolecular complexes
FR-Grenoble, 4–9 June 2012

Plant bioinformatics: Going -omics
UK-Hinxton, 11–15 June 2012

Electron microscopy and stereology in cell biology
CZ-Ceské Budejovice, 12–22 June 2012

Electron tomography in life science
NL-Leiden, 18–23 June 2012

Plant-microbe interactions
UK-Norwich, 18–29 June 2012

The application of transient kinetics methods to biological macromolecules
UK-Canterbury, 24–30 June 2012

3D developmental imaging
PT-Oeiras, 29 June–7 July 2012

Molecular genetics with fission yeast
FR-Paris, 2–13 July 2012

Correlative light electron microscopy
UK-Bristol, 15–21 July 2012

Multidimensional NMR in structural biology
DE-Goettingen, 12–17 August 2012

Lipid mass spectrometry and lipidomics
UK-Swansea, 19–24 August 2012

Cryo-electron microscopy and 3D image processing
DE-Heidelberg, 26 August–2 September 2012

PRACTICAL COURSES (cont.)

Microscopy, modelling and biophysical methods
DE-Heidelberg, 27 August–8 September 2012

Ubiquitin and SUMO
IT-Alghero, 1–8 September 2012

Computational analysis of protein-protein interactions for bench biologists
DE-Berlin, 3–8 September 2012

Protein expression, purification, characterization and crystallization (PEPC8)
DE-Hamburg, 3–11 September 2012

Anatomy and embryology of the mouse
HR-Split, 8–16 September 2012

WORKSHOPS

Mechanisms of nucleocytoplasmic trafficking
IL-Ma'ale Hachamisha 6–11 November 2011

Programmed cell death in model organisms
IL-Ein Gedi, 19–23 February 2012

Microbial sulfur metabolism
NL-Noordwijkerhout, 15–18 April 2012

Antigen presentation and processing
NL-Amsterdam, 24–27 April 2012

Genetic stability and change: Genome maintenance mechanisms in plants
FR-Roscoff, 2–5 May 2012

Evolution in the genome era
IT-Venice, 7–9 May 2012

Recombination mechanisms and genome instability
ES-Jerez de la Frontera, 21–25 May 2012

Advances in protein-protein interaction analysis and modulation
FR-Roscoff, 6–9 June 2012

Cortical interneurons in health and disease
ES-Costa d'en Blanes (Mallorca), 24–27 June 2012

Single cell physiology
FR-Paris, 23–28 July 2012

Cell biology of early mouse development
UK-Cambridge, 9–12 September 2012

Reconstructing the essential bacterial cell cycle machinery
ES-Real Sitio de San Ildefonso (Segovia), 16–19 September 2012

The reciprocal interactions of signalling pathways and non-coding RNA
CH-Ascona, 16–19 September 2012

Structure-specific nucleases in DNA replication and repair
FR-Hyères-les-Palmiers, 16–20 September 2012

CONFERENCES

Visualizing biological data (VizBi 2012)
DE-Heidelberg, 6–8 March 2012

Cellular organization and functions and their subversion by pathogens
CH-Villars-sur-Ollon, 6–10 May 2012

Microtubules: Structure, regulation and functions
DE-Heidelberg, 23–26 May 2012

Cellular signalling and molecular medicine
HR-Cavtat (Dubrovnik), 25–29 May 2012

Plant development and environmental interactions
IT-Matera, 27–30 May 2012

***C. elegans* neurobiology**
DE-Heidelberg, 14–17 June 2012

Gene transcription in yeast: From mechanisms to gene regulatory networks
ES-Girona, 16–21 June 2012

The molecular and developmental biology of *Drosophila*
GR-Kolybari, 24–29 June 2012

30 years of Wnt signalling
NL-Egmond aan Zee, 27 June–1 July 2012

Viruses of microbes: From exploration to applications in the -omics era
BE-Brussels, 16–20 July 2012

The molecular and cellular basis of regeneration and tissue repair
UK-Oxford, 2–6 September 2012

Physics of cells: From soft to living matter (PhysCell2012)
FR-Hyères-les-Palmiers, 5–9 September 2012

Morphogenesis and dynamics of multicellular systems
DE-Heidelberg, 7–9 September 2012

Microbial Genomes: Tuberculosis 2012
FR-Paris, 11–15 September 2012

Chemical biology 2012
DE-Heidelberg, 26–29 September 2012

SYMPOSIA

ESF | EMBO SYMPOSIA

Cell polarity and membrane traffic
PL-Pułtusk, 31 March–5 April 2012

Systems biology of *Drosophila* development
PL-Pułtusk, 21–26 May 2012

Antiviral RNAi: From molecular biology towards applications
PL-Pułtusk, 11–16 June 2012

ESF | EMBO SYMPOSIA (cont.)

Molecular biology and innovative therapies in sarcomas
PL-Pułtusk, 29 September–4 October 2012

EMBO | EMBL Symposia

New perspectives on immunity to infection
DE-Heidelberg, 19–22 May 2012

Diabetes and obesity
DE-Heidelberg, 13–16 September 2012

Quality control: From molecules to organelles
DE-Heidelberg, 19–22 September 2012

LECTURE COURSES

EMBO | FEBS LECTURE COURSES

Mesoscopic origins of cell behaviors during tissue morphogenesis: Biochemical circuits and mechanics
FR-Cargèse, 30 April–5 May 2012

Mitochondria in life, death and disease
GR-Crete, 9–13 May 2012

GLOBAL EXCHANGE LECTURE COURSES

Cellular and molecular medicine: Cancer, stem cells, and inflammation
IN-Vellore, 5–7 January 2012

Logic of regulatory circuits
TW-Taipei, 12–18 January 2012

Amoebiasis: Exploring the biology and the pathogenesis of *Entamoeba*
IN-Khajuraho, 4–7 March 2012

Introduction to synthetic biology
AR-Buenos Aires, 16–22 April 2012

OTHER EVENTS

Making sense of mental illness: Biology, medicine & society
DE-Heidelberg, 4–5 November 2011

Molecular insights for innovative therapies
DE-Heidelberg, 1–3 December 2011

The EMBO Meeting
FR-Nice, 22–25 September 2012

For more information and a list of all courses, workshops, conferences and symposia please go to events.embo.org.

Forthcoming application deadlines for organizers to apply for EMBO funds:

1 March

EMBO
Plenary Lectures

1 March

EMBO
Courses & Workshops

EMBO stands for excellence in life sciences

New tagline exemplifies EMBO scope and role

There has been a subtle change in the tagline that sits alongside the EMBO logo. Perhaps you noticed that we have been incorporating it into our website and other materials over the past months.

The EMBO logo itself has not changed. At our foundation in 1964, molecular biology was still a very new field. We believe these strong roots in molecular biology are a significant part of the organization's identity and we will continue to use the 'recombinant DNA-inspired' logo that first appeared in 1997.

But while our logo may represent our strong roots in molecular biology, the new tagline *excellence in life sciences* exemplifies the wide scientific scope of the organization's membership and the broader role that EMBO plays in the scientific community, today and into the future.

With molecular techniques now part of basic research practice in almost all life science fields, *Maria Leptin* – director of EMBO – led a project earlier this year to define the vision of the organization and its role, or mission, in Europe. Following interviews with scientists from within and beyond our community, the EMBO Council approved the vision and

mission statements that are now stated on our website and in our new image brochure. The word 'molecular' no longer modifies 'life science' in the tagline.

Maria says that the EMBO vision of "a Europe where top-level life science research thrives" can be achieved through a unified community of excellence represented by the EMBO membership. This community shares the associated values of expertise and insight, impartial evaluation, scientific creativity and high standards. Applied, they deliver on the EMBO mission to "enable the best science by supporting talented researchers, stimulating scientific exchange and advancing policies for a world-class European research environment".

You can read more about the EMBO vision and what leading researchers have to say about what it takes to do the best science in the image brochure, downloadable online at: www.embo.org/news-a-media-centre/reports-a-brochures.html

If you would like a printed copy, follow the link on the website or send us an email at communications@embo.org.



© Max Planck Society | Photo: Frank Vinken

"To do the best research, it takes irreverence for the received wisdom and even a desire to overturn it on the one hand, balanced by a rigorous and critical attitude to one's ideas on the other."

Svante Pääbo EMBO MEMBER



© Instituto de Neurociencias | Photo: Stuart Ingham

"Central funding of curiosity-driven research based on excellence will make Europe a place where top-level life science research thrives. Within the individual countries, we need to remove administrative hurdles so that our scientists can do their best research."

Angela Nieto EMBO MEMBER



© The Royal Society

"EMBO plays an important role in European science because of its recognition and support of the best molecular biologists, who do original research with creativity and passion to want to know the answer."

Sir Paul Nurse

EMBO MEMBER



© private

"My selection as an EMBO Young Investigator when I was starting my first lab as a young group leader opened many doors for me in terms of funding and visibility."

Maria Pia Cosma

EMBO MEMBER



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"The rigorous evaluation to select EMBO Young Investigators means that our selection is impartial recognition of our research as world class. For me, this was quite an honour."

Duncan Odom

EMBO YOUNG INVESTIGATOR



© Friedrich Miescher Institute for Biomedical Research

"Being part of the EMBO Fellows' network, I benefited from training and attending meetings with top speakers. Most important were the contacts I made in those years, some of whom [...] played a critical role when I started my own lab."

Mohammed Bentires-Alj

EMBO LONG-TERM FELLOW

EMBO Members in the ERC life sciences domain



Helga Nowotny

► In her opening address to *The EMBO Meeting 2011* in Vienna, Helga Nowotny, President of the European Research Council (ERC), said that over 40 percent of ERC panelists in the life science domain are EMBO Members. *EMBOencounters* spoke to ERC Vice-President and EMBO Member, Carl-Henrik (Calle) Heldin, to find out what role members play in the ERC.



Calle Heldin

“We get a lot of help from EMBO Members in evaluating life sciences applications at the ERC,” says Calle. “Since we have nine life sciences panels, we need a broad spread of knowledgeable scientists who can evaluate our many applications for funding.”

The ERC provides Starting Grants for young scientists developing independent careers and Advanced Grants for researchers who have already established themselves as leaders in their chosen fields. Researchers apply for grants in one of three domains: life sciences; social sciences and humanities; and physical science and engineering.

is in various aspects, not least in recruiting highly qualified scientists to the panels. This takes time, as does the travelling and the time I spend reading documents back home in Uppsala.”

Calle believes that the ERC, with its mission to fund investigator-driven frontier research, provides a fantastic opportunity for the future of European research. “The success of the ERC depends on the continued support of the scientific community and in regard to this, EMBO has had, and has, a very important role.”

“Since EMBO Members are always highly qualified scientists, we find that they do apply for and receive ERC funding themselves,” he says.

Calle, whose lab is based at the Ludwig Institute for Cancer Research at Uppsala University, Sweden, was appointed to the ERC Council in 2005 and is now Vice-President for life sciences. He spends much of his time travelling to Brussels on behalf of the ERC. “My involvement

EMBO Members appointed to the ERC

Scientific Council

Claudio Bordignon
Calle Heldin **VICE PRESIDENT**
Tim Hunt
Christine Nüsslein-Volhard
Mart Saarma
Anna Tramontano
Isabelle Vernos

ERC Identification Committee

Maciej Zyllicz

2011 Advanced Grants Peer Review Panel

Johan Auwerx
Peer Bork
Regine Kahmann
Luke O'Neill
Anne Ridley
Joel L. Sussmann

2011 Starting Grants Peer Review Panel

Christer Betzholtz
Reinhard Jahn

2010 Advanced Grants Peer Review Panel

Stylianos Antonarakis
Nancy Elisabeth Hynes
Maria Leptin
Rino Rappuoli
Daniela Rhodes

2010 Starting Grants Peer Review Panel

Guilio Cossu
Marcel Méchali
Kai Simons
Philippe Sansonetti
Janet Thornton

2010 Advanced Grants Life Sciences Panels*

Geneviève Almouzni
Paolo Amati
Stylianos Antonarakis **CHAIR**
Ruth Arnon
Andrea Ballabio
Wolfgang Baumeister
Miguel Beato
Walter Birchmeier

Meinrad Busslinger
Antonio Coutinho
Thomas Edland
Anne Ephrussi
Jiri Forejt
Matthew Freeman
Carl Gahmberg
Apostolos Georgopoulos
François Guillemot
Nick Hastie
Michael Hengartner
Veronica van Heyningen
Jonathon Howard
Nancy Elizabeth Hynes **CHAIR**
Marja Jäättelä
Sirpa Jalkanen
Klas Kärre
Jürgen Knoblich
Maria Leptin **CHAIR**
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Juan Modolell Mainou
Erwin Neher
Moshe Oren
Mehmet Öztürk
Pier Guiseppe Pelicci
Nicholas J. Proudfoot
Rino Rappuoli **CHAIR**
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Bernard Rossier
Titia Sixma
Guilio Superti-Furga

Dimitris Thanos
Vito Turk
Alfonso Valencia
Jean-Claude Weill
Bengt Westermark

2010 Starting Grants Life Sciences Panels

Julie Ahringer
Leif Andersson
Christer Betzholtz
Søren Brunak
Michel Caboche
Marie-France Carlier
Maria Carmo-Fonseca
Pico Caroni
Ana Carrera
Hans Clevers
Elena Conti
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Ivan Dikic
Denis Duboule
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Winship Herr
Dirk Inzé
Howard T. Jacobs
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Bert Sakmann
Francisco Sánchez-Madrid
Philippe Sansonetti **CHAIR**
Luis Serrano
Kai Simons **CHAIR**
Harald Stenmark
Brigitta Stockinger
Janet Thornton **CHAIR**

* The 2011 Advanced Grants and Starting Grants Life Sciences Panels will be published in December 2011.

SPOTLIGHT ON

EMBO Science Policy



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► The *EMBO Science Policy Programme* works towards understanding emerging science policy issues and crafting options for policymakers and others interested in the governance of science and in the roles of scientists in society.

Programme manager *Michele Garfinkel* – who joined EMBO in April this year from the J Craig Venter Institute in Maryland, US, where she worked as a policy analyst – says science policy forms a core part of the EMBO vision to promote excellence in the life sciences.

“Policy affects scientists; scientists affect policy. Through policy research, we will work to encourage dialogues between scientists, policymakers, research administrators and other stakeholders; to offer analysis of policy options based on those discussions; and to present those results to a wide variety of audiences,” says Michele.

In consultation with EMBO Members, Young Investigators and Installation Grantees, Michele crafted a response to the European Commission’s (EC) Green Paper. The Green Paper proposed a framework, now known as Horizon 2020, for EC research and innovation

funding that impacts many researchers in the EMBO community.

As part of her new role, Michele will look at issues like research integrity. “We’ll explore emerging concerns about the responsible conduct of research, including scientists’ roles in defining responsible conduct and issues related to international research.” She has also been appointed to the Reference User Group of Stakeholders of the European Marine Biological Resource Centre (EMBRC), headed by EMBO Member *Roberto di Lauro*.

Michele works closely with administrative officer *Sandra Bendiscioli*, who worked in the EMBO Science & Society Programme. Amongst other responsibilities, Sandra coordinates the annual Science & Society Conference, which is jointly organized by EMBO and EMBL.

Sandra says this high profile, interdisciplinary conference focuses on issues relevant to scientists and to society. The theme of this year’s meeting is *Making Sense of Mental Illness – Biology, Medicine and Society*. It will discuss the extent and societal impact of mental illness. Experts from a wide range of

Michele Garfinkel (left) and Sandra Bendiscioli

disciplines will explore the ethical implications of mental disorders for the individual and for society and explain the latest scientific knowledge on their causes and treatments. “The conference will also debate a number of difficult topics including the definition of mental disorders, financial interests in their diagnosis and treatment and controversial therapies,” she says.

In August, Michele and Sandra participated in the EMBL|EMBO Science and Society summer school, with the theme *The Human Animal: Scientific, Social and Moral Perspectives*. For six days, 20 student participants attended sessions run by various mentors, including EMBO Member *Robin Lovell-Badge*.

This is the first of a series of articles focusing on the various EMBO programmes.

EMBO Scientific Publications | Editor Picks

In each issue of *EMBO encounters*, the editors of *The EMBO Journal*, *EMBO reports*, *Molecular Systems Biology* and *EMBO Molecular Medicine* highlight particularly interesting papers.

THE EMBO JOURNAL

EMBO MEMBER REVIEW

The complex transcription regulatory landscape of our genome: control in three dimensions

Splinter E, de Laat W
doi:10.1038/emboj.2011.344

SCIENTIFIC ARTICLE

The Cutoff protein regulates piRNA cluster expression and piRNA production in the *Drosophila* germline

Pane A, Jiang P, Yanling Zhao D, Singh M, Schüpbach T
doi:10.1038/emboj.2011.334

BAX inhibitor-1 regulates autophagy by controlling the IRE1 branch of the unfolded protein response

Castillo K, Rojas-Rivera D, Lisbona F, Caballero B, Nassif M, Court FA, Schuck S, Ibar C, Walter P, Sierralta J, Glavic A, Hetz C
doi:10.1038/emboj.2011.318

Temporal orchestration of circadian autophagy rhythm by C/EBP

Ma D, Satchidananda Panda S, Lin JD
doi:10.1038/emboj.2011.322

A hippocampal insulin-growth factor 2 pathway regulates the extinction of fear memories

Agis-Balboa RC, Arcos-Diaz D, Wittnam J, Govindarajan N, Blom K, Burkhardt S, Haladyniak U, Agbemeyah HY, Zovoilis A, Salinas-Riester G, Opitz L, Sananbenesi F, Fischer A
doi:10.1038/emboj.2011.293

CAMTA1 is a novel tumour suppressor regulated by miR-9/9* in glioblastoma stem cells

Schraivogel D, Weinmann L, Beier D, Tabatabai G, Eichner A, Zhu JY, Anton M, Sixt M, Weller M, Beier CP, Meister G
doi:10.1038/emboj.2011.301

EMBO reports

SCIENTIFIC REPORTS

Molecular basis of α 1-antitrypsin deficiency revealed by the structure of a domain-swapped trimer

Yamasaki M, Sendall TJ, Pearce MC, Whisstock JC, Huntington JA
doi:10.1038/embor.2011.171

SIRT3-dependent deacetylation exacerbates acetaminophen hepatotoxicity

Lu Z, Bourdi M, Li JH, Aponte AM, Chen Y, Lombard DB, Gucek M, Pohl LR, Sack MN
doi:10.1038/embor.2011.121

E-cadherin is crucial for embryonic stem cell pluripotency and can replace OCT4 during somatic cell reprogramming

Redmer T, Diecke S, Grigoryan T, Quiroga-Negreira A, Birchmeier W, Besser D
doi:10.1038/embor.2011.88

G-quadruplex RNA structure as a signal for neurite mRNA targeting

Subramanian M, Rage F, Tabet R, Flatter E, Mandel J-L, Moine H
doi:10.1038/embor.2011.76

REVIEWS

The interplay between morphogens and tissue growth

Dekanty A, Milán M
doi:10.1038/embor.2011.172

Mitochondria in innate immunity

Arnould D, Soares F, Tattoli I, Girardin SE
doi:10.1038/embor.2011.157

Our microbial selves: what ecology can teach us

Gonzalez A, Clemente JC, Shade A, Metcalf JL, Song S, Prithiviraj B, Palmer BE, Knight R
doi:10.1038/embor.2011.137

SCIENCE & SOCIETY

Stem-cell tourism and scientific responsibility

Master Z, Resnik DB
doi:10.1038/embor.2011.156

molecular systems biology

REVIEW

Microbial laboratory evolution in the era of genome-scale science

Conrad TM, Lewis NE, Palsson BØ
doi:10.1038/msb.2011.42

RESEARCH ARTICLES

The essential genome of a bacterium

Christen B, Abeliuk E, Collier JM, Kalogeraki VS, Passarelli B, Collier JA, Fero MJ, McAdams HH, Shapiro L
doi:10.1038/msb.2011.58

Cellular reprogramming by the conjoint action of ER α , FOXA1, and GATA3 to a ligand-inducible growth state

Kong SL, Li G, Loh SL, Sung WK, Liu ET
doi:10.1038/msb.2011.59

Oncogenic K-Ras decouples glucose and glutamine metabolism to support cancer cell growth

Gaglio D, Metallo CM, Gameiro PA, Hiller K, Danna LS, Balestrieri C, Alberghina L, Stephanopoulos G, Chiaradonna F
doi:10.1038/msb.2011.56

Engineering microbes to sense and eradicate *Pseudomonas aeruginosa*, a human pathogen

Saeidi N, Wong CK, Lo TM, Nguyen HX, Ling H, Leong SS, Poh CL, Chang MW
doi:10.1038/msb.2011.55

Quantification of mRNA and protein and integration with protein turnover in a bacterium

Maier T, Schmidt A, Güell M, Kühner S, Gavin AC, Aebersold R, Serrano L
doi:10.1038/msb.2011.38

Predicting selective drug targets in cancer through metabolic networks

Folger O, Jerby L, Frezza C, Gottlieb E, Ruppin E, Shlomi T
doi:10.1038/msb.2011.35

EMBO Molecular Medicine

REVIEW

Links between genetics and pathophysiology in the autism spectrum disorders

Holt R, Monaco AP
doi:10.1002/emmm.201100157

RESEARCH ARTICLES

The isoenzyme of glutaminyl cyclase is an important regulator of monocyte infiltration under inflammatory conditions

Cynis H, Hoffmann T, Friedrich D, Kehlen A, Gans K, Kleinschmidt M, Rahfeld JU, Wolf R, Wermann M, Stephan A, Haegeler M, Sedlmeier R, Graubner S, Jagla W, Müller A, Eichentopf R, Heiser U, Seifert F, Quax PH, de Vries MR, Hesse I, Trautwein D, Wollert U, Berg S, Freyse EJ, Schilling S, Demuth HU
doi:10.1002/emmm.201100158

A serum circulating miRNA diagnostic test to identify asymptomatic high-risk individuals with early stage lung cancer

Bianchi F, Nicassio F, Marzi M, Belloni E, Dall'olio V, Bernard L, Pelosi G, Maisonneuve P, Veronesi G, Di Fiore PP
doi:10.1002/emmm.201100154

Intestinal mucosal adherence and translocation of commensal bacteria at the early onset of type 2 diabetes: molecular mechanisms and probiotic treatment

Amar J, Chabo C, Waget A, Klopp P, Vachoux C, Bermúdez-Humarán LG, Smirnova N, Bergé M, Sulpice T, Lahtinen S, Ouwehand A, Jangella P, Rautonen S, Sansonetti PJ, Burcelin R
doi:10.1002/emmm.201100159

Yvonne Kaul,
editor of
EMBO encounters
is on maternity leave.
Our congratulations
to Yvonne and Felix
on the arrival of

Maja
on Wednesday
24 August.

Next issue

The next *EMBO encounters* issue – Winter 2011|12 – will be dispatched in January 2012. Please send your suggestions, contributions and news to: communications@embo.org by 25 November 2011.

Editor Charlotte Otter
Contributing Editor Suzanne Beveridge
Proofreading Meryl Schneider
Print layout Uta Mackensen
Web version Sabine Rehberger-Schneider
E-newsletter Sandra Krahl, Katja Linssen

Journals make an impact

► The newest journal in the EMBO stable – *EMBO Molecular Medicine* – garnered its first Impact Factor since its launch in 2009. With an Impact Factor of 8.8, it now ranks fourth among primary research journals in the ISI category *Medicine, Research and Experimental*. It also has the highest Impact Factor of the journals dedicated to molecular medicine.

Amongst the other three journals, the 2010 Impact Factors also remained high. *Molecular*

Systems Biology has an Impact Factor of 9.6, the highest for a title dedicated to systems biology and synthetic biology.

EMBO reports has an Impact Factor of 7.8, a 13 percent rise on the previous year, while *The EMBO Journal* has an Impact Factor of 10.1 – for both journals a 13 percent rise on 2009 and a 22 percent rise on 2008. *The EMBO Journal* ranks ninth among research journals in the ISI category *Cell Biology*.

Head of Scientific Publications, *Bernd Pulverer*, says he is very pleased with the positive trajectory of the ISI journal Impact Factors for the EMBO publications, in particular with the strong launch Impact Factor of

EMBO Molecular Medicine – a journal that underlines EMBO's interest in this vibrant branch of biological research.

“Of course, we are aware of the significant limitations of this particular bibliometric parameter and we caution in applying any single measure to something as complex and multifaceted as a scientific journal. Nevertheless, it is encouraging that this increase is echoed by sizeable increases in online access.”

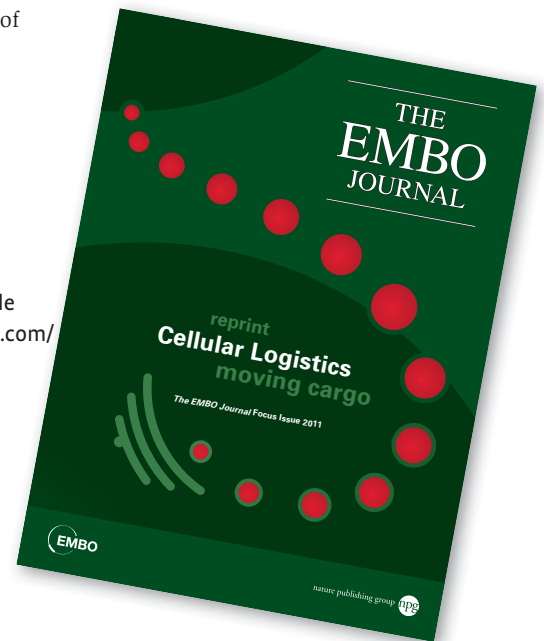
Focus on Cellular Logistics

► In September, *The EMBO Journal* published its fifth annual focus issue. This year's issue, titled *Cellular Logistics: moving cargo*, comprises a collection of review articles on the diversity of cellular transport.

“The purpose of these focus issues is to gather a diverse number of topics around a common theme,” say editors *Katherine Brown* and *Isabel Arnold*. “The reviews in the 2011 edition synthesise recent insights into the mechanics and regulation of intra- and intercellular transport. They focus on the what, where, when, how and why of moving things around within and between cells.”

The senior authors of the eight different reviews are *Dirk Görlich*, *Vivek Malhotra*, *Ari Helenius*, *Britta Qualmann*, *Ben-Zion Shilo*, *Michael Way*, *Michael Kiebler* and *David Baulcombe*.

The issue is available online www.nature.com/emboj/focus/Cellular_Logistics/index.html, where you will find a further reading list.



EMBO Poster Prize winners

Congratulations to the following winners of competitions held at recent EMBO events

Cornelia Schonbauer

Max Planck Institute of Biochemistry, Martinsried, Germany
Spalt mediates an evolutionarily conserved switch to fibrillar muscle fate in insects
Presented at *The EMBO Meeting 2011*
Vienna, Austria | 10–13 September 2011

Martin Bergert

Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany & International Institute of Molecular and Cell Biology, Warsaw, Poland
Mechanical and molecular requirements for bleb and lamellipodium formation in migrating cells
Presented at *The EMBO Meeting 2011*
Vienna, Austria | 10–13 September 2011

Fumiyo Ikeda

Frankfurt Institute for Molecular Life Sciences and Institute of Biochemistry II, Goethe University School of Medicine, Germany
A novel linear ubiquitin ligase complex regulating TNF α -induced NF- κ B activity and apoptosis
Presented at *The EMBO Meeting 2011*
Vienna, Austria | 10–13 September 2011

Vinicius Costa Galvao

Max Planck Institute for Developmental Biology, Tuebingen, Germany
A marker-enrichment method for mapping mutations in *Arabidopsis thaliana*
Presented at *The EMBO Meeting 2011*
Vienna, Austria | 10–13 September 2011

Silvia Engert

Institute for Stem Cell Research, Neuherberg, Germany
Wnt/ β -catenin signalling is essential for head induction and endoderm formation
Presented at the EMBO Workshop, *Lineages commitments: Emphasis on extraembryonic-embryonic interfaces*
Leuven, Belgium | 25–27 May 2011

Taotao Chen

Max Planck Institute of Biochemistry, Martinsried, Germany
Analysis of the DnaK (Hsp70) interactome: interplay of two main chaperone principles in *Escherichia coli*
Presented at the EMBO Conference Series, *The Biology of Molecular Chaperones*
Grundlsee, Austria | 19–24 May 2011

David Finkenstaedt

University of Duesseldorf, Germany
New insights into kinase-independent roles of Jak2: Putative scaffold function
Presented at the EMBO Conference Series, *Homeostasis and perturbations of immunity*
Capo Caccia, Sardinia, Italy
16–20 May 2011

Magdalena Paolino

IMBA, Vienna, Austria
Essential role of the E3 ubiquitin ligase activity in Cbl-b regulated T-cell functions
Presented at the EMBO Conference Series, *Homeostasis and perturbations of immunity*
Capo Caccia, Sardinia, Italy
16–20 May 2011

C. Laura Sayas

Center for Molecular Biology, Madrid, Spain
+TIPs are regulated by MAP1B in neuronal cells
Presented at the EMBO Workshop, *Cell biology of the neuron*
Heraklion, Greece | 7–10 May 2011

Marta Lloret-Llinares

Institute of Molecular Biology of Barcelona, Spain
***Drosophila* dKDM5/LID regulates H3K4me3 dynamics at the transcription-start site (TSS) of actively transcribed developmental genes**
Presented at the workshop, *Epigenetic mechanisms in health and disease*
Barcelona, Spain | 12–13 May 2011



EMBO bids Jan Taplick farewell

from 790 to 1668 applications between 2002 and 2010, which shows how much the scheme is appreciated,” says Bernhard.

Liselott Maidment worked with Jan in the Fellowship Programme during his long

EMBO career. She says that what stood out for her was Jan’s empathy for the fellows. “I think that having been one himself made him understand how important it was to create a strong and vibrant network.”

During his tenure, Jan oversaw enhancements to *EMBO FellowsNet*, the online network for EMBO Fellows around the world. He and his co-workers in the Fellowships office ran the annual *Fellows’ Meeting* in Heidelberg, while Jan initiated a biannual US Fellows’ Meeting. “That was a big success,” Liselott says. “Helping the fellows in the US to network resulted in scientific collaborations that otherwise would not have happened.” One of Jan’s goals for the *US Fellows’ Meeting* was to inform fellows about opportunities back in Europe and some of them were appointed to group leader positions that were advertised during the meeting.

Looking back on his time in Heidelberg, Jan says what was most rewarding for him was the family spirit that EMBO managed to create amongst the fellows. “I also appreciated the fact that the *EMBO Fellowship* allows young scientists to work independently on their projects in world-class laboratories – and

I know from their feedback that the fellows value this too.”

EMBO Director *Maria Leptin* says that Jan had a special passion for helping young scientists plan their careers. “Jan’s achievements over the past nine years have changed the face of the *EMBO Fellowships Programme*. I would like to thank him for his commitment to EMBO and to the EMBO Fellows and wish him well for the future.”

See the Winter 2012 edition of *EMBOencounters* for a special feature on the EMBO Fellowships Programme.

Jan Taplick at the *EMBO Fellows’ Meeting*



After nine years as manager of the *EMBO Fellowships Programme* and a concurrent three years as an EMBO Deputy Director, *Jan Taplick* waved goodbye to Heidelberg in July. Jan is now Associate Vice Provost at Nanyang Technological University in Singapore, with special focus on research strategy.

Jan – a molecular biologist and EMBO Fellow himself – was finishing a two-year postdoc at the Weizman Institute of Science in Rehovot, Israel, when he took the job as Fellowship Programme Manager in March 2002.

Bernhard Huber, head of EMBO Administration and Finance who worked closely with Jan during his nine-year tenure, says that two particular achievements stand out in Jan’s EMBO career.

“While EMBO promotes cross-border mobility, one disadvantage is that fellows delay saving for retirement and Jan recognized the need for a pensions plan. He fought for and delivered a unique pensions scheme to ensure that fellows have adequate coverage despite being out of their home countries.”

Jan also secured the European Commission’s co-funding for the *EMBO Fellowship Programme*. The EC co-financed one round of fellowships in 2009 and another round in 2010, enabling EMBO to offer 40 percent more fellowships.

“During Jan’s time, the number of applications for *EMBO Fellowships* more than doubled. *The Long-Term Fellowships* applications grew

Science in Poland

Reversing the brain drain

Polish researchers on the cusp of their science careers met with some of Europe's top young scientists at the EMBO Young Scientists' Forum in Warsaw in June.

Hosted by the International Institute of Molecular and Cell Biology (IIMCB), the forum aims to inspire students to pursue careers in the life sciences.

This is crucial in Poland, which has struggled with both funding shortages and a brain drain. However, the influx of funding such as the *EMBO Installation Grants*, which enable young group leaders to set up laboratories in their home countries, means that these trends are being reversed.

According to *Janusz Bujnicki*, a professor at the IIMCB and one of the forum's organizers, the meeting was a great success. "The poster sessions were very intense and lively. Judging from the feedback of participants, they particularly enjoyed the 'soft skills' session, in which various career paths and opportunities for young scientists were presented and discussed."

Duncan Odom, EMBO Young Investigator and forum speaker, agrees. "Scientists as a community spend a bit too much time being lost in the details of research, and miss a deceptively simple point – that undertaking scientific research is a career path with structure, pitfalls, and substantial limitations. By the end of the career panel, I think the graduate students had developed a much better idea of these issues," he says.

Anna Sokół, a Polish PhD student working at the Centre for Chromosome Biology, NUI Galway, attended the meeting. Anna, who moved to Ireland for its better research facilities, good funding opportunities and less formal student-supervisor relations, says she learned that the science coming out of the Polish research institutes is as good as the

EMBO Members lead the way in Poland



EMBO Member **Leszek Kaczmarek** chairs the Life Sciences Committee on the council of Poland's prestigious National Centre for Science (NCN). The NCN, which opened its doors in March 2011, is charged with distributing large-scale funds for basic science research.



EMBO Member **Maciej Żylicz** is the president of the Foundation for Polish Science (FNP) – the largest non-governmental organization involved in the financing of scientific research in Poland. FNP activities include awarding individual prizes and scholarships, providing subsidies for the modernization of scientific laboratories and financial support for implementation projects.

highest European standards. "I now consider Poland as my first choice for the next step in my career."

IIMCB postdoc *Małgorzata Sztolsztener* says the forum broke down the boundaries between experienced scientists and students. "With the help of the chairmen who encouraged the audience to be active, most of

speakers had a lot of questions and this led to really interesting discussions."

This dialogue and cooperation between Polish and other European scientists will continue in March 2012 when the *ESF|EMBO Symposia* move location from Sant Feliu de Guixois, Spain to Pultusk, Poland.

Deadlines

1 December

EMBO
Plenary Lectures

15 February

EMBO
Long-Term Fellowships

EMBO NEWS

EMBO signs cooperation agreements

Scientists in Singapore and South Africa will access the latest in European life sciences thinking and research following cooperation agreements with EMBO. In terms of the agreements, scientists from both countries may participate in EMBO programmes and activi-

ties, while certain EMBO activities will take place in Singapore and South Africa.

See the EMBO Media Centre for detailed press releases:

www.embo.org/news-a-media-centre/press-releases.html



Children explore science at the Open Lab, Vienna

Summer Science Camp

Bringing science to the next generation

Young science fans devoted a week of their summer holidays to performing molecular experiments and gaining hands-on laboratory experience at the Vienna Open Lab's annual Summer Science Camp.

The Open Lab is a joint project between the Institute of Molecular Biotechnology (IMBA) and the NGO dialog < > gentechnik that aims to bring science to a new generation.

Open Lab project assistant *Melanie Konegger*.

The Open Lab has offered summer camps since its inception in 2006. This year, the summer camp hosted 53 young people between the ages of 11 and 16 years, who attended three separate camps.

During the five days, the children performed molecular experiments, including extracting DNA from their own cheek

cells, making lactose-free milk and examining model organisms under the microscope. "In the lab the children have the amazing opportunity to experiment on their own and gain insights into the fields of genetics, genetic engineering and biotechnology," says Melanie.

The Open Lab recruits its camp tutors from the University of Vienna. They are all microbiology students and PhDs interested in teaching young people and adults about their field of study.

Fourteen-year-old *Clara* says she enjoyed it immensely. "I had lots of fun and learnt so much. It was ten times better than biology lessons in school."

Rebecca, also 14, agrees. "The summer science camp met all my expectations and I'm really happy that I was there. I finally understood a whole lot of things that we've already done at school, and I learnt some new things too."

The summer science camp is part of the Open Lab's ongoing work to introduce science to the public. During the year, it offers different workshops to children, teenagers and adults and has had over 20,000 visitors in the last five years.

NEWS AND EVENTS FROM THE EMBO COMMUNITY

Access advanced biological imaging facilities

The pan-European research infrastructure project, *Euro-Biolmaging*, will conduct a series of proof-of-concept studies from January to July 2012, in which they offer free access to European advanced biological

and biomedical imaging facilities. They invite applicants from all over Europe to submit their projects. Visit their website www.eurobioimaging.eu for more details on how to participate and take up the

opportunity to use cutting-edge biological and biomedical imaging technologies at world-class facilities for their research.

Three new iBioSeminars by EMBO Members

iBioSeminars provides free on-demand lectures from leading scientists. Three EMBO Members have recently delivered talks:

Tony Hyman uses *C. elegans* embryos to demonstrate how individual molecules form increasingly larger and more complex structures to ultimately build a cell.

Alfred Wittinghofer describes the 3-D structure of G-proteins, what the structure tells us about G-protein function and the link between G-proteins and disease.

Kai Simons explains how lipids act as key organizers in cell membranes, from lipid rafts to glycolipid-rich apical membranes in epithelial cells.

More at www.ibioseminars.org

The Royal Society launches fast, open access journal at the molecular and cellular level

The Royal Society launched its first, fully open access journal in September. Entitled *Open Biology*, it signifies a long-standing endeavour to represent and support science in its broadest sense. Until now, the Society has published very little biology at the cellular and molecular level but *Open Biology* has been conceived to bridge this gap, publishing high quality research in the areas of cell and developmental biology, molecular biology and biochemistry, structural biology, neuroscience, immunology, microbiology and genetics. Royal Society President and EMBO Member, **Sir Paul Nurse**, says, "The

Royal Society is a strong supporter of open access publishing and is pleased to launch this new journal which will draw on the high standards of the Society over its 350 year history of scientific publishing." The *Open Biology* editors and editorial board are practicing scientists who will actively engage in the review of submitted papers. Editor-in-Chief Professor **David Glover** explains, "Our intention is to publish research of the highest quality and to ensure a fair and speedy review process. I hope that by streamlining the review system and putting everything into the hands of active scientists, that we

can do something valuable for our respective communities. Above all, I want *Open Biology* to be a high profile journal run by biologists for biologists; where acceptance of a paper is based on quality and merit rather than the headline." Authors electing to publish their research in *Open Biology* will benefit from constructive peer review, rapid publication and immediate open access in a high quality journal that is published under the Creative Commons Attribution License, as well as the prestige and international visibility associated with the Royal Society and its journals.



Basel Biocentre
Director Erich Nigg
at the Open Door
Day

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Forty Years On

The Basel Biocentre celebrates its Jubilee

► The Biocentre of the University of Basel turned 40 in September and celebrated with a spectrum of events. These ranged from a VIP reception to a series of symposia and a two-day Open Door for the public. On the eve of the celebrations, *EMBO encounters* talked to Biocentre director and EMBO member, Erich Nigg, about the past, present and future of molecular biology research.

Erich, how has the Biocentre changed since its inception in 1971?

In many ways, not at all. We are still committed to basic research and teaching and still strive at doing science at the top international level. And we continue to take an interdisciplinary approach, something that was a novel concept 40 years ago, but has become even more important today. However, research topics do change over time. Our core topics are cell and developmental biology, neurobiology, structural biology and infection biology, and we are expanding on bioinformatics and systems biology. We will also move from qualitative to quantitative biology and this will have an impact on our teaching and research.



© Basel Biocentre

What are some of the Biocentre's milestones over the past 40 years?

The crowning glory was the Nobel Prize won by Werner Arber in 1978 for his discovery of restriction enzymes. Other highlights that come to mind are the discovery of the homeobox, work on the biogenesis of mitochondria, the elucidation of splicing mechanisms, the discovery of TOR – a key regulator of growth and metabolism, and a multitude of structural studies, for example on the nuclear pore complex or aquaporins. However, this listing is by no means complete!

What are your newest research areas?

Nanobiology is an interesting emerging topic. We are looking at devices at the nano scale, which mimic biological processes or can be used to analyse biological systems. Systems biology – with its focus on modeling – is growing in importance, and this means we are going to have to crank up mathematics in our training of future biology students.

Which challenges do you face in the science and society arena?

Science has left the ivory tower, which is good, and so we dedicate time and effort to communicate with the public. Since Switzerland has a system of direct democracy, it is important that we have the public behind us, for example when the University plans our new building. Basel has a children's university and a university for the elderly, and the Biocentre's professors are engaged in both. However, the challenge is to reach the middle generation, the people who often don't have

the luxury of time to attend courses. This is why our 40-year Jubilee is so important, because we can reach them, invite them in and show them what we are doing.

How will the Biocentre position itself in the future?

We don't want to change for the sake of changing. We have a strong identity and people feel part of the Biocentre with its non-hierarchical and interactive culture. We want to preserve this because it is precious. We will also continue to teach and research a broad spectrum of subjects because we believe that it is often at the interface of disciplines that interesting things happen. The interface between biology and physics is not fully exploited, and the interface between biology and chemistry must also be fostered.

We want our scientists to have access to top technology, and are working hard to implement core facilities (for instance proteomics, next-generation sequencing, electron- and high-end fluorescence microscopy), run by specialist staff who know how to best use these technologies and keep equipment in shape.

Are there any EMBO Members and Young Investigators at the Institute?

Of our approximately 30 professors, 11 are EMBO Members, as are 10 of our recent emeriti. There is a generation change happening – as the founding generation is leaving and young people come in – so at the moment, we have one EMBO Young Investigator at the Biocentre.

What are the high points for the Jubilee celebrations?

We have an opening ceremony, attended by our stakeholders from local politics, academic institutions and industry, followed by two *Open Door Days* aimed at the general public and a two-day symposium covering all our research areas. Four Nobel Prize winners are amongst the speakers. In addition, we have two flanking symposia covering Signaling and Infection Biology, respectively.



© Basel Biocentre

AWARDS OF EXCELLENCE

EMBO Members

Nobel Prize in Physiology or Medicine 2011



The Nobel Prize Committee award EMBO Member **Jules Hoffmann** and Associate Member **Bruce Beutler** the Nobel Prize in Physiology or Medicine 2011 for their discoveries concerning the activation of innate immunity. Scientists have long been searching for the gatekeepers of the immune response by which man and other animals defend themselves against attack by bacteria and other microorganisms. Beutler and Hoffmann discovered receptor proteins that can recognize such microorganisms and activate innate immunity, the first step in the body's immune response. Hoffmann and Beutler also won the **2011 Shaw Prize in Life Science and Medicine**.

National Medal for Science

US President **Barack Obama** announces recipients of the 2011 National Medal for Science. These include EMBO Associate Member **Rudolf Jaenisch** of the Whitehead Institute for Biomedical Research and the Massachusetts Institute of Technology. He is recognized for his work on improving our understanding of epigenetic regulation of gene expression: the biological mechanisms that affect how genetic information is variably expressed. His work has led to major advances in our understanding of mammalian cloning and embryonic stem cells.

2012 Arthur C. Cope Award for Organic Chemistry

EMBO Associate Member, **Chi-Huey Wong**, wins the 2012 Arthur C. Cope Award for Organic Chemistry for his outstanding achievements in the field. Chi-Huey Wong, known for his development of green methodology for carbohydrate synthesis, which has enabled the synthesis of complex carbohydrates, is the first Taiwanese academic to win the prestigious award set up by the American Chemical Society (ACS). He will receive the award in March 2012 at the ACS national conference in San Diego.

Wittgenstein Award

Jan-Michael Peters, EMBO Member and Senior Scientist at the Research Institute of Molecular Pathology (IMP), wins Austria's prestigious Wittgenstein Award, worth 1.5 million euros over five years. Jan-Michael Peters is researching the molecular mechanisms of cell division.

2011 Canada Gairdner International Award

EMBO Members, **Adrian Bird**, **Howard Cedar** and **Aharon Razin**, receive the 2011 Canada Gairdner International Award, for their pioneering discoveries on DNA methylation and its role in gene expression. The Gairdner Awards has a 50-year history of awarding the world's most creative and accomplished biomedical scientists.

Albert Lasker Basic Medical Research Award

EMBO Member **Frank-Ulrich Hartl** wins the 2011 Albert Lasker Basic Medical Research Award with his colleague **Arthur L. Horwich** for their ground-breaking discovery of how cage-like machinery in the cell folds proteins.

EMBO Young Investigators

GlaxoSmithKline Foundation Award

EMBO Young Investigator **Daniel Wilson** from the Gene Center at Ludwig-Maximilians-Universität Munich wins the GlaxoSmithKline Foundation Award for clinical research into the mechanism of action of antibiotics. The award comes with a prize of 10,000 euros.

Bayer Early Excellence in Science Award

Oliver Daumke, EMBO Young Investigator, wins the Bayer Early Excellence in Science Award. He was awarded the prize, worth 10,000 euros, for his contribution to the understanding of the structure and function of GTP-binding proteins (G proteins).

ERC 2011 Starting Grant

EMBO Young Investigator, **Jan Lohmann**, receives an ERC 2011 Starting Grant worth 1.5 million euros for his research into decoding the environmental adaptation of plant stem cell control. Jan's group works at Heidelberg's Ruprecht-Karls-Universität.

A GOOD READ – PUBLICATIONS FROM THE EMBO COMMUNITY

RESEARCH ARTICLES

SHARPIN is an endogenous inhibitor of β 1-integrin activation

Teijo Pellinen (EMBO Young Investigator) *et al.*
Nature Cell Biology | 25 September 2011
doi:10.1038/ncb2340

Crystal structure of nucleotide-free dynamin1

Oliver Daumke (EMBO Young Investigator) and Volker Haucke (EMBO Young Investigator) *et al.*
Nature | 18 September 2011
doi: 10.1038/nature10369

CTCF-binding elements mediate control of V(D)J recombination

Claudia Bossen (EMBO Fellow) *et al.*
Nature | 11 September 2011
doi:10.1038/nature10495

Derivation of haploid embryonic stem cells from mouse embryos

Martin Leeb (EMBO Fellow) and Anton Wutz (EMBO Young Investigator) *et al.*
Nature | 7 September 2011
doi: 10.1038/nature10448

Structural analysis of the interaction between Hsp90 and the tumor suppressor protein

Franz Hagn (EMBO Fellow) *et al.*
Nature Structural & Molecular Biology | 4 September 2011
doi:10.1038/nsmb.2114

Pol III binding in six mammals shows conservation among amino acid isotypes despite divergence among tRNA genes

Claudia Kutter (EMBO Young Investigator) and Duncan Odom (EMBO Young Investigator) *et al.*
Nature Genetics | 28 August 2011
doi:10.1038/ng.906

Whole-genome sequencing of multiple *Arabidopsis thaliana* populations

Detlef Weigel (EMBO Member) *et al.*
Nature Genetics | 28 August 2011
doi:10.1038/ng.911

The tumour suppressor L(3)mbt inhibits neuroepithelial proliferation and acts on insulator elements

Jürgen Knoblich (EMBO Member) *et al.*
Nature Cell Biology | 21 August 2011
doi:10.1038/ncb2306

Solution structure of a minor and transiently formed state of a T4 lysozyme mutant

Guillaume Bouvignies (Long Term Fellow) *et al.*
Nature | 21 August 2011
doi:10.1038/nature10349

Haem oxygenase is synthetically lethal with the tumour suppressor fumarate hydratase

Christian Frezza (EMBO Fellow) *et al.*
Nature | 17 August 2011
doi:10.1038/nature10363

Chromosomal rearrangements maintain a polymorphic supergene controlling butterfly mimicry

Mathieu Joron (EMBO Fellow) *et al.*
Nature | 14 August 2011
doi:10.1038/nature10341

Foxp3⁺ follicular regulatory T cells control the germinal center response

Michelle A Linterman (EMBO Fellow) *et al.*
Nature Medicine | 24 July 2011
doi:10.1038/nm.2425

CODA-RET reveals functional selectivity as a result of GPCR heteromerization

Eneko Urizar (EMBO Fellow) *et al.*
Nature Chemical Biology | 24 July 2011
doi:10.1038/nchembio.623

Differential excitatory and response dynamics of excitatory and inhibitory neurons in visual cortex

Sonja B Hofer (EMBO Fellow) *et al.*
Nature Neuroscience | 17 July 2011
doi:10.1038/nn.2876

Crystal structure of a chaperone-bound assembly intermediate of form I Rubisco

F Ulrich Hartl (EMBO Member) *et al.*
Nature Structural & Molecular Biology | 17 July 2011
doi:10.1038/nsmb.2090

Multi-domain conformational selection underlies pre-mRNA splicing regulation by U2AF

Tobias Madl (EMBO Fellow) *et al.*
Nature | 13 July 2011
doi:10.1038/nature10171

The ELF4-ELF3-LUX complex links the circadian clock to diurnal control of hypocotyl growth

Anne Helfer (EMBO Fellow) *et al.*
Nature | 13 July 2011
doi:10.1038/nature10182

Structural basis of steroid hormone perception by the receptor kinase BRI1

Michael Hothorn (EMBO Fellow) *et al.*
Nature | 12 June 2011
doi:10.1038/nature10153

The PIAS homologue Siz2 regulates perinuclear telomere position and telomerase activity in budding yeast

Helder C. Ferreira (EMBO Fellow) *et al.*
Nature Cell Biology | 12 June 2011
doi:10.1038/ncb2263

IFIT1 is an antiviral protein that recognizes 5'-triphosphate RNA

Andreas Pichlmair (EMBO Fellow) *et al.*
Nature Immunology | 05 June 2011
doi:10.1038/ni.2048

PRESS RELEASE

Synthetic biologists design suicidal bacteria to fight infection

Press release
Molecular Systems Biology
16 August 2011
doi: 10.1038/MSB.2011.55

TRANSITIONS

EMBO Member **Dario Alessi** has been appointed Director of the Medical Research Council's (MRC) Protein Phosphorylation Unit at the University of Dundee, Scotland. He will succeed the current director, **Philip Cohen**, also an EMBO Member, who will step down in April 2012.

EMBO Member **Dirk Heinz** is appointed Scientific Director of the Helmholtz Centre for Infection Research (HZI) in Braunschweig, Germany. The German Ministry for Education and Research (BMBF) appointed him as successor to Prof. **Jürgen Wehland**, who passed away a year ago, with effect from August 1. Heinz has been acting Scientific Director since September 2010.

The Centre for Genomic Regulation (CRG) in Barcelona, Spain appoints EMBO Member **Luis Serrano** as Director.