WINTER
2014 | 2015

ISSUE 29

EMBO encounters

50th Anniversary EMBO Members Meeting 2014

PAGES 10–11

The EMBO Meeting is coming to Birmingham

PAGE 4

Meet the scientist

Michael Potente

PAGES 6–7

EMBO Young Investigator

EMBO
excellence in life sciences

www.embo.org

Bringing data to the fore

The *SourceData* project improves access to the data in published scientific articles and enables further use of research results. This EMBO initiative has entered its proof-of-principle phase with the support of the Robert Bosch Foundation. The tools that are being developed as part of the project make the source data in scientific publications easier to find and allow scientists to use the data to their full potential.

Efficient access to primary research could significantly speed up science. Yet scientific journals publish most data as figures that do not easily allow further analysis of the data and are inaccessible to systematic data mining or search. "When I had to make an extensive review of all papers reporting Cdk1 substrates, I realized how cumbersome and time-consuming such an elementary task can be using standard literature search engines like PubMed, let alone finding and comparing the respective figures showing the experimental evidence," Tim Hunt explains to illustrate this problem. "It would be so wonderful to be able to find and compare all published cell cycle-dependent phosphorylation profiles of such substrates to analyse the differences, depending on the context of the experiments." To address this central issue in scientific publishing, EMBO has initiated the *SourceData* project. *SourceData* will develop tools adapted to the scientific publishing process that will make published data re-usable and searchable.

"The main objective of the *SourceData* project is to describe the biological content of the data underlying published figures—we call these 'source data'—by using standardized terminologies and developing data-oriented strategies to search the literature," explains Thomas Lemberger, Deputy Head of Scientific Publications at EMBO, who leads the project.

"All EMBO Press journals already encourage the presentation of source data for figures that convey the essential findings in a paper," says Bernd Pulverer, Head of Scientific Publications at EMBO. "Last year, more than half of the research papers in our journals contained source data and we are confident that this will become the standard for publication in the near future."

The *SourceData* project has recently received support from the Robert Bosch Foundation to develop the necessary software tools in collaboration with the Vital-IT Center for high-performance computing and the Swiss-Prot groups, both headed by Ioannis Xenarios at the Swiss Institute of Bioinformatics. One of the tools is a computer-assisted biocuration platform that helps biocurators to identify in an unambiguous way the biological components involved in a published experiment. In addition, whenever possible, a simplified computer-readable representation of the hypothesis tested by the experiment will be generated.

With the biocuration tool in place, editors of scientific manuscripts can describe the source data underlying the figures that represent the essential findings in the paper to the reader. At EMBO Press, dedicated scientific data editors already work with the authors of manuscripts to optimise and structure the presentation of their figures and data.

SourceData recently hired its first biocurators who joined EMBO in Heidelberg, Germany. "Part of our job is to annotate the figures of papers published in open access and other partner journals. We collaborate with publishers, including EMBO Press, Wiley, HighWire Press and Nature Publishing Group, to make a proof-of-principle demonstration of the capabilities of the *SourceData* curation process and semantic models that we are developing," says Sara El-Gebali, one of the new staff. "We are working closely with the software developers at Vital-IT to optimize the usability of the curation tool."

"Our goal is to transform the scientific paper into an enriched resource," says Thomas Lemberger. "We want to make scientific papers more useful to the community and the data in them more easily discoverable. One of the ways to do this is to publish the data in a more structured manner and in a form that is accessible to computers. The first paper published by EMBO that included source data was published in *Molecular Systems Biology* in 2009. More journals are adopting similar policies. We can now build on this experience to go full circle: Soon we will be able to publish figures in a way that not only includes the human-readable illustration and figure legends but also the associated source data and machine-readable metadata. This is a very exciting time." *SourceData* collaborates with publishers including Wiley Blackwell and HighWire to ensure the tools are applicable across journals.

"It is an essential part of our job to work in collaboration with our publishing partners Wiley and HighWire to optimize the integration of biocuration tasks within the production workflows. We also need to develop downstream applications such as 'Smart Figures' that will allow readers to view figures in one paper in the context of related data published in other papers," says Nancy George, biocurator at *SourceData*. "We also need to keep up to date with innovations in the fields related to biocuration as well as the development of community standards and data exchange formats."

"For a project like *SourceData*, we need to combine expertise in areas like scientific publishing, data mining, semantic web technologies and biocuration," says Lemberger. "Our recently appointed members of the Scientific Advisory Board will provide us with essential guidance in this respect."

The Scientific Advisory Board of *SourceData* includes Jason Swedlow, of the University of Dundee, Scotland, Alfonso Valencia, Director of the Spanish National Bioinformatics Institute, Susanna-Assunta Sansone, of the University of Oxford e-Research Centre, Phil Archer, Data Activity Lead of the World Wide Web Consortium, and Mark Patterson, Executive Director of eLife.

The *SourceData* website will be launched in April at sourcedata.embo.org

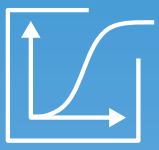
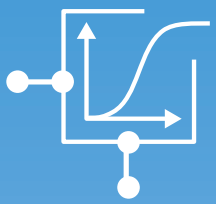


Figure source data

The source data underlying figures are published alongside the illustrations under the terms of a CCo licence to promote unrestricted re-use.



Descriptive metadata

Essential semantics of published experiments are represented in a machine-readable way using standardised terminologies.

Data-oriented search

The web of connected data can be searched to help researchers find the data they need and the papers where they were published.

Further reading:

Lemberger T (2010). From bench to website. *Molecular Systems Biology* **6**: 410.

Lemberger T (2014) Tools of discovery. *Molecular Systems Biology* **10**: 715.

In the public limelight

LORD ROBERT MAY has had a distinguished career that has spanned continents and research disciplines. From 1995–2000, he served as Chief Scientific Advisor to the United Kingdom Government followed by five years as President of the Royal Society. He talked to Barry Whyte about his career and achievements at the *50th Anniversary EMBO Members' Meeting* held in October last year.

I read that throughout your career you have liked to get in early to tackle problems. You prefer to get in quickly to a new area as opposed to looking at more established ideas?

In some ways, when people ask me about my career, I have to say I have a short attention span –that is why I keep hopping around. The truth is that I like the early stages of problems, when the area is not too crowded and there are interesting problems that have never attracted as much attention as I think they should have. When I do get into something new it has been my habit not to read too much about it – just to read a little bit and get a grasp of what is the problem. Then I think about how I would go about understanding it better. I try to learn about "the what" questions but I do not spend much effort on what are the "tentative why" questions, which are by and large lacking. I think if you read too much about what the current state of progress is on both "the what" and "the why" it will tend to channel your thinking.

"The truth is that I like the early stages of problems…"

There is a statistic out there that 80–90% of all scientists who have ever been alive are alive today. We live in a very different environment and there is a lot of pressure on younger scientists. Is it really more difficult today to be a scientist?

I think so. I would be surprised if it wasn't. My reply is purely a conjectural one because I am not as familiar with the facts of younger careers as I might be but it many ways it is just one aspect of a much wider problem. It is not just that there are more people wanting jobs in science but partly, not entirely, it is that there are more people. There are more young people than there ever have been and so it would be interesting whether the increase in numbers of people wanting to go into science is simply proportional to the extra increase in young people. I think it is a bit more than that but it is largely driven by the fact that there are more people and that is part of a much larger question.

How did you make the leap into public affairs?

Well [my wife and I] had been at Princeton University for about 16 years or so. I had been one of the senior administrators. Princeton had a President and a Vice President and then four major Deans, one for the faculty, one for the undergraduates, one for graduate students and one for research. The [post] for research was a legacy of World War II when they appreciated there was going to be much more government support for research at universities. Princeton is most unusual in having rules that say yes we want people to be doing good research but we want it to be basic research. It may not actually involve developing a product that is very much against the temper of some of the times today. That's the sort of place it was and I think it probably still is.

You were approached to be Chief Scientific Advisor of the United Kingdom?

The history of this particular job is an interesting one. Let me begin with that. There was in the labour party in Britain in the 1990s a very interesting figure behind the scenes called Jeremy Bray. He was a very original thinker and not interested in political advancement. He convinced Neil Kinnock about the importance of this post. The position of Chief Scientific Advisor had been hugely important in World War II and in the subsequent years it went down and down. In the 1970s, it was half a day a week when the person who held the job met not with the Prime Minister but with his top policy group. Mrs Thatcher began to bring it back up again. She created the advisory committee on science and technology. She had a very good person as her advisor but Jeremy Bray went beyond this. He suggested in the early 1980s to Neil Kinnock, who was expected to win the next election for the Labour Party, that one of the manifesto commitments would be to create a formal office of science and technology. Bring in someone from outside, appoint them at the top level in the civil service: Grade 1 permanent secretary level so they would have real clout in the hierarchical civil service and give them an appropriate staff, about 130 people to do the things they wanted to do. When they lost the election, a Tory peer, William Waldegrave, who was a very good friend of science, convinced the winner, John Major as Prime Minister, to implement the Labour Party manifesto.

And you were thrown immediately into several crises?

I enjoyed it very much. There were some quite interesting excitements on my watches. There have been on later ones. One of them motivated me to do what I think was the most important thing I did in the five years that the appointment was for – which was to actually issue protocols for science advice in policy making. One has to understand that the Chief Scientific Advisor's job is essentially to tell you what the facts are that constrain the political process of deciding what to do. But ultimately the Science Advisor can't tell you simply what you should do. They can only set out what are the facts, which point maybe to a particular action. You are painting the backdrop for, as it were, a drama in which the play will then be acted out as a democratic process in parliament.

Isn't it true that science works on the basis of skepticism and questioning and that this is sometimes very difficult to convey to a wide audience?

Absolutely. Sometimes people want to hear the answer that they would like to hear and it is not welcoming that they are to be told that it is not the right answer. It is not the job of the Chief Scientist to say its not the right answer, here is the right answer, this is what you must do. Point out that you think it may not be the best but you have got to respect the democratic process.

In 2014, EMBO enlarged its communities of ecology, neuroscience and evolution. What future directions might this take the organization?

I wouldn't be so bold as to venture looking into the far future. It seems to me certainly a good idea. Molecular biology is doing great things but from my perspective it does tend to be a little focused on accumulating experimental evidence, which is hugely important. I have always thought that when it finally begins to mature it is going to go a bit wider and it is going to ask larger questions beyond what is there. You want to go somehow right back to seeing how did it get to be like that and why did it get to be like that. So I think it can only be for the good of everybody that the knowledge base and the enquiry base – in the interests simply of pure molecular biology – broaden out to ask questions about evolution and ask questions about the ecological environment in which simple things happen.

Register now

10 June Early registration & abstract submission

19 August Late registration

The EMBO Meeting comes to Birmingham

the 6th EMBO meeting
advancing the life sciences
2015
Birmingham
United Kingdom
5–8 September

The 6th EMBO Meeting will take place at the ICC in Birmingham, England, on 5–8 September 2015. "*The EMBO Meeting* is a fantastic opportunity to learn about the latest developments in the life sciences across a broad range of topics," says EMBO Member Gillian Griffiths, Professor at the Cambridge Institute for Medical Research and one of the organizers and chairs of this year's meeting. "I'm very excited that the meeting will be held in the United Kingdom." The event takes place at the ICC, one of Europe's high-profile conference venues that typically hosts over 350 meetings and more than 300,000 delegates annually. A central location in the United Kingdom makes it a perfect choice for *The 6th EMBO Meeting*

The EMBO Meeting encourages scientists to look beyond their own fields, engage with the international scientific community and explore interdisciplinary approaches to research in the life sciences. Participants experience new perspectives on topics that cover the entire range of the life sciences – from studies of molecules and the cell all the way up to investigation of larger, complex biological systems. More than 1000 scientists are expected to attend.

This year's meeting includes 20 concurrent sessions that take a comprehensive look at biology from the perspective of molecules, cells, the organism and the very latest methods that researchers use to study the life sciences. The sessions include talks from more than 50 scientists from around the world.

EMBO Young Investigator Claudine Kraft, a Group Leader at the Max F. Perutz Laboratories at the University of Vienna, Austria, remarks: "Our work focuses on the signalling events and molecular steps leading to the induction of autophagy, the waste disposal system of a cell. Defects in autophagy are involved in numerous diseases, including cancer and neurodegenerative disorders such as Alzheimer's and Parkinson's disease, yet little is known about the cellular mechanisms that lead to these conditions. I am very much looking forward to presenting our latest findings at the meeting in Birmingham." EMBO Member Philippe Sansonetti, Professor at the Pasteur Institute and the Collège de France in Paris adds: "My talk will address how the concepts and tools of the cellular microbiology of bacterial pathogens can be adapted to study the symbiotic interaction between the gut microbiota and the host intestine."

"*The EMBO Meeting* is all about the community of life scientists in Europe and beyond'" says EMBO Director Maria Leptin. "It allows scientists from all countries in Europe to hear talks by leading international researchers from all over the world. Young scientists also have access to career opportunities through networking events and other career-related activities." The meeting will also include a full range of options for exhibitors to interact with attendees as well as poster sessions where researchers can present their work to the wider scientific community.

The plenary lectures will look at nuclear architecture, pathogens and defense and stem cell biology. Joan Steitz from Yale University School of Medicine and Peter Walter from the University of California, San Francisco will give keynote lectures covering non-coding RNA-protein complexes and the unfolded protein response, respectively. Other confirmed speakers at the meeting include Stephen P. Jackson, Robert Martienssen, Daniel St Johnston, Azim M. Surani, and Inder M. Verma.

EMBO Advanced Fellowships

Five researchers to receive two years of additional funding

"The quality of the applications was very high, five candidates were outstanding," reports Andrea Hutterer, Manager of the EMBO Fellowships Programme. Five successful candidates were announced in 2015 to receive the new Advanced Fellowship, a scheme introduced last July. This new funding allows former and current EMBO Fellows to apply for an additional two years of financial support.

By introducing this scheme, EMBO followed up on suggestions from the community of EMBO Fellows to extend the timeframe of the funding for senior postdoctoral researchers. Many of the postdoctoral scientists struggle to complete their scientific projects within the two years when they receive the stipend. Last year it was decided to grant an extra period of funding to those showing exceptional progress and potential to establish quickly their independent line of research.

Four of the successful candidates are based in the United Kingdom, one in Switzerland. "Being awarded the EMBO Advanced Fellowship allows me to finish my current postdoctoral project and take the first steps towards becoming an independent scientist," says one of the awardees, Julia Santiago Cuellar, currently working at the University of Geneva. "The award is a sign of trust and recognition to European researchers willing to pursue their scientific careers." Grzegorz Sarek from Cancer Research UK London Research Institute comments: " This fellowship gives me a fantastic opportunity to take my research to another level. EMBO Fellowships are one of the finest programmes for postdoctoral scientists seeking to advance their career."

The newly elected EMBO Advanced Fellows are:

- Suewei Lin, University of Oxford
- Julia Santiago Cuellar, University of Geneva
- Grzegorz Sarek, Cancer Research UK London Research Institute
- David Schwefel, MRC National Institute for Medical Research (NIMR)
- Emily Wong, EMBL-EBI, Hinxton

APPLICATION DEADLINE

The 2015 deadline for submission is 1 July.

More information:
www.embo.org/funding-awards/fellowships/advanced-fellowships

EMBO Fellows meet at the Salk Institute

120 past and present EMBO Fellows working in the United States came to the biennial meeting held in San Diego in November 2014. ELISABETE NASCIMENTO, postdoctoral researcher at Stanford University, reports on the three-day event.

As a second-year postdoctoral fellow at Stanford University, it is easy to get engrossed in the daily experimental work and forget that interactions with fellow scientists are just as important for a successful scientific career. Attending the sixth US EMBO Fellows' Meeting at the Salk Institute came as a breath of fresh air. During the three days in sunny San Diego, I experienced a friendly atmosphere and many chances to network with the more than one hundred EMBO Fellows living and working in the United States and Canada.

The meeting started off with a fascinating welcome talk on plasticity versus hierarchy in cancer stem cells by EMBO Member Inder Verma, who hosted the event. As a leader in developing virus-based gene therapy vectors, he has used engineered viruses to express oncogenes in glial cells and neurons, demonstrating that the introduction of oncogenes in this way leads to development of glioblastoma regardless of the cell of origin. He also discussed cell plasticity and presented evidence that both cell-intrinsic and cell-extrinsic factors can lead to de-differentiation of cancer cells to a stem cell-like state. His talk reiterated the incredible plasticity of cancer cells and the obstacles the field still needs to overcome to prevent tumour relapse.

Oren Ram from the Broad Institute presented an interesting talk describing his profiling of a large number of chromatin regulators at the single cell level by combining ChIP-Seq with microfluidic technology. His talk highlighted the importance of using single-cell profiling to tease out molecular mechanisms in heterogeneous systems such as cancer. Lukasz Swiech, from the Broad Institute spoke about the use of adeno-associated virus (AAV)-mediated Cas9 delivery into the brains of living mice, enabling the targeting of single or multiple genes into specific neural cell types.

Besides fascinating talks on research discoveries, I also enjoyed the talks from junior principal investigators Andrew Holland from Johns Hopkins University and Cristina Lo Celso from Imperial College London who described their career paths as EMBO Fellows. At dinner, Cristina gave me and other EMBO Fellows great advice on the do's and don'ts of starting your own laboratory. Valuable information on funding options available for junior researchers who wish to return to Europe and start their laboratories came from Isabelle Vernos, member of the ERC Scientific Council and Guntram Bauer from the Human Frontier Science Program. Finally, Dena Plemmons, University of California, San Diego, initiated an interesting discussion on research integrity, using several examples of ethical issues that happened in real life.

I found the meeting very productive, providing me with advice and information crucial to my career as a young scientist, and allowing me to network with highly skilled EMBO Fellows. I would recommend all EMBO Fellows in the United States and Canada to attend these meetings as they help you build your own scientific career.

Elisabete Nascimento, Stanford University

MEET THE SCIENTIST

EMBO Young Investigators & Installation Grantees

Michael Potente

Max Planck Institute for Heart and Lung Research, Bad Nauheim, Germany

Research focus. Our research focuses on blood vessels, particularly the regulation of blood vessel growth (angiogenesis) by metabolism. Angiogenesis and metabolism are intimately connected, as blood vessels provide nutrients and oxygen to energy-consuming tissues. We study how blood vessels sense their metabolic microenvironment and how they use this information to build vessel networks of organ-specific size, shape and function. We are also interested in the metabolism of endothelial cells (the cells that line the inner surface of blood vessels), aiming to understand how changes in metabolic state impact vascular growth and homeostasis.

Medical background. I was trained as a clinical cardiologist, but I always had a strong interest in basic science. Already as a young medical student I was fascinated by biochemistry, molecular signal transduction and the mechanisms of disease. I cannot say it was a concrete decision to focus on basic science. It was rather a continuous development.

How different is basic science from medicine? I think medicine has traditionally been more hierarchical, but this is beginning to change. I was lucky enough to do my medical training in a very science-oriented department in Frankfurt, where a lot of emphasis was put on cooperation. This collaborative environment helped me build up my research programme in the early days of my career.

Changing directions. My research interests have not changed much throughout my career. I guess this is, in part, a consequence of our scientific approach. Our research is primarily driven by observations of our model systems rather than hypotheses. We try to look very carefully at phenotypes and then formulate questions that will help us understand the underlying mechanisms.

Selection as EMBO Young Investigator. To me, it is the package that makes the Young Investigator Programme so attractive. Having access to excellent laboratory management courses and core facilities is fantastic and provides essential support at this key stage of my career. The networking aspect is also very appealing. I am already looking forward to meeting all the other Young Investigators at the upcoming meeting in Barcelona.

Scientific heroes. Since my early days at medical school, I have been fascinated by the work of Eric Olson and his ability to recognize fundamental mechanisms of gene regulation in complex biological phenotypes. I should also mention Holger Gerhardt in this context, whose innovative approach to developmental vascular biology has always been a source of inspiration. Holger used to be an EMBO Young Investigator and he encouraged me to apply to this programme.

Claudine Kraft

Max F. Perutz Laboratories, University of Vienna, Austria

Key career experience. At high school I was fascinated by physics, mathematics, chemistry, and also by genetics, although we merely touched upon it. Not quite sure which of these interesting paths to follow, I was advised to consider biochemistry. One day I walked into the laboratory of Gottfried Schatz at the Biozentrum Basel to inquire about an internship. I had only just finished school, but he accepted me for a three-month training. It turned out to be an invaluable experience and the basis of my future career as a biochemist. I still turn to Jeff's advice when confronted with the ups and downs of life as a scientist. For my postdoctoral research, I joined the group of Matthias Peter at the ETH in Zurich. Since I was interested in protein degradation and wanted to work with yeast, his group turned out to be an ideal choice. Matthias already had plans to work on autophagy and he let me establish my own line of research.

Encounters with EMBO. My relationship with EMBO is deeply rooted: As a PhD student I worked in the laboratory of former EMBO Young Investigator Jan-Michael Peters and as a postdoctoral researcher I was granted an EMBO Long-Term Fellowship. Jan-Michael was a great role model and mentor for me. He gave me a chance to join the Young Investigator PhD course offered by EMBO. Now, more than ten years later, I can send my own PhD students to this course. I am very proud of being selected as a Young Investigator myself.

Recent research. We are interested in the function and regulation of the cellular waste disposal system called autophagy. Defects in autophagy are involved in numerous diseases, including cancer and neurodegenerative disorders such as Alzheimer's and Parkinson's disease, yet little is known about the cellular mechanisms that lead to these conditions. A special focus of my team is the function and regulation of the Atg1 kinase complex, a major regulator of autophagy in yeast as well as in humans. Its function still remains unclear. We use budding yeast as our main model system but expand to mammalian systems where appropriate. At *The EMBO Meeting 2015* in Birmingham I will present the work done by my group over the last three years.

You have a young family. How do you manage? Good question. It works because my lab team and my husband are flexible. And the good thing about being a group leader is that a lot of the work can be done at home when the kids are in bed. As a postdoc it was much more difficult because the bigger part of the work was still pipetting.

MEET THE SCIENTIST

EMBO Young Investigators & Installation Grantees

Pavel Plevka

Masaryk University, Brno, Czech Republic

Recent research. My research is focused on viruses that cause diseases in humans or are economically important pathogens of honeybees. We are interested in honeybee viruses because they are a major factor contributing to the decline of honeybee population in the European Union and United States. The honeybee plays a vital role in the agricultural industry by providing pollination services for many food crops. Moreover, abundance of wild insect-pollinated plant species declines in areas with reduced populations of honeybees. Among human viruses, we are interested in picornaviruses that induce illnesses ranging from the common cold to life-threatening encephalitis caused by enteroviruses and polioviruses. My laboratory uses a combination of crystallographic studies with cryo-electron microscopy to study picornavirus-host interactions.

We also work on bacteriophages that could be used as antibacterial therapy agents. We study infection cycle of phage 812K1 that can be used as an antibacterial agent to treat *Staphylococcus aureus* infections. Many *S. aureus* strains are resistant to antibiotics and cause a range of human diseases from skin infections to life-threatening pneumonia, meningitis, and sepsis. Phages can be used to treat pathogenic bacteria, even those that are resistant to antibiotics. Structural description of the phage-bacteria interactions may allow preparation of genetically modified phages targeting new bacterial strains.

Changing directions. My research interests have always been related to viruses. From the time I entered university I was intrigued by virology and molecular biology. During my pre- and post-doctoral studies I worked on virus-related projects ranging from bacteriophages and plant viruses to mouse polyomavirus and viruses causing disease in humans. However, I have changed the methodological approaches from molecular and cell biology methods to X-ray crystallography and electron microscopy.

Research in the United States. Working with Michael Rossmann at Purdue University was a stimulating experience. The team was very international – it included at least seven nationalities. I am striving to emulate a similar environment in my laboratory. The Czech scientific environment is quite different to the United States for historical reasons. Diversity and mobility of researchers are limited but the situation is improving. In the structural biology research program of CEITEC (my home institute) all new research group leaders have experience from abroad or are foreigners.

Challenges in setting up my own group. I face four major challenges: securing research funding, recruiting capable team members, establishing functional collaborations, and training PhD students and postdoctoral researchers in my group. Perhaps it is balancing all the requirements that is most challenging.

Ana Domingos

Gulbenkian Institute of Science, Oeiras, Portugal

What drew you to research on obesity and eating behaviour? I became fascinated by the topic when I first heard a talk by Jeffrey Friedman of the Rockefeller University before he became my postdoctoral mentor. He has been a constant role model and valuable guide along with my PhD advisor Leslie Vosshall. Both are unique and interesting personalities who create science that can change society. For me, it has been really inspiring. In addition to my bench work I am also committed to reaching the public. Scientific education of the the general public is the most important means of preventing stigmatization and prejudice against obese patients.

Gender ratio. The gender ratio in my institute reflects the typical gender ratio in the life sciences in Portugal. In our institute, 45 percent of group leaders are women, and the ratio of mothers among them is almost as high as that of fathers. This comes as a surprise considering the inverse global trend in terms of gender ratio in science leadership. For specialists studying gender ratios in leadership, Portugal provides a lot of food for thought.

Experience at the Rockefeller University. Rockefeller University is an outstanding institution. I was fortunate to spend more than a decade there during my graduate studies as well as my postgraduate research. The University is like a small oasis in the middle of New York city. People say that good perfumes come in small packages, and I feel that Rockefeller is all about that: a university with a small campus that already gave rise to 24 Nobel Laureates. A small campus like this facilitates human and scientific interactions that can lead to groundbreaking research.

Changing directions. It happened very often. First I changed direction from an undergraduate degree in pencil-and-paper mathematics (not applied mathematics) to a PhD in "wet" neurobiology of olfaction in *Drosophila*. As a postdoctoral researcher, I switched to research in neurobiology of obesity, using mice as a model system. Currently I am dipping my fingers in immunology. Obesity involves malfunction of multiple systems and organs – I think of it as a systems level disease. We need to have an integrative approach to understand what goes wrong, and that will require a multidisciplinary effort.

Initial collaborations after coming back to Portugal. First I established collaborations locally and now I am counting on the EMBO network to expand them. I already touched base with some scientists from the network but it is still too early to know if this will work. I am optimistic.

We need a CERN for genomics

EMMANOUIL DERMITZAKIS is currently the Louis-Jeantet Professor of Genetics at the University of Geneva. From 2004-2009, he was a group leader at the Wellcome Trust Sanger Institute in Cambridge. His research focuses on the genetic basis of cellular phenotypes and complex traits. In an interview with Thomas Lemberger, chief editor of the journal *Molecular Systems Biology*, he talks about the functional use of population genomics, disease biology and the power and challenges of large-scale sequencing projects.

Your research focuses on understanding the genomic basis of human variation. What is your general approach?

Studying variation in humans touches both basic science and medically related questions dealing with disease, treatment and the understanding of disease in general. Our approach is from a basic perspective. We are trying to understand how genetic variation in general – meaning all the variants in the human population – has an impact on cellular processes.

Conducting genetic experiments is possible in mice but impossible in humans. So what is the critical advantage of studying genomic variants in humans at the level of entire populations?

The advantage is not as much scientific as it is social. I think the interest in understanding medically related questions has opened up a lot of doors both on the hospital side as well as at the level of the individual citizen. Sampling tissues from individuals in a non-invasive way is more and more accepted. We can look at cells and generate cell lines, which serve as models to do experiments on. In fact, we do plenty of experiments on cell lines.

How do you address the often complex mechanisms that lead to a disease?

There are two aspects to this issue: how you get a particular disease and how you approach its treatment are two different things. One example is diabetes that results from loss of control of glycemia. The causes of the disease are probably long-term. It is a combination of genetics and environment. You cannot just reverse the causes and treat the disease. Because if you could, you would just lose weight and be fine again. Understanding the causes and informing people how to prevent a disease – called preventive medicine – is one thing. But treating a patient who lost the equilibrium is a whole different approach.

Why is it important to sequence more and more individual human genomes?

We should sequence everybody. In fact, people should be sequenced at birth. Not because this will predict a disease. The reason is that each one of us is going to have something that is rare or even private. To better understand a rare condition it is always helpful if you compare to other patients without that mutation. It will also improve our understanding of the impact of the DNA sequence on particular phenotypes. Some people might be able to control it just by changing their behaviour as opposed to drug treatment. I think everybody should be sequenced because it is a fundamental thing. This is similar to looking at yourself in a mirror, weighing yourself or measuring your height. It would be a great benefit to humanity if we reached the level where we can share DNA information without being afraid that somebody will take advantage of it. It might be difficult but we should aim for that.

"I think everybody should be sequenced because it is a fundamental thing. This is similar to looking at yourself in a mirror, weighing yourself or measuring your height."

Sequencing has become very cheap, which explains why we can sequence more and more people. Is it going hand in hand with similar efforts to measure molecular and clinical phenotypes?

Phenotyping of individuals in a medical setting, so called clinical phenotypes, and the recording of those phenotypes in an electronic health record in an organised fashion is not very advanced. It is disappointing that now that the genome is available we have to wait for the electronic health record. It would have been great if those records were already organised. It is late to do it now because every hospital has its own system and in addition the national health systems are often totally different.

Speaking about the scientific process in genomics: research in genomics often involves large consortia. Do you think we need a CERN-like structure for genomics?

We need large consortia because the major efforts need to be done collectively – compiling the data, deciding on standards, organising and sharing available data. Establishing a homogenous way to do all these things has helped genomics very much. On the other hand, innovation will not come from consortia. Consortia are just helping to build a base line that people can step on and move on to discover interesting things. We need a mix of both. In my opinion we do need a CERN for genomics for two reasons. First of all we need structures in Europe that will influence the European setting. What we also need is a place to meet. Because CERN is not just about doing research. It is also a meeting point for scientists. EMBL has fulfilled this role for molecular biology. Genomics is a new revolution and we need to build something similar now.

Is it important to share findings and data prior to publication, posting the manuscripts on bioRxiv (bio-archive) for example?

I am split on this. My group has always been very open about announcing things at conferences and in talks on unpublished data. I really like sharing data, information and discovery. But I am worried about the gossip. Publication, with all its caveats and its disadvantages, is an organised way of sharing information. You cannot start sharing findings and data in an aggressive way. The community needs to mature first. And we need to be more organised about sharing information, particularly publication.

© Photolab EMBL

Euro-BioImaging

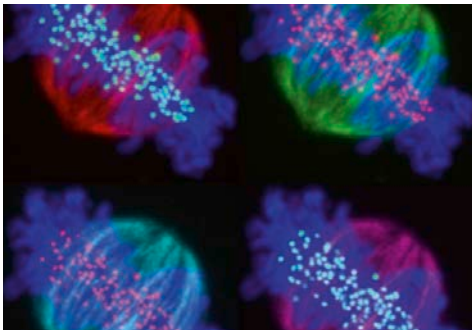
Open Access infrastructure for imaging technologies

FRET stands for Fluorescence Resonance Energy Transfer and describes a microscopy technique used to visualise processes in individual cells, such as protein–protein or protein–DNA interactions. The technique is not new, but it is complex and requires years of expertise. The demand from the scientific community to use this powerful tool has been unflagging.

Bio-imaging techniques such as FRET and other functional imaging techniques, for example super resolution, high content screening or Correlative Light and Electron Microscopy (CLEM), have experienced phenomenal growth within the last decades. However, these technologies are costly and require very high level of expertise to run them. Many European life scientists lack access to such innovative imaging technologies and this can slow down scientific discovery.

In 2010, EMBL and 38 research institutes joined forces to create a pan-European infrastructure called Euro-BioImaging. Its aim is to facilitate access to innovative imaging technologies in the biological and medical fields. "Euro-BioImaging will provide access to the latest equipment at a reasonable cost and distance," says EMBO Member Jan Ellenberg, who was the scientific coordinator of the Preparatory Phase coordinated by EMBL. "All European scientists should have access to the full range of advanced, innovative imaging technologies including the instruments, handling and processing of data, and converting it into publishable results."

The growing need for service, training and technology infrastructure poses capacity problems for many research centres. "We are hitting our limits," admits Tanja Ninkovic, Euro-BioImaging project officer at EMBL. Bottlenecks mainly occur in providing highly demanding and challenging technologies such as super resolution, functional imaging or correlative imaging that are only offered by a small number of institutes, but are in huge demand by a large number of scientists in Europe and worldwide.



© Mayumi Isokane, EMBL

The nodes and the hub

The model is simple. The platform will be composed of imaging facilities – nodes – distributed in a geographically balanced way throughout Europe to keep costs and time involved at bay. Research centres from 19 European countries have already submitted written expressions of interest in becoming such a node. Nodes will be accessible to European and international researchers, and experts working there will support them through all steps of their imaging experiments. A European hub, where strategic and financial decisions are made, will coordinate the services offered by the nodes. The call for the countries that wish to host the hub and provide legal personality to Euro-BioImaging was opened last January.

Academic research is clearly a driving force in this project but it is also relevant to industry. Companies and scientific institutes are working increasingly together to develop new and upgrade existing microscopes that will speed up innovation in Europe. The recently launched Euro-BioImaging Industry Board aims to bring imaging companies in Europe closer to this infrastructure. In the times of economic austerity, biotech and pharmaceutical companies are reducing budgets for R&D and are becoming increasingly interested in shared resources.

Ensuring Europe's competitiveness

"Europe is quite competitive in biological and medical imaging research, and must remain so in the future," says Jason Swedlow, Professor at the University of Dundee. New innovative imaging technologies were born here – one of the most recent was developed by Stefan Hell, who was awarded the Nobel Prize in Chemistry last year. Another European asset is a strong network of software developers working on the next generation of data processing tools for imaging. And thanks to the launch of the Euro-BioImaging project five years ago, new national imaging communities have opened and are actively operating in 25 European countries. Bioimaging has been declared a national priority in twelve EU countries.

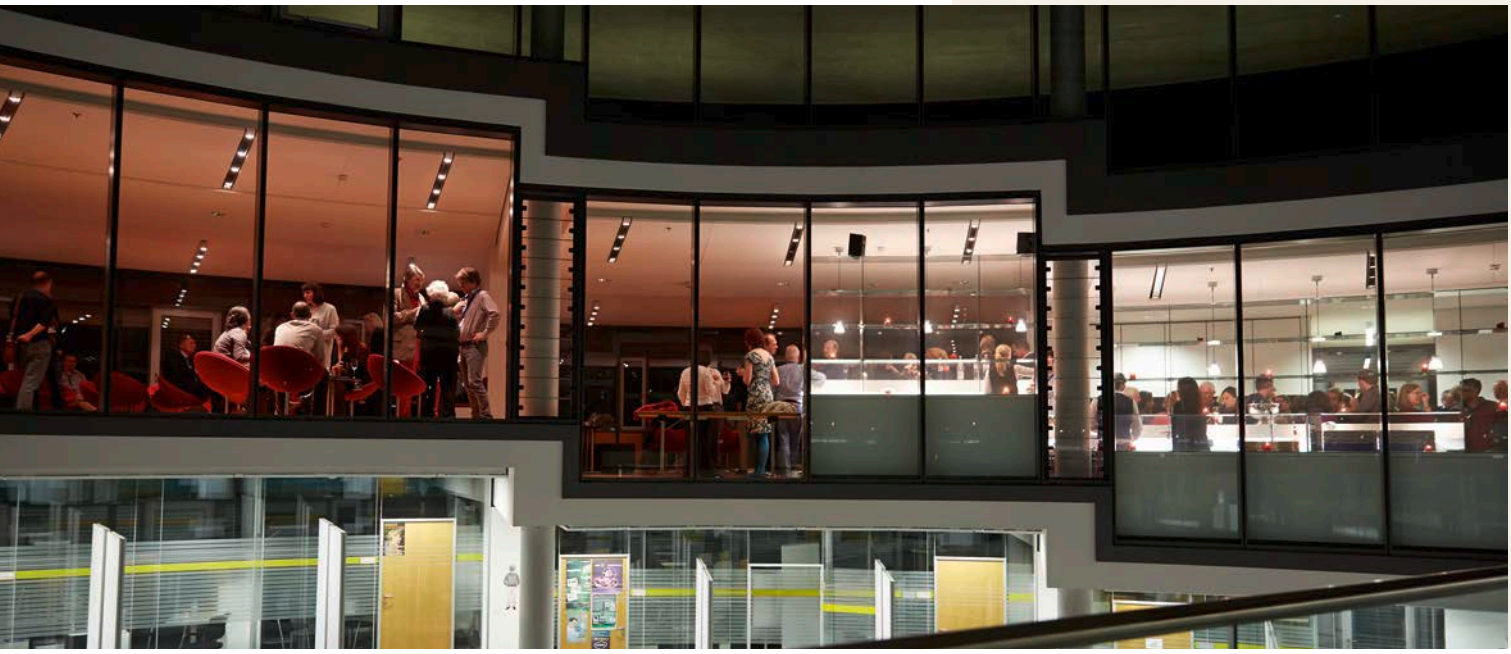
Inna Ulyakina from the University of Lisbon is one of the visiting scientists who used the high-throughput content light microscopy at EMBL's Advanced Light Microscopy Facility. She was able to identify novel therapeutic compounds for cystic fibrosis and the results of the study were finally published in a Cell paper in 2013. "It is important to have a new pan-European infrastructure to be able to perform high quality research using the best available technologies and having professional support for the assay development, data processing and analysis," she says.

After the five-year preparatory phase finished in 2014, the project was handed over from the scientific community to the research ministries that will now decide which centres may join the infrastructure and receive the needed financial upgrade. The funding for the nodes will come from the respective Member States, and, in some cases, countries can use European Union funds. Currently, thirteen countries and EMBL have signed the Memorandum of Understanding.

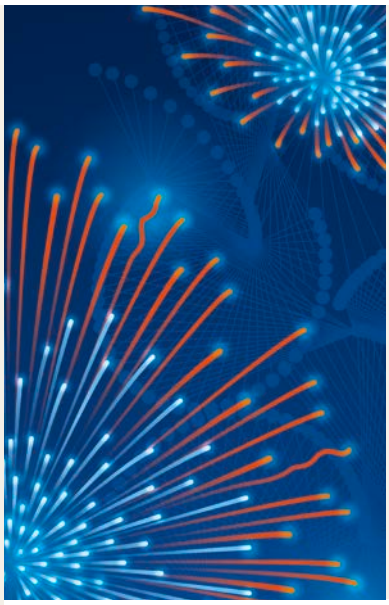
The opportunities for discovery based on microscopy are enormous: imaging could provide the basis for novel applications across many biological and biomedical sciences. One example could be linking spatial and temporal scales by combining different approaches to imaging. A promising technique to achieve this is to link MRI or X-ray images of whole plants, animals or humans with the molecular specificity and resolution afforded by light and electron microscopy – a method that could bring about improvements in both diagnosis and therapy.

www.eurobioimaging.eu/

The EMBO building plunged into darkness on the first evening of the Members' Meeting held last October. A slideshow of *The EMBO Journal* cover images framed the welcome reception attended by more than a hundred guests (left). An audiovisual performance in the ATC auditorium was one of the highlights (above).



© Pictures: Photolab EMBL



50th Anniversary EMBO Members' Meeting

EMBO celebrated its 50th anniversary with a series of inspiring activities and events throughout 2014. The EMBO-EMBL Science and Policy Meeting held in July to celebrate the anniversaries of EMBO, EMBL and EMBC was followed by the FEBS-EMBO Anniversary Conference held in Paris in September 2014. The festivities culminated in a central event for all EMBO Members held in October in Heidelberg.

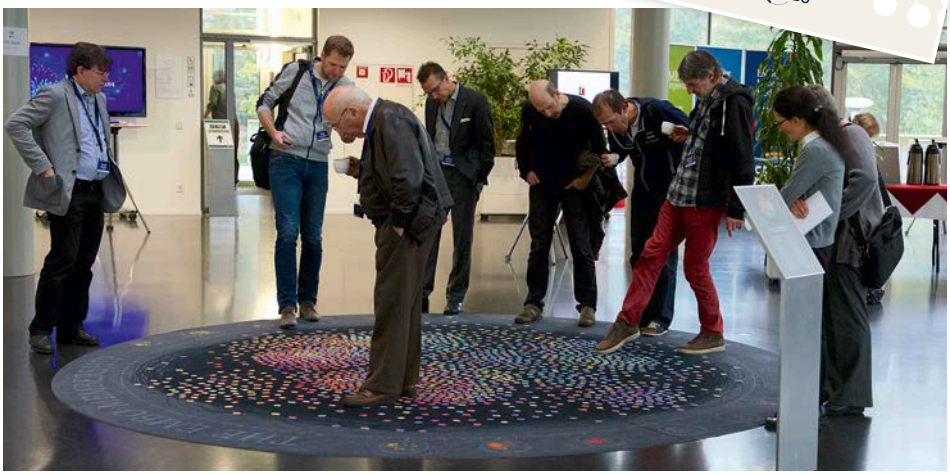
On the occasion of its 50th anniversary, EMBO decided to enlarge its membership to include more researchers who work in the areas of neuroscience, ecology and evolution. The new members selected in the anniversary year and in 2013 were invited to present their latest research and discuss the role of EMBO in furthering the latest science.

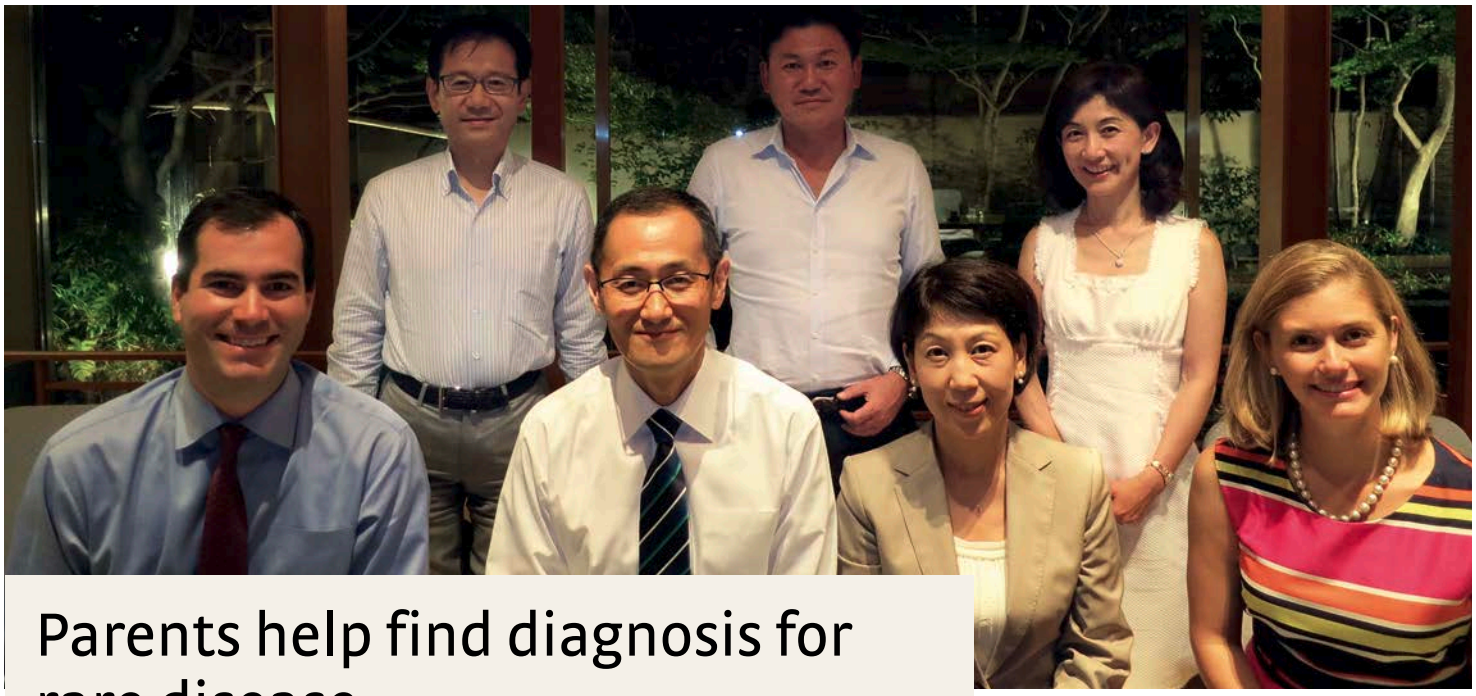
The meeting was a wonderful occasion for new and established members to meet their colleagues and to celebrate the organisation and the people who made EMBO what it is today. More than 120 guests enjoyed three days filled with scientific talks and creative entertainment featuring a molecular gala dinner and an experimental audiovisual performance.

Finding one's own name on the carpet showing the names of 1650 Members was a challenging task (below).

Day two culminated in a molecular dinner featuring Professor of Molecular Gastronomy Peter Barham shown live from the United Kingdom.

The guests created their own dessert – a vanilla ice-cream – by using liquid nitrogen





Parents help find diagnosis for rare disease

EMBO Member LARS STEINMETZ and Associate Member SHINYA YAMANAKA are part of an international team trying to find a solution for a rare disease that was first diagnosed thanks to the efforts of the parents of affected children.

Matt Wilsey (front left), Kristen Wilsey (front right), EMBO Associate Member Shinya Yamanaka (front, second left) and colleagues.

A disease or disorder is defined as rare in Europe when it affects fewer than 1 in 2000. In the United States it has to affect fewer than 200, 000 Americans at any given time. Grace Wilsey was a huge puzzle to her parents and doctors after she was born. At the age of 4 months onwards her development was delayed, but initial diagnostic tests gave no clear answer about the cause of the problems. Whatever condition she had seemed to affect every organ in her body. What followed were visits from one doctor to another, incorrect diagnoses, tests and further tests. Frustrated by the lack of interest from the pharmaceutical industry as well as uncertainty from the medical community the parents of Grace set out to involve others in finding a solution.

Things started to fall into place about the cause of the disease after a small group of patients was identified. One of the crucial pieces of evidence arose from whole genome sequencing for Grace (other patients had their whole exome sequenced), which confirmed that those affected had defective copies of the *NGLY1* gene. Another crucial clinical observation was a lack of tears in patients.

It turns out the *NGLY1* gene encodes an enzyme that removes a sugar molecule from damaged proteins. "What is known is that NGLY1 helps to get rid of misfolded proteins in cells," says Steinmetz, Associate Head of Genome Biology & Senior Scientist at the European Molecular Biology Laboratory in Heidelberg, Germany, Professor of Genetics at Stanford University and Co-director of the Stanford Genome Technology Center, who is working on the project. "When this enzyme is defective you could get an accumulation of protein aggregates in cells. However, NGLY1 could also be involved in other functions."

For NGLY1 deficiency to arise, a person needs to inherit two faulty copies of the gene from his or her parents (autosomal recessive disorder). The condition affects a degradation pathway that takes place within the endoplasmic reticulum of cells in such a way that it leads to neurological dysfunction, abnormal tear production, and liver disease. NGLY1 deficiency patients show global developmental delay, movement disorder, and low muscle tone (hypotonia). Other common symptoms include elevated levels of liver transaminase enzymes, reduced head size (microcephaly), diminished reflexes and seizures.

"NGLY1 happens to be a very central part of cellular metabolism and it is going to be linked to a lot more types of disorders as we work out what it is doing," says Dr Gregory Enns, Director of the Biochemical Genetics Program at Stanford University. Much of the work that led to the diagnosis has been written up in a paper published in *Genetics in Medicine*.* Enns wrote the paper that included input from thirty-three authors from four countries around the world. The paper describes the DNA sequencing work and the findings from the study of eight patients.

"The parents really spearheaded putting the international team of scientists together," says Steinmetz. To further the work on NGLY1 deficiency, the Wilsey's established the Grace Wilsey Foundation (gracewilsey.org), which is led by people from science, medicine, business, and the public service. The foundation helps to coordinate fundraising. The Wilsey's have also provided significant personal financial support for the research. Today a scientific team of glycobiologists, cell biologists, biochemical geneticists, chemists and experts in gene therapy are working on the project.

It has been a long path for the parents to reach a point where they have a diagnosis for the disease and some understanding of what goes wrong in the cells of patients. No one is under any illusion that the journey towards a cure will be straightforward. What is needed now is a concerted effort to understand the molecular events that arise from NGLY1 deficiency and to identify possible intervention points where new therapeutics or treatments would make sense. This is where the work of Steinmetz, Yamanaka and other members of the team that the Wilsey's have put together hope to make contributions.

"We are now trying to find out why deficiencies in the *NGLY1* gene cause many of the symptoms of these children and we are trying to find a cure," says Yamanaka. "We still need to do a lot of basic research to do this and also to find out how frequent the disease is. At this point in time, we just do not know."

*Enns G, Shashi V and Bainbridge M (2014) Mutations in NGLY1 cause an inherited disorder of the endoplasmic reticulum–associated degradation pathway. *Genetics in Medicine* **16**: 751–758.

Teenager discovers a possible cause for her own cancer

"When I was diagnosed with fibrolamellar cancer, it seemed like few people knew much about the disease," says ELANA SIMON who was 12 years old at the time. "No one knew much about what to do with it."

Fibrolamellar hepatocellular carcinoma is a rare liver tumour that affects adolescents and young adults who have no history of liver disease. The standard treatment is removal of the tumour by surgery. Little is known about how the disease develops at the molecular level and diagnostic tests are currently unavailable. Patients with advanced stages of the disease have few treatment options. After diagnosis, Elana had an operation to remove much of her liver. Four years after the surgery she decided to learn more about her cancer and made the bold decision to investigate her own disease. To train herself, she took an internship in a medical school laboratory exploring the genomics of pancreatic cancer. However, the results frustrated her. Pancreatic cancers have thousands of single nucleotide variants because they have often been in the patient for years before being found, giving time for many mutations to accumulate. Since they occur in an older population even the normal cells have many mutations due to the aging process. Elana wanted to study a paediatric cancer – her own cancer – in the hope there would be fewer mutations in the tumour cells and few mutations in the normal cells of the body. "When we identify a possible mutation in an adolescent, it is much more likely to be driving the cancer," says Elana. Her surgeon, Dr. Michael LaQuaglia of Memorial Sloan-Kettering Cancer Center, encouraged her, but she could not find a lab space to work. She ignored the offer of space from her father, Sandy Simon, professor and head of the Laboratory of Cellular Biophysics at the Rockefeller University, since she wanted to be independent. However, the possibility of pursuing her dream took precedence over independence and she started working in his laboratory in her spare time outside of high school, together with surgical fellows of Dr. LaQuaglia's group at the Memorial Sloan-Kettering.

Elana and colleagues used the latest sequencing technologies and bioinformatics tools and made the decision to study not just a select section of fibrolamellar DNA but her entire genome, even though this meant far more work than usual. Together with other patients, family members, scientists, and contributors, they set up The Fibrolamellar Tissue Repository at the Rockefeller University. The ready availability of tissue samples facilitates the daily work of researchers. It helps scientists build up a picture of the shared molecular similarities of patients with the same diseases. In many cases patients may be living in very different geographic locations and communication and outreach are essential to build an effective repository. Elana, together with other patients, also established the Fibrolamellar Registry, which helps provide information about research for patients and is serving as a nascent Patient-Owned Electronic Medical (POEM) registry. Elana and colleagues hope to expand this to a full-scale medical database for the disease that is shared with multiple groups and institutions. The goals are to help inform both patients and researchers about a disease for which any one institution only has a small about of data.

The genetic data from the tumours of 15 patients were obtained for the fibrolamellar cancer project. It turned out that all 15 patients shared a piece of DNA that had been broken and joined back together in a way that created a mutant gene or "chimera." During this fracture-fusion process a 400-kilobase sequence of DNA on chromosome 19 is removed. The mutant gene that resulted was not present in the tissue of healthy individuals. This DNA deletion most likely creates "unnatural proteins" that can drive the onset and progress of fibrolamellar cancer.

The results of the study have been published in a paper that appeared in *Science* early last year.* Elana, now a 19-year-old student studying computer science at Harvard University, is one of the lead authors on the paper. Sanford Simon, Elana's father, adds: "It is uncommon for a genetic screen for a cancer to turn up such a strong candidate mutation, and for the mutation to be present in every single patient tested." The hope now is that the molecular signature that has been discovered can be developed into an effective early-stage diagnostic marker of the disease. If successful it should be possible to screen blood samples of individuals for the tell-tale signs of cancer and make interventions at the earliest possible opportunity. Further work is in progress to see what molecular changes ensue from the observed deletion of DNA and to try and characterize the many molecular events that give rise to fibrolamellar hepatocellular carcinoma.

On January 30, 2015, in the East Room of the White House, President Obama delivered remarks on his plan to expand precision medicine, a medical approach that will provide treatments that match the needs of individuals and which offers new ways to understand and tackle rare diseases. Elana Simon was at the event to talk about her experience and had the pleasure of introducing the President. Determination and curiosity have been essential in Elana Simon's quest to understand her disease. "I want everyone out there with rare diseases to know that it's really up to the patients to motivate progress and now we can actually do so," concludes Simon.

*Joshua N. Honeyman, Elana P. Simon, et al. (2014) Detection of a recurrent DNAJB1-PRKACA chimeric transcript in fibrolamellar hepatocellular carcinoma. *Science* 6174: 1010–1014.

For further information:
The Fibrolamellar Cancer Foundation:
www.fibrofoundation.org
The Fibrolamellar Registry:
www.fibroregistry.org
The Fibrolamellar Tissue Repository:
fibrolamellar.rockefeller.edu
President Obama speaks on the Precision Medicine Initiative:
www.youtube.com/watch?v=MKiw7yAqqsU

Practical Courses

In vivo plant imaging
DE-Heidelberg, 9–15 March 2015

Single molecule and single cell fluorescence Å/nm/µm/mm-scopy
DE-Heidelberg, 15–23 March 2015

Advanced optical microscopy
UK-Plymouth, 8–18 April 2015

The characterization of post-translational modifications
DK-Odense, 9–15 April 2015

Computational biology: From genomes to systems
JP-Okinawa, 17–22 April 2015

Single-cell gene expression analysis
DE-Heidelberg, 17–22 April 2015

Small angle neutron and X-ray scattering from proteins in solution
FR-Grenoble, 18–22 May 2015

Modern biophysical methods for protein-ligand interactions
FI-Oulu, 1–5 June 2015

Synthetic biology in action
DE-Heidelberg, 8–20 June 2015

Advanced electron microscopy for cell biology
FR-Bordeaux, 9–18 June 2015

The application of transient kinetic methods to biological macromolecules
UK-Kent, 21–27 June 2015

Developmental neurobiology: From worms to mammals
UK-London, 21 June–4 July 2015

High-throughput protein production and crystallization
FR-Marseille, 29 June–8 July 2015

Marine animal models in evolution and development
SE-Fiskebäckskil, 5–18 July 2015

Multi-level modelling of morphogenesis
UK-Norwich, 12–24 July 2015

Analysis of small non-coding RNAs: _Per aspera ad astra_
CZ-Brno, 25–31 July 2015

Measuring intra-species diversity using high-throughput sequencing
PT-Oeiras, 27–31 July 2015

Structure, dynamics and function of biomacromolecules by solution NMR
DE-Garching, 31 July–7 August 2015

Image processing for cryo electron microscopy
UK-London, 1–11 September 2015

Two-photon imaging of brain function: From spiny dendrites to circuits
DE-Munich, 6–12 September 2015

Insights into plant biological processes through phenotyping
BE-Ghent, 13–19 September 2015

Current methods in cell biology
DE-Heidelberg, 14–22 September 2015

Computational analysis of protein-protein interactions: From sequences to networks
UK-Norwich, 28 September–4 October 2015

Analysis of high-throughput sequencing data
UK-Hinxton, 19–24 October 2015

Workshops

Emerging concepts of the neuronal cytoskeleton
CL-Puerto Varas, 22–26 March 2015

Modern DNA concepts and tools for safe gene transfer and modification
FR-Evry, 30 March–3 April 2015

Microbial sulfur metabolism
DK-Helsingør, 12–15 April 2015

Cortical development in health and disease
IL-Rehovot, 26–29 April 2015

Embryonic-extraembryonic interfaces: Emphasis on molecular control of development in amniotes
DE-Göttingen, 6–9 May 2015

SMC proteins: Chromosomal organizers from bacteria to human
AT-Vienna, 12–15 May 2015

Dynamic kinetochore
DK-Copenhagen, 18–21 May 2015

Developmental circuits in aging
GR-Hersonissos, 25–28 May 2015

Cellular synapsis for cell-cell signalling
ES-San Lorenzo del Escorial (Madrid), 26–29 May 2015

Macromolecular assemblies at the crossroads of cell stress and function
IL-Jerusalem, 31 May–4 June 2015

Mechanisms of plant speciation
SE-Norrtälje, 9–13 June 2015

Cell biology of animal lectins
IL-Rehovot, 21–25 June 2015

Cortical interneurons in health and disease
ES-Costa d´En Blanes (Mallorca), 22–25 June 2015

Neural circuits and behaviour of _Drosophila_
GR-Kolymbari, 5–10 July 2015

Cellular and molecular mechanism of tumour–microenvironment crosstalk
RU-Tomsk, 9–12 July 2015

Cell and developmental systems
CH-Arolla, 18–22 August 2015

Cell cycle
HU-Budapest, 4–7 September 2015

Mitochondria, apoptosis and cancer (MAC 2015)
DE-Frankfurt, 10–12 September 2015

DNA topoisomerases, DNA topology and human health
CH-Les Diablerets, 13–17 September 2015

Molecular mechanisms of muscle growth and wasting in health and disease
CH-Ascona, 20–25 September 2015

Mitochondrial DNA and neurodegeneration
ES-Sitges, 23–25 September 2015

Conferences

Mechanisms and regulation of protein translocation
HR-Dubrovnik, 21–25 March 2015

Chromatin and epigenetics
DE-Heidelberg, 6–10 May 2015

Molecular chaperones: From molecules to cells and misfolding diseases
GR-Heraklion, 8–13 May 2015

Europhosphatase 2015: Phosphorylation switches and cellular homeostasis
FI-Turku, 24–29 June 2015

RNA localization and local translation
GR-Hersonissos, 28 June–3 July 2015

Molecular and population biology of mosquitoes and other disease vectors: Current, resurgent and emerging diseases
GR-Kolymbari, 24–29 July 2015

DNA replication, chromosome segregation and cell division
UK-Egham, 27–31 July 2015

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 Staffelstein, 30 August–4 September 2015

Autophagy signalling and progression in health and disease
IT-Chia, 9–12 September 2015

Cell therapy today: Achievements, hopes and hypes
UK-Manchester, 9–12 September 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, 18–22 September 2015

Signalling in plant development
CZ-Brno, 20–24 September 2015

Nuclear receptors: From molecules to humans
FR-Ajaccio, 24–28 September 2015

The multidisciplinary era of endocytic mechanics and functions
FR-Mandelieu-la-Napoule, 27 September–2 October 2015

Genetic control of development and evolution
FR-Paris, 29 September–2 October 2015

The DNA damage response in cell physiology and disease
GR-Cape Sounio, 5–9 October 2015

ESF | EMBO Symposia

Bacterial Networks (BacNet 15)
ES-Sant Feliu de Guixols, 9–15 May 2015

Be there or die? The role of the microenvironment in B cell behaviour in health and disease
ES-Sant Feliu de Guixols, 16–21 May 2015

Symbiomes: Systems biology of host-microbiome interactions
PL-Pułtusk, 5–10 June 2015

Thiol-based redox switches in life sciences
ES-Sant Feliu de Guixols, 12–17 September 2015

Interaction between the immune system and nanomaterials: Safety and medical exploitation
PL-Pułtusk, 4–9 October 2015

EMBO | FEBS Lecture Courses

Biomembranes: Molecular architecture, dynamics and function
FR-Cargèse, 15–25 June 2015

Mitochondria in life, death and disease
GR-Fodele, 12–16 October 2015

EMBO | EMBL Symposia

Frontiers in stem cells and cancer
DE-Heidelberg, 29–31 March 2015

Cellular heterogeneity: Role of variability and noise in biological decision-making
DE-Heidelberg, 15–18 April 2015

Mechanisms of neurodegeneration
DE-Heidelberg, 14–17 June 2015

Enabling technologies for eukaryotic synthetic biology
DE-Heidelberg, 21–23 June 2015

The mobile genome: Genetic and physiological impacts of transposable elements
DE-Heidelberg, 16–19 September 2015

Seeing is believing: Imaging the processes of life
DE-Heidelberg, 6–10 October 2015

New approaches and concepts in microbiology
DE-Heidelberg, 11–14 October 2015

EMBO Global Exhange Lecture Courses

Structural and biophysical methods for biological macromolecules in solution
TW-Taipei, 4–10 May 2015

Frontiers in innate immunity and drug discovery
ZA-Johannesburg, 6–11 July 2015

Other EMBO events

EMBO Laboratory Management Courses
DE-Leimen, Various dates

The EMBO Meeting
UK-Birmingham, 5–8 September 2015

EMBO Members' Meeting
DE-Heidelberg, 28–30 October 2015

16th EMBO|EMBL Science and Society Conference | Emerging Biotechnologies – Hype, hope, and hard reality
DE-Heidelberg , 5–6 November 2015

ORGANIZERS: APPLY NOW FOR:

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

Keynote lectures given by EMBO members at major international scientific meetings in 2016 by 1 February, 1 June and 1 October

For a complete and up-to-date list of EMBO events please go to ***events.embo.org***

EMBO Molecular Medicine

RESEARCH ARTICLE

Bats are a possible source of the Ebola epidemic in West Africa

The outbreak of Ebola in West Africa may have originated from contact between humans and virus-infected bats, suggests a study led by researchers from the Robert Koch-Institute in Berlin, Germany. The report identifies insectivorous free-tailed bats as plausible reservoirs and expands the range of possible Ebola virus sources to this type of bats.

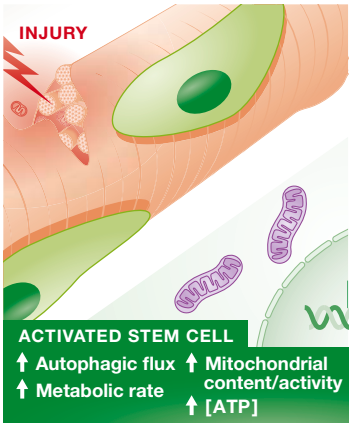
Ebola virus disease epidemics are of zoonotic origin, transmitted to human populations either through contact with larger wildlife or by direct contact with bats. "We monitored the large mammal populations close to the index village Meliandou in south-eastern Guinea and found no evidence for a concurrent outbreak," says Fabian H. Leendertz of the Robert Koch Institute, who led the study. The second infection route appears more plausible as direct contact with bats is usual in the affected region.

Fruit bats are the commonly suspected Ebola virus reservoir as previous outbreaks in Africa show. Yet fruit bats seem an unlikely source of infection, as a food-borne transmission would have affected adults before or concurrently with the two-year-old boy – the index case. This suggests a source of infection unrelated to food.

Another opportunity for infection was a large colony of free-tailed insectivorous bats housed in a hollow tree nearby the home of the index case. Villagers reported that children often used to play in and around the tree. This may have resulted in a massive exposure to bats.

Investigating the Zoonotic Origin of the West African Ebola Epidemic
Almudena Marí Saéz, Sabrina Weiss, Kathrin Nowak et al.
Read the paper:
doi: 10.15252/emmm.201404792

THE EMBO JOURNAL



RESEARCH ARTICLE

Autophagy helps fast track stem cell activation

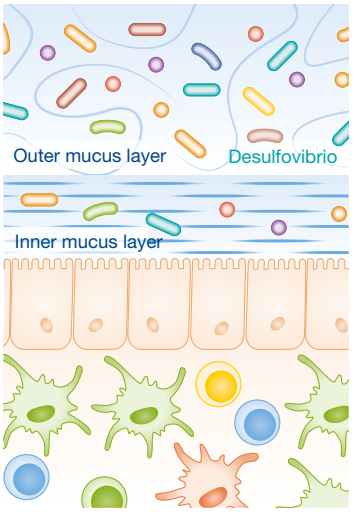
Researchers from Stanford University School of Medicine have discovered a link between a protective mechanism used by cells and the activation of muscle stem cells. Cells use autophagy to recycle cellular "building blocks" and generate energy during times of nutrient deprivation. The scientists report that when this protective mechanism is operational it also seems to assist in the activation of stem cells.

"Our study reveals that when stem cells emerge from a quiescent state there is a rapid and dramatic change in their metabolic activity," says Thomas Rando Professor at Stanford University School of Medicine and the lead author of the study. "The induction of autophagy seems to be a critical component of these metabolic shifts and allows stem cells to cope with the stressful demands for nutrients and the building blocks for the synthesis of large molecules like proteins and DNA that arise due to the rapid growth of the cell."

When stem cells are activated, cells experience large changes in their metabolism since they require increased biosynthesis of proteins and other large molecules. The scientists discovered that autophagy is turned on when muscle stem cells are activated. They also showed that when autophagy was inhibited the activation of the stem cells was delayed.

Induction of autophagy supports the bioenergetic demands of quiescent muscle stem cell activation
Anne H. Tang and Thomas A. Rando
Read the paper:
doi: 10.15252/embj.201488278

EMBO reports



RESEARCH ARTICLE

Protection of the mouse gut by mucus depends on microbes

The quality of the colon mucus in mice depends on the composition of gut microbiota, reports a Swedish-Norwegian team of researchers from the University of Gothenburg and the Norwegian University of Life Sciences in Oslo. The work suggests that bacteria in the gut affect mucus barrier properties in ways that can have implications for health and disease.

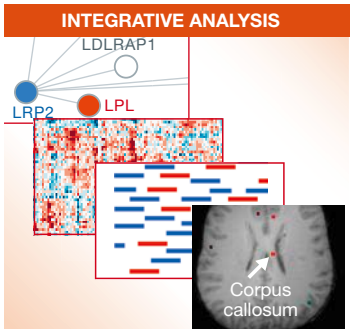
"Genetically similar mice with subtle but stable and transmissible intestinal microbiota showed unexpectedly large differences in the inner colon mucus layer. The composition of the gut microbiota has significant effects on mucus properties," says Malin E.V. Johansson from the University of Gothenburg who led the study.

By sequencing the microbiota and examining the 16S ribosomal RNA genes, the researchers discovered that two mouse colonies maintained in two different rooms in the same specific pathogen-free facility had different gut microbiota.

The different mucus properties were recreated by transplanting the microbial communities into germ-free mice. "After recolonisation of germ-free mice with the different microbiota we observed the same structural and functional differences in their mucus properties," added Johansson.

The gut microbiota composition impairs the colon inner mucus layer barrier
Hedvig E Jakobsson, Ana M Rodríguez-Piñeiro, André Schütte et al.
Read the paper:
doi: 10.15252/embr.201439263

molecular systems biology



RESEARCH ARTICLE

Molecular network identified underlying autism spectrum disorders

Researchers in the United States have identified a molecular network that comprises many of the genes previously shown to contribute to autism spectrum disorders. The findings provide a map of some of the crucial protein interactions that contribute to autism and will help uncover novel candidate genes for the disease.

"We wanted to see to what extent shared molecular pathways are perturbed by the diverse set of mutations linked to autism in the hope of distilling tractable information that would benefit future studies," says Michael Snyder, Professor at the Stanford Center for Genomics and Personalized Medicine and the lead author of the study.

The researchers generated their interactome – the whole set of interactions within a cell – using the BioGrid database of protein and genetic interactions. "We have identified a specific module within this interactome that comprises 119 proteins and which shows a very strong enrichment for autism genes," remarks Snyder.

"The module we identified which is enriched in autism genes had two distinct components," says Snyder. "One of these components was expressed throughout different regions of the brain. The second component had enhanced molecular expression in the corpus callosum. Both components of the network interacted extensively with each other."

Integrated systems analysis reveals a molecular network underlying autism spectrum disorders
Jingjing Li, Minyi Shi, Zhihai Ma et al.
Read the paper:
doi: 10.15252/msb.20145487

New systems biology institute opens in Portugal

The Biosystems & Integrative Sciences Institute (BioISI) is one of the most recent research institutions in the Portuguese life science sector

© Margarida Amaral

Located on the campus of the Faculty of Sciences of the University of Lisbon, the centre officially started at the beginning of 2015 as a result of a merger of three research facilities. The focus of its eight research groups comprising more than a hundred scientists is to solve challenges in biology and medicine through a systems biology approach. The centre has attracted around 2.2 million Euros a year of external annual funding and also received strategic funding from the Portuguese Foundation for Science and Technology for its "excellent" mark in a recent evaluation by the European Science Foundation.

"This new facility will further boost Portugal's internationally renowned reputation in the life science landscape," says EMBO Member Margarida Amaral who coordinates BioISI. The institute will host more than one hundred researchers with backgrounds in bioscience, physics and computational sciences, making it a unique multidisciplinary environment. "It became clear to us that only researchers with different expertise can really address the fundamental questions in systems biology," says Amaral. "We were lucky enough to mobilize enthusiastic colleagues from the areas of physics and computer science who were looking for new challenges in biology."

Major flagship projects in biosciences include research on crop improvement for cork oak and grapevine and also on diseases such as autism and cystic fibrosis. In a recent project, scientists from BioISI in collaboration with two clinicians from a hospital in Valencia pre-clinically tested the repurposing of a new drug for cystic fibrosis patients with very rare mutations. The drug is expected to be approved in the United States and in the European Union soon.

Another interesting line of research focuses on cork oak and its symbiotic interaction with fungi, which enable the plant to more efficiently use soil nutrients, absorb water and resist pathogens. The results indicate a potential use of mycorrhizal fungi in cork oak forest nurseries on a larger scale. Portugal is home to the largest cork oak forests in the world and cork export is one of the key economic pillars. The symbiotic interaction in cork oak roots has also been subject of molecular studies of thousands of genes involved in the response of cork oak to mycorrhiza fungi formation.

One of the key challenges in establishing BioISI is to actually facilitate the cooperation between researchers with different backgrounds to create maximal synergies. Located on the University of Lisbon, Faculty of Sciences campus, BioISI frequently interacts with the faculty of the mathematics and chemistry departments. BioISI also cooperates with the National Health Institute (INSA) and the UniNorte consortium to explore the challenges of Horizon 2020, create regional strategies and smart specialization. It also runs a multidisciplinary PhD programme in Systems Biology ("BioSys"). A programme for postdoctoral fellows will start soon.

www.fc.ul.pt/pt/unidade/bioisi

International consortium reveals reprogramming of the cell

EMBO Member ALBERT HECK has as part of an international consortium revealed the molecular events underlying the reprogramming of specialized cells to stem cells

The researchers have shown how cells change their signature from specialized cells, for example those found in the skin (fibroblasts) to stem cells, and established a blueprint for the molecular events involved in cellular reprogramming. The work has so far led to five publications published on the same day in *Nature* and *Nature Communications* at the end of last year. The five publications are part of an international collaboration called Project Grandiose overseen by Andras Nagy at Mount Sinai Hospital in Toronto, Canada. In addition to the proteomics expertise provided by Dr. Heck's group, the project includes contributions from experts in cellular reprogramming, epigenetics, and RNA biology from laboratories in Canada, South Korea and Australia.

Since Shinya Yamanaka's groundbreaking work, researchers know that pluripotent stem cells, which can give rise to almost all types of known cells, can also be regenerated from mature cells. The researchers of Project Grandiose were able to catalogue all of the major biological checkpoints in this reprogramming process, which takes place in about three weeks. This included identifying which combination of genes and proteins, as well as the modified versions of these genes and proteins, were associated with each step. A new type of stem cells, which they term fuzzy or F-class stem cells, was also discovered. F-class stem cells have the advantage that they can be produced more economically and in very large quantities compared to embryonic-like stem cells. They offer opportunities to speed up drug screening efforts, provide new possibilities to model disease and, in time, could lead to the development of new treatments for different illnesses. Moreover, the data are a resource that can be used to make the reprogramming process more efficient.

"I truly believe you can say we cracked the reprogramming of the cell," says Dr. Heck, Professor of Biomolecular Mass Spectrometry and Proteomics at Utrecht University.

Dr. Andreas Nagy from the University of Toronto provided overall coordination of the project. Thomas Preiss of the Australian National University led the RNA biology investigations and Dr. Jeong-Sun Seo of Seoul National University led the epigenetic studies.

The researchers generated extensive transcriptomic, epigenomic and proteomic data sets describing the reprogramming routes leading from mouse embryonic fibroblasts to induced pluripotency, the point where a cell is capable of generating all the cell types in the adult organism. The data provide a comprehensive molecular description of the reprogramming routes and are accessible through the Project Grandiose portal www.stemformatics.org 1,2

1. Hussein et al (2014) Genome-wide characterization of the routes to pluripotency. *Nature* **516**: 198–206.
2. Benevento et al (2014) Proteome adaptation in cell reprogramming proceeds via distinct transcriptional networks. *Nature Communications* **5**: 5613

New research centre for stroke, dementia and neurodegenerative diseases

Opportunities to link disease-oriented basic science with clinical research

As individuals get older, many people report a decline of cognitive skills. The number of people with dementia is estimated to increase to more than 80 million by 2040. In Europe, more than 5 million people suffer from dementia disorders. Like dementia, stroke ranks among the ten most frequent diseases worldwide and the most pressing health problems in ageing societies (WHO World Health Report 2002). To further strengthen and concentrate the research on dementia and stroke in Munich, Germany, two leading institutions in these fields were recently combined under one roof: the Institute for Stroke and Dementia Research (ISD) and the Munich site of the German Center for Neurodegenerative Diseases (DZNE).

The new research building opens up exciting opportunities for interdisciplinary research strategies ranging from biophysics to patient oriented research. While in the past the research teams of the DZNE were based in many different locations on the Munich university campus, they are now able to work hand in hand with their colleagues at the ISD, which is situated next door. The idea behind the move is to tightly link disease-oriented basic science with clinical research in an attempt to develop new diagnostic and therapeutic options for neurodegenerative diseases.

Both institutes differ considerably in their scientific approach. At the ISD, the basic idea is to integrate patient care with clinical and basic research to change medicine. The institute, headed by Martin Dichgans, is designed as a novel type of research facility bridging the traditional barriers between academic medicine and basic science. Patient care involves prevention, diagnosis and treatment of stroke and cognitive decline. Outpatient services at ISD are provided by board certified neurologists and psychiatrists, neuropsychologists, social workers, and specially trained staff. In ISD's Memory Clinic, patients and individuals at risk receive comprehensive diagnostic workup and counselling.

The scientists at the DZNE study neurodegenerative diseases such as Alzheimer's disease, frontotemporal dementia (FTD), amyotrophic lateral sclerosis (ALS) and Parkinson's disease. They investigate their causes and novel approaches to prevention and therapy, including new healthcare strategies. DZNE research ranges from the study of molecular processes in simple organisms and brain cells to human clinical trials, population studies and healthcare research.

EMBO Member Christian Haass, a renowned researcher who studies dementia, has been appointed as speaker of the DZNE. Haass and his colleagues are interested in the cellular and genetic mechanisms linked to different neurodegenerative diseases. "In our laboratories, we focus for example on the cellular mechanisms of neurodegeneration. We believe that protein deposition and clearance of amyloidogenic peptides is mediated by common general mechanisms."

Munich is one of nine DZNE sites located all over Germany. The DZNE closely cooperates with the two Munich universities, their clinics and with other research institutions in the region. The Biochemistry Department of the Medical Faculty of the Ludwig Maximilian University, which is also headed by Haass, also moved into the new research building.

Stem cell highlights for high schoolers

Courses for 12–14 year olds on the essential concepts, applications and ethics of stem cell biology

© EuroStemCell

Researchers are often enthusiastic about outreach to high-school students but lack the time to prepare lessons or implement them in a school setting. EMBO Member Ian Chambers from the University of Edinburgh developed a popular series of lessons for 12–14 year olds that has been widely used in schools and other training events throughout Europe and beyond. The three lessons focused on the essential concepts, applications for regenerative medicine and the ethical implications of developing stem cell treatments. They are available online at www.eurostemcell.org in five different languages.

Chambers teamed up with Emma Kemp, a science communicator for EuroStemCell, to develop this tool. "Our motivation was to reach those who would not choose science as their career," says Chambers. "Engaging these students is essential to enhance the general level of scientific literacy in society." Their experience and the learning process were eventually described in the January 2015 issue of the journal *EMBO reports*. (http://embor.embopress.org/content/16/1/7)

The article offers guidance and advice for all scientists interested in developing similar educational modules. The authors list critical points such as paying attention to the curriculum and setting clear learning objectives, using a modular format for flexibility and ease of translation and building a relationship with the teachers. At the end of the three-year learning process, the lessons had been delivered to approximately 700 students by six researchers. 300 print kits of the first lesson have been distributed to educators and scientists all over Europe and more than 250 European science teachers attended professional development workshops using these lessons as an example. The Guardian rated them as a "top resource" and made them available on its website. (http://tinyurl.com/139uaav)

It all started with an email: The idea to develop creative and fun lessons for school children was triggered by the head teacher of Chambers' old high school, The Derby School in Edinburgh. She found out that the professor's interest in science was sparked off during an open day visit at the local university at the age of 13. So she invited him to give a talk about stem cell science at his old school. Developing full-fledged educational modules and rolling them out to hundreds of students and science teachers across Europe were natural next steps.

Awards of excellence

EMBO MEMBERS

2015 Breakthrough Prize

Emmanuelle Charpentier of the Helmholtz Centre for Infection Research and the Laboratory for Molecular Infection Medicine Sweden (EMBL Nordic Node in Molecular Medicine) is one of the winners of the Breakthrough Prize in Life Sciences this year. She received it together with Jennifer Doudna for their revolutionary work on CRISPR-Cas9. Since their groundbreaking research on genome editing in 2012, the CRISPR-Cas9 system is now used by research groups worldwide for applications in disease diagnosis and treatment, medical therapeutics and bioenergy. The Breakthrough Prize, which is worth 3 million US dollars, is sponsored, among others, by internet entrepreneurs Mark Zuckerberg of Facebook and Sergey Brin of Google.

Louis-Jeantet Prize for Medicine

Emmanuelle Charpentier is also the recipient of the 2015 Louis-Jeantet Prize for Medicine for her contribution to harnessing an ancient mechanism of bacterial immunity into a powerful technology for editing genomes. She wins the prize together with the Austrian scientist Rudolf Zechner. Each award is worth 700,000 Swiss Francs.

Japan Prize

Alain Fischer, director of immunology at the Necker Hospital in Paris, France, was named one of the three recipients of the 2015 Japan Prize, a prestigious international award. Fischer is credited with demonstrating the clinical efficacy of gene therapy by successfully treating children suffering from a severe genetic disorder that renders them extremely vulnerable to infections. He has received the prize and a cash award of approximately 416,600 US dollars together with Theodore Friedmann of the University of California San Diego.

Emil von Behring Prize

Stewart Cole has been awarded the 2014 Emil von Behring Prize from the University of Marburg for his contributions to the field of tuberculosis. He is being recognized "for his outstanding work in the field of tuberculosis research," which includes groundbreaking publications on the genomics of *Mycobacterium tuberculosis* and *Mycobacterium leprae*. The Emil von Behring Prize is awarded every two years by the University of Marburg to honour scientific achievements in medical, veterinary and scientific areas, with an emphasis on immunology and disease control.

Thomas Hunt Morgan Medal

Brian Charlesworth (University of Edinburgh) has been awarded the Thomas Hunt Morgan Medal from the Genetics Society of America for lifetime achievement in the field of genetics. The award recognizes his extraordinary impact on our understanding of population genetics and evolutionary biology.

Anders Jahre's Award for Medical Research

Kristian Helin of the University of Copenhagen received the Anders Jahre's Award for Medical Research in 2014 "for his groundbreaking contributions to understand epigenetics – chemical modifications of our genetic material that turn genes on and off." The prizes are awarded by the University of Oslo and are among the most important within Nordic biomedical research.

Helmholtz International Fellow Award

The British cell biologist *Amanda Gay Fisher* of Imperial College London has been honored with the Helmholtz International Fellow Award for her research. Fisher is one of seven outstanding researchers from abroad who received the award, each of which is endowed with 20,000 Euros.

Avery-Landsteiner-Award

Andreas Radbruch of the German Rheumatism Research Center in Berlin has been awarded the Avery-Landsteiner-Award 2014 of the German Society for Immunology. The 10,000 Euro prize is awarded every two years to outstanding immunologists.

French Academy of Science

Olivier Voinnet of the ETH Zurich has been elected to the French Academy of Science in December 2014.

French Academy of Science Award

Shahragim Tajbakhsh of the Pasteur Institute, France, was awarded the French Academy of Sciences award for work on stem cell research in October 2014. The prize comes with an award of 50,000 Euros.

Academy of Athens

Nektarios Tavernarakis of the University of Crete Medical School has been awarded the BioMedical Research Prize of the Academy of Athens in 2014.

EMBO YOUNG INVESTIGATORS

Richard Lounsbery Award

Frédéric Saudou of the Grenoble Institute of Neuroscience was awarded the 2014 Richard Lounsbery Award for 2014. The 50,000 US dollar prize is given in alternate years to young French and American scientists by the National Academy of Sciences or the French Académie des Sciences. Saudou received the award "for his major contributions to the understanding of molecular and cellular mechanisms causing Huntington's disease. His findings represent a seminal discovery in the understanding of Huntington's disease and an important step towards a future therapeutic strategy."

2015 Women in Cell Biology Early Career Medal

Victoria Cowling of the University of Dundee has been awarded the Women in Cell Biology Early Career Medal from the British Society of Cell Biology (BSCB) for 2015. The WICB Early Career Medal has been established this year to mark the 50th anniversary of the founding of the BSCB. It will be awarded to an outstanding female cell biologist who has started their own research group in the United Kingdom within the last seven years.

Congratulations to EMBO Members, Young Investigators and Installation Grantees who received this year's Starting Grants awarded by the European Research Council. The full list of names can be found at http://erc.europa.eu/media-and-events/press-releases/2014

BOOKS

Life's Blueprint: The science and art of embryo creation
Benny Shilo (EMBO Member)
Yale University Press |
October 2014
ISBN: 9780300196634
http://shilobook.weizmann.ac.il/?page_id=65

From a pinch of salt to the ribosome.
The history of crystallography as seen through the lens of the Nobel Prize
Edited by: Ivar Olofsson, Sven Lidin and Anders Liljas (EMBO Member)
World Scientific | December 2014
ISBN: 978-981-4623-11-7

Microbial Biochemistry
(2nd ed.)
Georges Cohen (EMBO Member)
Springer
ISBN 978-90-481-9437-7

Metallomics and the Cell
Series Metal Ions in Life
Sciences Vol. 12
Lucia Banci (EMBO Member)
Springer
ISBN: 978-94-007-5561-1

A good read – Publications from the EMBO Community

EMBO MEMBERS, YOUNG INVESTIGATORS & FELLOWS

Mouse tetrad analysis provides insights into recombination mechanisms and hotspot evolutionary dynamics
Bernhard de Massy (EMBO Member) and colleagues
Nature Genetics | 24 August 2014
doi: 10.1038/ng.3068

Sequence composition of disordered regions fine-tunes protein half-life
M Madan Babu (EMBO Young Investigator), Sreenivas Chavali (EMBO Fellow) and colleagues
Nature Structural & Molecular Biology | 2 February 2015
doi:10.1038/nsmb.2958

Genomic profiling of DNA methyltransferases reveals a role for DNMT3B in genic methylation
Tuncay Baubec (EMBO Fellow), Dirk Schübeler (EMBO Member) and colleagues
Nature | 21 January 2015
doi: 10.1038/nature14176

Computational analysis of cell-to-cell heterogeneity in single-cell RNA-sequencing data reveals hidden subpopulations of cells
Sarah Teichmann (EMBO Member), Florian Buettner (EMBO Short-Term Fellow) and colleagues
Nature Biotechnology | 19 January 2015
doi: 10.1038/nbt.3102

SLC38A9 is a component of the lysosomal amino acid sensing machinery that controls mTORC1
Giulio Superti-Furga (EMBO Member), Claudine Kraft (EMBO Young Investigator), Richard K. Kandasamy (EMBO Fellow) and colleagues
Nature | 7 January 2015
doi: 10.1038/nature14107

Spatiotemporal transcriptomics reveals the evolutionary history of the endoderm germ layer
Itai Yanai (EMBO Young Investigator) and colleagues
Nature | 10 December 2014
doi: 10.1038/nature13996

In-cell NMR reveals potential precursor of toxic species from SOD1 fALS mutants
Lucia Banci (EMBO Member) and colleagues
Nature Communications | 27 November 2014
doi: 10.1038/ncomms6502

***In vivo* imaging of *Nematostella vectensis* embryogenesis and late development using fluorescent probes**
Timothy DuBuc (EMBO Short-Term Fellow) and colleagues
BMC Cell Biology | 2014
doi: 10.1186/s12860-014-0044-2

Combining in-cell NMR and X-ray fluorescence microscopy to reveal the intracellular maturation states of human superoxide dismutase 1
Lucia Banci (EMBO Member) and colleagues
Chemical Communications | 13 November 2014
doi: 10.1039/C4CC08129C

Origins and functional consequences of somatic mitochondrial DNA mutations in human cancer
Young Seok Ju (EMBO Fellow), Michael Stratton (EMBO Member) and colleagues
eLife | 1 October 2014
doi: 10.7554/eLife.02935

Extensive transduction of non repetitive DNA mediated by L1 retrotransposition in cancer genomes
Young Seok Ju (EMBO Fellow), Michael Stratton (EMBO Member) and colleagues
Science | August 2014
doi: 10.1126/science.1251343
Cell | 7 November 2013
doi: 10.1016/j.cell.2013.10.001

EMBO Young Investigators & Installation Grantees 2014

YOUNG INVESTIGATORS 2014

Gad Asher
Mammalian circadian clocks
IL Weizmann Institute of Science

Petr Broz
Inflammasome complexes
CH Biocentre, University of Basel

Felipe Cortés Ledesma
Repair of blocked DNA breaks
ES Andalusian Molecular Biology and Regenerative Medicine Centre

Filippo Del Bene
Neural circuit formation and function
FR Institute Curie

Mads Gyrd-Hansen
Ubiquitin signalling
UK Ludwig Institute for Cancer Research, University of Oxford

Mario Halic
Small RNA mediated heterochromatin formation
DE University of Munich (LMU)

Sebastian Hiller
Outer membrane protein biogenesis
CH Biocentre, University of Basel

Michael Hothorn
Membrane signalling in plants
CH University of Geneva

Jan Huisken
Imaging developmental processes
DE Max-Planck-Institute of Molecular Cell Biology and Genetics

Claudine Kraft
Regulation and signalling in autophagy
AT Max F. Perutz Laboratories

François Leulier
Host/microbiota interactions
FR Institute of Functional Genomics in Lyon (IGFL)

Hai-Kun Liu
Central nervous system stem cells
DE German Cancer Research Center (DKFZ)

Massimiliano Mazzone
Macrophages in ischemia and cancer
BE Vesalius Research Center, VIB & KU Leuven

Yuki Nakamura
Lipid diversity in plant development
TW Academia Sinica

Lionel Navarro
Small RNAs and innate immunity
FR Institute of Biology of the ENS (IBENS)

Caren Norden
Retinal morphogenesis
DE Max-Planck-Institute of Molecular Cell Biology and Genetics

Diego Pasini
Epigenetics in differentiation and cancer
IT European Institute of Oncology (IEO)

Lori Passmore
Macromolecular machines for RNA synthesis
UK MRC Laboratory of Molecular Biology

Michael Potente
Angiogenesis and metabolism
DE Max-Planck-Institute for Heart and Lung Research

Halyna Shcherbata
miRNAs in cell differentiation and maintenance
DE Max-Planck-Institute for Biophysical Chemistry

Maria Teresa Teixeira
Telomere biology
FR Laboratory of Molecular and Cellular Biology of Eukaryotes, IBPC

Kristin Tessmar-Raible
Circalunar clocks
AT Max F. Perutz Laboratories

Ines Thiele
Modelling of human metabolism
LU Luxembourg Centre for Systems Biomedicine, University of Luxembourg

Steven West
Nuclear pre-mRNA processing
UK Wellcome Trust Centre for Cell Biology, University of Edinburgh

Thomas Wollert
Molecular mechanism of autophagy
DE Max-Planck-Institute of Biochemistry

Philip Zegerman
Regulation of genome replication
UK Wellcome Trust / CRUK Gurdon Institute

Johannes Zuber
Cancer drug target identification with RNAi
AT Research Institute for Molecular Pathology (IMP)

INSTALLATION GRANTEES 2014

Nuno Barbosa-Morais
Cancer transcriptomes and metastasis
PT Institute of Molecular Medicine, Lisbon
Moving from:
CA University of Toronto

Tolga Çukur
Investigation of the visual system
TR Bilkent University, Ankara
Moving from:
US University of California, Berkeley

Ana Domingos
Neurobiological control of obesity
PT Gulbenkian Institute of Science, Oeiras
Moving from:
US The Rockefeller University, New York

Peter Lukavsky
Molecular basis of aberrant splicing
CZ CEITEC, Masaryk University, Brno
Moving from:
US Stanford University

Günes Özhan
Wnt β-catenin signalling
TR Dokuz Eylul University, Izmir
Moving from:
DE Technical University Dresden

Pavel Plevka
Structural studies of picornaviruses
CZ CEITEC, Masaryk University, Brno
Moving from:
US Indiana University

Piotr Setny
Hydration effects in proteins
PL University of Warsaw
Moving from:
DE Technical University Munich

Gerhard Wingender
Invariant natural killer T cells in allergy
TR Bahçesehir University, Istanbul
Moving from:
US La Jolla Institute for Allergy & Immunology

Events

EMBO MEMBERS

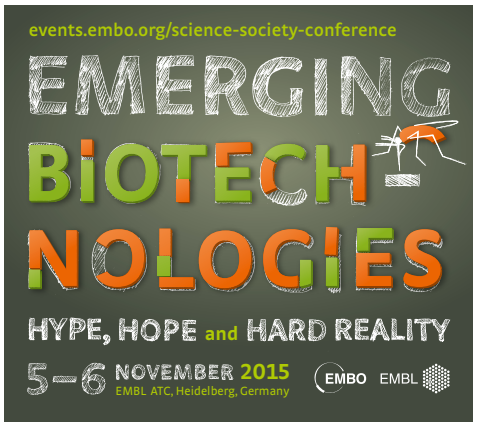
EMBO Members **Marie-France Carlier** and **Thomas Surrey** are the organizers of the *Jacques Monod Conference Actin and Microtubule Cytoskeletons in Cell Motility and Morphogenesis: an integrated view*, to be held in **Roscoff, France**, from **26–30 May 2015**. For full information visit http://sites.google.com/site/CJMac4nMT

EMBO MEMBERS

Registration is now open for the *Meeting on the Molecular Biology of Ageing* in **Groningen, the Netherlands**, from **25–28 October**. The meeting is co-organized by EMBO Member **Ellen Nollen**. The goal of this meeting is to bring together scientists working in the diverse research areas that are relevant for understanding the biology of aging. Paper submission and registration: www.bioageing.nl/

EMBO MEMBERS

Register for the *Applied Bioinformatics and Public Health Microbiology conference* by **8 April**: https://registration.hinxton.wellcome.ac.uk/display_info.asp?id=474
The meeting will be held from 6-8 May at the Wellcome Trust Genome Campus in Hinxton, Cambridge, United Kingdom.



Upcoming deadlines

EMBO Keynote Lectures
1 June

EMBO Young Investigators
1 April

EMBO Installation Grantees
15 April

***The EMBO Meeting 2015*:**
Early registration and abstract submission deadline: 10 June

Editorial

Managing Editor
Barry Whyte
Editor
Yvonne Kaul
Print & Web layout
Sandra Krahl
E-Newsletter & Web version
Yvonne Kaul

Next issue

EMBOencounters

The next *EMBOencounters* issue – **Summer 2015** – will be dispatched in **July 2015**.

Please send your suggestions, contributions and news to **communications@embo.org** by **15 May**.

Register now

10 June Early registration & abstract submission

19 August Late registration

the 6th EMBO meeting

advancing the life sciences

2015

Birmingham

United Kingdom

5–8 September

Conference Chairs

Geneviève **Almouzni**
Gillian M. **Griffiths**
Jürgen **Knoblich**

Speakers include

Ewan **Birney**
Susan M. **Gasser**
Stephen P. **Jackson**
Robert **Martienssen**
Daniel **St Johnston**
Joan A. **Steitz**
Azim M. **Surani**
Inder M. **Verma**
Olivier **Voinnet**
Peter **Walter**
Fiona **Watt**

20
concurrent sessions
covering the latest research in the life sciences

the-embo-meeting.org

The EMBO Meeting is administered by the Gesellschaft zur Förderung der Lebenswissenschaften Heidelberg GmbH – VAT Reg. No.: DE264471047