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EMBO 50 years

www.embo.org

Highlights from the FEBS-EMBO Anniversary Conference in Paris

The FEBS-EMBO Anniversary Conference hosted by the French Society for Biochemistry and Molecular Biology (SFBBM) took place in Paris from 30 August to 4 September. More than 2500 scientists from over 60 countries came together to listen to six exciting days of talks from leading researchers in the life sciences and to celebrate the joint anniversaries of EMBO, FEBS and the SFBBM.

"I would like to extend a warm thank you to everyone who contributed to an outstanding anniversary meeting in Paris," said Maria Leptin, Director of EMBO. "It was a wonderful event that reflected both the excitement and excellence of science in Europe. I am convinced that the relationships we have established between our organizations will serve us well in the years ahead."

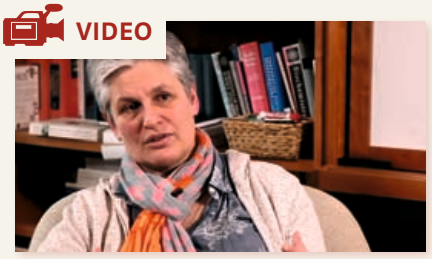
Marie-Christine Lemardeley from the Office of the Mayor of Paris opened the meeting and remarked that she was particularly looking forward to the opening lecture by Svante Pääbo and the session on transparent publishing. After welcoming remarks from EMBO, FEBS and SFBBM, Gottfried Schatz and William Whelan revealed the early histories and development of EMBO and FEBS, respectively. "EMBO is unashamedly elitist," said Schatz. "It has never joined the mania of big science. I hope its heart will beat vigorously for years to come." William Whelan, the first Secretary General of FEBS, has been an active participant in the activities of FEBS since it took its first steps 50 years ago. He emphasized the importance of the contributions of the FEBS journals to the development of the society as well as the crucial contributions of "Mr. FEBS" Satya Prakash Datta. Whelan first proposed a journal for the rapid communication of short reports in biochemistry, biophysics and molecular biology in 1967. Datta played a key role in establishing and running *FEBS Letters* which went on to be very successful. At the meeting, the EMBO and FEBS journals collaborated to award prizes for the best posters of the day and the winning posters were displayed in a special area of the conference.

In the opening scientific lectures, Catherine Dulac from Harvard University and Svante Pääbo from the Max Planck institute for Evolutionary Anthropology in Leipzig described their latest scientific work. Dulac's talk focused on how the mouse brain is geared for social interaction. She outlined the striking antagonistic interactions in brain systems that underlie parental care and infant-directed aggression in both male and female mice. Remarkably the mouse brain has the infrastructure to support male or female child-rearing characteristics. "Highly conserved circuits and modulatory mechanisms may exist across species and in both male and female brains to regulate parental interactions with offspring," said Dulac. The fine line that divides the differences in mental processes in mice for what we would call good and bad parenting is striking. Dulac believes that studying these processes in mice will help reveal the complexities of human parental behavior and its susceptibility to mental illness.

Svante Pääbo's talk focused on the origins and evolution of humans. He described what new DNA sequencing technologies have been able to reveal about the incredible geographic migration of humans over the years. "Modern humans originated in Africa and began their migration to other parts of the world almost 100 000 to 125 000 years ago," said Pääbo. His work, which involves painstaking analysis of often scarce amounts of genetic material recovered from human bones in remote locations, has helped to build up a picture of the influence of Neanderthals on the migration of humans out of Africa, through parts of Europe and into Asia. Pääbo's work on ancient DNA has successfully distinguished at the genetic level what makes us different from our Neanderthal cousins. His recent book *"Neanderthal man: In search of lost genomes,"* which comprises memoirs from his career, was recently published by Basic Books.

On the second day of the meeting, Thomas Stocker from the University of Bern gave a special plenary lecture on climate change. "Climate change is the biggest challenge of the century," commented EMBO Secretary General Sir Paul Nurse in his introduction to the talk.

VIDEO



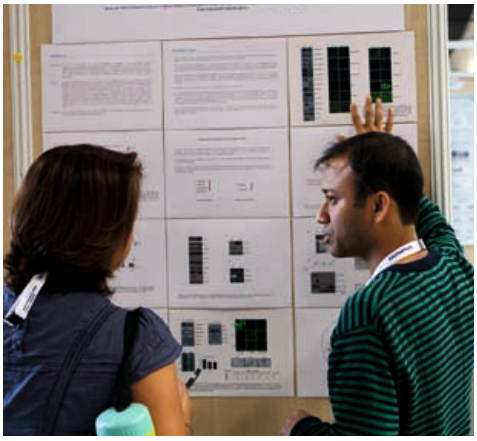
Catherine Dulac
Brain function and chromatin plasticity
Harvard University Professor Catherine Dulac talks about the role of histone, the basis of memory, and the future of molecular neurosciences.

http://serious-science.org/videos/934

"The consequences for the planet are huge if we do not limit it." Stocker described how the Intergovernmental Panel on Climate Change had put together their most recent assessment entitled *Climate Change 2013: The Physical Science Basis*. A four-year project with input from 259 scientists and approval from governments around the world, the report documents the evidence for human influence on the world's climate. Warming of the climate system is unequivocal, say the contributors to the report, and it is extremely likely that human influence is the dominant cause of the observed warming since the mid-20th century. "One only has to look at the change in the energy content of the world's oceans to see what a dramatic effect humans have had on the planet. There has been a huge change in energy content down to a depth of 2 km, almost 250 x 10^{21} Joules over the years 1970 to 2010. This is greater than the energy output of the world for a year." Limiting climate change will require substantial and sustained reductions in greenhouse gas emissions. "There is no magic bullet to reduce emissions from fossil fuels," said Stocker "but we have a choice."

Michael Hall delivered the FEBS Sir Hans Krebs Lecture describing the discovery of TOR (target of rapamycin) and its role in signaling events for growth and metabolism. Since its discovery in 1991, around 3000 papers have been published in the scientific literature on TOR (2012 data). He went on to describe some of the applications that have arisen from this work. Research on TOR has resulted in drugs to prevent organ rejection during transplantations and new ways to treat cancer and cardiovascular disease. Rapamycin received clinical approval in 1999 for use in the prevention of organ rejection in kidney transplant patients. Torisel and Afinitor were approved in 2007 and 2009, respectively, for the treatment of advanced kidney cancer. Hall went on to present a unified model for TOR signaling in genetics and biochemistry.

Other highlights at the meeting included a plenary session on epigenetics. The session ended with talks from EMBO Members David Baulcombe, Wolf Reik and Susan Gasser. The FEBS-EMBO Anniversary Conference included 30 concurrent sessions that spanned the cell cycle, chromosome structure, cilia and disease, mitochondria and mitochondrial disease, stem cells, microbiology and synthetic biology. Four plenary sessions explored topics that included bioinformatics, genomics, epigenetics, the immune system, cell biology and systems biology.



Participants at the FEBS-EMBO anniversary conference in the Exhibition Hall in Paris

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The EMBO Gold Medal

SOPHIE MARTIN of the University of Lausanne, Switzerland, received the 2014 EMBO Gold Medal at the FEBS-EMBO Anniversary Conference in Paris. The medal was awarded for her work to understand the molecular events that define the organization and development of the cell.

The Gold Medal has been redesigned for EMBO's anniversary year. "2014 is the perfect year to introduce a new look for the EMBO Gold Medal," commented EMBO Director Maria Leptin. "We wanted to mark the occasion of our 50th anniversary with a new design for the medal that we award to young scientists for outstanding contributions to the life sciences in Europe."

The new design created by the EMBO graphic design team not only includes a fresh representation of the cell but also incorporates new elements that reflect, for example, the more quantitative aspects of molecular biology.

Martin has been working for the past 15 years to understand cellular polarity, in particular the way in which the spatial organization of cells contributes to cell size and cell division. In the last 11 years, she has been using fission yeast, which grow as single, rod-shaped cells, as a model system for her investigations.

Martin and her team have revealed how gradients of specific control proteins at the extremities of the cell contribute to the control of cell growth and the ultimate size of the cell.

"I have always been fascinated by how biological processes are spatially organized within cells. I feel incredibly lucky not only to have the freedom to study this basic problem but to be rewarded for it," said Martin.

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Building bridges for translational research

Behind the scenes, a European Union-funded project is ironing out important details to help scientists translate basic research into solutions

Janet Thornton,
Director of the European Bioinformatics Institute

The gap between curiosity-driven, basic research and application-driven research is a long-standing challenge in the life sciences. Basic research generates valuable new ideas that help scientists approach tough problems in new ways. But there is a long road between a bright idea and the development of a new medicine or crop, and the journey is made even longer by technical stumbling blocks. Even the seemingly simple process of sharing different kinds of data can be frustrating, as researchers from diverse communities often describe things in very different ways.

The BioMedBridges project is building a shared data culture in the life sciences, finding technical solutions to the flow of information from basic research into medical and environmental applications. Funded by the European Commission's Seventh Framework Programme (2012 to 2016), the project's partners are linking up 12 of Europe's new biological, biomedical and environmental research infrastructures. BioMedBridges is digging deep into the details of biological data to make data-driven research easier and more transparent for scientists working in life-science research and development, and for the many patients who have volunteered their information.

The central principle driving BioMedBridges is the development of necessary infrastructure to enable the use of data from publicly funded research in new and different contexts, including data from genomics, biological and medical imaging, structural biology, mouse disease models, clinical trials, highly contagious agents and chemical biology, to name just a few.

With so many fields coming together, BioMedBridges has put a lot of effort into opening up communication channels between the people behind the data, who work in many groups scattered throughout Europe.

"Some of these groups were looking at data interoperability from an expert level and others were just getting to grips with the fact that this can be a challenge," says Janet Thornton, Director of the European Molecular Biology Laboratory's European Bioinformatics Institute and BioMedBridges coordinator. "One of the greatest achievements of the project so far is that we have an active and engaged network of technical staff from all 12 infrastructures who are starting to speak the same language with respect to data interoperability. This is a very important step, because it means we can lay a strong foundation for uniting biomedical resources."

BioMedBridges takes on fiddly problems and rationalises them. Research data starts with the output coming from some instrument and gains meaning when information is added to it. Each discipline has its own standard methods for doing this. However, techniques constantly evolve, research questions change and separate disciplines begin to interact. BioMedBridges is developing and implementing shared standards and semantic web technologies, which are designed to connect disparate data sources – this is pioneering work for life science data.

How does BioMedBridges work in practice? One example might be diabetes and obesity research. To find what role a gene plays in an organism, researchers can "switch it off" and see what happens. This is a powerful tool, particularly when studying diseases that affect different organisms in the same way: the effectiveness of possible treatments for human patients can be tested on mouse models. But biologists working with mouse models and clinicians use different terms to describe symptoms in mice and humans, so it can be difficult to relate them to each other – for example, "hyperglycemia" in a human is described as "increased circulating blood glucose" in mice even though they are exactly the same thing. BioMedBridges is working to reconcile the vocabularies used in diabetes and obesity research, effectively translating between species and making research faster and more efficient. With hundreds of millions of people suffering from these diseases, the importance of this work is obvious.

Biological and medical imaging is another area where BioMedBridges can help accelerate discovery. Researchers and technical staff in the project are developing tools that make it possible to "zoom" between images created on different scales, from a single cell via tissues to whole organisms. Ultimately, this will enable linking certain phenotypes to genomic information, making it possible to identify potential disease biomarkers and drug targets.

"Our goal is to help researchers make maximum use of the vast data resources available to them, in whichever life-science discipline they may work," says Thornton.

The project outcomes will be launched at an open conference, to be held on the Wellcome Trust Genome Campus in Hinxton on 17-19 November 2015. Everyone from the biological and biomedical data community is welcome to attend.

For more information see:
www.biomedbridges.eu/

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EMBO and Poland

Members of the Polish EMBO community presented their research at the BIO 2014 Congress in Warsaw

Poland joined the EMBC – the intergovernmental funding body of EMBO – in 1999. A few years later the very first Polish EMBO Member, Maciej Żylicz, encouraged the creation of the EMBO Installation Grants – a scheme to bring talented scientists to countries experiencing an exodus of scientific talent. Since its inception, 13 researchers have been granted extra money and support to establish independent research groups in Poland. The scheme is important for Poland as the country has struggled with both funding shortages and loss of researchers over the last decades. Since then, Poland has taken a number of measures, including the founding of the Polish Science Foundation (FNP) and the National Science Centre (NCN), to provide research grants for their scientists.

A recent international life science conference in Warsaw gave scientists working in Poland an opportunity to present their latest research and recent developments. The *BIO 2014 Congress* was the first joint meeting of the largest Polish societies in the area of life sciences. It took place on the University of Warsaw campus from 9-12 September. The session "EMBO and Poland" was an important part of the four-day conference. Organized by EMBO Council Member Leszek Kaczmarek, the session included more than a dozen lectures by Members, present and former Young Investigators and Installation Grantees – a forum revealing the fruitful dialogue between EMBO and Poland that has continually grown over the last fifteen years.

The 2014 Installation Grantee Joanna Sułkowska from the University of Warsaw spoke about knots in proteins. This relatively new field – knots in proteins were not discovered until 1994 – is still understudied. "Knots are conserved across life, from bacteria to humans. They are doing something very important," said the biophysicist. The major challenge of working with knotted proteins experimentally is to distinguish between knotted and unknotted topology, yet this can be solved theoretically. The current goal is to understand the function of knots in proteins. Almost all knotted globular proteins discovered so far are enzymes responsible for metabolic processes. Some forms may play a role in infectious diseases – an angle that Sulkowska and colleagues are actively exploring now.

Tomasz Wilanowski – a 2011 Installation Grantee – gave a well-received talk on the new roles of the Grainyhead-like (GRHL) family of transcription factors in cancer. He set the foundation for his research during his stay at the Australian National University and later the Royal Melbourne Hospital in Australia before coming back to Poland. His goal is to optimize cancer therapies on the basis of GRHL patterns in tumours. "We have very many anti-cancer drugs. The issue is which one works in a particular patient in a particular tumour."

Leszek Kaczmarek, current head of the EMBO Installation Grant Committee, gave a talk entitled *Molecular biology of mind*. Maciej Żylicz spoke about *Chaperoning the guardian. Lessons from tumours.*

Concluding the two-day session, EMBO Installation Grant Programme Manager Gerlind Wallon gave an overview of EMBO activities in Poland. Since 2011, up to five *EMBO | ESF Symposia* funded by EMBO and the European Science Foundation have been held in Poland, each of them attracting around 600 scientists from all over the world. Yet these conferences are organized mainly by foreign researchers and not necessarily by Polish scientists. "We would like to encourage Polish scientists to run more conferences in Poland," stated Wallon. The same goes for fellowship applications where EMBO would like to see an increase in the numbers of applications from Poland for Long-Term and Short-Term Fellowships.

The dialogue will continue in 2015 when the annual Young Scientists Forum will come to Warsaw next May.

Leszek Kaczmarek, current head of the EMBO Installation Grant Committee

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Finding the right path

RANDOLF MENZEL is Professor Emeritus of Neurobiology at the Free University of Berlin in Germany. Since he first started investigating insects almost 50 years ago, Professor Menzel has studied how honeybees learn colours, how their memory is organized, and how memory is implemented in the neural network of the bee brain. More recently he has been looking at how bees navigate to different locations and how they communicate about locations. Here he discusses his recent paper published in *Proceedings of the National Academy of Sciences* about a proof for the existence of mental maps in honeybees.[1]

What got you started in studying the way honeybees "think" and behave?

One of the questions that motivated me to study biology, chemistry and physics at university was how animals with rather small brains like worms, crustaceans and insects learn and use memory for adapting their behavior to the conditions of a changing world. At high school, I observed plankton under the microscope. Tiny little animals, rotifers, which belong to the group of nematodes, particularly impressed me. They have a clear glass body, and I could see their eyes, muscles and brain under a microscope when they maneuvered through the water. My first scientific publication describes the ecology of a fresh water pond close to my hometown on the Rhine River. Martin Lindauer, a Professor at the University of Frankfurt and a co-worker of Karl von Frisch, accepted me as a graduate student without any exams, and allowed me to address the question of how bees learn colours. Martin Lindauer was an enthusiastic zoologist. He continued to do experimental work even when he had to run the zoology department. He and Franz Huber, an inspiring Professor at the University of Tübingen, were role models for me throughout my academic career.

"Behavioral biologists find it difficult to accept the concept of a cognitive map because they believe that the same behavioral phenomena can be explained by multiple and separate sensory-motor routines."

One of your recent projects is bee navigation and how it depends on mental maps. How do you define a mental map?

Animals, including humans, use many senses and many behavioral strategies to navigate from one place to the next. Both innate mechanisms and acquired information about the world are used for navigation. The question for behavioral biologists and neuroscientists is how these various forms of information about the environment are integrated to organize navigation. Neuroscientists have good reasons to believe that mammals, for example the laboratory rat, navigate by a map-like representation of the explored environment – a cognitive map in the hippocampus of the brain. Such forms of memory about the environment store the spatial relations of landmarks and the meaning of locations for behavioral control. Behavioral biologists find it difficult to accept the concept of a cognitive map because they believe that the same behavioral phenomena can be explained by multiple and separate sensory-motor routines. Since there is no neural correlate of navigation in insects it is rather difficult to prove the necessity or existence of a cognitive map in insects. I define a mental or cognitive map as a memory structure that stores spatial and temporal relations of landmarks in such a way that behavioral routines like expectation, planning and travel shortcuts are possible. Shortcutting is the essential proof of a metric mental map, because it requires self-localization and goal localization if other, more simple mechanisms, like steering towards a beacon or matching with the panorama, can be excluded. I view the mental map of animals, including the honeybee, as an action memory of spatial relations rather than a sensory representation as we humans experience by introspection. Action means not only expressed motor behavior but also "internal doing" or "thinking" that leads to expectation and planning.

Do we know what type of molecular or cellular events underlie the formation of a mental map in an insect's brain?

Unfortunately no. Together with my co-workers we are working hard to search for neural correlates in the honeybee brain that code for spatial relations of objects that possibly control navigation.

On a practical note, how difficult is it to track the flight paths of bees?

Navigation cannot be studied in the lab or in the vicinity of the hive or a feeding place. In my view, the large amount of data collected under such restricted conditions are rather irrelevant for navigational studies. Bees cover distances of kilometers. Therefore, we use a special radar system, a harmonic radar, that tracks them over 1–2 km. The bee has to be equipped with a transponder, a passive radar antenna that weighs 20 mg and measures 12 mm in length. It can easily be carried by a bee and does not disturb its flight. The data are highly informative, but the method is not easy because the harmonic radar is a sensitive device that is exposed to the rough conditions of the environment, for example rain, strong wind, thunderstorms. I would not have been able to collect such data if I had not had the luck to collaborate with Uwe Greggers, a highly gifted engineer, for more than 40 years.

"Navigation according to a mental map has been considered to be the realm of big brains."

You reported your recent results in *Proceedings of the National Academy of Sciences*. Have you been surprised by the interest in the paper?

Bees are small animals with a small brain. Navigation according to a mental map has been considered to be the realm of big brains. Documenting a mental map for navigation in bees comes as a surprise for some and arouses skepticism and opposition. We had proposed the existence of a mental map in bees earlier as one of several mechanisms of their navigation.[2] This interpretation was met with skepticism and alternative interpretations were published. We therefore searched for experimental approaches that could decide between alternative interpretations.

Some researchers say bees can navigate without a mental map and that your study does not exclude this possibility. What is the reasoning and how do you respond to this?

We documented in earlier publications that bees are able to perform shortcutting flights thus fulfilling the requirement of a mental map if more elementary solutions could be excluded. One elementary solution of shortcutting could not be excluded in our former studies which is discussed in an earlier paper.[3] It was therefore helpful that Cruse and Wehner pointed out that bees could

solve the kind of shortcutting we demonstrated by an algorithmic procedure, namely vector addition of two stored vectors.[4]

The essence of the argument put forward by Cruse and Wehner was that the directional component of the respective vectors is related to the sun compass. We therefore searched for a method that allows us to shift the sun compass. We found a solution by anesthetizing the animals for six hours, which is a long time. This stops their inner clock, which in turns leads to a shift

"I view the mental map of animals, including the honeybee, as an action memory of spatial relations rather than a sensory representation as we humans experience by introspection."

in their sun compass. We found that these time-shifted animals initially fly in the wrong direction. In this case, further to the east because the inner clock gave them an earlier time. However they returned home as fast as the control bees that had not had their internal clocks shifted in time.[1] Since we excluded more elementary solutions we concluded that the bees referred to a representation of the ground structure equivalent to a mental map. This conclusion was questioned on two grounds: First, bees may have adjusted their inner clock within minutes during the vector and search flights, and second bees may have referred to the skyline of the panorama.[5] Both of these suggestions can be rebutted because adjustment of the time shift after 6 hours of anesthesia requires days and the angular modulation of the skyline was below a 2° visual angle in the test area. Bees do not have a spatial resolution by their compound eye better than a 2° visual angle. An improvement of spatial resolution as suggested by Cheung and co-workers, namely a modulation of the brightness received by a single ommatidium, a single visual pixel in the compound eye, has not been shown in any insect and is not supported by any experimental evidence in the honeybee.[5] We therefore maintain our conclusion that vector addition is excluded as a possible mechanism for homing in these experiments.

Is it a bold statement to say that your experiments prove the use of mental maps in bees?

There are two components to the concept of a mental map: the relational representation of landmarks and the meaning of locations to the animal. Indeed, we believe that we have documented beyond doubt that bees refer in their navigation to a metric representation of the environment. However, we have only little evidence that they assign meaning to the experienced locations. It will be a topic of further research to address this question and honeybees provide us with the opportunity for an answer. Bees communicate about locations with a symbolic form of information transfer – the waggle dance. Relating waggle dance communication and navigation has allowed us to postulate that they refer to the same kind of spatial memory in their own navigation and in their dance communication.[3] Further studies will help us to test whether they make decisions about the value of the dance-indicated goal based on their own experience with that goal.

It is true that there is a distinct difference between the way ants, for example, navigate on the ground and bees navigate in flight?

Indeed there is a distinct difference between earth bound animals like ants and airborne animals like bees as they experience and use spatial information about the environment. Ants see the panorama as a 360° circle of skyline profile, bees experience the ground structure as a geometric map at the outset combining these sequentially experienced maps to an integrated map. Generalizing from ants to bees appears to me as inappropriate.

Science is often more about differences in opinion that many people think and it is important to reach a consensus. What is the best way to do this?

Disagreement is a highly productive resource in science and should not be considered as a nuisance. The opinion of the minority can open the field to significant new discoveries and fundamentally new directions. Science is not about democratic consensus building. Experimental evidence and conclusive arguments are the backbone of science. The controversy about the mental map in the bee is an intense debate going on right now in behavioral biology and neuroscience.

"Disagreement is a highly productive resource in science and should not be considered as a nuisance."

Traditional behavioral biology tends to ignore the richness of even small brains and tries to avoid making any assumptions about their capacity to probe the potential outcomes of future behavioral actions. This "inner doing" is at the realm of neuroscience. In this sense, neuroscience has followed the cognitive turn much more radically than behavioral biology. My thinking is governed by both disciplines but I notice that behavioral biology lags behind evidence and sticks to traditional concepts that become increasingly irrelevant when we ask how the brain performs all these wonderful tasks.

You plan to do experiments with bees in mazes. What will this show?

We need to find neural correlates of navigation in insects. There is no hippocampus in insects but the necessary convergence site between the multiple sensory modalities involved in navigation and the high order control of behavioral acts is already quite well known. Insects are too small to mount amplifiers and wireless transmitting electronic units on their body. We recently succeeded to record multiple high order interneurons in the bee brain when the animal is freely moving within a colony. We also found it possible to record from such neurons when walking bumble bees navigate in a small maze. I say navigate but this kind of navigation in such a maze is rather simple. It is close to the conditions rats are tested when their hippocampus is recorded. These experiments are a beginning. We are confident we shall find ways to record high order interneurons in the bee brain even when they fly and explore the environment.

© Randolf Menzel

Honeybee with a transponder for harmonic radar tracking

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The European Genome-phenome Archive: a secure, sustainable data resource

The Centre for Genomic Regulation in Barcelona, Spain, has joined forces with the European Bioinformatics Institute in the United Kingdom to further develop the European Genome-phenome Archive (*www.ebi.ac.uk/ega*), a large-scale repository for biomedical research data initially launched by EMBL-EBI in 2008. Through the ELIXIR data infrastructure, this secure, public resource of human genotype and phenotype data is now more sustainable and able to meet the rapidly growing needs of the scientific community thanks to a formal agreement between the two institutes.

From left to Right: **Arcadi Navarro** Affiliate Head of the EGA team; **Jaime Lanaspa** Director General of the "la Caixa" Foundation; **Andreu Mas-Colell** Minister of Economy and Knowledge from the Government of Catalonia; **Carmen Vela** Secretary of State for Research & Development from the Spanish Ministry of Economy and Competitiveness; **Luis Serrano,** Director of the CRG; and **Francesc Subirada**, Associate Director of the Barcelona Supercomputing Center.

As its defining feature, the EGA provides a means for sensitive, individual-level human biomedical data to be made available through a secure channel to bona fide researchers. Researchers gain access through a data request process, ensuring that the security and research use requirements for data are met.

Working together, the CRG and EMBL-EBI teams provide the EGA service to data submitters, which range from large global consortium projects to individual research groups. The EGA provides an effective way for submitters to meet the long-term archiving and data dissemination policies often required by funding agencies and publishers, and a means to increase the impact of their research through collaboration.

Users of the EGA are able to discover and access datasets relevant to their research. Both EGA submitters and users benefit from the new, larger, combined EGA team. It will distribute the workload, offer a larger help-desk and training team, and develop new services such as secure, interactive browsing of EGA datasets.

Clinical data in the public domain

The EGA accepts data from sequencing, genotyping, transcriptome or epigenetics experiments using next-generation sequencing platforms or array-based technologies, paired with phenotypic or clinically derived data. It supports prepublication data release in accordance with the Toronto agreement, which endorses the value of rapid prepublication data release for large reference data sets that have broad utility in biology and medicine.

"The EGA adds enormous value to Barcelona's already exceptional genomics and health research cluster," says Luis Serrano, EMBO Member and director of the CRG. "In a very important way, the EGA is an excellent example of how a range of different national institutes can join forces to reach a common goal."

"The EGA provides a foundational resource for biomedical research, enabling the secure sharing of data that has been collected to further our understanding of numerous diseases. The knowledge gained by further analyses of these data will help shape clinical applications of genomics across Europe and beyond," says Paul Flicek, head of genes, genomes and variation resources at EMBL-EBI.

Simplifying access

The EGA is a controlled-access resource that strives to help scientists use the information it contains to maximum effect. EMBL-EBI and the CRG are working to develop data-mining and federated-access tools that will vastly improve the utility of the information on offer.

The EGA contains data from around 300,000 individuals, so ensuring data privacy is paramount. The information in the archive comes from individuals who consent to the sharing of their data, but with an understanding that the data will only be made available to bona fide researchers for research projects that meet appropriate data use policies. Future developments will streamline the data-access application process, which will continue to ensure data privacy while reducing frustration.

A growing archive

The EGA currently stores around 1100 terabytes of data, generated by more than 700 scientific studies on cancer, diabetes, autoimmune diseases, cardiovascular problems and neurological disorders, amongst other illnesses. Researchers from over 200 organisations have submitted their data, and with the increasingly rapid uptake of sequencing technologies, many more are expected to contribute.

Scientists who are granted permission can download specific datasets for re-analysis. These data might represent experimental investigations of a particular trait or disease, for example inflammatory bowel disease, hypertension or rheumatoid arthritis. The wealth of information in the EGA can potentially be used to inform the design of therapeutic interventions for a wide range of diseases and conditions.

Support

Supported by two ELIXIR pilot projects (www.elixir-europe.org), both the extension of the EGA as a collaboration between EMBL-EBI and the development of federated access to the data aim to ensure the long-term availability of genomic and phenomic data in the public domain. La Obra Social "la Caixa," the Government of Catalonia and the Spanish Ministry of Economy and Competitiveness (through the "Centre of Excellence Severo Ochoa" programme), the Barcelona Supercomputing Center (BSC-CNS), and the National Institute of Bioinformatics (INB-ISCIII) provided support for the EGA at the CRG. The Wellcome Trust, the European Commission's Seventh Framework Programme, the UK Medical Research Council and the European Molecular Biology Laboratory have provided support to the European Bioinformatics Institute (EMBL-EBI).

The EGA project is made available through the following EMBL-EBI and CRG-based web portals: *www.ebi.ac.uk/ega and ega.crg.eu*

Focus on Science Policy
Scientific societies and the Open Access debate

The Initiative for Science in Europe (ISE) has finalized a paper that describes the situation of scientific societies that publish journals in the context of the transition to Open Access publishing. The paper, which was approved by the ISE General Assembly on 10 April 2014, was prepared by Michele Garfinkel, EMBO Science Policy Manager, with contributions from the ISE Open Access working group. EMBO has been a member of ISE since 2004. The document is based on the input from 19 European learned societies, federations and other organizations that collectively represent a community of at least 330 000 individual researchers. The purpose of the report is not to make recommendations but to provide information on the role that journal publishing has for scientific societies and their activities.

The origins of the Open Access movement go back to discussions in the early 2000s. In 2001, an official statement was released from a meeting held in Hungary calling for all scientific papers to be made freely available to readers and users. Since the Budapest Declaration, different solutions have been pursued in the hope of improving access to the research literature as well as its utility. This has included the launch of new journals that rely on article-processing charges in their efforts to achieve financial sustainability.

The new report from ISE focuses attention on scientific societies, many of which are involved in scientific publishing. These organizations often use revenue generated from their journals to support activities that they provide for the benefit of the scientific community, for example fellowships, start-up grants, workshops, meetings, travel grants and childcare support. Since the transition to Open Access can entail a decrease in revenue these groups face a dilemma: how to continue providing the same level of services to their communities. The report highlights a few options including introducing or increasing membership fees, raising charges for attending meetings, or securing direct support from governmental or non-profit agencies. Increasing article-processing charges or licensing more value-added journal content could also generate additional revenue for journals that could be used to support the activities of societies. It is not clear if any of these alternatives are sustainable.

Most discussions about how to transition to Open Access have focused on funders and researchers. "Little attention has been directed to scientific societies when Open Access publishing is discussed," says Wolfgang Eppenschwandtner, ISE Executive Coordinator. "One of our main goals for the report was therefore to provide information on the role that journal publishing has for scientific societies and their activities."

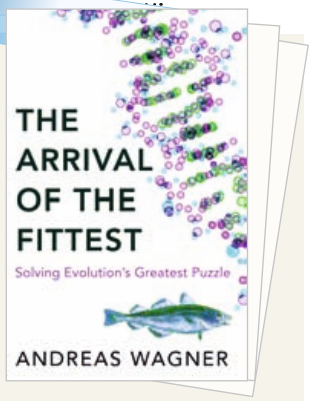
Very few individual journals have undergone a successful changeover to full Open Access publishing but more journals are trying. EMBO Molecular Medicine made a successful transition to fully open access publishing in 2012. The Royal Society is placing its bets on *Royal Society Open Science* which will be their first journal to cover the entire range of science and mathematics.

About the Initiative for Science in Europe

The Initiative for Science in Europe (ISE) is an independent platform of European learned societies and scientific organizations whose aim is to promote mechanisms to support all fields of science at a European level, involve scientists in the design and implementation of European science policies, and to advocate strong independent scientific advice in European policy making. The ISE paper "Learned societies, academic publishing, and transitions to Open Access" can be downloaded at *www.i-se.org/pdf/learned_societies_academic_publishing_and_transitions.pdf*

BOOK REVIEW

Solving evolution's greatest puzzle



A radical departure from the mainstream perspective on Darwinian evolution," says Swiss author Rolf Dobelli on Andreas Wagner's book *Arrival of the fittest*. "Wagner cuts to the core of innovation in living systems. Fundamental. Entertaining. Brilliant."

Andreas Wagner is a professor in the Institute of Evolutionary Biology and Environmental Studies at the University of Zurich. He is the author of more than 150 scientific papers published in leading international journals. *Arrival of the fittest* is his first book popularizing the new evolutionary systems research.

The recently published book, which is at the intersection of science and general interest, offers a new view on the structure of evolution. While Darwin's theory is still powerful in explaining how useful adaptations are preserved over generations, Wagner goes one step further in trying to reveal how adaptations are not just driven by chance. Using experimental and computational technologies, he explains, for example, how useful adaptations arise in the first place.

"The main motivation to write this book was to present a number of potentially revolutionary insights into evolution to an audience much broader than a handful of specialists," says the author. "I wanted readers to be able to share in the excitement and the discoveries that are still to be made in the otherwise mature field of evolutionary biology." He added: "It was a daunting experience – much harder than any technical writing I have ever done."

The book is published by Oneworld and is available from 6 November. The US edition is available on 2 October from Current (Penguin).

Dr Jackie Hunter, Chief Executive and Deputy Chair of the BBSRC, officially opened the Hounsfield Facility at the University of Nottingham

Uncovering the hidden half of plants

A new centre for advanced imaging technologies, a resource that promises to allow scientists to design better root systems for plants, was recently opened at the University of Nottingham, England. Dr. Jackie Hunter CBE, chief executive and deputy chair of the Biotechnology and Biological Sciences Research Council (BBSRC), officially launched the Hounsfield Facility, named in honour of the Nottinghamshire born Nobel Prize-winning inventor of X-ray microcomputed tomography (microCT), Sir Godfrey Hounsfield, on 18 September at the University's Sutton Bonington Campus. The 5-million Euro state-of-the-art imaging centre, which provides access to the most advanced microCT scanners in the world, is funded by the European Research Council, the BBSRC, the Wolfson Foundation and the University of Nottingham.

The new Hounsfield Facility is being launched to address one of the biggest global challenges, namely food security. "For the first time in 10 000 years of plant breeding, we can non-invasively image root architecture directly in the soil and then use this information to select the most efficient varieties for farmers to grow," says EMBO Member Malcolm Bennett, Professor of Plant Sciences at the University of Nottingham and Director of the Centre for Plant Integrative Biology.

The new imaging facility will allow the researchers to delve in detail into the rhizosphere, the thin layer of soil directly influenced by the proteins and sugars released by roots and inhabited by the bacteria that live off discarded plant cells. The team of scientists at Nottingham University will use the microCT equipment and novel image analysis techniques to understand how roots of different crop varieties take up water and nitrogen. These facilities have enabled Professor Bennett's team to observe that the distribution of water in soil profoundly influences root branching, revealing that new lateral roots form on the side of roots in contact with water, but rarely on a dry side. In collaboration with US researcher Jose Dinneny, Professor Bennett's team reported that this response in roots is regulated by a novel hormone-based mechanism termed '*hydropatterning*'.[1] Lateral root hydropatterning occurs in both dicot and monocot species and therefore appears to be a highly conserved adaptive trait in land plants.

The new facility is equipped with three microCT scanners capable of imaging objects as fine as a soil particle and root hairs to entire root systems: A small high-resolution scanner is available for visualizing fine details such as single roots, root hairs and the soil around them; a medium-scale microCT scanner can image whole roots; a large custom-designed microCT system can be used to look at large plants such as wheat from seedling to flowering stages. In addition, a fully automated greenhouse is equipped with a laser-guided robot that feeds the 1-metre-long, 80-kg samples to the largest scanner.

Speaking at the meeting, Dr. Jackie Hunter, remarked: "The Hounsfield Facility is set to play a key role developing crops with improved root architecture and underpinning research efforts to ensure global food security. Research carried out at the new Hounsfield facility is truly interdisciplinary, involving plant, crop and soil scientists with engineers, mathematicians and computer scientists. Equipped with robots, microCT scanners and specialised image analysis methods developed in-house, Nottingham researchers can now image root architecture in a non-destructive way throughout the life cycle of the plant, from seed to flowering, across a range of different soil environments, for the very first time."

The Hounsfield Facility

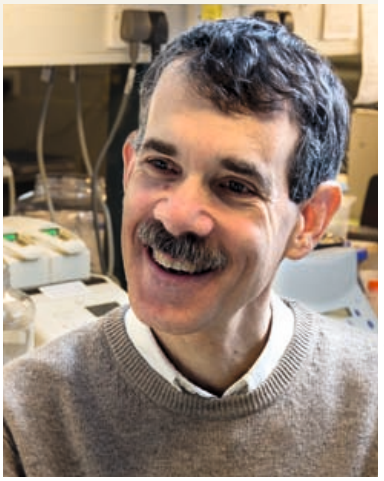
REFERENCES

1. Bao et al. (2014) Plant roots use a patterning mechanism to position lateral root branches toward available water. *Proceedings of the National Academy of Sciences* 111: 9319–9324.

Further information is available from Professor Malcolm *Bennett Malcolm.bennett@nottingham.ac.uk*

The benefits of agitation

Endocrinologist by education, DAVID RON switched to basic research during his postdoctoral training – and has stuck to it ever since. His laboratory at the Cambridge Institute for Medical Research focuses on the regulation of protein folding homeostasis in the endoplasmic reticulum. More recently, Ron has examined the emerging links between protein folding homeostasis and metabolism. This year he was elected to the Fellowship of the Royal Society.



Why is it important to study the unfolded protein response and metabolic disorders?

The mechanisms that cells use to monitor protein folding homeostasis and to respond to perturbations are intriguing. Unifying features conserved across phyla and compartments of the cell have been revealed, such as the ability of chaperones to attenuate the unfolded protein signal. Remarkable diversity and natural inventiveness have been unearthed. In the secretory pathway, maintaining conditions that favour protein folding is especially challenging. The premium on evolution of a robust unfolded protein response has been large.

Unfolded protein stress in the endoplasmic reticulum and the cell's response to it have pervasive consequences and affect important biological processes such as ageing, memory and cognition, inflammation, oncogenesis and – of particular interest to me as an endocrinologist – metabolism.

What inspired you to go into this type of research?

Having trained in clinical medicine, I stumbled into research. When I set up my own lab in 1992, I had planned to follow-up on a transcription factor called CHOP/Ddit3 that I had identified as a postdoctoral researcher. I hoped that its study would lead to the discovery of important disease mechanisms. This hope was only partially realised. It turned out, however, that CHOP is remarkably inducible by stress. This was in the middle of the 1990s and endoplasmic reticulum stress was not unambiguously differentiated from other types of stress such as genotoxic stress or oxidative stress. It was the discovery by my student, XiaoZhong (Alec) Wang, who is now at Northwestern University, of CHOP induction during endoplasmic reticulum stress that kindled my interest in the underlying molecular mechanisms. This work was a collaboration with Linda Hendershot from St. Jude Children's Research Hospital. I have been following up on this question ever since.

How has the focus of your research changed throughout your career?

I set off doing non-redundant clinical research. With time I realised that unless one has a pipeline of unique clinical material or unnatural insight, restricting research to mysterious clinical phenomena might limit the range of possible discovery. So I chose to do my postdoctoral research at the Massachusetts General Hospital in Boston, in a laboratory that acknowledged physiological relevance but also encouraged fundamental inquiry. I identified CHOP during my postdoctoral training in an effort to find transcription factors relevant to adipose tissue differentiation. The first discovery of my own laboratory at New York University was of CHOP's involvement in the development of liposarcoma, a tumour of adipose tissue. At the time, I had hoped that further digging into the function of CHOP and the Translocated in Sarcoma-CHOP fusion protein would unearth important clues about adipose tissue differentiation and more generally about oncogenesis. But over time I realised that there are many roads to cancer. We were rescued from this frustratingly unproductive line of research by Xiaozhong's work on CHOP as a target gene of the unfolded protein response and have stuck with the latter problem ever since.

Are you also planning to focus on protein folding in the future?

I was born in 1955 so I am only concerned with a limited portion of the cosmic future. Therefore we shall likely stick with the study of protein folding homeostasis for the duration of my tenure. What may change are the tools we use. For example, since moving to Cambridge our laboratory has embarked on structural and biophysical studies of unfolded protein response components. It is something I enjoy and I hope we shall do more in this area.

What are the advantages and the drawbacks of being a scientist today?

The drawback of being a scientist is the difficulty to reconcile two conflicting personal attributes: to be irrationally optimistic whilst working on a problem, believing despite all the lessons of the past that the next attempt will be informative; and at the same time to be brutally realistic in appreciating that, like all previous attempts, this one too may fail. Henry Thoreau noted that the mass of men lead lives of quiet desperation. But the hope of discovery agitates the scientists' desperation. That, I believe, is the advantage of being one.

What does it mean to you to become a Fellow of the Royal Society?

The meaning of having an honour bestowed upon one is inversely proportional to how deserving one feels of that honour. By that token, having been made a Fellow of the Royal Society, means a great deal to me. The Royal Society of London for Improving Natural Knowledge was one of the first learned societies, an early product of the age of enlightenment. But there is a great deal that remains to be improved today and the importance of the Society in promoting conditions conducive to the acquisition of knowledge is undiminished in our times. Eternal vigilance is required to sustain public support for the scientific enterprise and I am pleased to have any role, even a small one, in organizations like the Royal Society and EMBO that take that job seriously.

VIDEO

David Ron
The Unfolded Protein Response
David Ron discusses protein unfolding and metabolic disorders for the Association of Cell Biology and Differentiation

www.youtube.com/watch?v=09zP4eTusUo

Practical Courses

Metabolomics bioinformatics for life scientists
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The characterization of post-translational modifications
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JP-Okinawa, 17–22 April 2015

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

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FR-Bordeaux, 8–19 June 2015

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DE-Heidelberg, 8–20 June 2015

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

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

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Workshops

Upstream and downstream of Hox genes
IN-Hyderabad, 14–17 December 2014

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

Developmental circuits in aging
GR-Hersonissos, 25–28 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 and developmental systems
CH-Arolla, 18–22 August 2015

Cell cycle
HU-Budapest, 4–7 September 2015

Stem cell mechanobiology in development and disease
IT-Capri, 18–21 October 2015

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Conferences

From functional genomics to systems biology
DE-Heidelberg, 8–11 November 2014

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

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

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

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

Ribosome synthesis
BE-Brussels, 19–23 August 2015

Meiosis
UK-Oxford, 30 August–4 September 2015

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

Ubiquitin and ubiquitin-like modifiers: From molecular mechanisms to human diseases
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The multidisciplinary era of endocytic mechanics and functions
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ESF | EMBO Symposia

Bacterial Networks (BacNet15)
ES-Sant Feliu de Guixols, 9–14 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

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

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

Enabling technologies for eukaryotic synthetic biology
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Other EMBO events

15th EMBO|EMBL Science and Society Conference
Foods are us! On eating and becoming
DE-Heidelberg , 6–7 November 2014

The EMBO Meeting 2015 – Advancing the life sciences
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Vladimir Joukov
Harvard Medical School, Boston, United States

The Cep192-organized Aurora A-Plk1 cascade is essential for centrosome cycle and bipolar spindle assembly

Presented at the FEBS-EMBO joint anniversary conference in Paris, France

EMBO REPORTS

Nicholas R. Y. Lim
University of Melbourne, Australia

Regulation of WD40 Repeat Protein 62 by Aurora A – insights into the maintenance of the mitotic spindle

Presented at the FEBS-EMBO joint anniversary conference in Paris, France

MOLECULAR SYSTEMS BIOLOGY

Mohammad Fallahi-Sichani
Harvard Medical School, Boston, United States

Systematic characterisation of drug-induced adaptive responses in melanoma

Presented at the FEBS-EMBO joint anniversary conference in Paris, France

EMBO MOLECULAR MEDICINE

Alexander Goginashvili
IGBMC, Illkirch, France

PKD links Golgi to nutrient starvation response in pancreatic β cells

Presented at the FEBS-EMBO joint anniversary conference in Paris, France

Call for applications

The Beug Foundation has issued a call for applications for its 2015 Prize for Metastasis Research. Two prizes of 12 000 Euros will be awarded to scientists who convincingly present an original project to facilitate the implementation of novel, original approaches to combat cancer metastasis. One of the prizes will be awarded to a scientist who obtained a PhD in the past 5 years; the second prize will go to a scientist who obtained a PhD in the past 12 years.

Further information is available at *www.beugstiftung-metastase.org*

The deadline for submissions via the website is November 30, 2014

Discovery Centre opens in Dundee

On the 1st October, SIR PAUL NURSE, Nobel Laureate, President of The Royal Society of London, and EMBO Secretary General, officially opened the new £26 million Discovery Centre at the University of Dundee. The Discovery Centre is home to researchers supported by over £31 million of research grants, bringing the investment in the total operation to well over £57 million. The Discovery Centre for Translational and Interdisciplinary Research will further enhance Dundee's internationally renowned life sciences capacity, including in drug discovery – an area in which Dundee is the leading University in the United Kingdom and one of the foremost academia-based centres in the world.

Below: **Professor Elaine Shemilt and Sir Paul Nurse in the foyer of the new building**

© Lewis J Houghton

The new Centre will provide 180 new, externally funded, high-value jobs for Scotland's Life Sciences sector. They will join around 900 scientists, research students and support staff from 61 countries who are already based in the College of Life Sciences at Dundee.

"This is a major new facility which will significantly boost Scotland's biomedical sector and help us make an impact on people's lives around the globe," said Professor Michael Ferguson, Regius Professor of Life Sciences at Dundee.

"The Centre will further develop our already very strong drug discovery programmes in neglected tropical diseases and in other areas of unmet medical need, such as cancer, inflammation and eczema."

The Centre is also home to a new research division of Computational Biology, incorporating Bioinformatics, Biophysics, Data Analysis and Software Development, and a Laboratory for Quantitative Proteomics, integrating expertise in cell biology, mass spectrometry and "big-data" analytics.

"These highly interdisciplinary and high-tech activities are essential to the future of life sciences research and provide many opportunities," said Professor Ferguson. "The Centre will also provide an in-house biotech spin-out "pre-incubator," where fledgling spin-out companies can be nurtured before reaching critical mass. "We are extremely grateful to the organisations and individuals who have generously supported this major investment in Life Sciences at Dundee."

Sir Paul Nurse said, "I am delighted to be opening the Discovery Centre. Life sciences research in Dundee has an international reputation and this new centre provides exciting opportunities to bring different disciplines together, each bringing expertise to bear on aspects of larger, systems-level problems relating to biology, drug discovery and drug design."

The Discovery Centre has attracted funding from public, private and charity sources, including a peer-reviewed Wellcome-Wolfson Capital Award in Biomedical Science of £5 million, with matched funding by the University of Dundee, and a £12 million award through the UK Research Partnership Investment Fund. The Centre also received substantial funding from several charitable trusts, government funding agencies and research councils as well as a significant donation from the late Sir Kenneth Murray, one of the world's most distinguished molecular biologists.

The facade of the building features large anodised aluminium cladding panels incorporating artistic abstractions representative of four key scales of life science research: molecular, organellar, cellular and tissue. The scientific images have been translated into artwork by Professor Elaine Shemilt and her team from Duncan of Jordanstone College of Art and Design. In addition, the new Centre contains a gallery called LifeSpace for art-science collaborative projects.

New home for the Telethon Institute of Genetics and Medicine

Laboratories, offices and research services in a former factory

The Telethon Institute of Genetics and Medicine (TIGEM) is a multidisciplinary research Institute devoted to the study of the mechanisms underlying rare genetic diseases and to the development of new therapies. Founded twenty years ago, the institute is one of the leading centres for fundamental life science research in Italy. It is particularly renowned for its research on neurodegenerative diseases, lysosomal disorders, membrane trafficking defects, disorders of liver metabolism, and eye diseases.

Earlier this year, the institute moved to a newly refurbished 5000-square-meter complex on the former Olivetti campus in Pozzuoli. Pozzuoli is a small town at the Mediterranean Sea, adjacent to Napoli. The campus is a historic, architectural complex that used to host the old Olivetti factory. The new building has large open-space laboratories, specialized facilities, a large auditorium and even a small gym. "The new space offers TIGEM the ideal setting for the full development of our current programmes, the expansion of some critical areas and new recruitments," says Andrea Ballabio, EMBO Member and Scientific Director of the Institute. "Our plan is to continue performing excellent basic research in the field of genetic diseases with a move towards the development of new therapies."

Over the past five years, TIGEM has made a significant step to translate discoveries into clinical applications and has built strategic alliances with biotechnology companies to support translational studies and clinical trials. The Italian Telethon Foundation has invested considerably in TIGEM by providing the critical financial support and a foundation for further funding from other sources. Today, more than 80 percent of TIGEM's financial support comes from external sources. The growth of research funding resulted in an increase of personnel and an urgent need for additional space.

Research at TIGEM is focused on three strategic programs: Cell Biology of Genetic Diseases, Molecular Therapy and Systems Biology, and Functional Genomics. The Institute employs 200 Italian and foreign researchers in fifteen independent research groups and seven research facilities including advanced microscopy, bioinformatics, high-content screening, next generation sequencing and viral vector production. Five scientists have received grants from the European Research Council. TIGEM has also established international postdoctoral and graduate training programmes. www.tigem.it

New leadership structure at IMM

Three former EMBO Young Investigators are now steering the affairs of the Lisbon-based Instituto de Medicina Molecular (IMM)

After celebrating a decade of existence, the Instituto de Medicina Molecular, formerly directed by EMBO member Maria Carmo-Fonseca, has a new leadership. The renowned malaria researcher Maria Mota is now Executive Director, while Maria Carmo-Fonseca became the institute's President. Other members of the board of directors include Vice-Director Bruno Silva-Santos and Henrique Veiga-Fernandes, Director of Strategy.

"We all represent the new generation of researchers that returned to Portugal in the past decade to lead independent laboratories at IMM," says Silva-Santos. It was Maria Mota who proposed a mix of personalities and versatile expertise at the helm of IMM to provide the best solutions to the challenges ahead. The other reason for sharing responsibilities was to stay active in their laboratories, especially as all three scientists are still in their early forties. "We are by far the youngest directors of a research institution in Portugal," concludes Mota.

Under Carmo-Fonseca's direction, IMM established itself as one of the leading biomedical research institutions in Portugal. The aim now is to turn it into a European player by attracting more foreign and established principal investigators. The strategy is to tap additional funds – both within Horizon 2020 and with private institutions – that will allow for better starting packages, state-of-the-art facilities and international networking. This will go hand in hand with converting the fixed structure of departments based on traditional disciplines into a flexible, multidisciplinary organization.

© IMM

From left:
Bruno Silva-Santos, Maria Mota, Henrique Veiga-Fernandes

"The EMBO Young Investigator Programme allowed us all to gain knowledge about various institutional models across Europe, and helped us establish international networks with fellow scientists," comments Silva-Santos. To further develop and promote IMM within the European research community seems like a natural step forward. *www.imm.fm.ul.pt*

EMBO Molecular Medicine

RESEARCH ARTICLE

Dendritic cells affect onset and progress of psoriasis

Different types of dendritic cells in human skin have assorted functions in the early and more advanced stages of psoriasis report researchers in the journal *EMBO Molecular Medicine*. The scientists suggest that new strategies to regulate the composition of dendritic cells in psoriatic skin lesions might represent an approach for the future treatment of the disease.

"Our experiments have revealed that increases in the number of plasmacytoid dendritic cells are important early triggers of the disease while other types of dendritic cells, the Langerhans cells, help to protect the balance of the immune response that is established during inflammation of the skin," said EMBO Member Maria Sibilia, a Professor at the Medical University of Vienna in Austria, and one of the lead authors of the study.

The researchers observed an increase in the accumulation of plasmacytoid dendritic cells in the psoriatic lesions of patients as well as in mice that are model organisms for the study of the disease. In contrast, the levels of another type of dendritic cells, known as Langerhans cells, were significantly decreased in the lesions compared to healthy skin in humans and mice. If the levels of plasmacytoid dendritic cells in mice were decreased during the early stages of the disease then the symptoms of psoriasis were quelled. A similar decrease in Langerhans cells at an early stage of the disease had no effect. If the levels of Langerhans cells were reduced at advanced stages of the disease, the symptoms of psoriasis were exacerbated.

Specific roles for dendritic cell subsets during initiation and progression of psoriasis
Elisabeth Glitzner, Ana Korosec, Patrick M. Brunner, Barbara Drobits, Nicole Amberg, Helia B. Schonthaler, Tamara Kopp, Erwin F. Wagner, Georg Stingl, Martin Holcmann and Maria Sibilia
Read the paper:
DOI: 10.15252/emmm.201404114

THE EMBO JOURNAL

RESEARCH ARTICLE

A new therapeutic strategy for stroke?

A new study in *The EMBO Journal* shows that the mitochondrial protein Mfn2 may be a future therapeutic target for reducing neuronal death in the late phases of an ischemic stroke. Dr. Francesc Soriano, Ramón y Cajal researcher at the Department of Cell Biology of the University of Barcelona, has coordinated the study.

Mfn2 is a mitochondrial protein involved in the regulation of the morphology and function of mitochondria. The team led by Dr. Soriano recently discovered that the reduction in Mfn2 protein levels occurs four hours after the initiation of the excitotoxicity in *in vitro* and *in vivo* animal models. Excitotoxicity is the process by which nerve cells are damaged and killed by excessive stimulation by neurotransmitters such as glutamate and related substances.

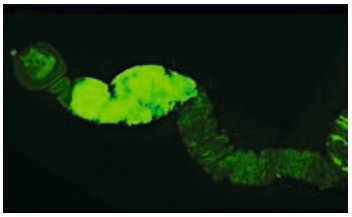
In vivo experiments in the current study revealed that if Mfn2 reduction is stopped, delayed excitotoxic cell death is blocked. The research team found that the Mfn2 reduction is triggered by a genetic transcription mechanism. The researchers also discovered that MEF2 is the transcription factor involved in this process. These findings are an important step forward in finding ways to reverse Mfn2 reduction. The main objective of the research in the long term is to design therapeutic strategies to reduce damage due to stroke.

Mfn2 downregulation in excitotoxicity causes mitochondrial dysfunction and delayed neuronal death
Alejandro Martorell-Riera, Marc Segarra-Mondejar, Juan P Muñoz, Vanessa Ginet, Jordi Olloquequi, Jeús Pérez-Clausell, Manuel Palacín, Manuel Reina, Julien Puyal, Antonio Zorzano, Francesc X Soriano
Source: Adapted from University of Barcelona press release
Read the paper:
DOI: 10.15252/embj.201488327

EMBO reports

RESEARCH ARTICLE

Researchers reveal transcription factor's likely role in human intestinal cancer



Researchers in Spain have determined how a transcription factor known as Mirror regulates tumour-like growth in the intestines of fruit flies. The scientists believe a related system may be at work in humans during the progression of colorectal cancer due to the observation of similar genes and genetic interactions in cultured colorectal cancer cells.

"We have been able to use flies as a model system to study molecular events that are very similar to the steps that take place in colorectal cancer in humans and we have been able to use this system to identify new genetic regulations relevant to human disease," says Andreu Casali, lead author of the study and a research associate at the Institute for Research in Biomedicine in Barcelona.

Mutations in two signalling pathways – the Wnt and EGFR/Ras pathways – are known to activate tumour-like growths in the intestines of fruit flies. In Drosophila, the researchers were able to show that activity of the Decapentaplegic (Dpp) pathway suppresses the growth of these intestinal tumours but that this suppression is counteracted by the Mirror transcription factor, a specific type of Irx transcription factor.

Iro/Irx transcription factors negatively regulate Dpp/TGF-beta pathway activity during intestinal tumorigenesis
Òscar Martorell, Francisco M. Barriga, Anna Merlos-Suárez, Camille Stephan-Otto Attolini, Jordi Casanova, Eduard Batlle, Elena Sancho and Andreu Casali
Read the paper:
DOI: 10.15252/embr.201438622

molecular systems biology

RESEARCH ARTICLE

A computational study of the Warburg effect

Over the last decade, researchers in the field of cancer metabolism have mainly focused on studying how tumorigenic metabolic rewiring supports cancer proliferation. In this new study, scientists performed the first genome scale computational analysis of the metabolic underpinnings of cancer migration. The researchers built genome scale metabolic models of the NCI 60 cell lines that capture the Warburg effect (aerobic glycolysis) as it typically occurs in cancer cells. The extent of the Warburg effect in each of these cell line models was quantified by the ratio of glycolytic to oxidative ATP flux, which was found to be highly positively associated with cancer cell migration. They predicted that targeting genes that mitigate the Warburg effect by reducing the ATP flux may specifically inhibit cancer migration.

By testing the anti migratory effects of silencing the 17 top predicted genes in four breast and lung cancer cell lines, the researchers found that up to 13 of these novel predictions significantly attenuate cell migration either in all or one cell line only, while having almost no effect on cell proliferation. In accordance with the predictions, a significant reduction was observed in the ratio between the experimentally measured extracellular acidification rate (ECAR) and rate of oxygen consumption (OCR) following these perturbations.

A computational study of the Warburg effect identifies metabolic targets inhibiting cancer migration
Keren Yizhak, Sylvia E Le Dévédec, Vasiliki Maria Rogkoti, Franziska Baenke, Vincent C de Boer, Christian Frezza, Almut Schulze, Bob van de Water, Eytan Ruppin
Source: Adapted from the paper
Read the paper:
DOI: 10.15252/msb.20134993

Centre for Evolution and Cancer

The Institute of Cancer Research, London, recently established a Centre for Evolution and Cancer in 2013. The goal is to assemble a multidisciplinary team of investigators that will interrogate cancer afresh using evolutionary principles derived from ecology and state-of-the-art cellular, genomic and bioinformatic technologies. The hope is to improve the survival of patients with cancer by determining how best to thwart the evolutionary resilience of the disease.

Evolution by natural selection is the foundation of biology. It should be no surprise therefore that it has great relevance to cancer. The idea that cancer is fundamentally a process of somatic cell evolution was first advocated in the 1970s. Since then the concept has been validated, greatly elaborated and the striking parallels with Darwinian evolution by natural selection in ecosystems highlighted. Cancer genomics has greatly endorsed this perspective by providing detailed genetic descriptions and technologies for interrogating single cells and multiregional small biopsies, revealing space-time genetic diversification of cancer cells and allowing clonal phylogenies, or evolutionary history, to be inferred. "It's a striking fact that every patient's cancer has an individually unique and variegated clonal architecture and evolutionary trajectory," says Professor Mel Greaves, EMBO Member and Founding Director of the Centre for Evolution and Cancer.

Looking at cancer in the context of evolution has major implications for the way scientists think about the fundamental biology of cancer and attempts to control it. This also applies to evolutionary considerations of why humans are so vulnerable to cancer. "Evolutionary biology is not a sub-topic of cancer sciences, it is a conceptual framework for everything in cancer," says Greaves.

Researchers at the centre seek to answer three big questions in cancer medicine: why are humans so vulnerable to cancer; what determines the unpredictable development of cancers in the body over time; and why is drug resistance so frequent? The Centre for Evolution and Cancer brings together computational biologists, geneticists, cell biologists and clinical scientists to tackle these questions. Research initiatives include efforts to identify the genetic diversity within individual tumours. Scientists are also looking at ways to profile tumours through genetic fingerprints that could predict progression of disease, metastases or drug resistance. The genetic diversity of cancer stem cells is also a focus of work at the centre. The hope is that one day stem cells may be the target for cancer treatment and provide information on what type of targeted treatment is likely to work for a patient.

Further information is available at ***www.icr.ac.uk/our-research/our-research-centres/centre-for-evolution-and-cancer***

Journalists and scientists share a common goal

EMBO Fellow TYLER SHENDRUK swapped his lab coat for a suit and a tie to work at the *Financial Times* of London last September. In EMBOencounters he tells his story about what it feels like to work for one the most respected newspapers worldwide.

I don't think many academics get to research subjects as varied as the evolutionary biology of rabbits, the Rosetta space mission and hypothetical quantization of space-time. However, this is only a selection of the topics I was lucky enough to cover as the British Science Association's (BSA) Media Fellow at the *Financial Times* (FT) of London. The BSA drops scientists into Britain's most respected newsrooms for a month to build bridges between journalism and science communities.

At first glance, these might appear to be long bridges indeed. Anna Williams, the New Scientist's media fellow, roundly summarized the key difference between our communities by blogging that facts "are a commodity to be traded, but the exchange rate is very steep. Scientists... cherish the few true facts that they might be lucky enough to generate over the course of their careers... Journalists are fact hungry. They will procure several precious facts from a handful of different scientists before breakfast."

Even as a visitor at the FT, I wrote nearly an article per day for science editor Clive Cookson. This entailed identifying potential stories, doing background research, contacting interviewees in any number of time zones, writing the article and even acquiring accompanying images. Since the FT is a classy institution, this was done while sporting a tie – certainly not the traditional regalia of working scientists. Such hyperactive daily productivity is mind-boggling compared to the perfectly acceptable month it took me to craft my response to the latest peer-review process I went through.

But there are striking similarities as well. My short time at the FT convinced me that science and journalism are truly sister vocations. Both journalists and scientists work far too hard at jobs they love for a pittance; we both work strange hours; both doggedly strive to discover the underlying reality in the well-honed chaos of newsrooms or laboratories; and we both possess a definite moral obligation to communicate what we uncover to the wider world.

Engaging with the media takes effort but it is our responsibility. Some of us enjoy it more than others, just as some are fonder of teaching. Although we experts may not always be content with specifics in science articles, journalists and scientists share a common goal. We both want discoveries explained as clearly and concisely as possible to as wide an audience as possible. In practice much of this partnership is institutionalized through press releases, which scientists should view as publications in their own right, and embargoes, which give journalists sufficient time to cover science news.

In maintaining and improving our relationship with journalism, we need to recognize that we have both shared and differing goals. We do not need to spend a month at the FT to step away from our viewpoint as academics and see science stories from journalists' perspective. Science reporters are searching all the time for the most concise, engaging narratives so that they can keep casual readers informed about the rapidly advancing and often inconsistent forefront of scientific discovery. That is certainly a goal that we can all respect and support.

Every institute needs a good canteen

On the occasion of the 100th birthday of Nobel Prize Laureate Max F. Perutz, the Max F. Perutz Laboratories (MFPL) held a celebratory scientific symposium entitled *Crossing Frontiers in Life Sciences* at the University of Vienna on September 11–12. MFPL is a joint venture of the University of Vienna and the Medical University of Vienna.

© MFPL, Daniel Hinterramskogler

The Vienna-born Max F. Perutz, who died in 2002, was one of the founding fathers of molecular biology and EMBO. He was among the first to build bridges between biology and physics to solve the structure of haemoglobin, for which he and his colleague John Kendrew were awarded the Nobel Prize in Chemistry in 1962.

At the symposium, more than twenty scientists presented their latest findings in structural biology, cell signaling, bioinformatics, chromosome dynamics and RNA-biology. Former colleagues and friends of Max Perutz honoured the researcher and scientific leader.

Michael Rossmann, a former postdoctoral researcher of Max Perutz in Cambridge in the early 1960s, opened the symposium. Rossmann, whose career as a crystallographer spans almost 70 years, developed the first computer programs to analyze Perutz's X-ray crystallography data and solve protein structures. His talk *From hemoglobin to the structure of viruses* gave personal insights into how his career had been influenced by working with the Nobelist. "He changed my life and was tremendously important for my education. On the train to London to our collaborators at the Royal Institution, Max was often teaching me science, which I didn't realize at that time." For Rossmann, the most important effect of solving the structure of haemoglobin is that for the first time scientists could prove on a molecular level that Darwin's theory of evolution was correct.

Tom Steitz, who received the Nobel Prize in 2009 for his work on the structure and function of the ribosome, honoured Perutz as a great inspiration. This was particularly true for himself, he explained, as the Dunham Lectures that Perutz held in 1963 in Harvard had inspired him to become a protein crystallographer.

Richard Henderson, who had worked with Perutz at the Laboratory of Molecular Biology in Cambridge until his death, revealed in his closing EMBO Lecture that the laboratory still follows some of Perutz's ideas. One of them is that every institute needs a good canteen as a place where scientists can meet and exchange information. "Often you go there with your brilliant idea and then it gets shot down within half an hour. And you realize that this half an hour saved you a year of work," said Henderson.

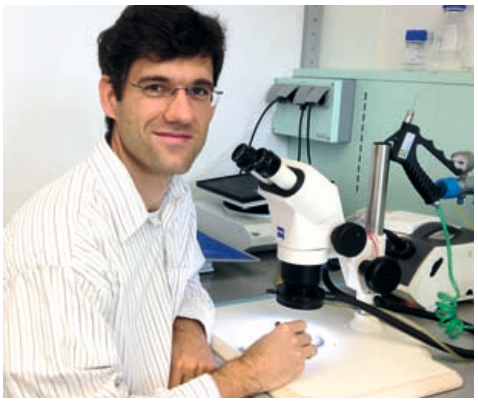
"The symposium was a terrific occasion for scientific exchange, and also highlighted Vienna as a life science hub," concluded Graham Warren, Scientific Director of the MFPL.

TripAdvisor for researchers

LabLore – an online tool to help plan future experiments

Our project was to find out the activity of a specific transcription factor in one of our mutants," reports Aurelio Teleman, group leader at the German Cancer Research Center and former EMBO Young Investigator. "To do this, we looked at a related paper where the authors reported a transcriptional signature for this transcription factor. When we went on to test it, the results could not be reproduced."

What Aurelio experienced with his project happens to many scientists. They build experiments on data that turn out to be unreliable, follow the wrong paths and as a result – waste their time. "There is an amazing amount of information relating to published articles in each and every laboratory," explains Aurelio. What he refers to is information about which results are reproducible and which are not, which conclusions have held up to the test of time and which are shaky. A lot of this knowledge is not shared amongst laboratories.



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To address these problems, Aurelio and his colleague Thomas Horn established LabLore, an online database to accompany published life science literature (*www.lablore.com*). The authors compare LabLore to other well-known online services. Just like TripAdvisor, it offers a forum to record the scientists' opinions and document their experience with the published data. The tool is especially useful as research becomes more interdisciplinary and projects draw from results outside one's core field of competence. Aurelio's own research interests include insulin signalling and tissue growth control.

LabLore stands or falls with the users' engagement. Comments can be voted up or down, users can ask anonymous questions to the authors and opt for automatic email updates whenever there is activity related to papers of interest.

"If the scientists take a few minutes to write their comments on LabLore, I am confident that we will all benefit from it," concludes Aurelio. Wikipedia also started with relatively few articles – and it has grown to become an invaluable resource.

Sunscreen insufficient for protection from melanoma

A recent publication in *Nature* reports that sunscreen cannot be relied upon exclusively to prevent malignant melanoma, the most deadly form of skin cancer.[1] The work, which was carried out by a team of researchers supported by Cancer Research UK and led by EMBO Member Richard Marais, examined the molecular effects of ultraviolet light on the skin of mice at risk of melanoma and tested whether the development of the disease was blocked by sunscreen.

"This study provides proof that sunscreen does not offer complete protection from the damaging effects of ultraviolet light," says Marais, Director of the Cancer Research UK Manchester Institute. The researchers revealed that ultraviolet light produces mutations in the p53 gene of mice, a gene that under normal conditions helps protect cells from the effects of DNA damage due to this type of irradiation. When the mice were protected by sunscreen the amount of DNA damage was considerably reduced and the development of melanoma was delayed. However, sunscreen did not offer complete protection and exposure to ultraviolet light still induced melanoma albeit at a reduced rate.

The researchers are careful to point out that their studies do validate public health campaigns that promote sunscreen protection for individuals at risk of melanoma. The caveat is that sunscreen does not provide complete protection and must therefore be combined with other sun protection strategies to ensure full safety.

Malignant melanoma is the major cause of death from skin cancer. In the United States alone, the number of cases has increased by an average of 4% each year since 1970. In Europe, melanoma affects over 100,000 new patients each year and rates continue to increase in most European countries. In many countries the rate is almost doubling every decade.

REFERENCE

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Living transplantation centre for pancreatic cells

EMBO Member Per-Olof Berggren and his research team have been developing a transplantation technique that allows researchers to study the function and survival of pancreatic islet cells and other tissue in the anterior chamber of the mouse, rat and monkey eye.[1] The work, which started in 2008, has been dubbed the "living window" model and allows scientists to study living cells in a non-invasive system at single-cell resolution.

In the case of transplanted pancreatic cells, researchers can gain valuable information by directly imaging healthy and diabetic cells in action. In time, this type of investigation may lead to new ways to tackle diabetes and other diseases.

The scientists have demonstrated the effectiveness of the transplantation procedure in the eyes of living mice. In addition to enabling direct visualization of a variety of transplanted tissues, the approach provides a way to screen drugs and monitor the effects of treatment on target tissues over longer periods of time.

In 2011, the group reported in a publication in *Proceedings of the National Academy of Sciences* on the use of the "living window" to study immune responses during islet allograft rejection in real-time.[2] The findings included the observation of unique structural changes that increased the mobility of cytotoxic T lymphocytes, results that were not predicted by *in vitro* studies.

More recently, in collaboration with Zhibin Chen, the group published another article in the *Journal of Experimental Medicine* where they also used the "living window" to uncover a novel mechanism of T regulatory cell function in curbing immune attack by antigen-specific effector T cells against pancreatic islets. The mechanism that was uncovered comprised motility regulation of effector T cells within the target tissue by direct cell-cell contact.[3] Moreover, the "living window" was successfully adopted as a reporter of the *in situ* status of the endocrine pancreas.[4]

REFERENCE

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2 Abdulreda et al. (2011) *Proceedings of the National Academy of Sciences* 108(31): 12 863–12 868.
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4 Ilegems et al. (2013) *Proceedings of the National Academy of Sciences* 110(51): 20 581–20 586.

2014 Nobel Prize

Professor John O'Keefe, Director of the Sainsbury Wellcome Centre in Neural Circuits and Behaviour at University College London, Edvard Moser, Director of the Kavli Institute for Systems Neuroscience and Centre for Neural Computation at the Norwegian University of Science and Technology, and May-Britt Moser, Director of the Centre for Neural Computation at the Norwegian University of Science and Technology have been awarded the 2014 Nobel Prize in Physiology or Medicine.

John O'Keefe became an EMBO Member this year. Edvard and Britt Moser joined the EMBO membership in 2011 and 2012, respectively. The award was made in recognition of their discoveries of cells that constitute a positioning system in the brain.

From their work, John O´Keefe, May-Britt Moser and Edvard Moser have elucidated how the brain of larger organisms creates a map of the space surrounding themselves and how these organisms can navigate their way through a complex environment. This problem has vexed philosophers and scientists for centuries.

Yamanaka receives honorary degree

The University of Hong Kong has awarded Shinya Yamanaka an honorary degree in recognition of his invaluable intellectual, social and cultural contributions to society and the world. The presentation of the award took place on the occasion of the EMBO Workshop entitled *Stem cells and epigenetics in cancer* held from 16–18 October at the University of Hong Kong. Professor Yamanaka received the doctor of science, *honoris causa*, award as part of the 191st degree ceremony of the university that took place at the Faculty of Medicine Building on October 18.

Past recipients of the honorary degree award from the University of Hong Kong include Dr. Nelson Mandela and Mother Theresa. The degree is the highest accolade the university can bestow on an individual.

A good read – Publications from the EMBO Community

EMBO MEMBERS, YOUNG INVESTIGATORS & FELLOWS

Mutations in SPRTN cause early onset hepatocellular carcinoma, genomic instability and progeroid features

Jaime Lopez-Mosqueda (EMBO Fellow) and colleagues

Nature Genetics | 28 September 2014
doi:10.1038/ng.3103

Neural correlates of water reward in thirsty *Drosophila*

Suewei Lin, David Owald (EMBO Fellows), Scott Waddell (EMBO Member) and colleagues

Nature Neuroscience | 28 September 2014
doi:10.1038/nn.3827

An evolutionary arms race between KRAB zinc finger genes 91/93 and SVA/L1 retrotransposons

Maximilian Haeussler (EMBO Fellow) and colleagues

Nature | 28 September 2014
doi: 10.1038/nature13760

Substrate binding and specificity of rhomboid intramembrane protease revealed by substrate–peptide complex structures

Kvido Strisovsky (EMBO Installation Grantee) and colleagues

The EMBO Journal | 12 September 2014
doi: 10.15252/embj.201489367

Gibbon genome gives insights on the fast karyotype evolution of small apes

Duncan T. Odom (EMBO Young Investigator) and colleagues

Nature | 10 September 2014
doi:10.1038/nature13679

Structural basis for the assembly of the SXL-UNR translation regulatory complex

Michael Sattler (EMBO Member), Janosch Hennig (EMBO Fellow) and colleagues

Nature | 7 September 2014
doi: 10.1038/nature13693

Metabolic regulator LKB1 is crucial for Schwann cell–mediated axon maintenance Bogdan Beirowski (EMBO Fellow),

Nature Neuroscience | 7 September 2014
doi: 10.1038/NN.3809

A sentinel protein assay for simultaneously quantifying cellular processes

Rita Hrabakova (EMBO Member) and colleagues

Nature Methods | 7 September 2014
doi: 10.1038/NMETH.3101

A unique inhibitor-binding site in ERK1/2 is associated with slow binding kinetics

Madalena Tarsounas (EMBO Young Investigator) and colleagues

Nature Chemical Biology | 7 September
doi: 10.1038/NCHEMBIO.1629

Systematic characterization of deubiquitylating enzymes for roles in maintaining genome integrity

Carlos le Sage (EMBO Fellow), Stephen P. Jackson (EMBO Member) and colleagues

Nature Cell Biology | 7 September 2014
doi: 10.1038/ncb3028

Rabbit genome analysis reveals a polygenic basis for phenotypic change during domestication

Leif Andersson (EMBO Member) and colleagues

Science | 29 August 2014
doi: 10.1126/science.1253714

PLETHORA gradient formation mechanism separates auxin responses

Ari Pekka Mähönen, Kalika Prasad (EMBO Fellows), Ben Scheres (EMBO Member) and colleagues

Nature | 24 August 2014
doi: 10.1038/nature13663

Early lineage restriction in temporally distinct populations of Mesp1 progenitors during mammalian heart development

Cédric Blanpain (EMBO Member), Fabienne Lescroart (EMBO Fellow) and colleagues

Nature Cell Biology | 24 August 2014
doi:10.1038/ncb3024

A new tubulin-binding site and pharmacophore for microtubule-destabilizing anticancer drugs

Michel O. Steinmetz (EMBO Member) and colleagues

Proceedings of the National Academy of Sciences | 7 August 2014
doi: 10.1073/pnas.1408124111

Glial origin of mesenchymal stem cells in a tooth model system

Marketa Kaucka (EMBO Fellow) and colleagues

Nature | 27 July 2014
doi:10.1038/nature13536

BRCA2 prevents R-loop accumulation and associates with TREX-2 mRNA export factor PCID2

Andrés Aguilera (EMBO Member) and colleagues

Nature | 17 July 2014
doi:10.1038/nature13374

The structural analysis of shark IgNAR antibodies reveals evolutionary principles of immunoglobulins

Janosch Hennig (EMBO Fellow) and colleagues

Proceedings of the National Academy of Sciences | 3 June 2014
doi: 10.1073/pnas.1321502111

Cell adhesion geometry regulates non-random DNA segregation and asymmetric cell fates in mouse skeletal muscle stem cells

Shahragim Tajbakhsh (EMBO Member), Manuel Théry (EMBO Young Investigator) and colleagues

Cell Reports | 15 May 2014
doi: http://dx.doi.org/10.1016/j.celrep.2014.04.016

The progress of science. Past, present and future

Arthur Rörsch (EMBO Member)

Humanities 3, 2014
doi:10.3390/h30x000x

Editorial

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Awards of excellence

EMBO MEMBERS

Albert Lasker Basic Medical Research Award

This year's Lasker Award for basic medical research goes to EMBO Associate Member **Peter Walter** of the University of California, San Francisco. He receives the award jointly with Kazutoshi Mori of Kyoto University in Japan for their work on the unfolded protein response.

Wolfson Research Merit Award

Malcolm White of the University of St. Andrews was awarded a Wolfson Research Merit award by the Royal Society in recognition of his laboratory's work on the CRISPR-Cas system for antiviral defence. White's award recognises his research into a recently discovered immune system in microbes.

Gruber Genetics Prize

The plant scientist and geneticist **Sir David Baulcombe** of the University of Cambridge will share the 2014 Gruber Prize for Genetics with Gary Ruvkun and Victor Ambros. David Baulcombe will also be the next president of the Biochemical Society from January 2015.

Royal Medal by the Royal Society

Howard R. Morris, Emeritus Professor at the Imperial College, London, has recently been awarded the 2014 Royal Medal by the Royal Society "for pioneering work in biomolecular mass spectrometry including strategy and instrument design enabling advanced discovery research and for outstanding entrepreneurship in biopharmaceutical characterisation accelerating the release of new medicinal products"

Heinrich Wieland Prize

Reinhard Jahn has been selected as the recipient of the international Heinrich Wieland Prize for his studies on membrane fusion, synaptic vesicles, and neurotransmitter release – processes that occur when cells grow, transport substances, or signal. With the 100,000 Euro prize the Boehringer Ingelheim Foundation is honouring the pioneering achievements of the Director at the Max Planck Institute for Biophysical Chemistry in Göttingen, Germany.

Michael and Kate Bárány Award

Sarah Teichmann of EMBL-EBI and the Wellcome Trust Sanger Institute is the recipient of the Michael and Kate Bárány Award for Young Investigators from the Biophysical Society. She received this award for her contributions to two distinct areas: protein interactions and complexes; and global regulation of gene expression. The Michael and Kate Bárány Award for Young Investigators recognizes scientists who have not yet achieved the rank of full professor.

American Academy of Arts and Sciences

Claudio Stern of the University College London was awarded a Foreign Honorary Member of the American Academy of Arts and Sciences this year.

Academia Europaea

Nektarios Tavernarakis of the University of Crete Medical School has been invited to join the Academia Europaea Section of Cell Biology as one of the eight new members. Lucia Banci of the University of Florence has joined the Biochemistry and Molecular Biology Section of the academy. Academia Europaea was founded in 1988 to promote excellence in science and scholarship around Europe. Its membership comprises the humanities, social, physical and life sciences as well as mathematics, engineering and medicine; currently there are 3000 members. Lucia Banci has also been appointed member of the EMBL Council in 2014.

US National Academy of Sciences

Christopher Dobson of the University of Cambridge was elected Foreign Associate of the US National Academy of Sciences in 2014. He has also been awarded the 2014 H.P. Heineken Prize for Biochemistry and Biophysics from the Royal Netherlands Academy of Arts and Sciences and he received the Feltrinelli International Prize for Medicine from the Accademia Nazionale dei Lincei in Rome this year.

EMBO YOUNG INVESTIGATORS

Early Career Life Scientist Award

Manuel Théry, research director at the Saint Louis Hospital in Paris, received the 2014 ASCB Early Career Life Scientist Award for 2014. Théry was selected for his development of a novel and innovative microfabrication technology, which he has applied to fundamental cell biological problems. The award will be presented at the 2014 ASCB/IFCB Meeting.

Gold Award of the LEO Pharma Research Foundation

Kim Jensen of the University of Copenhagen received the Gold Award of the LEO Pharma Research Foundation worth 1 million DKK (around 135,000 Euros) for his pioneering advances in dermatology research. Kim Jensen's research focuses on how the epidermis, the outer layer of the skin, is constantly renewed throughout life in an organised manner by epidermal stem cells.

European Research Council Grants

50 scientists are receiving "Proof-of-Concept" grants of up to 150,000 euros each from the European Research Council this year. This "top-up" funding is designed to help researchers who already hold an ERC grant, to test the market potential of their frontier research. **Kerem Pekkan** of the Koç University, Turkey, and **Ido Amit** of the Weizmann Institute, Israel, are among the awardees.

Appointments

EMBO YOUNG INVESTIGATOR

The Board of the Academy of Finland has announced former EMBO Young Investigator **Johanna Ivaska** from the University of Turku as one of the seven new Academy Professors for 2014–2019. The aim of this funding from the Academy of Finland for Academic Professor research posts is to facilitate full-time scientific research for internationally renowned researchers.

Next issue

EMBOencounters

The next *EMBOencounters* issue – **Winter 2014 | 2015** – will be dispatched in **February 2015**.

Please send your suggestions, contributions and news to **communications@embo.org** by **9 January 2015.**

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