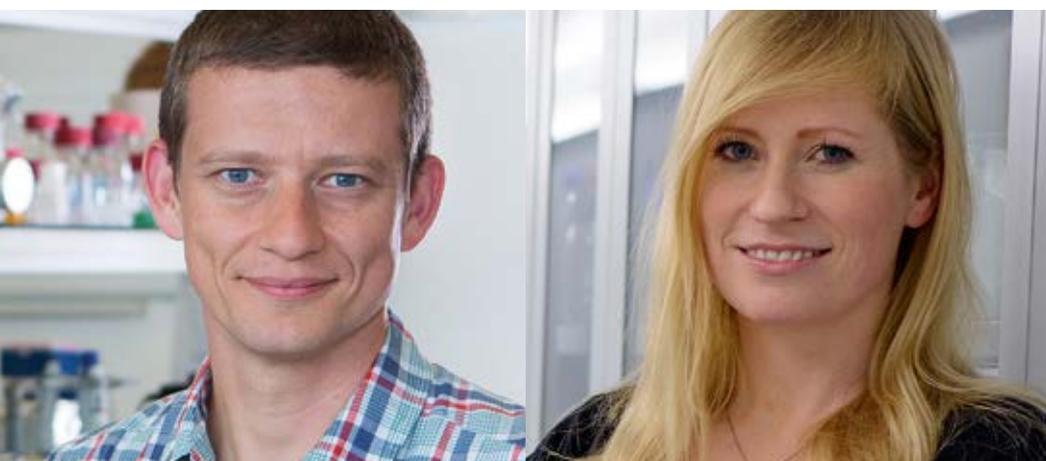
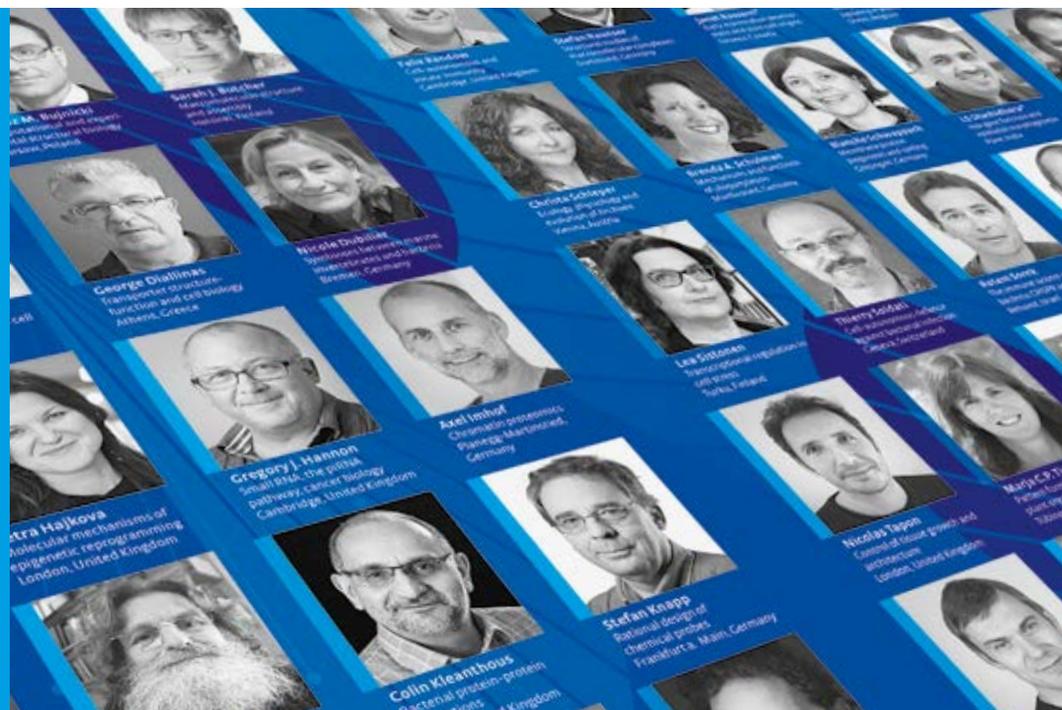


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62 new
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Fresh from EMBO Press



Five of EMBO's latest publications at a glance Page 19



Editorial

The first EMBO Gold Medal was presented to John Tooze in 1986. Since then, it has been awarded annually to celebrate the scientific achievements of young scientists. The work of this year's recipients, Marek Basler and Melina Schuh (see p 3), continues in the same vein, exemplifying the exciting research that takes place across Europe.

Each year, we ask our Members and Young Investigators to nominate candidates for the Gold Medal. Selecting one, or sometimes two, recipients from the many deserving nominees is not an easy task. To make the selection process as fair as possible, we have changed the way EMBO Council assesses and discusses each candidate.

As one of the original signatories of the San Francisco Declaration on Research Assessment (DORA), we believe that the way researchers and their work are assessed must change. Using the journal impact factor to evaluate someone's work might be easy, but it is also inaccurate and unfair. DORA aims to change that, and on p 11 we explore examples from institutes and funders on how different ways of assessing researchers could look.

The change we made to the Gold Medal selection process is in line with these principles. EMBO Council no longer considers the publication lists of the shortlisted nominees. Instead, it begins its deliberations with short presentations on each nominee's contribution to their field and the originality of their work.

From not promoting our own journal's impact factors to asking applicants to describe their most important research outcomes, EMBO applies DORA principles in many different ways. However, to make a real difference in how researchers are assessed, it is important to involve everyone in the system, including scientists and institutes as well as publishers and funders.

As the European DORA hub, we are interested in highlighting examples of good practice and sharing people's experience to show that selection criteria don't have to be based on the journal impact factor. So let us know about initiatives that you are aware of.

Maria Leptin
Director, EMBO



Marek Basler



Melina Schuh

Gold Medal honour for Marek Basler and Melina Schuh

EMBO award celebrates achievements of Czech microbiologist and German biochemist

Young independent group leaders are important for a strong research environment. To recognize some of the remarkable achievements of scientists under the age of 40 in Europe, EMBO annually awards its Gold Medal, which is endowed with an award of 10,000 euros.

Marek Basler, who is based at the Biozentrum at the University of Basel, Switzerland, receives the award for his work on bacterial type VI secretion systems (T6SS).

Following his PhD research on bacterial toxins at the Institute of Microbiology of the Czech Academy of Sciences in Prague, Czech Republic, Basler began working on T6SS in John Mekalanos' lab at Harvard Medical School, Boston, USA. Combining cryo-electron microscopy with live-cell imaging approaches, he determined the system's structure and functional dynamics in great detail. In addition to showing how T6SS functions as a molecular spearhead, Basler also demonstrated that these nanomachines are involved in interbacterial signal transduction.

EMBO Member Erich Nigg, University of Basel, says about Basler: "He has shown originality and productivity throughout his career, and has made many groundbreaking contributions. His work has revolutionized research on bacterial secretion systems and clearly established him as a leader in this field."

Basler himself says about receiving the award: "It's an incredible honour, and a great motivation. It is fantastic to know that there are people outside my research field who think that the work we do is exciting and important. I'm also happy about the recognition for the students and

postdocs in my lab, without whom the work we do would not be possible."

Melina Schuh from the Max Planck Institute for Biophysical Chemistry in Göttingen, Germany, is awarded the medal in recognition of her work on meiosis in mammalian oocytes.

As a PhD student at the University of Heidelberg and the European Molecular Biology Laboratory (EMBL), Schuh developed a way to use live cell imaging microscopy to study meiosis in mouse oocytes. She later extended this technique to observing the processes that result in aneuploidy in human eggs. In addition to identifying molecular processes during meiosis, Schuh has also established new tools to study gene and protein function in the female germ cell.

EMBO Member Sean Munro, MRC Laboratory of Molecular Biology, Cambridge, UK, describes Schuh as "a truly remarkable young scientist. She is utterly committed, a broad thinker, experimentally fearless, and always looking for new questions and approaches. She has pioneered methods to image mammalian meiosis and used them to identify new players in this fundamental process. In a particularly important move she also performed the first live imaging of meiosis in human oocytes."

"It is an absolute honour to be amongst so many excellent colleagues who received the EMBO Gold Medal in previous years," says Schuh. "But the award should really go to the many outstanding postdocs and students I have had the pleasure to work with. None of our work would have been possible without their enthusiasm and dedication."

Interviews with the recipients are available online:

embo.org/news/articles/2018/probing-bacterial-injection-needles-at-nanoscale

embo.org/news/articles/2018/illuminating-the-beginning-of-life



About the EMBO Gold Medal

The EMBO Gold Medal is awarded annually to life science researchers under the age of 40, who are currently working in one of the EMBO Member States.

EMBO Members and EMBO Young Investigators are invited to nominate candidates for the medal. To be considered, a nomination must be supported by one proposer and two sponsors.

The nominations deadline for the 2019 award is 1 February 2019.

embo.org/funding-awards/gold-medal

62 life scientists elected as EMBO Members 2018

In May this year, EMBO welcomed 53 Members residing in 17 EMBC Member States and nine Associate Members currently working in Argentina, Brazil, Canada, China, India, Japan and the USA. They join a group of more than 1800 of the best researchers in Europe and around the world, and will be formally welcomed at the Members' Meeting in Heidelberg between 24 and 26 October 2018.



Judith E. Allen
Type 2 immunity, helminths and macrophage biology
Manchester, United Kingdom



Maria Ina Arnone
Developmental gene regulatory network evolution
Naples, Italy



Salvador Aznar Benitah
Stem cells in homeostasis, aging and cancer
Barcelona, Spain



Marc Bühler
Epigenetic regulation of gene expression
Basel, Switzerland



Janusz M. Bujnicki
Computational and experimental structural biology
Warsaw, Poland



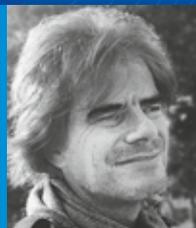
Sarah J. Butcher
Macromolecular structure and assembly
Helsinki, Finland



Alfredo Oscar Cáceres*
Cytoskeletal signaling and neuronal polarity
Córdoba, Argentina



Peter J. Campbell
Somatic mutations in cancer and normal cells
Cambridge, United Kingdom



A. Bernardo Carvalho*
Evolutionary genomics of *Drosophila* Y chromosomes
Rio de Janeiro, Brazil



Michele De Luca
Epithelial stem cells in cell and gene therapy
Modena, Italy



George Diallinas
Transporter structure-function and cell biology
Athens, Greece



Nicole Dubilier
Symbioses between marine invertebrates and bacteria
Bremen, Germany



Michael B. Elowitz*
Synthetic and systems biology
Pasadena, United States



Michaela Frye
RNA modifications in stem cells
Cambridge, United Kingdom



Sonia Garel
Forebrain wiring and plasticity
Paris, France



Petra Hajkova
Molecular mechanisms of epigenetic reprogramming
London, United Kingdom



Gregory J. Hannon
Small RNA, the piRNA pathway, cancer biology
Cambridge, United Kingdom



Axel Imhof
Chromatin proteomics
Planegg-Martinsried, Germany



Artur Jarmolowski
RNA metabolism in plants
Poznań, Poland



Luca Jovine
Molecular basis of egg-sperm recognition
Huddinge, Sweden



Frank Jülicher
Physics of living matter
Dresden, Germany



Jim Kaufman
Structure, function and evolution of immunity
Cambridge, United Kingdom



Colin Kleanthous
Bacterial protein-protein interactions
Oxford, United Kingdom



Stefan Knapp
Rational design of chemical probes
Frankfurt a. Main, Germany



Ana-Maria Lennon-Duménil
Immune cell migration
Paris, France



Karolin Luger*
Chromatin structure and function
Boulder, United States



Matthias P. Lutolf
Engineering stem cell self-organization
Lausanne, Switzerland



Alexander Meissner
DNA methylation in development and disease
Berlin, Germany



Guillermo Montoya
Structural molecular biology of nanomachines
Copenhagen, Denmark



Eduardo Moreno
Fitness fingerprints and mechanical cell competition
Lisbon, Portugal



François Nédélec
Cellular architecture
Heidelberg, Germany



Salvatore Oliviero
Epigenetic modifications to
regulate cell fate
Turin, Italy



Ewa K. Paluch
Biophysics of cell shape
London, United Kingdom



Lori A. Passmore
Protein complexes that
regulate mRNA polyA tails
Cambridge, United Kingdom



Duanqing Pei*
Stem cell pluripotency and
reprogramming
Guangzhou, China



Ana Pombo
Gene regulation and
genome architecture
Berlin, Germany



Felix Randow
Cell-autonomous and
innate immunity
Cambridge, United Kingdom



Stefan Raunser
Structural studies of
macromolecular complexes
Dortmund, Germany



Janet Rossant*
Early mammalian develop-
ment and stem cell origins
Toronto, Canada



Eugenia Russinova
Receptor-mediated
signaling in plants
Ghent, Belgium



Leonid A. Sazanov
Structure and function of
membrane proteins
Klosterneuburg, Austria



Alexander F. Schier
Vertebrate embryogenesis
and behavior
Basel, Switzerland



Christa Schleper
Ecology, physiology and
evolution of Archaea
Vienna, Austria



Brenda A. Schulman
Mechanisms and functions
of ubiquitylation
Martinsried, Germany



Blanche Schwappach
Membrane protein
biogenesis and sorting
Göttingen, Germany



LS Shashidhara*
Hox gene function and
epithelial morphogenesis
Pune, India



Benjamin D. Simons
Mechanisms of stem and
progenitor cell fate
Cambridge, United Kingdom



Mikiko C. Siomi*
RNA silencing; small RNA
biogenesis & functions
Tokyo, Japan



Lea Sistonen
Transcriptional regulation in
cell stress
Turku, Finland



Thierry Soldati
Cell-autonomous defence
against bacterial infection
Geneva, Switzerland



Rotem Sorek
The immune system of
bacteria: CRISPR and beyond
Rehovot, Israel



Petr Svoboda
Small and long non-coding
RNAs in mammalian oocytes
Prague, Czech Republic



Kikuë Tachibana
Mechanisms of zygotic repro-
gramming to totipotency
Vienna, Austria



Tadatsugu Taniguchi*
Regulation of immunity,
inflammation and cancer
Tokyo, Japan



Nicolas Tapon
Control of tissue growth and
architecture
London, United Kingdom



Marja C.P. Timmermans
Pattern formation during
plant organogenesis
Tübingen, Germany



Iva Tolić
Biophysics of the
mitotic spindle
Zagreb, Croatia



Xavier Trepac
Integrative cell and tissue
mechanobiology
Barcelona, Spain



Marie-Hélène Verlhac
Oocyte mechanics and
morphogenesis
Paris, France



Patrik Verstreken
Synaptic and mitochondrial
dysfunction in PD
Leuven, Belgium



Manuel Zimmer
Neural network dynamics
and behavior
Vienna, Austria



Cyril Zipfel
Plant immunity and
receptor kinase signalling
Zurich, Switzerland

*EMBO Associate Member

Creative collaborations

The EMBO Young Investigator Programme supports and encourages networking and collaborative working. Here, six current and former members of the programme describe the lasting scientific and personal connections they have formed.

By Kathy Weston



Rink

Berezikov

Hunting
the wild
worm

Many free-living flatworms have a superpower – the ability to regenerate. Due to large numbers of pluripotent adult stem cells, flatworms continuously rebuild themselves in a food-supply dependent manner. This makes them an ideal model to study not only the mechanisms of regeneration, but also stem cell biology, ageing, and how body size, shape and proportions are laid down and maintained.

Flatworm aficionados Eugene Berezikov, University Medical Center Groningen, The Netherlands and Jochen Rink, Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany, first bonded over drinks at a conference in 2012, when they discovered a shared fascination with the idea that besides the small number of haphazardly chosen model species currently in use, there were likely to be many more interesting flatworm species waiting to be found. Since then, wild worm hunting has taken them to exotic locations all over the world.

Berezikov and Rink had different reasons for their wish to find new worms. Berezikov studies macrostomids, and was unhappy with the current lab species, *Macrostomum lignano*, whose genome is too complex for straightforward genetic manipulation. Rink studies planarians, which come with a spectrum of regenerative abilities. Comparing the different species

might be the key to unlocking the puzzle of why regenerative abilities vary so much among animals.

Adventurous journeys

Their first field trip together, to the Caribbean island of Curaçao in 2015, was driven solely by logic insists Berezikov: “The impetus was that the water temperature is much higher, and therefore worms are likely to develop faster, which is a desirable trait in a potential model species.” The two researchers poked around on the seashore for macrostomids with great success, but their search for planarians was more of a challenge. “I had to climb down a well to find them,” says Rink. “It’s basically a desert island and looking for freshwater planarians was not exactly straightforward.”

Since then, the two have refined their search criteria. “We’ve learned that macrostomids like protected beaches on little river estuaries,” Rink says. “Google Earth is a very important tool.” They have since been to India, Japan and Siberia, are keen to sample the East African lakes, and will shortly be returning to Curaçao and Aruba.

Siberia offered a particularly adventurous trip. “We wanted to find a species that could survive freezing,” says Berezikov, “so Siberia seemed to be a good place.” Rink relished the chance to visit Berezikov’s homeland: “We spent about a week

Three days of science and networking for Young Investigators

The annual Young Investigator Meeting is a key component of the practical and networking support that young group leaders receive as part of the programme. Participants, who are former or current EMBO Young Investigators and Installation Grantees, present their research, meet each other and learn more about EMBO.

This year, the meeting took place from 16 to 18 May at the Vienna BioCenter in Austria. 65 researchers from Europe, Taiwan and Singapore came together for three days of scientific discussions and informal networking. Each attendee presented their work in a short talk. In addition, Programme Manager Gerlind Wallon gave an overview of the programme and EMBO Head of Scientific Publications Bernd Pulverer introduced EMBO Press. Two additional sessions focused on the importance and relevance of responsible conduct of research.

Structured and informal networking sessions rounded off the programme and included a speed networking session and a tour of the Natural History Museum in Vienna.

driving through Northern Siberia together and camping out by the streams,” he says. “We were sampling planarians in abandoned sites from the Soviet era in the middle of nowhere – there were still buildings but everything was overgrown. There was a real ‘Mad Max’ feeling to it!”

Mission complete?

The expeditions are also paying off in terms of scientific benefit. Berezikov has achieved his aim of finding a better lab model, which he has already sequenced in collaboration with Rink. And with over 70 planaria species in the bag, Rink’s lab has begun to unravel the mechanism behind the differences in regeneration ability: it hangs on the balance between sexual and asexual reproduction, and there are strong hints as to the signalling pathways involved.

Both researchers emphasise that being EMBO Young Investigators has enhanced their collaboration. Subsidised access to the genomics facilities at the European Molecular Biology Laboratory in Heidelberg has been invaluable, but the intellectual stimulus of the Young Investigator Meetings also stands out: “The annual meetings are my out-of-the-box-thinking week,” says Rink. Berezikov agrees: “You go there to meet great colleagues and hear great science from all the different fields of biology – I really cherish it.”



Ginhoux



Garel

Crossing continents

Singapore-based French immunologist Florent Ginhoux's collaboration with neurobiologist Sonia Garel is the result of a coincidence: Garel's lab at the Institute of Biology of the Ecole Normale Supérieure in Paris, France, is just round the corner from Ginhoux's parents' home. While on a filial visit, Ginhoux, who had heard that Garel's scientific interests were close to his own, dropped in to introduce himself. They hit it off immediately, and since then, as Ginhoux says, "Sonia and I are besties!"

Ginhoux's lab at the Agency for Science, Technology and Research studies the development and function of macrophages and dendritic cells. His interest in Garel's work came about through her work on microglia, the resident macrophages of the central nervous system. Microglia are the system's first line of defense, but also contribute

to fetal and adult brain development, which is the primary focus of Garel's research.

Microbiome and microglia

Immunology and developmental neurobiology are perfect partners in the study of microglia, which have been linked to diseases with neurological and inflammatory components, such as Parkinson's and Alzheimer's, multiple sclerosis, autism spectrum disorders and schizophrenia. The collaboration has resulted in three papers so far, culminating in the most recent publication this year (doi 10.1016/j.cell.2017.11.042) that is likely to have important implications for human health.

"We knew that microglia could be an entry point for all sorts of signals from the outside

world into the brain, and contribute at different stages of development to cerebral maintenance and functioning," says Garel. "We decided to focus on one important external modulator – the gut microbiome – and we showed that the presence or absence of gut microbiota could change the microglia, and that this has a different impact in different stages of life, and in the different sexes." Although the study was done in mice, there is significant overlap in the transcriptional profile of murine and human fetal microglia, suggesting that microbiota may also affect human brain function.

Exploring new questions

The two researchers agree that being EMBO Young Investigators has been immensely useful to their collaboration. "It enabled us to do two things that were absolutely fabulous," Ginhoux says. "The first was a joint lab meeting in Paris, which created a strong bond between the two teams, and the second was a two-day creative-problem-solving workshop." Garel adds: "the workshop freed us up to think about novel questions and solutions, and one of the results was this last paper, which we're both really proud of."

The distance between the two labs has sometimes made exchanging materials and expertise tricky, but they are committed to continuing to work together. "We have a great time together, but also, if we really want to understand what immune cells do in the brain, we need to work at the interface between our two fields," says Garel.

Observing what goes on in a single cell at a defined location within the body is a problem that has occupied biologists for many years. Immunology has been particularly vexed by this issue. So it's not by chance that two immunologists, Matteo Iannacone from the San Raffaele Scientific Institute in Milan, Italy and Ido Amit from the Weizmann Institute of Science in Rehovot, Israel, together with the Weizmann Institute's Ziv Shulman, have finally cracked the problem, in a collaboration that's produced a technical tour-de-force called NICHE-seq.

Their recent paper (doi: 10.1126/science.aao4277) describes using two-photon microscopy to switch on a ubiquitously-expressed photo-activatable fluorescent reporter protein in a specific cell niche, either in a transgenic animal, or *ex vivo*. Once marked in this way, the cells are purified by flow-sorting, and individually subjected to massively parallel single-cell RNA sequencing, giving a genome-wide transcriptional readout that can be linked to a precise location. This breakthrough has opened up a whole new vista of research and biomedical possibilities.

Chance encounter

Amit and Iannacone first met as postdocs over ten years ago, when they were on the same plane to a meeting in Japan. They kept in touch sporadically, but it wasn't until they both became EMBO Young Investigators that they started to

bump into each other on a regular basis. In the intervening years, Amit had become an expert in immunogenomics, and Iannacone in intravital imaging, and they quickly realized that combining their knowledge might be synergistic. "We shared a passion and interest in this problem, but separately, we didn't have the technological understanding to actually solve it," says Amit.

"We were both pushing the limits of the technology, one related to looking in real time at immune cells within living organisms, and the other in doing large scale single cell RNA sequencing analysis on organs," Iannacone says. "We came up with the idea to see if Ido's lab could read genome wide expression patterns in cells that my lab could label and purify."

Both researchers are enthusiastic supporters of the EMBO Young Investigator Programme: "You need a spark to start a big fire and I think that's what being an EMBO Young Investigator allows you to do," Amit says. "Having this ability to go to Young Investigator meetings and think together in a different atmosphere is a very



Iannacone



Amit

Location, location, location

important bridge that allows people to meet and discuss their work."

Iannacone agrees: "EMBO funded some exchange visits between our two labs, which really drove the project forward," he says, "but the most critical aspect for me is the possibility of networking and meeting people like Ido in the crucial early years of building my group."

Learning to lead

Alumni of the EMBO Lab Leadership course on getting the best out of their teams and research

Starting out as a new group leader provides researchers with an opportunity to develop their research vision and shape their own questions, putting their scientific training to use on a topic that interests them. But new principal investigators must also get to grips with responsibilities for which they have often received little training: recruitment and management of staff, leadership, budgeting, dealing with conflicts, mentoring and many more; tasks that are also relevant to the quality of the research done in their laboratories and, ultimately, their success as leaders.



Ishtiaq

Team building as priority

Farah Ishtiaq's group at the Indian Institute of Science in Bangalore studies how malaria is introduced and spreads in bird species. Her team members spend their days monitoring seven field sites at different altitudes – from the jungle up into the Himalayan mountains. The job can involve long hours, difficult conditions, intense periods together, and long times apart. “When people are spread across different sites it can be very isolating, even if they are working towards a common goal. It is important to prioritise team building and clear and inclusive communication to overcome this,” Ishtiaq explains. “In the field, sometimes we set out at 4:30 am and trek to an observation site – it might start out sunny, but two hours later we could be in the middle of a hail storm. Not everyone copes in the same way and some aspects can be stressful, especially if they did not go to plan. As a leader, it is important for me to keep a high energy and create a good atmosphere. You need to be mindful about how you are feeling as it can impact your entire team.”

Ishtiaq leads a team of seven and was a participant on one of the first EMBO Lab Leadership courses run in India in March this year. “You are

dealing with people and it is the job of the leader to get the best out of them,” she says of her role. “The important things that I learned on the lab leadership course are the importance of giving good feedback, to communicate clear expectations, how to react to potential conflicts in the workplace, and to be assertive.”



Ladurner

Recognising personalities

EMBO Member Andreas Ladurner, who first took the EMBO leadership course in early 2005 as a group leader, and who is now head of the Department of Physiological Chemistry at the Ludwig Maximilian University in Munich, Germany, says that there is always more to learn as a leader. “It’s important to seek advice; this is a strength, not a weakness. I used to think that there was a recipe to be a

manager, but I have learned that you just need to be yourself.”

His group studies chromatin and the mechanisms that help to govern the function and adaptability of our genome to new environments. “I have learned that you also need to show and communicate that you care,” he says of leading a team. “This could be by prioritising opportunities to help team members excel in their careers, but is also important at the emotional level – casual conversations can help you to learn about your team members and their distinct needs and abilities.”

“Rather than trying to get everyone to fit into your formula, it is important to recognise and support their differences.”

One of the key things about understanding and working with your team is accepting that they are not all the same and that you will need to be flexible to get the best from them. “Science is a people business: everyone comes with different ideas, skill sets, backgrounds, and needs,” Ladurner says.

“Rather than trying to get everyone to fit into your formula, it is important to recognise and support their differences. I believe everyone has an intrinsic drive and ambition: you need to manage that, meet regularly, find out who they are and what motivates them. In my group, I really want people to invent – that requires a structured freedom or an intentional defocus. There are great opportunities for new areas by trying to find new connections between established fields.”

Words from the trainers

The value of good leadership to high quality, reproducible research cannot be overstated. The principle that good leadership can and should be taught to improve the conduct and outcomes of research was the original impetus for creating the EMBO Laboratory Leadership course.

Over the three or four days of the course, we work to equip our participants with models, tools and concepts about the work environment, people and their behaviour, so that when they return to their labs, they can lead thoughtfully, skillfully and responsibly. The leaders in this article illustrate this in action and the success to which it can lead.

Since its launch in 2005, the course has been field tested in the most challenging of environments: research laboratories. What we have come to, through adaptation to that environment, is a suite of tools and models that the scientists we train find readily useful.

EMBO brings two advantages to ‘soft skills’ training in the sciences. Members of EMBO’s community keep us updated on their needs, and

EMBO’s reputation for excellence, which promises high quality training tailored directly to the experience of research scientists.

As a result, and as the research environment and the challenges facing those navigating it evolve, we continue to refine the course. We are also launching new courses this year to address some of the additional needs of our community. These include Project Management, Project Portfolio Management, Advanced Leadership, and Creative Problem Solving that we will pilot this year and that will be added to our regular schedule in 2019.

Samuel Krahl and CJ Fitzsimons

To stay up to date with our work and our course schedule, join our mailing list
lab-management.embo.org/newsletter



Shelest

Consider individual strengths

Ekaterina Shelest, Head of the Bioinformatics Unit at the German Centre for Integrative Biodiversity Research (iDiv) in Leipzig, Germany, has found that it can be challenging to help very creative people focus enough to finish projects. “One of my students was very talented and was always coming up with a lot of great new ideas, but I needed him to focus,” she recalls. “On the EMBO Lab Leadership course, we learned coaching techniques – breaking down tasks into manageable pieces, setting intermediate goals, monitoring progress, meeting regularly and giving feedback and guidance. I have seen a different world of leadership and this has been especially important for work with my PhD students: the outcome is remarkable.”

Shelest took the course in February of this year to support her leadership of multidisciplinary work that combines areas such as sequence analysis, ‘omics’ data integration, and the functional analysis of genomes. She says it is important for a leader not to get buried in the detail. “Our field develops very fast, and a Master’s student may be more advanced than a group leader in terms of ‘narrow’ technical aspects of the work,” she says. “This is great: it’s the leader’s role to focus on the broader scientific view, delegate tasks, help people to excel and to set ambitious, but realistic goals. My job is to provide the overarching vision that touches the interests of everyone and lay out the goals that can help our team to achieve its best work.”

One of the ways to do that, she says, is to consider the strengths and preferences of each team member. “Personal interests and inclinations are very important: select the tasks and challenges that people like to do, set them ambitious targets, and above all, be yourself and do what you are good at.”

The experiences of researchers who have attended an EMBO Lab Leadership course show that there is no rule book for becoming a great leader. Rather, by applying models, tools and concepts to the huge range of challenges that science leaders face, it can bring out the best qualities of a team. And that, in turn, benefits science.

Motivation

When we ask participants how motivation feels, they usually come up with things like: high energy, happy, satisfied, in control, sense of achievement. In short: motivation feels great! The bad news is that you cannot motivate other people – they can only motivate themselves.

What you can do, as a leader, is to ensure that your people have the appropriate environment in which they can themselves feel motivated. The American psychologist Frederik Herzberg provides a useful model (shown below) for ensuring that such an environment is in place, and for trouble-shooting with a team member what is missing for them if they are currently struggling with their levels of motivation.

Meaning/Context

We need to understand why our work is meaningful and the context in which we are doing it. How are we advancing knowledge? How are we contributing to the research vision of the lab?

TIP: It’s easy to lose sight of these things, so it’s sometimes enough simply to remind a team member of the bigger picture.

Feedback

We need to see that both we and our work are successful: Experiments are going well, we publish in a good journal, we present the work at a conference. It also means that we need to receive detailed, positive feedback from our boss or peers.

TIP: If a team member’s experiments are failing, try giving them extra technical support and/or praise their perseverance and dedication.



Frederick Herzberg’s Hygiene-Motivation Theory

Herzberg worked with 200 employees in Pittsburgh in the 1950s to discover their attitudes to their jobs, what led to these attitudes, and how this affected their motivation. He identified two main areas: Hygiene Factors and Motivation Factors. When Hygiene Factors

are missing, we experience dissatisfaction and struggle to feel motivated. When Motivation Factors are present, we experience satisfaction and are capable of even higher levels of motivation. All of these factors together contribute to motivation and the feelings that accompany it.

Private and public funders are powerful players in science, enabling a wide range of research worldwide. Their goals, conditions and evaluation procedures influence the types of research carried out and shape researchers' careers.

“Funders have an important role in shaping the research system, through their internal policies and the conditions they attach to grants.”

At the same time, funders have an important role in shaping the research system, through their internal policies and the conditions they attach to grants. The Open Access mandates implemented by funders including the European Commission and the UK's Wellcome Trust are prime examples of this, and are changing how researchers publish their results.

A problem for the whole system

Funders, however, could go further in exerting influence on research practices. There is growing awareness of problems with the reliability of research results and breaches of scientific norms and values. A review of surveys on scientists' behaviour has found that a third of respondents admitted to problematic research practices such as omitting outliers, adding data points, beautifying images, distorting statistics, ignoring negative results or plagiarism (doi: 10.1371/journal.pone.0005738). The result is an atmosphere of mistrust, with researchers expressing concerns about the quality of research practices; the review found that 72% reported having observed questionable practices by colleagues.

“There is growing awareness of problems with the reliability of research results and breaches of scientific norms and values.”

Ultimately, individual researchers are responsible for their own conduct. But the research system must try to create an environment in which scientists can carry out work to the highest ethical and integrity standards. This is not entirely the case at present. The extreme competitiveness of research leads to an overemphasis of the journal impact factor, the devaluation of work focused on negative or confirmatory results, and

a lack of attention for how data are stored and managed. This in turn encourages violations of procedures, norms and values.

Funders on the case

Funders have already begun to use their influence to address some of these problems. Several are putting mechanisms in place to ensure the research they fund can be readily accessed and reused, so that research results can be verified and built upon more easily. Cancer Research UK and the Wellcome Trust in the UK require project proposals to have data management and sharing plans. And the European Commission is running an Open Research Data Pilot, which gives applicants the option to submit data management plans for some Horizon 2020 funding calls.

In an effort to move the focus away from the quantity of research outputs, some funders are changing how they assess researchers. EMBO, for example, has signed up to the San Francisco

Policy Officer Sandra Bendiscioli, the panel presented and discussed existing and potential new initiatives.

Maria Leptin presented an overview of EMBO's initiatives, including its research integrity training mandate, its work on research assessment and accepting preprints as part of an applicant's publication list (also see above).

Jim Smith talked about initiatives at Wellcome: To support reproducibility and transparency, the Wellcome Trust encourages open sharing of research data and publications. Through the Wellcome Open Research platform it allows grant holders to rapidly publish all research outputs, including datasets, case reports, protocols, and null or negative results. Wellcome has also released a policy on bullying and harassment to ensure a fair and open research environment.

Bringing up the duty of institutions to audit their employees' compliance with research integrity guidelines, Mark Ferguson reported on two experiments at Science Foundation Ireland (SFI). SFI now encourages the scientists that make up the site visit teams that review individual laboratories' progress to discuss with the researchers their use of integrity procedures. This removes the bureaucratic element, and turns the matter into a peer-to-peer interaction, which is expected to be more productive. In addition, SFI is explor-

Research integrity: funders on the case

EMBO-led panel inspects role of funding bodies at the EuroScience Open Forum

Declaration on Research Assessment (DORA), which advises against using journal impact factors to assess the scientific performance of researchers and institutions, and has adopted its principles in its Fellowship Programme (also see p 11).

Other initiatives aim to get a broader view of a researchers' work. Cancer Research UK, for example, has started evaluating other research outputs in addition to journal papers, such as datasets, patents and training.

In a bid to address research misconduct more directly, some funders, such as the Wellcome Trust and Health Research Board Ireland, require or encourage grantees' institutions to develop policies to handle allegations of misconduct. EMBO requires its Long-Term Fellows and Young Investigators to take training in responsible research conduct, and provides an online course that allows them to meet this requirement.

Panel discussion at ESOF 2018

To explore how funders in Europe might go further, EMBO organised a session titled “Research Integrity: Funders on the case” at the EuroScience Open Forum (ESOF) in Toulouse on 10 July. EMBO Director Maria Leptin was joined by Jim Smith from the Wellcome Trust, Maura Hiney from Health Research Board Ireland and Science Europe, and Mark Ferguson from Science Foundation Ireland. Chaired by EMBO Science

“Funders should develop clear and accessible procedures for promoting research integrity.”

ing alternative means to assess scientists' track records. Instead of looking at metrics, it now seeks answers to the questions: What have you discovered? Why is it important? What have you done about it?

Maura Hiney presented the recommendations developed by the Science Europe Working Group on Research Integrity, which she chaired. For example, funders should develop clear and easily accessible procedures for promoting research integrity and dealing with misconduct. The outcomes of investigations in misconduct should be transparent and collected centrally; and training in research integrity should be supported as part of or as a condition for the funding. She ended by saying that funding agencies have a lot of power to drive change, but that this requires the will to change their own practices and behaviour.

This is an adapted version of an article published in Research Professional (www.researchresearch.com/news/article/?articleId=1376027)
embo.org/science-policy/research-integrity

“DORA has provided the impetus for the research community, together with its institutions and funders, to begin to break the addiction to JIFs.”

Just over five years ago, EMBO was one of the original signatories of the San Francisco Declaration on Research Assessment (DORA). Conceived by a group of journal editors and academic publishers, and since signed by around 500 institutions and 12,000 individuals, the declaration calls for the reform of research assessment practices, particularly the use of journal impact factors (JIFs) and similar metrics to judge an individual’s research output. Following on from DORA, the bibliometric community itself warned in the 2015 Leiden Manifesto of the dangers of using bibliometrics as a sole arbiter of quality. In the words of the economist Charles Goodhart: “when a measure becomes a target, it ceases to be a good measure.”

Bernd Pulverer, EMBO Head of Scientific Publications says: “To put it bluntly: by making the decision to accept or reject a paper, we as editors,

are playing a sometimes decisive but unwanted role in the judgment of people’s careers. This is problematic as we select for editorial not hiring criteria.” Pulverer thinks that DORA has provided the impetus for the research community, together with its institutions and funders, to begin to break the addiction to JIFs. Power lies where the money is, and so he is particularly happy that research funders are taking steps to kick the JIF habit.

At EMBO, applicants for Long-Term Fellowships or the Young Investigator Programme are asked to provide summaries of their most important research outcomes without reference to the impact factor of their publications. And EMBO Council’s deliberation of the Gold Medal recipient now begins with four-minute summaries of each of the nominee’s scientific merits in terms of the originality of their work and the impact it has had on their fields, explicitly and deliberately banning any discussions on where they have published; a practice that has wholly changed the subsequent discussions.

Focusing on content and overall output

In the UK, the Wellcome Trust, Cancer Research UK, and all seven of the UK research councils have signed up to DORA, instructing reviewers, recruitment and promotion panels that they should be assessing the content of specific papers, rather than where they’re published, when considering the impact of an individual’s

contribution. And both Cancer Research UK and Wellcome now ask applicants to select their top research outputs and highlight why they are interesting, rather than list all their papers. These can include datasets, patents and contributions to changing medical practice or health policy.

Fiona Reddington, Head of Population Research Funding at Cancer Research UK, says that, so far, researchers have been enthusiastic, but that culture change will take some time – committee members still fall into old habits, and applicants “aren’t yet quite sure what good looks like when filling out the new-style application forms.”

Jim Smith, Director of Science at Wellcome, agrees: “We’ve been doing it the old way for decades, and it’s hard for people to change, even when they want to, which I think they do.” Smith and his team have also been thinking how they can influence others to adopt DORA’s principles. “Wellcome does have the ability to make grand

with industry, were not always appreciated for their ‘non-scientific’ activities and were failing to win the promotions they deserved.

Candidate (associate) professors at UMC Utrecht are now assessed using a portfolio that better reflects the multifaceted nature of a scientific career. Research programmes are also evaluated based on their wider clinical and social impact, rather than a simplistic bibliometric approach.

Rinze Benedictus, staff advisor at UMC Utrecht, says that there has been an overall increase in the number of professors appointed, with more coming from otherwise meritorious fields that do not traditionally publish in high impact journals. He hopes that this will lead to increased diversity in senior positions, completing the virtuous circle. However, he says, “you have to be aware of what is going on in the rest of the system – you can be a front runner but you can’t be too far ahead.”

Researchers’ careers are inherently mobile, so a new post-JIF CV has to be flexible enough to work in less progressive places. And Benedictus echoes the concerns of many when he points out that faculty are still faced with the conundrum of whether to boost their lab members’ careers by publishing in high impact publications, thereby reinforcing the existing system.

Making change happen

Stephen Curry of Imperial College, who chairs the DORA steering committee, is mindful that signing DORA is not enough [doi: 10.1038/d41586-018-01642-w]. “Some people have criticized DORA as being ‘clicktivism’,” he says, “so we need to walk the walk as well as talk the talk.” The DORA website will become a forum highlighting good practice, and hubs will be established around the world to start to reach into countries, such as India and China, that are still heavily reliant on bibliometrics.

“We’re sending a terrible message to the next generation about what we reward in research... and that needs to change.”

What of the next five years? “I would hope many more institutions will change how they go about research assessment,” Curry suggests, but he also has a more immediate wish: “At present, we’re sending a terrible message to the next generation about what we reward in research,” he says, “and that needs to change as fast as possible.”

.....
www.sfdora.org

Kicking the impact factor habit

How institutes and funders are turning the DORA theory into practice

By Kathy Weston

gestures,” he says, “so we could, for example, stipulate that the host institutions of our grant-holders are DORA signatories.”

Hiring practices revisited

Universities are also starting to rethink how they hire and reward their researchers. In the USA, the Department of Cell Biology at University of Texas Southwestern Medical Center in Dallas has revamped its recruitment procedures for junior faculty.

Candidates write a brief cover letter outlining their past contributions and future vision, which can be viewed by all the faculty. They have a short video call interview if even just one member of the faculty expresses interest, and shortlisted candidates then proceed to a full interview. Doing away with a standard publication-based CV as a triage method has led to a better, more diverse field of candidates being interviewed, and the hiring of motivated, enthusiastic scientists [doi: 10.1091/mbc.E17-08-0534].

In the Netherlands, University Medical Center (UMC) Utrecht is leading the way in redesigning its internal assessment and promotion methods [doi: 10.1038/538453a]. Biomedical research in the Netherlands was particularly in thrall to JIFs, which was hampering the careers of some excellent researchers. Those who spent time on work such as making health policy, writing official reports rather than papers, or establishing links

Stand out from the crowd

How to prepare an EMBO Long-Term Fellowship application

International mobility is a key characteristic of EMBO Long-Term Fellowships, which require researchers to move to a different country from the one where they carried out their PhD. When EMBO introduced the fellowships in the 1960s they were the first of their kind. Today, several similar funding options exist. Nonetheless, the success rate of anywhere between 11 and 16% shows that EMBO Fellowships remain sought after and highly competitive. Here, the Chair of the EMBO Fellowship Committee, Luca Scorrano from the Venetian Institute of Molecular Medicine and the University in Padua, Italy, and the Head of the Fellowship Programme, David del Alamo, give tips on how to put together the best possible application.

Step 1

Careful planning

One of the most important things to do is planning. "If you are applying for a postdoctoral fellowship such as an EMBO Long-Term Fellowship, you will probably be doing so at the end of your PhD," says del Alamo, "and that is an extraordinarily busy time."

With finishing off research for and writing the PhD thesis, trying to publish the results, looking for career options, and visiting potential host laboratories, time to spend on writing an application can be scarce. Yet, a good project proposal requires careful consideration and a strong application needs time to write. So careful time management can make all the difference.

"The first thing you need to do is to develop an idea into a project," adds Scorrano, who has served on the EMBO selection committee for five years and chaired it for the last year. "This should be done together with the host laboratory. But do not reuse a host lab grant proposal: the fellowship funds your project, not the work of a team, and it should be tailored to the amount of time the funding is available for and the resource of one fellow."

What's in a fellowship application?

Introduction:

The introduction should answer the following three questions.

- What is the research topic?
- What is already known about it and why it is important to know more?
- What is the research question, and in which direction will it extend knowledge?

Project proposal:

The project proposal is the core of an application. The easiest way to write it is to follow a hypothesis-driven structure. The research question is defined in the introduction, so the hypothesis should be the start of the project proposal. Once the hypothesis is defined, the experimental plan to test it should be provided.

- Research question: how are proteins A and B involved in cancer development?
- Hypothesis: proteins A and B form a complex that activates an oncogene.
- Experimental plan: use technique 1 to test complex formation, technique 2 to test complex formation in vivo, technique 3 to test oncogene activation, etc.

Step 2

Thorough preparation

Just like a scientific investigation, a strong application begins with some desk research. A variety of different funding options are available, but not all of them may be suitable. Del Alamo explains: "Look at funders' scopes and their eligibility and selection criteria. Read guidelines, frequently asked questions and anything else you can find. You need to determine not only whether you are eligible, but also whether your application will be competitive."

At this stage being honest with oneself is crucial: it is important not to waste time applying for fellowships for which one is not eligible or has very a low chance for success. "This will only take away time from preparing the applications for programmes for which you are truly competitive," says del Alamo.

The initial work will pay off when preparing the application. At this stage it is important to follow instructions and to only provide the information asked for. Generic applications are usually not very successful. "Make sure your application fits the requirements of the funder," explains Scorrano. "The scopes may be different, and the same project needs to be described differently if you apply to a medically-focused organization, or to one supporting fundamental research."

The final bit of research should include finding out who will be evaluating the proposal. The project description needs to be adapted for whether it is assessed by a single expert in the field, or by a panel of scientists who are expert in related but different fields.

Step 3

Clear and concise writing

Before applicants put pen to paper, it is valuable to read a successful proposal from someone they know. Seeing how someone else structured their writing might provide additional insight.

The most important thing is to write clearly, concisely and to avoid jargon. Most likely, the project proposal will also be read by people who are not experts in that field. Scorrano says: "Never take knowledge for granted, particularly when you explain the background and importance of your research. If an evaluator does not understand why you want to do something, then it does not matter how much detail you add about experiments." It is important to emphasize novel ideas, including how they compare with previous work, but lengthy descriptions should be avoided.

Generally, a proposal contains two parts: the introduction and the core project proposal (see box). It is important to define, whenever possible, 'plan B' scenarios in case the hypothesis or the experimental plan do not deliver results as intended. Scorrano also highlights that "when it comes to techniques, consider the suitability to the experiments proposed instead of listing the newest available technologies."

The final tip del Alamo offers is to "read through your application, and then read it again and again. Make sure it is complete and clear. To test whether it will be understood by the assessors, ask two colleagues to read it: one topic expert and one non-expert scientist. The first may correct mistakes in your hypothesis or experimental approach, the second will be able to indicate whether the proposal is interesting to and can be understood by non-experts."

embo.org/funding-awards/fellowships

EMBO Fellows meet in Heidelberg

Postdoctoral researchers come together for four days of discussing science and building networks



Between 14 and 17 June 2018, 103 EMBO Long-Term Fellows attended the annual Fellows' Meeting in Heidelberg, Germany. The event brings together the postdoctoral researchers to talk about science and their research experiences, and to hear from external speakers about topics relevant to working in the life sciences.

During the meeting each of the EMBO Fellows presented their work in a short talk or a poster. The scientific programme also included a

keynote lecture by EMBO Member Laurent Keller, University of Lausanne, Switzerland, on "Sex, sociality and supergenes".

Communication, careers and more

In addition to the scientific talks, the fellows heard from a range of invited speakers. Celine Carret, Senior Editor at *EMBO Molecular Medicine* talked about scientific publishing and research integrity. Head of the EMBO Science Policy Programme, Michele Garfinkel, discussed

award selection mechanisms at the limits of peer review. And Thomas Schwarz-Romond, former editor at *The EMBO Journal* and now Director of Operations at the Helmholtz Pioneer Campus in Neuherberg, Germany, and former EMBO Fellow Silvia Portugal, University Clinic Heidelberg, Germany talked about their career decisions.

Sam Krahl, Project Coordinator of the EMBO Lab Leadership Courses, provided insights into science communication in a half-day workshop, whereas Bernd Klaus from the European Molecular Biology Laboratory in Heidelberg, Germany, talked the participants through essential statistics for modern biology.

Making connections

A central aspect of the meeting is to enable the participants to develop their personal networks in addition to talking about science. Kathrin Leppek from Stanford University, USA, described the meeting as "four days of great people [and] science. It's been ... an amazing opportunity to connect."

embo.org/funding-awards/fellowships/fellows-meeting



Welcome, Montenegro

The country becomes the 30th EMBC Member State

In May 2018, Montenegro joined EMBO's inter-governmental funding body, the European Molecular Biology Conference (EMBC). It is the 30th country to become part of the EMBC, and will now be able to benefit from the support EMBO offers to talented life science researchers at all career stages.

"Montenegro is making a strong effort to improve life science research in their own country and through cross-border initiatives," says EMBO Director Maria Leptin. "We are pleased to welcome Montenegro as part of the European life science community that EMBO represents. And we look forward to offering the country's scientists the opportunities and support available in our member states."

Montenegro's accession as EMBC Member State was agreed by EMBC Council following a presentation from Montenegrin Minister of Science Sanja Damjanović, and Danilo Mrdak,

Associate Professor at the Faculty of Science at the University of Montenegro.

"It is our goal to strengthen science in Montenegro," says Damjanović. "One of the ways in which we are looking to do this is through creating international connections. Being part of EMBO will help us to intensify the ties with the rest of Europe and to provide financial and professional support to researchers in our country."

Following the completion of the parliamentary ratification procedure, life scientists working in Montenegro are now eligible to apply to EMBO for Long-Term and Short-Term Fellowships, Courses & Workshops funding and the EMBO Young Investigator Programme. Access to support in these areas helps some of Europe's best scientists to excel in their research and to engage in professional networking with an international community of peers.

Science meets politics in Strasbourg

On 31 May, 23 ERC grantees, including EMBO Member Panayiota Poirazi from the Foundation for Research and Technology Hellas, Greece, joined MEPs at a meeting at the European Parliament in Strasbourg. The event was a joint initiative of the European Parliament's Science and Technology Options Assessment (STOA) panel and the European Research Council (ERC) and included speakers from the European Parliament, the Commission and the ERC.

ERC grantees and MEPs addressed current science policy issues and shaped the future directions of European Research. Poirazi was a

speaker in the session titled "Digital revolution - Potential and challenges of the Information Society", which focused on Artificial Intelligence and its impact on jobs, society, democracy and the future of humanity.

She says: "It was very useful to see how politicians think when it comes to important scientific and societal issues. We, as scientists, need to do more about communicating the importance of science for addressing many of the public concerns by providing simple examples and explanations of how science can benefit society."



Exploiting lipid rafts for industrial applications

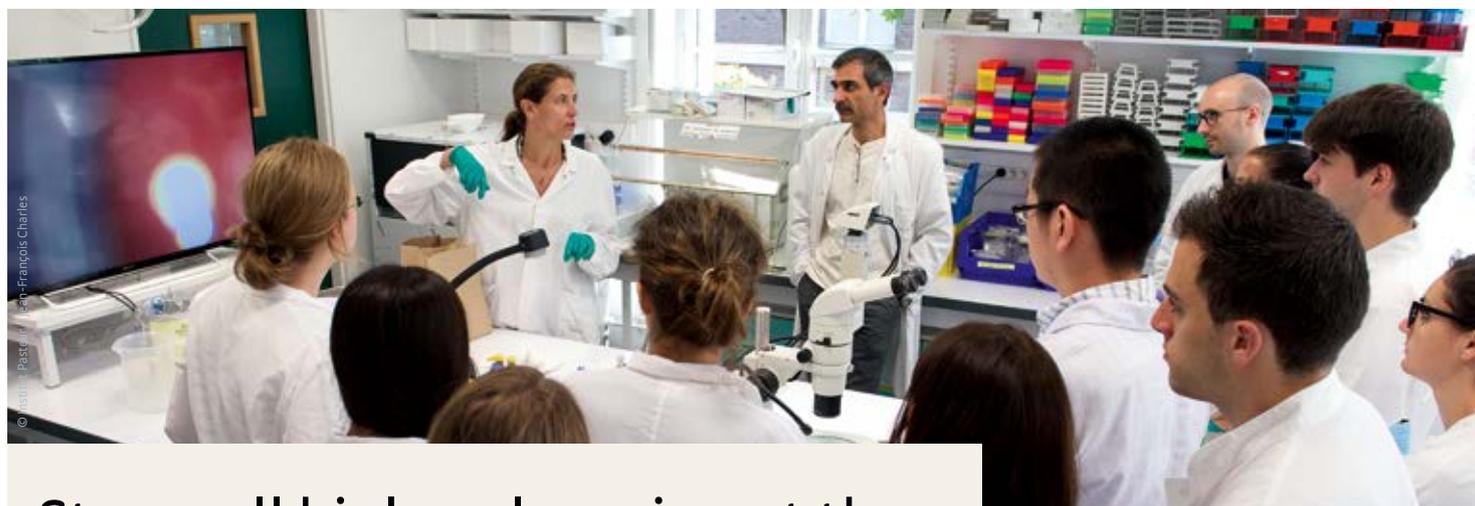
Rafts4Biotech is a Horizon-2020-funded research project that exploits bacterial lipid rafts as a biotechnological tool to spatially confine reactions of industrial interest. The project objective is to engineer synthetic bacterial lipid rafts to foster the industrial application of bacteria and allow the production of a broad range of novel compounds for pharmaceutical, cosmetic and food industries.

The project is based on the cooperation of an international team of partners, coordinated

by Daniel López from The National Centre for Biotechnology in Madrid, Spain. EMBO Member Jiri Damborsky represents one of the leading partners, the International Clinical Research Center of St. Anne's University Hospital, Czech Republic. Damborsky and his team at the Loschmidt Laboratories are developing a lab-on-chip technology and smart algorithms for automated optimization of complex metabolic pathways to enable project partners to quickly optimize stoichiometric ratios of valuable enzymes.

Rafts4Biotech also organizes training activities such as a symposium for PhD students and postdoctoral researchers in the field of membrane lipids. The first symposium will take place on 18 and 19 September 2018 in Madrid. EMBO Member Anne-Claude Gavin from the European Molecular Biology Laboratory in Heidelberg, Germany is among the speakers discussing lipid membrane biology in eukaryotes and prokaryotes.

rafts4biotech.eu/r4b-symposium/



Stem cell biology learning at the click of a button

The Revive Consortium for Stem Cells in Regenerative Biology and Medicine is a French initiative coordinated at the Institut Pasteur in Paris by EMBO Members Shahragim Tajbakhsh and François Schweisguth. A major focus of Revive is to train the next generation of scientists in stem cell biology.

With this goal in mind, the consortium has created a summer course "Advances in Stem Cell Biology course (ASCBC)" for students at the Institut Pasteur. To reach an even greater audience, Revive has now produced a Massive Open Online Course (MOOC) based on the ASCBC programme. The course provides an overview on

stem cell biology, their properties and potential in directing organogenesis and regeneration in different organisms, and how they can be exploited for therapeutic purposes.

Renowned international experts in stem cell biology, including EMBO Members Alfonso Martinez-Arias, Matthias Lutolf, Benjamin Simons and Ana Cumano, participated in the MOOC. It will be launched in autumn through the COURSERA platform.

www.revive.fr/en

Manchester Cancer Institute relocated after fire

It has been an eventful year for EMBO Members Richard Marais, Nic Jones, Iain Hagan and their colleagues at the Cancer Research UK Manchester Institute, UK. On 26 April 2017 the Paterson Building, which housed the institute alongside other University of Manchester cancer researchers, caught fire and suffered significant damage.

The remainder of 2017 was dominated by efforts to clear the building, temporarily rehouse scientists and staff, and rescuing experiments and stocks. Iain Hagan, for example, lost stocks of 52 bespoke antibodies, but was able to save a 25-year collection of 15,000 yeast strains.

Twelve months after the fire, the institute has relocated to a temporary site. Institute Director



Managing Director Chris Doherty welcomes Richard Marais to temporary lab space at Alderley Park

Richard Marais worked together with former director Nic Jones, operational staff and senior members of The University of Manchester to lead the institute through the transition phase. During this time, business as usual continued, including the recruitment of new staff.

Future plans include building an integrated cancer research centre in Manchester that supports seamless transitions between basic,

translational and clinical sciences within the context of Europe's biggest dedicated cancer hospital, the Christie NHS Foundation Trust.

www.cruk.manchester.ac.uk



Research center for Brain Sciences opens in Jerusalem

The Hebrew University of Jerusalem in Israel has established the Edmond and Lily Safra Center for Brain Sciences (ELSC), directed by Israel Nelken and Adi Mizrahi, to establish an interdisciplinary team of scientific experts to explore the relationships between gene function, neuronal circuits and behaviour. A particular focus will lie on bridging theoretical and experimental neuroscience using computational and

molecular approaches to understand the mechanisms by which neurons and neural networks form and underlie brain function in the adult organism.

The scientific inauguration of the new ELSC building took place between 4 and 6 June 2018 with the symposium "What Makes Us Human: From Genes to Machines". The meeting covered topics ranging from molecular biology to philosophy and featured talks by ELSC scientists, including EMBO Members Hermona Soreq and Idan Segev.

www.elsc.huji.ac.il

Recorded lectures from the event are available via www.what-mu-human-elsc.com

Super-resolution imaging in Edinburgh

The Edinburgh Super-Resolution Imaging Consortium (ESRIC), is a multidisciplinary collaboration between the Institute of Biological Chemistry, Biophysics and Bioengineering at Heriot-Watt University and the MRC Institute of Genetics and Molecular Medicine (IGMM) at the University of Edinburgh. The facility provides a platform for researchers from anywhere in the world to access state-of-the-art super-resolution microscope systems and expertise to push the boundaries of light microscopy and its application to biomedical research.

EMBO Member Wendy Bickmore from the IGMM says about the consortium: "Myself and other EMBO Members at the University of Edinburgh such as Andrew Jackson, Javier Caceres and Margaret Frame have hugely benefited from ESRIC, its training and facilities. We all now incorporate super-resolution and advanced imaging approaches in our work."

One aspect she specifically highlights is the annual ESRIC summer school, which teaches participants theory and applications of super-resolution techniques through informal seminars and practical workshops.

www.esric.org

CORBEL: shared life science services

Biomedical and translational research often involves interdisciplinary projects that rely on a variety of different technologies and services. For scientists this means engaging with multiple project partners and the challenge of resources not always being easily available.

The cluster project CORBEL aims to facilitate researchers' access to resources offered by 13 European biological and medical research infrastructures in order to support complex research projects, provide innovation pipelines in the life sciences and offer expertise in managing sensitive data.



EMBO Member Lucia Banci has been involved since the start of the project. She is Head of the Italian Core Center of Instruct-ERIC, the European research infrastructure for structural biology, and one of the founders and former Director of the Magnetic Resonance Center (CERM). She describes CORBEL as "a strategic project for the European life science research community as it coordinates the infrastructure's activities so that users can access a wide range of

cutting-edge technologies. CERM has been active for decades in providing international researchers with access to magnetic resonance and structural biology techniques. Our participation in CORBEL as a service provider within Instruct-ERIC will be beneficial for a much broader scientific community working on interdisciplinary biomedical projects."

21 different projects are currently benefiting from the technologies and services offered via CORBEL. A second call for research projects opened in March 2018. Proposals can now be submitted to gain access to cutting-edge technologies and services available at more than 20 service providers across Europe.

www.corbel-project.eu

CORBEL receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654248.

Pisa university hires first female professor

The Scuola Normale Superiore di Pisa is a prestigious university in Italy. Established by Napoleon as an engineering school, it continues to select students exclusively on merit. While many of the university's traditions contribute to its unique character, one such custom meant that there were no female professors in the school of science. This has now changed.

EMBO Member Annalisa Pastore will become the first woman to take up a Professorial Chair in the sciences at the Scuola Normale di Pisa.

"I was actually unaware of the gender imbalance when I applied for this role – for me the Normale is a great scientific place that I had always dreamed of going to," says Pastore. "Now that the pattern is broken, it will be crucial to continue on this path potentiating the presence of women in science at the Normale and elsewhere."

Pastore's plans for her own work are to continue to pursue research spanning the sciences and humanities. She has proposed two meetings that connect genetics and neuroscience with linguistics, and says that this line of research is something she will promote in Pisa.



VijayRaghavan becomes scientific advisor in India

In March 2018, EMBO Member VijayRaghavan, former director of the National Centre for Biological Sciences in Bangalore, India, was appointed as the new science advisor to the government of India. VijayRaghavan replaces physicist Rajagopala Chidambaram, who held the post as Principle Scientific Advisor for the last 16 years.

EMBO Member Satyajit Mayor of the National Centre for Biological Sciences in Bangalore, India, said, "Please join me in wishing Vijay all the very best in his new appointment at the helm of science in the Indian Government. We all hope that Vijay will bring his advocacy for excellent science and its application to the [government's] vision for science in India."

Poster Prizes

Through our journals, we sponsor a number of poster prizes at various conferences. The recipients include:

Sebastian Bänfer

Philipps-Universität Marburg, Germany

Recruitment of galectin-3 into multivesicular bodies for polarized exosomal secretion

Presented at the EMBO Workshop "Transducing glycan information into function: Lessons from galectins"
Mandelieu-la-Napoule, France,
27 November – 1 December 2016

Olga Tsores

Tel Aviv University, Israel

Novel E-selectin Binding Polymers Reduce Atherosclerotic Lesions and Improve Cardiac Remodeling in ApoE KO Mice

Presented at the 8th ILANIT/FISEB Conference
Eilat, Israel, 20–23 February 2017

Takahide Matsui

The University of Tokyo, Japan

A novel autophagosomal SNARE protein YKT6 regulates autophagosome-lysosome fusion independently of STX17

Presented at The 8th International Symposium on Autophagy
Nara, Japan, 29 May – 1 June 2017

Annie Lee

Columbia University, USA

Abeta42 oligomers mediate its synaptotoxic effects through AMPK-dependent increase in mitochondrial fission in dendrites of hippocampal CA1 neurons

Presented at the EMBO | EMBL Symposium "Mechanisms of Neurodegeneration"
Heidelberg, Germany, 14–17 June, 2017

Carsten Bahr

German Centre for Cancer Research (DKFZ), Heidelberg, Germany

A cluster of enhancer modules directs differential Myc expression along the normal and leukemic haematopoietic stem cell hierarchies

Presented at the EMBO Conference "Chromatin and Epigenetics"
Heidelberg, 3–6 May 2017

Dhana Friedrich

Max Delbrück Center for Molecular Medicine, Berlin, Germany

From transcription factor dynamics to cell fate: p53 nuclear accumulation changes stochastic gene expression of target genes.

Presented at the IMB Conference "Gene Regulation by Numbers"
Mainz, 19–21 June 2017

Awards of Excellence

EMBO MEMBERS

Houska Award

Stefan Ameres and his team at the Institute of Molecular Biotechnology, Vienna, Austria received the Houska Award for the development of the sequencing method SLAMseq, which allows the direct detection of sudden changes in gene expression. The prize is awarded by the B&C Private Foundation. Ameres received 400,000 euros and the Houska trophy.

Pradel Research Award

The National Academy of Sciences in the USA has recognized **Silvia Arber's** (Biozentrum, University of Basel, Switzerland) work on neuronal circuitry controlling motor behavior with the Pradel Research Award. The annual award recognizes mid-career neuroscientists and is endowed with 50,000 US dollars.

Manfred Eigen Award

The Max-Planck-Institute for Biophysical Chemistry in Göttingen, Germany, awarded its first Manfred Eigen Award to **Peter Schuster** of the University of Vienna, Austria. The award honours the work of scientists carrying out research related to the work of institute founder and

Chemistry-Nobel-Prize recipient Manfred Eigen.

Kavli Prize in Nanoscience

The Kavli Prize in Nanoscience was awarded to EMBO Members **Emmanuelle Charpentier**, Max Planck Institute of Infection Biology, Berlin, Germany, and **Virginijus Šikšnyš**, Vilnius University, Lithuania, together with Jennifer Doudna, University of California, Berkeley, USA. They receive the prize, which is endowed with one million US dollars, for the invention of CRISPR-Cas9.

Kavli Prize in Neuroscience

EMBO Member **Christine Petit**, Collège de France and Pasteur Institute, Paris, France, received the Kavli Prize in Neuroscience together with A. James Hudspeth, Rockefeller University, New York, USA and Robert Fettiplace, University of Wisconsin, Madison, USA. They receive the prize, which is endowed with one million US dollars, for the discovery of the molecular and neural mechanisms of hearing.

Richard Lounsbery Prize

Yohanns Bellaiche, Curie Institute, Paris, France, received the Richard Lounsbery Prize

for his work on the genetic and mechanical regulation underlying tissue proliferation, homeostasis and repair. The prize recognizes extraordinary scientific achievement by American or French scientists under the age of 45. It is endowed with a 70,000 US dollar prize.

Princess of Asturias Award for Technical and Scientific Research

The 2018 Princess of Asturias Award for Technical and Scientific and Research has been awarded to **Svante Pääbo**, Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany, for developing methods to study ancient DNA. The award is part of a series of annual prizes awarded in Spain by the Princess of Asturias Foundation.

Charles F. Kettering Award

Manajit Hayer-Hartl, Max Planck Institute for Biochemistry, Munich, Germany, received the Charles F. Kettering Award. The award by the American Society of Plant Biologists honours outstanding work in the field of photosynthesis. Hayer-Hartl is recognized for her insights into chloroplast protein-chaperone biology and

solving many of the challenges associated with Rubisco research.

Roger de Spoelberch Prize

The Roger de Spoelberch Foundation has awarded its annual prize to **David Rubinsztein**, University of Cambridge, UK. The prize is endowed with 750,000 euros and is awarded for clinical and basic scientific research in the area of neurodegenerative diseases and psychiatric disorders.

Spinoza Prize

Anna Akhmanova, Utrecht University, **Marileen Dogterom**, Delft University of Technology, and **John van der Oost**, Wageningen University, are recipients of the Spinoza Prize 2018. The prize is the highest award in Dutch science, given by the Netherlands Organisation for Scientific Research scientists working in the Netherlands. Each will receive 2.5 million euros to support their research on the cytoskeleton (Akhmanova and Dogterom) and CRISPR-Cas (van der Oost).

KFJ Prize

Kristian Helin, together with Anne Tybjerg-Hansen, University of Copenhagen, Denmark, received the KFJ Prize for his

ground breaking contribution to cancer research. Specifically, the prize recognizes his discovery of transcription factor E2F1 and its role in cell division. The prize is endowed with 1.5 million Danish kroner.

Ignaz L. Lieben Award

Iva Tolić, Ruder Bošković Institute, Zagreb, Croatia, received the Ignaz L. Lieben Award 2017 for her outstanding achievements in molecular cell biology, especially for her work on microtubules. The award is granted to scientists who have worked in Austria, Bosnia-Herzegovina, Croatia, the Czech Republic, Hungary, Slovakia or Slovenia for the last three years and includes a prize of 36,000 US dollars.

EMBO INSTALLATION GRANTEE

CNRS Silver Medal

The French National Center for Scientific Research (CNRS) has honoured **Bruno Klaholz**, Institute of Genetics and Molecular and Cellular Biology, Illkirch, France with the CNRS Silver Medal for his research on the structure and function of ribosomes and his contribution to the development of high-resolution cryo-electron microscopy.

Good Read – Publications from the EMBO community

Visualization and analysis of non-covalent contacts using the Protein Contacts Atlas

M. Madan Babu (EMBO Member) and colleagues
Nature Structural & Molecular | 15 January 2018
Doi: 10.1038/s41594-017-0019-z

Mutant p53 gain of function underlies high expression levels of colorectal cancer stem cells markers

Varda Rotter (EMBO Member) and colleagues
Oncogene | 18 January 2018
Doi: 10.1038/s41388-017-0060-8

Structural basis of RNA polymerase III transcription initiation

Alessandro Vannini (EMBO Young Investigator) and colleagues
Nature | 18 January 2018
Doi: 10.1038/nature25441

Phosphoethanolamine cellulose: a naturally produced chemically modified cellulose

Regine Hengge (EMBO Member) and colleagues
Science | 19 January 2018
Doi: 10.1126/science.aaa0406

Recon3D enables a three-dimensional view of gene variation in human metabolism

Ines Thiele (EMBO Young Investigator) and colleagues
Nature Biotechnology | 19 February 2018
Doi: 10.1038/nbt.4072

Cell-type specific sequencing of microRNAs from complex animal tissues

Luisa Cochella, Stefan Ameres (EMBO Young Investigators) and colleagues
Nature Methods | 26 February 2018
Doi: 10.1038/nmeth.4610

Dynamic changes in Sox2 spatio-temporal expression promote the second cell fate decision through Fgf4/Fgfr2 signalling in preimplantation mouse embryos

Ian Chambers (EMBO Member) and colleagues
Biochemical Journal | 27 February 2018
Doi: 10.1042/BCJ20170418

Live imaging of neurogenesis in the adult mouse hippocampus activity is essential for morphogenesis

Gregor-Alexander Pilz (former EMBO Long-Term Fellow), Sebastian Jessberger (former EMBO Young Investigator) and colleagues
Science | 9 February 2018
Doi: 10.1126/science.aaa0506

PRDM9 methyltransferase activity is essential for meiotic DNA double-strand break formation at its binding sites

Bernard de Massy (EMBO Member) and colleagues
Molecular Cell | 1 March 2018
Doi: 10.1016/j.molcel.2018.01.033

The Ubiquitin E3/E4 Ligase UBE4A Adjusts Protein Ubiquitylation and Accumulation at Sites of DNA Damage, Facilitating Double-Strand Break Repair

Yosef Shiloh (EMBO Member) and colleagues
Molecular Cell | 1 March 2018
Doi: 10.1016/j.molcel.2018.02.002

Systematic discovery of antiphage defense systems in the microbial pangenome

Rotem Sorek (EMBO Member) and colleagues
Science | 2 March 2018
Doi: 10.1126/science.aar4120

Environment dominates over host genetics in shaping human gut microbiota

Eran Elinav and Eran Segal (EMBO Members) and colleagues
Nature | 8 March 2018
Doi: 10.1038/nature25973

Intensify3D: Normalizing signal intensity in large heterogenic image stacks

Hermona Soreq (EMBO Member) and colleagues
Science Reports | 9 March 2018
Doi: 10.1038/s41598-018-22489-1

Daughter-cell-specific modulation of nuclear pore complexes controls cell cycle entry during asymmetric division

Miguel Beato (EMBO Member) and colleagues
Nature Cell Biology | 12 March 2018
Doi: 10.1038/s41556-018-0056-9

Toolbox: Creating a systematic database of secretory pathway proteins uncovers new cargo for COPI

Maya Schuldiner (EMBO Member) and colleagues
Traffic | 12 March 2018
Doi: 10.1111/tra.12560

Transient external force induces phenotypic reversion of malignant epithelial structures via nitric oxide signaling

Mina Bissell (EMBO Associate Member) and colleagues
eLife | 21 March 2018
Doi: 10.7554/eLife.26161

Expanding Actin Rings Zipper the Mouse Embryo for Blastocyst Formation

Nicolas Plachta (EMBO Young Investigator) and colleagues
Cell | 19 April 2018
Doi: 10.1016/j.cell.2018.02.035

Feedback inhibition of actin on Rho mediates content release from large secretory vesicles

Benny Shilo (EMBO Member) and colleagues
Journal of Cell Biology | 7 May 2018
Doi: 10.1083/jcb.201711006

Local arrangement of fibronectin by myofibroblasts governs peripheral nuclear positioning in muscle cells

Edgar Gomes (EMBO Installation Grantee) and colleagues
Developmental Cell | 8 May 2018
Doi: 10.17632/trhmpz9h23.1

PTEN deletion in luminal cells of mature prostate induces replication stress and senescence in vivo

Daniel Metzger (EMBO Member) and colleagues
Journal of Experimental Medicine | 9 May 2018
Doi: 10.1084/jem.20171207

Quiescin Sulfhydryl Oxidase 1 (QSOX1) Glycosite Mutation Perturbs Secretion but Not Golgi Localization

Deborah Fass (EMBO Member) and colleagues
Glycobiology | 11 May 2018
Doi: 10.1093/glycob/cwy044

RSPO2 inhibition of RNF43 and ZNRF3 governs limb development independently of LGR4/5/6

Bruno Reversade (former EMBO Young Investigator) and colleagues
Nature | 16 May 2018
Doi: 10.1038/s41586-018-0118-y

FAM35A associates with REV7 and modulates DNA damage responses of normal and BRCA1-defective cells

Richard Wood (EMBO Member) and colleagues
The EMBO Journal | 22 May 2018
Doi: 10.15252/emj.201899543

Practical Courses

DE-Heidelberg | 26–31 August 2018 | H. Sapers

Molecular geobiology

BE-Bruxelles | 2–7 September 2018 | D. Fontaneto

Microbial ecology: Hands-on training in prokaryotic and eukaryotic metagenomics (ICME-9)

DE-Heidelberg | 2–10 September 2018 | C. Sachse

Cryo-electron microscopy and 3D image processing methods

DE-Hamburg | 10–18 September 2018 | C. Löw

Membrane PEPC1 – Membrane Protein Expression Purification Characterization 1

UK-Bristol | 23–28 September 2018 | P. Verkade

Correlative light electron microscopy

PT-Faro | 24–29 September 2018 | T.M. Embley

Tree building: Advanced concepts and practice of phylogenetic analysis

LU-Luxembourg | 4–10 October 2018 | R. Krause

Phenotyping neurological syndromes for systems genetics

PT-Porto | 29 October–3 November 2018 | F. Silva

Biomolecular interaction analysis: From molecules to cells

IT-Rome | 5–10 November 2018 | A. Via

Computational analysis of protein-protein interactions: Sequences, networks and diseases

ES-Barcelona | 11–16 November 2018 | E. Sabidó

Targeted proteomics: Experimental design and data analysis

DE-Hamburg | 19–26 November 2018 | D. Svergun

Solution scattering from biological macromolecules

DE-Dresden | 5–13 February 2019 | A. Hyman

Methods for studying phase separation in biology

DE-Heidelberg | 7–12 April 2019 | M. Schorb

High-accuracy CLEM: Applications at room temperature and in cryo

ES-Barcelona | 7–13 April 2019 | M. Lluch Senar

The 2019 whole-cell modeling summer school

Workshops

CH-Arolla | 20–24 August 2018 | S.G. Martin

Cell and developmental systems

IT-Siena | 25–29 August 2018 | C.T. Baldari

Lymphocyte antigen receptor signalling

DE-Heidelberg | 29 August–1 September 2018 | M. Köhn

Chemical biology

AT-Vienna | 3–5 September 2018 | C. Schleper

Molecular biology of archaea: From mechanisms to ecology

UK-Harrogate | 3–7 September 2018 | R. Hawkins

Physics of cells: From biochemical to mechanical (PhysCell)

IN-Bangalore | 4–8 September 2018 | J. Rink

Size and shape

IT-Pavia | 9–12 September 2018 | A. Mattevi

Enzymes, biocatalysis and chemical biology: The new frontiers

GR-Kolymbari | 11–15 September 2018 | S. Mandrup

Nuclear receptors and biological networks

FR-Cargèse | 11–21 September 2018 | M. Labouesse

Physics of integrated biological systems

FR-Montpellier | 12–15 September 2018 | M. Simonelig

piRNAs and PIWI proteins

HR-Cavtat | 14–18 September 2018 | M. Sibilica

Cellular signalling and cancer therapy

MT-Valetta | 15–19 September 2018 | J. Godwin

The molecular and cellular basis of regeneration and tissue repair

AT-Seefeld in Tirol | 16–21 September 2018 | Y. Ivarsson

Modularity of signaling proteins and networks

GR-Kyllini | 17–21 September 2018 | Z. Lygerou

DNA replication, chromosome segregation and fate decisions

CH-Arosa | 21–25 September 2018 | T. Simmen

Membrane contact sites in health and disease

DE-Martinsried | 25–28 September 2018 | V. Hornung

The inflammasomes

FR-Les Embiez Island | 30 September–3 October 2018 | M.A. Hakimi

Molecular advances and parasite strategies in host infection

DK-Copenhagen V | 2–5 October 2018 | L. Pedersen

Cilia

DE-Mainz | 10–13 October 2018 | P. Beli

RNA and genome maintenance: Cooperation and conflict management

IT-Capri | 14–17 October 2018 | M.R. Matarazzo

From epigenome towards epitranscriptome in cell fate choice

DE-Heidelberg | 17–20 October 2018 | K.R. Patil

Editorial

Coordinating editor
Annika Grandison

Text Sandra Bendiscioli, Annika Grandison, Adam Gristwood, Katrin Weigmann, Kathy Weston

Print & web layout
Sandra Krahl**Experimental approaches to evolution and ecology using yeast and other model systems**

IT-Lucca | 21–25 October 2018 | M. Lemberg

Endoplasmic reticulum function in health and disease

BE-Ghent | 24–27 October 2018 | K. Ravichandran

Phagocytosis of dying cells: Molecules, mechanisms and therapeutic implications

SG-Singapore | 11–13 November 2018 | R. Dunn

Molecular mechanisms of developmental and regenerative biology

IL-Kibbutz Ein-Gedi | 8–12 December 2018 | A. Yaron

Mechanisms of neuronal remodelling

IN-Bangalore | 4–7 February 2019 | H. Ghosh

Molecular neuroscience: From genes to circuits in health and disease

DE-Heidelberg | 13–15 March 2019 | S. O'Donoghue

Visualizing biological data (VIZBI)

ES-Sant Feliu de Guixols | 23–27 March 2019 | R. Erdmann

Current advances in protein translocation across membranes

UK-Oxford | 1–5 April 2019 | J. Rehwinkel

Pathogen immunity and signalling

CL-Santiago | 2–5 April 2019 | M. Concha

Bridging cell and tissue mechanics to fate specification in development

IL-Herzliya | 7–11 April 2019 | Y. Shiloh

Genome dynamics in neuroscience and aging

ES-El Puerto de Sta María | 8–11 April 2019 | G. Sabio

Organ crosstalk in energy balance and metabolic disease

UK-Windsor | 15–17 April 2019 | S. Helaine

Toxin-antitoxin systems in bacteria

ES-Paguera | 28 April–3 May 2019 | B. Bukau

Protein quality control: From mechanisms to disease

DE-Heidelberg | 1–4 May 2019 | A. Akhtar

Chromatin and epigenetics

GR-Heraklion | 7–10 May 2019 | F. Bradke

Cell biology of the neuron: Polarity, plasticity and regeneration

PT-Cascais | 11–15 May 2019 | L. Jansen

Chromosome segregation and aneuploidy

CZ-Prague | 15–18 May 2019 | P. Svoboda

Awakening of the genome: The maternal-to-zygotic transition

GR-Athens | 19–23 May 2019 | G. Kollias

Mesenchymal cells in inflammation, immunity and cancer

IL-Rehovot | 19–24 May 2019 | J. Abramson

ThymE: T cell and thymus biology

Symposia

EMBO | EMBL Symposia

DE-Heidelberg | 5–8 September 2018 | C. Haering

Principles of chromosome structure and function

DE-Heidelberg | 10–13 September 2018 | J. Knoblich

Organoids: Modelling organ development and disease in 3D culture

DE-Heidelberg | 16–19 September 2018 | P. Bork

The human microbiome

DE-Heidelberg | 3–6 October 2018 | A. Ephrussi

The complex life of RNA

India | EMBO Symposia

IN-Manesar | 15–18 October 2018 | S. Banerjee

From synapses to memory: RNA based regulatory mechanisms

IN-Chennai | 10–13 March 2019 | R. Siddharthan

Regulatory epigenomics: From large data to useful models

IN-New Delhi | 15–17 April 2019 | A. Pareek

Sensing and signalling in plant stress response

Lecture Courses

EMBO | FEBS Lecture Course

GR-Spetses Island | 23–31 May 2019 | S. Rose-John

Molecular mechanisms of tissue injury, repair and fibrosis

Global Exchange Lecture Course
CL-Las Cruces | 5–13 April 2019 | J. Sierralta

Small brains, big ideas

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

Next issue

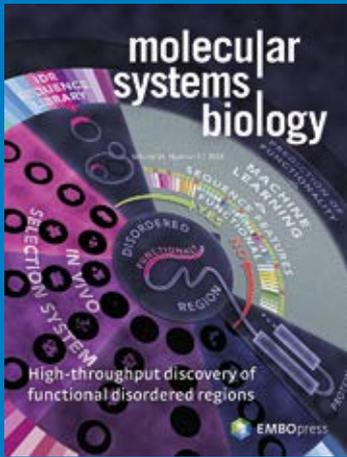
The next issue of EMBO Encounters issue will be dispatched in **December 2018**. Please send your suggestions, contributions and news to communications@embo.org by **22 October 2018**.

UPCOMING DEADLINES

Young Investigator Programme
1 April

EMBO Installation Grants
15 April

Long-Term Fellowships
throughout the year



Unstructured function

More than 40% of the proteins in eukaryotes encode intrinsically disordered regions (IDRs) that do not adopt defined structures, but are nonetheless functionally important. IDRs tolerate mutations and evolve rapidly, making it difficult to assign them specific functionalities.

Ravarani *et al.* have now developed a high-throughput screen to assign function to disordered regions. Specifically, the researchers, led by EMBO Member Madan Babu, probed the presence of a transactivation domain (TAD), which is required for transcription factors to interact with their transactivation partners, within an IDR. They substituted the TAD domain of a heat shock transcription factor with a random sequence

library and then tested for functional transcription in a biological assay. By comparing functional and non-functional sequences, the researchers established that TAD functionality requires mini-motifs of negatively charged and aromatic residues. Negatively charged residues may ensure that the segment is in an extended conformation, while aromatic residues bind to the interaction partners. The approach can be expanded to study other functions mediated by IDRs.

High-throughput discovery of functional disordered regions: investigation of transactivation domains.

Ravarani *et al.*

Read the paper: msb.embo.org/content/14/5/e8190

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Mitochondrial fusion in the balance

Charcot-Marie-Tooth disease type 2A (CMT2A) is a neurological disorder characterized by muscle weakness and loss of sensation. It is caused by mutations in the Mitofusin 2 (MFN2) gene, a dynamin-related GTPase that promotes mitochondrial fusion. To investigate the mechanism behind these mutations, El Fissi *et al.* generated *Drosophila* models of CMT2A expressing MFN2 with mutations in either the GTPase domain or the adjacent helix bundle.

The researchers showed that alleles associated with the GTPase domain not only impair mitochondrial fusion, as may be expected, but also trigger aggregation of unfused mitochondria in neurons. Mutations in the helix bundle, in contrast, increase the activity of the protein, leading to enhanced mitochondrial fusion. Both types of mutations result in mitochondria being trapped in the cell bodies, unable to move along the axon towards the synapse. Mitochondrial depletion at the synapse, in turn, may impair neurotransmission, thus explaining the disease phenotype.

Drugs that increase mitochondrial fusion have previously been envisioned as treatments for CMT2A. The data presented by El Fissi *et al.* indicate that they could be detrimental for some patients.

Mitofusin gain and loss of function drive pathogenesis in *Drosophila* models of CMT2A neuropathy

El Fissi *et al.*

Read the paper: embo.org/content/early/2018/06/13/embr.201745241

Respiration relies on serine

Serine plays a central role in the synthesis of nucleotides and some cancer cells are highly dependent on serine uptake for proliferation. In mammalian cells, two serine hydroxymethyltransferase (SHMT) enzymes, SHMT1 and SHMT2, break down serine into glycine and one-carbon units, which can then be used as building block for the biosynthesis of nucleotides and for other biosynthetic reactions.

By ablating SHMT2 using the CRISPR-Cas9 system, Lucas *et al.* showed that the enzyme is required to support the mitochondrial oxidative phosphorylation system, the main process through which mammalian cells generate ATP. Serine catabolism thus couples biosynthesis and energy production in the cell. While other research groups had previously demonstrated a role of SHMT2 in mitochondrial translation, Lucas *et al.* reveal a novel regulatory link between SHMT2-mediated one-carbon metabolism and the mitochondrial respiratory chain. They showed that one-carbon units produced by SHMT2-mediated serine catabolism are essential for the assembly of functional Complex I of the respiratory chain. These findings suggest that serine catabolism could be a useful target for the treatment of cancer or diseases associated with mitochondrial dysfunction.

Serine catabolism is essential to maintain mitochondrial respiration in mammalian cells

Lucas *et al.*

Read the paper: life-science-alliance.org/content/1/2/e201800036

Blood test for Alzheimer's

It is often argued that the development of drugs against Alzheimer's disease has been hampered by the fact that the disorder can only be diagnosed when it is too late for an effective intervention. To tackle this problem, Nabers *et al.* developed a blood test for Alzheimer's disease that can detect early indicators of the disease. The blood test works by measuring the relative amounts of a pathological and a healthy form of amyloid- β in the blood. The accumulation of pathological amyloid- β in the brain is one of the hallmarks of the disease.

The researchers found that their test reliably detected amyloid- β alterations in the blood of participants with mild cognitive impairment that also showed abnormal amyloid deposits in brain scans. In addition, the assay was able to detect signs of the disease on average eight years before diagnosis. It correctly identified those with the disease in almost 70% of the cases, while about 9% of true negative subjects would wrongly be detected as positive. The researchers suggest that their blood test serves as a cheap and simple option to pre-select individuals from the general population for further testing by more invasive and costly methods to exclude the falsely positive subjects.

Amyloid blood biomarker detects Alzheimer's disease

Nabers *et al.*

Read the paper: embo-molmed.org/content/early/2018/04/04/emmm.201708763

Putting cancer cells to sleep

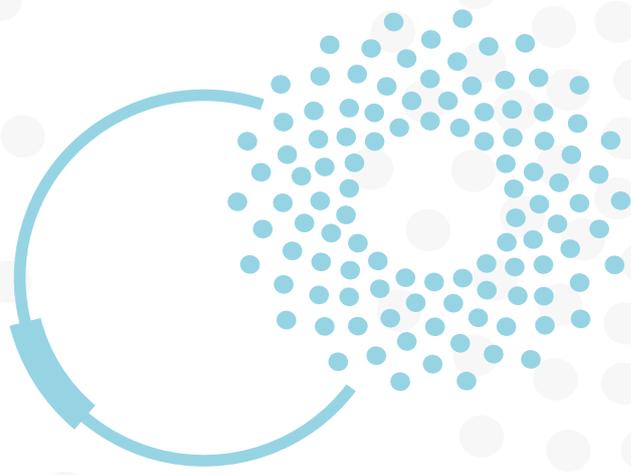
Palbociclib is a drug used for the treatment of advanced estrogen-receptor-positive breast cancer. It induces cell cycle arrest and senescence, an irreversible resting state marking these 'out-of-order' cells to be cleared by the immune system. Miettinen *et al.* now address in more detail why cells treated with palbociclib enter senescence. The researchers used a novel method called thermal proteome profiling to detect cellular changes induced by the drug. This technology is based on observing drug induced changes in the thermal stability of cellular proteins. It will pick up proteins that either bind to the drug directly or change their activity in response to the drug.

With this approach the researchers uncovered the proteasome as a yet unknown target of palbociclib. More specifically, palbociclib dissociates the proteasome from an inhibitory component. Once freed, the proteasome can degrade proteins required for cell cycle progression, thus driving cells into senescence. The discovery could help expand palbociclib-based breast cancer treatments and identify patients that would profit most from this medication.

Thermal proteome profiling of breast cancer cells reveals proteasomal activation by CDK4/6 inhibitor palbociclib

Miettinen *et al.*

Read the paper: embo-journal.org/content/early/2018/04/16/emboj.201798359



ASCB | EMBO 2018 meeting

San Diego, CA • December 8-12

The scientific programme is being organized by:

Thomas Langer

Max Planck Institute for Biology of Ageing, Cologne, for EMBO

Samara Reck-Peterson

University of California, San Diego/HHMI, for ASCB

Discounts for EMBO community members

ASCB offers a discount to any EMBO Members, EMBO Young Investigators, EMBO Installation Grantees, current EMBO Fellows, lab members of EMBO Members, EMBO Young Investigators and EMBO Installation Grantees. The discount gives EMBO community members the same reduced fees as ASCB members.

To obtain the discount, EMBO community members are asked to use the following coupon codes on the registration check-out page:

EMBO Members	EMBOMem130118
EMBO Young Investigators	EMBOYI130218
EMBO Installation Grantees	EMBOIGP130318
Current EMBO Fellows	EMBOFEL130418
Lab members of EMBO Members	EMBOLABMem130618
Lab members of EMBO Young Investigators and Installation Grantees	EMBOLABYI130518

Coupon codes

ascb-embo2018.ascb.org

Early registration rates apply until 4 October.