The Newsletter of the European Molecular Biology Laboratory

EMBL etcetera

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Back in town

Nobel Prize winning alumnus Eric Wieschaus has returned to EMBL Heidelberg to take a sabbaticle in the De Renzis lab. In an interview, Eric reflects on what he hopes to achieve during his time back at the lab, the new challenges he aims to tackle in field of developmental biology, and what happened when he was told he had become a Nobel laureate. He also speaks about an adventure when he ventured down to his old laboratory and considers how life has changed at EMBL, thirty years after he moved to the US to run a lab at Princeton University. Look inside to find out more...

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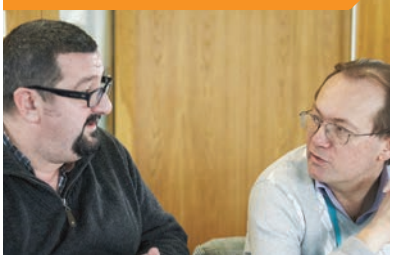
The right medicine

How research and initiatives across EMBL's sites are connecting basic science with clinical practice

Hope for Atypical Rett Syndrome, page 9

Exploring the human gut, page 5

Better drug discovery, page 4

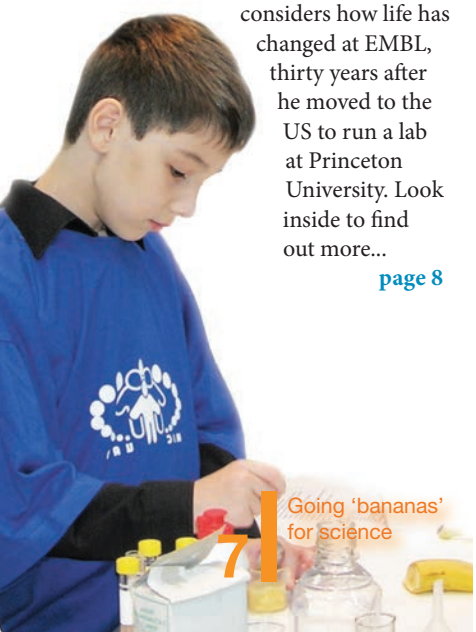


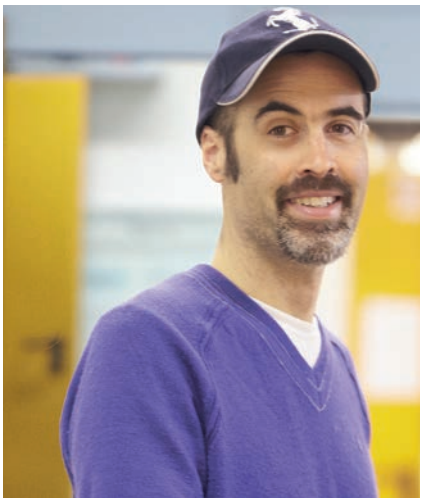
ELIXIR gets a green light

Crucial milestone is passed for pan-European reseach infrastructure project

Six countries have signed a Memorandum of Understanding, which effectively gives the go-ahead for the implementation of ELIXIR, a major research infrastructure for biological data in Europe. Denmark, Finland, the Netherlands, Sweden, Switzerland and the UK have all signed the agreement, which will establish the infrastructure to better manage the data underlying biological research. The hub will be located at EMBL-EBI.

find out more on page 3





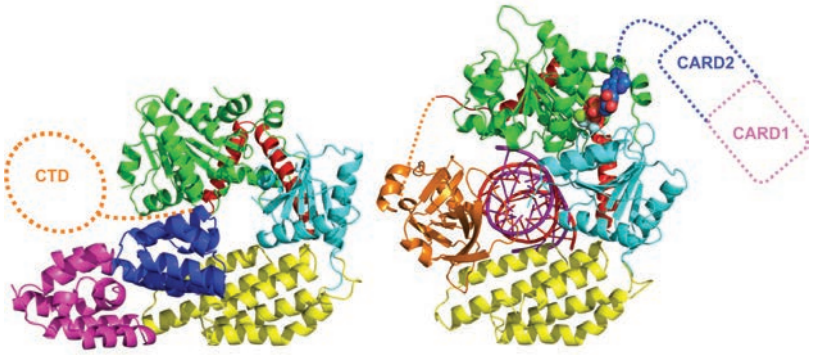
The research was carried out by Kasper Rasmussen and Donal O'Carroll (pictured)

Turning red blood cells green

No, it's not a Halloween trick. Scientists at EMBL Monterotondo have devised a new labelling technique that, for the first time, enables researchers to pinpoint the stem cells in bone marrow that give rise to red blood cells. With the method, developed by Kasper Rasmussen and Donal O'Carroll, cells turn fluorescent green when they commit to becoming red blood cells. It means that scientists can now study the process at the single-cell level.

"I was very surprised to see how accurately our marker could measure the red blood cell output from the hematopoietic stem cells. It was one of those rare moments when the raw data was crystal clear," says Kasper, a postdoc who led the research. "In contrast to available techniques, our marker allows researchers to follow the production of red blood cells *in vivo* easily and accurately."

By using this new single-cell marker, the scientists hope to learn more about which groups of hematopoietic stem cell give rise to red blood cells and under what circumstances. "The technique gives us a much bigger picture than before," adds Donal, who is a group leader at Monterotondo. "It enables the visualisation and quantification of the red blood cell output from stem cells or multi-potent progenitors." The research was published in *Blood*.



In the absence of viral RNA (left), the part of the protein receptor RIG-I that senses viral RNA is exposed (orange), whilst the domains responsible for signalling (blue and pink) are out of reach of the signalling machinery. When RIG-I detects viral RNA, it changes shape, and the signalling domains become accessible to sound the alarm

An alarming discovery

When an intruder breaks into a bank vault, sensors are activated and the alarm is raised. Cells, like bank vaults, contain precious contents and so they too need an early-warning system to mount a defence following the entry of uninvited guests, such as viruses and bacteria.

> "I'm interested in influenza, I'm interested in RNA, and it all came together in this project"
> – *Stephen Cusack*

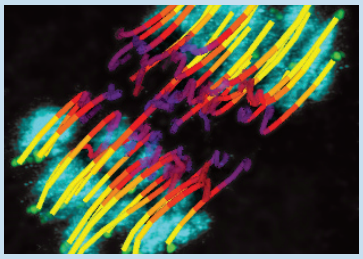
This is the job of the innate immune system, which is characterised by a series of receptors that change shape on recognition of molecular signatures carried by intruders. The shape change triggers a signal that ultimately alerts surrounding cells to the invasion. Stephen Cusack's group at EMBL Grenoble have, for the first time, shown how these two processes – sensing and signalling – are connected.

Stephen's group found that when one of these protein receptors, RIG-I, binds to viral RNA, it changes shape, 'waking up' its signalling domains, which become accessible to the cell's machinery, enabling an anti-viral response.

"I'm interested in influenza, I'm interested in RNA, and it all came together in this project," says Stephen. The group was particularly keen to understand how RIG-I works, as it targets almost all RNA viruses, including influenza, measles and hepatitis C.

"RIG-I is activated in response to viral RNA, but a similar mechanism is likely to be used by a number of other immune receptors, whether they are specific to viruses or bacteria," says Eva Kowalinski, a PhD student in Stephen's group who initiated much of the research. The study was published in *Cell* in October.

Something fishy



Children playing magnetic fishing games sometimes cheat, using their fishing rod to nudge a fish into a more favourable position. Jan Ellenberg and Tomoya Kitajima, a postdoc in Jan's group, have found that microtubules also 'cheat' in this way. For an oocyte to mature into an egg cell, fibres called microtubules must fish chromosomes apart, attaching themselves to a protein structure on the chromosome called a kinetochore, which acts like the magnet in a toy fish.

Jan and Tomoya were the first to track all the oocyte's kinetochores throughout cell division, and discovered that, before they start fishing, microtubules nudge chromosomes into position in a 'belt' around the centre of the spindle. But not even this chromosome belt, which had never been observed before, is enough to ensure that microtubules fish out the chromosomes correctly. "Overall, 90% of all chromosomes get grabbed by the wrong microtubule, which then has to try again," Jan says. This could help explain why errors in the number of chromosomes in the egg cell are a significant cause of miscarriages and congenital diseases such as Down's syndrome.

Six countries sign up to ELIXIR

The ELIXIR project passed a crucial milestone this autumn, when six countries plus EMBL signed a Memorandum of Understanding to catalyse the implementation of this important infrastructure for biological data. Denmark, Finland, the Netherlands, Sweden, the UK, and (as we were going to press) Switzerland have signed, and more countries plan to join in the near future.

ELIXIR is a pan-European initiative to operate a sustainable research infrastructure for managing and safeguarding biological information in Europe, with the hub located at EMBL-EBI. "We are very excited that six countries have signed ELIXIR's Memorandum of Understanding so quickly, and that several others are already going through the process. This underlines the broad consensus on the need to establish a sustainable infrastructure for managing the data underlying life science research in Europe," says Janet Thornton, Director of EMBL-EBI and coordinator of ELIXIR. "ELIXIR has the potential to make a real and lasting difference to Europe's citizens – access to data is central to answering the pressing problems of our time, including food security and the health and well-being of an ageing population."

The Interim Board will have its first meeting in November. An important role of the Board will be to establish an international consortium agreement and determine how ELIXIR will be governed and funded in the future.

www.elixir-europe.org

ELIXIR supports open innovation in a large range of industries

Enlightening life science with XFEL

Signing of the MoU: Karl Witte (European XFEL Administrative Director), Massimo Altarelli (Chairman of the European XFEL Management Board), Iain Mattaj (Director General of EMBL), and Matthias Wilmanns (Head of EMBL Hamburg)

EMBL will help to explore new areas of experimentation thanks to a Memorandum of Understanding signed with the new European X-Ray Free Electron Laser (XFEL).

> "Free-electron lasers, like the European XFEL, have enormous potential for life science"
> – *Iain Mattaj*

The European XFEL is unique worldwide, designed to generate high intensity X-ray pulses – 27 000 times per second – with a brilliance a billion times higher than that of conventional X-ray radiation sources. The 3.4km facility begins at the DESY research campus shared with EMBL Hamburg, making it a natural partner for cooperation. Among others, XFEL offers exciting prospects for deciphering the structure and dynamics of biomolecules. The signing of a Memorandum of Understanding, on 12 September, is an expression of intended common action and lays the foundations for future opportunities and collaboration.

"Free-electron lasers, like the European XFEL, have an enormous potential for life science, a potential we only start to understand," Director General Iain Mattaj commented at the signing. Massimo Altarelli, Chairman of the European XFEL Management Board, added: "We will be very happy to cooperate with EMBL to unravel the full biological potential of this new light source."

Nordic networking

Scientists from EMBL and major Scandinavian institutions convened in Helsinki at the end of September for the second meeting of the Nordic Molecular Medicine Network. On the agenda was a wide range of of topics focussed on enhancing the translation of basic research into clinical practice.

Since its establishment in 2007, the partnership has combined the recognised and complementary strengths of EMBL, and the universities of Oslo, Umeå and Helsinki to collaborate closely in the area of molecular medicine, taking on some of the biggest challenges in disease research.

EMBL group leader Wolfgang Huber and Director of International Relations Silke Schumacher gave talks during the packed two-day programme, which included presentations from researchers from EMBL and all three Nordic 'nodes'.

"The Nordic Molecular Medicine Network has created a very active and scientifically stimulating community of researchers across the region. I was deeply impressed by the great science presented by PhD students and postdocs," says Wolfgang.

Next year's conference will take place at the Centre for Genomic Regulation in Barcelona 17-19 September and is open to all EMBL molecular medicine partnerships and EMBL faculty.

New opportunities in drug discovery

EMBL-EBI's John Overington (left), speaking to Mark Forster of Syngenta at an Industry Programme meeting

An international consortium of pharmaceutical companies, public and commercial data providers and academic groups has agreed on a new standard for describing the effect of a compound on a biological entity. Published in *Nature Reviews Drug Discovery*, the Minimum Information about a Bioactive Entity (MIABE) standard makes it possible to enhance the interchange of public data on drug discovery success and attrition.

A deeper understanding of what makes successful drugs work can be gained by putting together data from a large number of drug discovery programmes. But to analyse these data properly, they need to be comparable. At present, crucial data are often missing from the published literature or are reported in an unstructured format. MIABE reporting guidelines will make it possible to capture more information about bioactive compounds, which will greatly benefit the scientific community.

"We hope that MIABE will make possible an order-of-magnitude increase in the amount of data available for analysis," explains John Overington, who heads the ChEMBL group at EMBL-EBI. "Experience with other standards has shown that as more groups come to adopt them, the amount of useable data available to researchers snowballs."

> "We hope that MIABE will make possible an order-of-magnitude increase in the amount of data available for analysis"
> *– John Overington*

MIABE is the result of a precompetitive project that originated in the EMBL-EBI Industry Programme. The ideas were originally developed in a series of drug-discovery research workshops, and the outcome will benefit industrial and academic communities alike.

The X factor

BioStruct-X is being coordinated by Matthias Wilmanns, Head of EMBL Hamburg

Structural biologists can now apply for access to an integrated, transnational infrastructure of facilities and services via the new BioStruct-X project – a collaboration of 11 European installations, including EMBL Hamburg and Grenoble.

BioStruct-X offers multi-site access to structural biology applications in four key areas: X-ray scattering, macromolecular X-ray crystallography, biological X-ray imaging, and protein production and high-throughput crystallisation.

"Our aim is to provide a consolidated platform that brings together all relevant methods in structural biology – creating a single gateway to Europe's leading European synchrotron facilities and associated infrastructures, ultimately to the benefit of our user community," says Matthias Wilmanns, Head of EMBL Hamburg. BioStruct-X offers a unified portal for project proposals and evaluation. Electronic application forms and detailed description of the facilities are available at **www.biostruct-x.eu**. Proposals can be submitted at any time.

BioStruct-X cooperates with the ESRFI project INSTRUCT (Integrated Structural Biology Infrastructure for Europe) in aiming to provide an integrated and coordinated technology platform; it is funded through the Seventh Framework Programme (FP7) of the European Commission.

For further information, please contact: Ivana Custic, Project Manager on +49 (0)40 89902-124, or email **biostructx@embl-hamburg.de**.

It's a knockout!

This September saw the launch of the International Mouse Phenotyping Consortium (IMPC), bringing together worldwide efforts, including those of the Infrafrontier research infrastructure. The project will create one of the largest libraries of mammalian genetic function data and will allow researchers to easily access a significant amount of information about knockout mice.

The first phase of the 10-year project will knock out 5000 mouse genes and describe their physical characteristics or phenotypes. A data coordination centre will allow unrestricted public access to IMPC data. "The open resources created by IMPC will be integrated with many other molecular databases at EMBL-EBI and elsewhere, and benefit from advanced search functionality," says Paul Flicek, team leader at EMBL-EBI. "This will ensure that researchers can make use of detailed data and high-level summaries of mouse phenotypes and other relevant biological information – for example human disease associations – well into the future."

EMBL-EBI's Paul Flicek and Petra Schwalie

The study follows up research published by the group in *Nature* which identified three 'gut types' in humans

That's my gut feeling, what's yours?

As social networks go, one that brings people together to discuss analyses of their stool samples does not necessarily sound particularly, well, sociable. But my.microbes, a new study that aims to collect 5000 faecal samples and sequence the bacteria that live in the human gut could help scientists understand how different conditions, illnesses and diets are related to gut flora – and connect people with similar profiles.

To the Bork group, which is leading the research, it was a logical avenue to pursue after their study earlier this year, in which they identified three distinct 'gut types' in humans. "After that paper was published, we received over 50 emails from people with a whole spectrum of bowel problems," says Peer Bork.

> "This is new scientific territory and we just want to explore how things work"
> *– Peer Bork*

"We have no idea how diet affects the composition of bacteria in the gut, so it is important to get samples from all over the world," adds research scientist Mani Arumugam. Through the my.microbes website, the scientists hope to reach out to potential participants worldwide. Enabling people to interact with each other (should they choose to do so) could not only help them share experiences but also help bring to light unexpected phenomena.

"It may not have immediate medical value, but we could find things that we never thought of before: for instance, if two people with similar gut profiles realise they both eat a lot of chocolate this could open up areas for important sub-studies," says postdoc Julien Tap.

Although the group covers some of the costs, the expenses involved in sample processing and sequencing are such that participants are asked to pay 1451 Euro (although this is likely to drop with increasing sequencing efficiency). Nevertheless, the project has already drawn participants from Asia, Europe and North America and is also being boosted through collaborations with other institutions collecting samples. "Some people from our group will also participate," says Peer. "This is new scientific territory and we just want to explore how things work."

www.my.microbes.eu

Catching up at the faculty retreat

In spite of the balmy September weather, the sun was outshone by bright presentations, and its heat outdone by the warmth of the discussions at this year's faculty retreat.

Presentations by newly arrived group leaders mixed with talks by more established EMBL names, in a vivid demonstration of the variety of topics and approaches covered by the different labs. Group leaders are bringing together seemingly disparate disciplines and methods to address complex issues, and a common theme ran throughout the talks: collaboration.

Participants heard how microfluidics can help study marine ecology and evolution, and how electron and light microscopy can be combined for use on a single sample, for instance. And inevitably, in the coffee and meal breaks that followed the presentations, new collaborations were forged, and existing ones reinforced in formal meetings and more casual chats at the bar.

A novelty this year was a session on the opportunities and challenges of personal genomics, with discussions concerning everything from how long it will be before we each have our genome sequenced, to how useful that information will be, medically, and what ethical concerns such a prospect raises.

Another highlight was a much-awaited presentation by Nobel Prize winning EMBL alumnus Eric Wieschaus, who has returned to Heidelberg for a sabbatical in the De Renzis group – **see page 8**.

EURO-BIOIMAGING

Open access imaging

Coordinators of the Euro-BioImaging project are calling for applications to make use of advanced biological and biomedical facilities across Europe as part of a series of proof-of-concept studies taking place between January and July 2012.

The initiative, which offers free access to facilities such as super resolution microscopy and functional imaging presents open access to more than 50 imaging facilities in 16 countries.

Euro-BioImaging is a large-scale European research infrastructure project led by the Head of EMBL's Cell Biology and Biophysics Unit, Jan Ellenberg. It aims to develop a distributed system of imaging facilities. Through proof-of-concept studies, participants will benefit from use of the most advanced facilities in Europe free of charge. It will also allow project coordinators to test and revise key aspects.

Registrations and submissions of proposals are open until 15 November.

www.eurobioimaging.eu

Director of International Relations Silke Schumacher speaking at the official opening of CEITEC

Czech this out...

EMBL has begun a number of important interactions with scientific institutions in the Czech Republic.

In July, the Czech Ministry for Research and Higher Education wrote to major national institutions in the country dealing with molecular biology and bioinformatics, asking them to outline how EMBL membership might benefit their organisation: the responses were highly positive.

In September, EMBL Director General Iain Mattaj and EMBL-EBI Director Janet Thornton presented EMBL and ELIXIR (a unique model for managing biomedical data across Europe) at a workshop delivered by the Ministry. Iain met with Vice-Minister Ivan Wilhelm to discuss possible membership of the Czech Republic in EMBL, with both sides optimistic about the outcome. "EMBL can undoubtedly benefit from the unique skills of the Czech Republic's scientists and institutions, and we hope to intensify our collaborations," says Iain. Also in September, Director of International Relations Silke Schumacher gave a keynote presentation at the official opening of the Central European Institute of Technology (CEITEC) in Brno, with a view to extending cooperation between EMBL and Czech research institutions. A workshop, bringing together key CEITEC researchers with EMBL scientists took place in October.

> "The aim for CEITEC is to build a scientific centre of excellence with a critical mass that can really deliver. Our philosophy is to have, for each of our programmes, an international strategic partner, which is really top class in its field and EMBL is certainly one of those institutions. This provides a benchmark, together with a mutually beneficial exchange of staff and best practice."
>
> **Tomas Hruda, Executive Director, CEITEC**

EMBL alumnus Daniel Gerich was one of many staff and alumni in attendance

Photos: EMBO

Large audiences enjoyed the plenary sessions

A Viennese blend at *The EMBO Meeting*

1500 delegates, two Nobel Prize winners, three fascinating plenary sessions and a beautiful Viennese setting promised to make *The EMBO Meeting* the must-attend conference for life scientists this year, and it did not disappoint.

A broad and engaging programme featured lectures from leading scientists from around the world, including Susan Lindquist, Richard Axel, Eric Wieschaus and Giacomo Rizzolatti. Speakers explored topics spanning genome evolution, neuroscience, microbial interactions and more.

EMBL was well represented at the meeting, with talks from scientists and several alumni included in the programme. Conversation flowed out of the packed auditoria and into the large exhibition hall, where large queues formed around EMBL's stand. Participants expressed interested in research, services and career opportunities, while representatives from EMBL-EBI showcased Train online, a free online training service to guide researchers through the EBI's public molecular data resources.

"The interest from delegates was phenomenal, we had more than 250 people register with Train online at the conference and the numbers of people at the stand exceeded our expectations," says Cath Brooksbank, head of outreach and training at EMBL-EBI.

Next year's conference takes place in Nice, 22-25 September.
www.the-embo-meeting.org

✏ EMBL scientists joined more than 2500 participants in Madrid at the end of August for the 22nd International Union of Crystallographers (IUCR) congress. The meeting, which takes place once every three years, represents a highlight for crystallographers worldwide, drawing visitors from more than 70 countries and covering state-of-the-art crystallography in fields from biomedicine to mineralogy. Many EMBL structural biologists attended, and the lab was well represented throughout the eight-day programme in posters, presentations, as well as at the 'software fayre'. The EMBL stand drew many interested visitors, from prospective students and potential collaborators to old friends of the Hamburg and Grenoble beamlines and services.

A rooftop ‘a-CeMMBL-y’

It was sunshine and blue skies for the 50 EMBL and EMBO former and current staff who gathered to enjoy good company, a skyline view of Vienna, and wine and cheese on the CeMM (Research Center for Molecular Medicine) rooftop terrace.

The get-together, referred to as ‘a-CeMMBL’, after its venue and participants, was generously hosted by Giulio Superti-Furga, Scientific Director and CEO of CeMM, to coincide with the end of *The EMBO Meeting*.

Giulio, EMBO Member and former EMBL Developmental Biology team leader, was delighted with the turn out of current and former EMBL and EMBO staff. Guests included EMBO Director Maria Leptin, who remarked: “We really value the interaction with EMBL alumni, and look forward to this event becoming a tradition.” Other EMBO attendees included Deputy Director (and EMBL alumna) Gerlind Wallon, and Head of Public Relations and Communications Suzanne Beveridge. They were joined by legendary EMBL alumnus Graham Warren (Cell Biology Joint Head, 1977–1985), who said afterwards: “It really felt like a family occasion, though being an EMBL great-grandfather was a mixed blessing.”

It was also a great opportunity for EMBL alumni based in Austria to meet one another, and where better than Austria’s largest medical research complex, located at the campus of the Medical University (MUV) and the Vienna General Hospital (AKH). Here, CeMM functions as a bidirectional channel between basic research and clinical applications.

With no programme other than to create-and-sport-your-own large and colourful name badge, the get-together offered participants a refreshing opportunity to have fun with familiar and new faces in the EMBL/EMBO community.

The EMBO Meeting 2012 will be held 22–25 September in Nice. The EMBL Alumni Office will work again with the organisers to offer a similar get-together with the help of the French local chapter.

Graham Warren and Maria Leptin

Welcome to the new board

Thank you to the 400 alumni who voted for a new EMBL Alumni Association board in September. Elected were the 10 candidates with the most votes. Two additional members were co-opted, as the board strives to be representative of gender, non-scientific staff, outstations and industry work experience.

The new board is composed of Giulio Superti-Furga (Chair), Maria Vivanco (Vice Chair), Marja Makarow (Vice Chair), Oscar Martin-Almendral (Treasurer), Gareth Griffiths, Maj Britt Hansen, Des Higgins, Jacqueline Mermoud, Preben Morth, Joep Muijrers, Anastasia Politou and Sarah Sherwood, who will serve for a term of four years.

They will be responsible for representing your interests in building the EMBL Alumni Association, so do contact them or the Alumni Office with your requests, suggestions or feedback – contact information can be found at **www.embl.org/alumni/board**.

Giulio Superti-Furga

Maria Vivanco

Marja Makarow

Oscar Martin-Almendral

Gareth Griffiths

Maj Britt Hansen

Des Higgins

Jacqueline Mermoud

Preben Morth

Joep Muijrers

Anastasia Politou

Sarah Sherwood

It could have been you!

EMBL-EBI alumnus wins contest to be 2000th member

Winner of the EMBL Alumni Association 2000th Member competition is Robert (Bob) Vaughan, recent EMBL-EBI alumnus. As his prize, Bob will receive a goody bag with EMBL, EBI, and CeMM memorabilia.

"We are very happy that a former outstation colleague has won the 2000th member prize," said EMBL Alumni Association Chair, Giulio Superti-Furga. "It highlights the fact that the Association represents and reaches out to *all* EMBL alumni."

Staying in touch

When asked why he joined the EMBL Alumni Association, Bob said: "Because you kept asking me! More seriously, it's always good to be able to stay in touch with former colleagues, both on personal and professional levels."

Bob started working at EMBL-EBI in 2001, following a student visit in 2000. "I was really impressed by the atmosphere, and in particular the enthusiasm of everyone I met. When a temporary post in the EMBL Nucleotide database team arose, I leapt at the chance to apply. Obviously trivialities like the beautiful green field environment of Hinxton Hall did not influence my decision at all."

Scaling up

Bob worked at EMBL-EBI for nine years, first with Rolf Apweiler and later with Guy Cochrane, progressing from data curator to ENA curation co-ordinator of the PANDA group (Protein and Nucleotide Database). While there he experienced the "massive expansion of staff numbers, construction of a new wing to our building, expansion of the Sanger Centre, two team reorganisations from the Sequence Database Group to PANDA, and a vast increase in the scale of biological data." And, of course, there was the annual campus Burns Supper: "They were always fun, but I mention them mainly because Graham Cameron would kill me if I didn't."

> "It's always good to be able to stay in touch with former colleagues, both on personal and professional levels."
> *– Bob Vaughan*

A particular highlight for Bob was working alongside his team to meet the 'scale-up' challenge through automation and improved practices. "When I started, all the accession numbers were held as a big text file and you were sent a block of the file to manually paste into entries – crazy to consider the challenge that would pose today!"

Good chemistry

Bob recently started working on a Technology Standards Board project on chemical and biological data integration and visualisation at Syngenta, in collaboration with Chris Rawlings' group at the Biotechnology and Biological Sciences Research Council (BBSRC), Rothamstead. Much of his new job involves working with data and tools provided by EMBL-EBI, so don't be surprised to spot him around campus from time to time.

Main picture: "Beautiful green field environment" of the EBI. Inset: Bob

Chemistry being one of the challenges of his new role has made Bob thankful for the years he spent sharing Friday afternoon beer sessions with the ChEBI team next door – he hopes he has soaked up some of their knowledge!

Competition time

The competition to win EMBL memorabilia was so popular that the Alumni Office has decided to offer similar prizes for every 100th member! To join, or to find out more on how we can mutually support one another, please contact **alumni@embl.org**.

Mark your diaries...

Open to all EMBL staff and alumni

November **Alumni survey**
All EMBL alumni are invited to provide their feedback on alumni services.

16 December **18th EMBL Alumni Association board meeting, Grenoble**
11:30–18:30 board meeting; 18:30 on-site dinner with Grenoble staff and local alumni.

Tell us what you see

This year, before launching our annual fundraising call, we're asking for feedback on how we can better support you.

In November, we'll invite alumni to take part in a survey to tell us what you think of our services, communication platforms, activities, events and fundraising goals. Responses will help us better channel our resources to areas that matter to you.

Thank you in advance for taking a few minutes to help us to see what you want!

Understanding the personal genome

Staff at EMBL-EBI have been taking part in lively discussions about personal genomics through a series of talks, debates, games and other initiatives jointly organised by the EBI and the Wellcome Trust Sanger Institute.

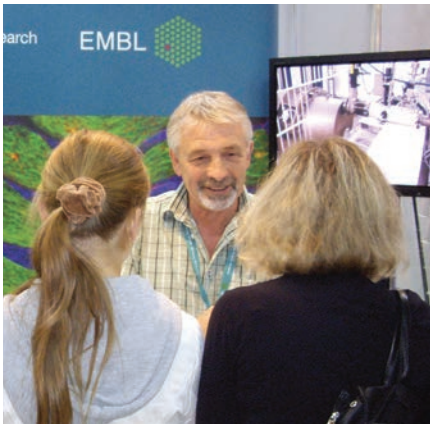
The campus-wide programme, which began in September, aims to stimulate discussion about the ethical implications of personal genome sequencing and its impact on society. An opening seminar series featured engaging topics such as direct-to-consumer genomic testing and the falling cost of personal genome sequencing, which could have a profound influence on healthcare.

The three-month programme also includes a screening of the sci-fi film *GATTACA* accompanied by an expert discussion panel, a visit by a media figure to discuss news coverage of the topic, and an interactive card game. The Sanger Institute had also offered a number of staff on campus

the chance to have a small portion of their own genome screened anonymously. "As discussed in *Nature* recently, personal genomics is increasingly being applied in a clinical setting," says EMBL-EBI group leader John Marioni, who helped coordinate the seminar series. "Developing a deeper understanding of the scientific and ethical challenges that this entails is vital. This is especially true for research groups whose work is directly related to this area."

✏ Such questions are also being considered by a three-year initiative run by Marsilius Kolleg, a centre for advanced studies at Heidelberg University. The 'Ethical and Legal Aspects of Total Genome Sequencing' project brings together experts from fields such as genetics, law, ethics and economics to develop a position statement on how whole genome sequencing can and should be used in medicine. "It is important to have a platform where people from different areas of expertise can work together on this important and often controversial field," explains EMBL Heidelberg group leader Jan Korbel, who sits on the committee. Members meet at least once a month and will deliver their findings in 2013.

Fruit for thought



Vladimir Rybin, senior officer in the Protein Expression and Purification Core Facility, answers questions from visitors

Alexey helping children to extract banana DNA using household chemicals

Young and old went 'bananas' for science as representatives from EMBL showcased the lab at Russia's biggest popular science event. The sixth Russian Science Festival brought together hundreds of institutions with members of the public, with much focus on EMBL's stand following broadcasts in Russian media.

"Showcasing EMBL here is a valuable way of connecting people with science"
– *Alexey Kikhney*

"Our simple experiments attracted the attention of several journalists, including those from some of Russia's biggest television channels," explains Alexey Kikhney, a postdoc in the Svergun group at EMBL Hamburg. "The next day people were hurrying over to our stand saying 'we saw you on TV!'" The three-day event takes place in more than 80 locations across Moscow and other cities in Russia. Featured on the diverse programme were lectures and seminars, such as a symposium on the human brain and its memory functions, together with literary and drawing competitions and a chance to pitch ideas to business leaders. "People want to see what real researchers are like, and showcasing EMBL here is a valuable way of connecting people with science," adds Alexey.

In December last year, EMBL signed a Memorandum of Understanding with the Russian Foundation of Basic Research, expressing significant interest in Russia becoming an EMBL member state.

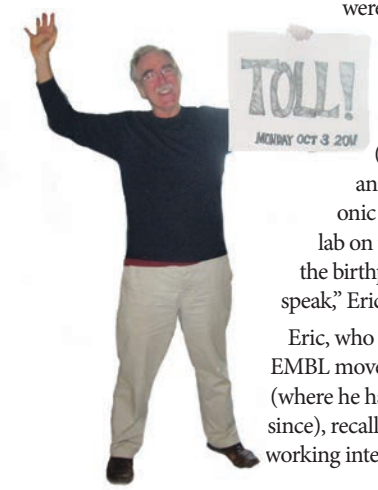
Intuition or evidence?

While our intuition tells us there is a central structure in our brain where information from internal and external sources comes together, neurobiological research suggests otherwise, instead indicating a highly distributed system without a singular centre. For Wolf Singer, who gave a Heidelberg Forum on Biosciences and Society talk in September, understanding such conflicts between intuition and evidence give rise to important considerations. Singer, who is director of the Max Planck Institute for Brain Research in Frankfurt, spoke about often-controversial questions relating to the nature of the neuronal correlates of consciousness and related issues such as its subsequent implications on intention and free will. The talk sparked lively discussion amongst a capacity audience at the Print Media Academy. The lecture was jointly organised by EMBL, the German Cancer Research Centre and Heidelberg University.

Back in the neighbourhood

When Jules Hoffmann's research was recognised with a Nobel Prize earlier this month, EMBL Alumnus Eric Wieschaus, who is currently taking a sabattical in the De Renzis lab, sent Jules a simple one-word message...

'Toll', which means 'great' in German, is also the name given to receptors whose role in fighting infections in fruit flies was determined by Hoffmann in his prize winning research. But the path to Hoffman's discovery in Strasbourg, which has led to significant advancements in some vaccinations, can be traced back to studies carried out in 1979-1980 at EMBL Heidelberg, when the original Toll mutants were isolated and characterised. "They were discovered as a byproduct of the zygotic mutagenesis screens that Christiane (Nüsslein-Volhard) and I did for embryonic lethals, so our old lab on the fourth floor is the birthplace of Toll, so to speak," Eric explains.



Eric, who after leaving EMBL moved to Princeton (where he has been based since), recalls vividly his time working intensively in the lab. "The thing you carry away with you are memories of people you worked with, argued with, and did specific experiments with," he explains. One particular set of large-scale genetic screening experiments were ultimately rewarded with a 5am phone call from Stockholm in 1995. "Five minutes after the call saying we (Eric, Christiane and Edward Lewis) had won the Nobel Prize, I got another, this time from Christiane – the gentleman from the committee had asked her to contact me because he was worried I was not awake enough to understand him!"

No such problems today, as he reflects thoughtfully on his goals during his sabbatical with Stefano De Renzis' group in the Developmental Biology Unit. "Stefano and I have interesting, but unfinished experiments that we are looking to tackle again," Eric explains. "Mostly they are focused on Notch signalling and whether cells could control directionality of signalling by modulation levels of the receptor rather than the ligand itself. But for me it is also important to speak to cell and developmental biologists here and identify the kinds of approaches that are possible, even if they are well outside the timeframe of a reasonable sabbatical."

One such approach is to explore the potential of different quantitative imaging techniques. "Mathing something out is the most rigorous way of testing what you think," he explains. "Over the past 20 years we have learned a lot about genes and through simulations how things actually work. Our challenge is to take those simulations and ask questions to a level where we are not developmental biologists any more, but biophysicists."

"We have unfinished experiments that we are looking to tackle again"
– Eric Wieschaus

But while scientific techniques evolve and develop, some things remain somewhat the same. "Thirty years later and the construction people are still here!" he laughs, looking around. "But you can see huge amounts of growth, for instance with the PhD programme. EMBL is always an exciting place to come, intellectually and in part coming here is just getting used to what is possible."

Photo: EMBO

Bacteria had long been considered deprived of any social interaction. In the 1970s, by studying the bioluminescence of the marine bacteria *Vibrio fischeri*, scientists started to understand that bacteria talk to their fellows using a chemical language.

Since then much has been learned about the grammar and vocabulary of this language, central to the research of Bonnie Bassler, who recently delivered a Distinguished Visitor Lecture at EMBL Heidelberg. In a process called quorum sensing, bacteria decide to change their behaviour depending on how many other bacteria are around them, Bonnie told the audience. For instance, *Vibrio fisheri* secrete an autoinducer molecule that controls, through a specific receptor, their luminescence. When enough bacteria are present, and so enough autoinducer, the bacteria collectively switch to their glow-in-the-dark mode. Bonnie found that not only do bacteria communicate intra-species, but they are in fact 'multi-lingual' and for thus they use a molecule, common to all bacteria – a kind of 'bacteria esperanto'.

The story becomes more interesting when considering that this characteristic could help develop new types of antibiotics. Bacteria use quorum sensing to decide when to start their attack. "What if we make those bacteria so that they can't talk or can't hear?" Bonnie asked. Her group identified the chemical structure of the signalling molecules and are now able to synthesise analogues to hijack bacterial communication and impede quorum sensing. In mice, such an approach has led to some promising results. Bonnie revealed she and her colleagues hope, in the future, to have a complete dictionary that allows us to influence our little ancestors and better understand how multicellularity evolved.

– Antonio Politi

Emanuela's daughter Elena was diagnosed with Rett Syndrome in 2008

Photo: Rosa Paolicelli

EMBL Monterotondo deputy head Cornelius Gross with Elena Amendola

Mission to find a cure

Following a call from a mother who's daughter suffers from a rare form of Rett Syndrome, scientists in the Gross group at EMBL Monterotondo have developed a model for the disease

Emanuela deFranceschi, who also heads an Italian parents group that has been instrumental in getting research funding for this disorder, visited the lab to learn more about how research could give insight into the rare X chromosome-linked genetic disorder. The disease affects children (mostly girls) at a critical early stage in the body's development, often depriving them of vital skills such as the ability to talk and walk.

There is no cure for Rett Syndrome, but research indicates that early diagnosis can play a crucial role in improving outcomes. It is typically caused by a mutation on the MECP2 gene, however, a small fraction of children with the disease show early onset seizures, termed 'Atypical Rett'. Scientists have recently identified another gene, CDLK5, as missing in many such cases, but little is known about how this gene may contribute to the disease. This has resulted in misdiagnoses, with conditions such as epilepsy, autism or pervasive development disorder frequently blamed (as happened to Emanuela's daughter). This is a reality that Emanuela is determined to change through a collaboration of parents with children affected by the disease.

> "It is important for the parents to know that this rare condition has not been forgotten"
> *– Elena Amendola*

"Emanuela got in contact with us to ask us if we could generate a mouse model to better understand the molecular mechanisms that are involved in the pathway of the disease," explains Elena Amendola, a postdoc who is leading the research. "There are no drugs for this variant of Rett Syndrome."

The development of the animal model could change this. The International Foundation for CDKL5 Research awarded Elena its first grant in October 2010. One year on she has successfully developed a line of mice without the Cdkl5 gene. "It is a complex physiological system," she says. "We need the animal model to understand the role of Cdkl5 in the brain and why this disease develops in its absence."

The challenge now is to look for symptoms common to the disease such as seizures, motor behaviour deficits, decreased brain weight and respiratory problems such as apnea. Similar models removing the Mecp2 gene have produced promising results and some therapies. But the research is also important to maintain focus on a disease that scientists currently know so little about. "The parents know that the studies and any possible breakthroughs will require a lot of time," explains Elena. "But it is important for them to know that this rare condition has not been forgotten."

www.cdkl5.org

Sources of inspiration

Understanding rhythms: Four EMBL scientists joined 100 researchers at 'Roche Continents' (Federico Rossi, Mateusz Putyrski, Jens Kultima and Aditya Sankar)

Roche Continents is a unique one-week programme centred around exploring the common grounds of creativity between arts and science. Set in the hallowed confines of the annual Salzburg music festival, the gathering brought together students from areas as diverse as music, chemistry, theater, biology, philosophy, choreography, writing, composition and performance. It made me realise that the machinery of innovation is common to everyone but its source, utilisation and ways of fostering them are multiple.

Busy schedules of workshops, team events, and lectures were complemented by fascinating performances every evening. Living in the age when polymaths are nearing extinction, the Continents provided a platform where I witnessed musical genius in scientists, and objectivity and critical insight in artists.

One impression that I took away from the event is that all creative professionals are on a constant journey towards perfection, and Roche Continents is a fantastic initiative where you can meet fellow travellers on that path, experience and savour their company, and bring back a valuable, fresh perspective to keep pushing yourself further.

– Aditya Sankar

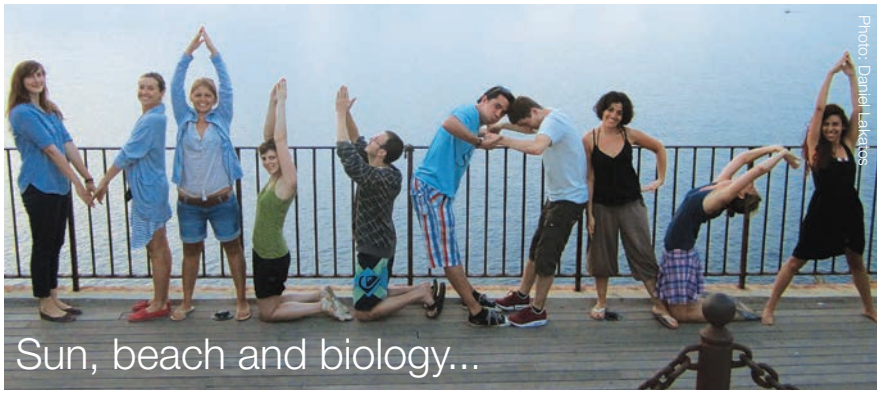


Photo: Daniel Lakatos

Sun, beach and biology...

These were the keynote features of the 2011 EMBL PhD retreat held in Mallorca 23–25 September. Almost 100 predocs enjoyed two-days of warm temperature and productive meetings and reunions. The programme included a set of research talks, on a broad range of subjects, including structural biology, genome analysis and cancer.

Interactive activities, organised by a team of predocs, focussed on the effective communication of biological results, with many in the audience both amused and surprised when contrasting the original research with how it had been presented. The meetings provided the opportunity to refresh relationships with EMBL colleagues from all EMBL sites and to discuss ideas relating to PhD projects and more.

During the evenings students took time to do some sightseeing and, as with light microscopy generated images, they searched for inspiration while wandering amongst the neon lights of Palma Bay reflected across the surface of the Mediterranean Sea.

– Sergio Martinez Cuesta


Photo: Christian Tischer

Postdoc Antonio Politi closely pursued by visiting scientist Dan Bucher

To boldly go...

For those whose idea of a relaxing weekend involves clambering down ice crevaces or up giant rock peaks, the second annual Alpine Club retreat provided the perfect getaway. Staying a two-hour treck away from civilisation in the Cabane d'Orny (2831m), the mountain hut nestled in the Mont Blanc massif became base camp for 10 (apprentice) EMBL mountaineers. Some, clad with crampons and ice-axes, went for a glacier hike in the company of a mountain guide, and there were some hesitant looks when he threw down a rope into the crevace for some ice climbing. Meanwhile, others successfully climbed the Aiguille de la Cabane, a 200m rock-peak overlooking the spectacular view down the valley. Activities over the weekend included hiking and swimming in a lake next to the glacier. The EMBL Alpine Club organises numerous activities, including hiking, climbing and ski touring. Join us and share our passion for mountains!
alpine_info@embl.de

– Laure Plantard and Pablo Rios

Tour de force

Administrative staff at EMBL Heidelberg crossed the road to get a taste of life in the lab recently, thanks to a series of tours organised by the Administrative Director's Office.

Each mini-tour, of no more than eight staff, includes an insight into a core facility, as well as the opportunity to see science in action with a guided tour of two labs. The latest tours included developmental biology, the Advanced Light Microscopy Core Facility, Director's research and genome biology.

"It's important to acquaint EMBL's administrators with the unique business we're supporting," explains Senior Project Officer and tour organiser, Anna Efstathiou. "The tours have had great feedback from both sides: participants are inspired by the passion of the scientists, while the guides value their colleagues' curiosity."

To find out more, please contact **anna.efstathiou@embl.de**.

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facebook

www.facebook.com/embl.org
Photo of the week: Happy European Day of Languages!

September 26 at 1:48pm

19 people like this

Nirupama R. Wow :) I see tamil and hindi!
September 26 at 6:12pm

Shirin M. and Farsi.
September 26 at 9:55pm · Like

Sonia N. Hehe, EMBL is too international to be confined to European languages only... ;)
September 27 at 11:52am

- From October, **EMBLEM will officially reopen it's EMBL presence office**, located in room V301 at the main laboratory in Heidelberg. In addition to prearranged meetings, the office will be staffed every Wednesday between 14:00–16:30. We look forward to welcoming all EMBL staff with questions relating to technology transfer during these hours, no prior appointment is required. For further information visit us at: **www.embl-em.de**
- Representatives from EMBL attended an **international summer school** on the Isle of Spetses: Nuclear Receptor Signalling in Physiology and Disease. The FEBS Advanced Lecture Course included diverse topics such as regulatory principles, structure-function relationships, genome technologies and developments in areas such as epigenetic profiling of human disease. "The course explored a number of recent advances in the field and encouraged collaborations between participants," says Claudio Alfieri, predoc in the Müller group at EMBL Heidelberg. "Beyond the scientific exchange, interesting discussions about careers were tackled during discussion sessions on the beach and in restaurants."
- **Tired of singing in the shower?** The EMBL choir is looking for singers to join our performance on December 8th at EMBL Heidelberg. Experience not necessary, anyone who likes to sing is welcome! Contact: **rohr@embl.de**.
- The **second P-CUBE user meeting** took place at the University of Zurich in September, with a number of presentations from EMBL scientists and users from across Europe. P-CUBE, an EU-funded project that supports access to cutting edge technologies in structural biology, brings together expertise in the field of protine expression and production technologies at the universities of Zurich and Oxford, and EMBL.
- **Wondering about the autumnal image on the front cover?** The image, by Andrew Carnie, zooms in on cells in a certain organ in the human body. The best description of what is happening in the picture posted on the EMBL Facebook page competition wins a stylish EMBL t-shirt. **www.facebook.com/embl.org**

Developing sequencing opportunities in Africa

EMBL-EBI's Bert Overduin was among 13 facilitators at the EMBO Global Exchange Lecture Course titled 'Next Generation Sequencing for Africa' held in Nairobi. Over 10 days, researchers and students from across Africa learned about the principles of Next Generation Sequencing (NGS) technologies, data analysis, applications and the limitations of NGS data. The course was aimed at empowering participants to take advantage of new sequencing technologies acquired by Biosciences Eastern and Central Africa, a center of excellence that provides research-related services and capacity building opportunities in the region. The event organisers included EMBL-EBI's Vicky Schneider, James Watson and Nelson Ndegwa, formerly a visiting student at the EBI

Participants had the opportunity to present their own research work, which created lively discussions. Four notable collaborations between the facilitators and participants resulted from the event. Course materials, including video lectures, will be shared through the Bioinformatics Training Network. **www.biotnet.org**

Row, row, your boat

Scientists in the Lemke lab at EMBL Heidelberg downed their pipettes for rowing oars as they took part in a charity regatta in the September sunshine. Although few in the group had any rowing experience, they took part in gruelling training sessions. And for predoc Swati Tyagi, the challenge was even greater: "In the rules it says that you have to be able to swim, but I could not – so I had to learn quickly!" she says. Research technician Christine Köhler points out that success, in part, came down to the teams' specially designed EMBL t-shirts. "They are very cool, we like the colours a lot," she says. The two teams raised more than 400 Euros for charity.

events@EMBL

1 November *EMBL-EBI*
EBI Open Day

4–5 November *EMBL Heidelberg*
Conference: 12th EMBO|EMBL Science and Society Conference: Making Sense of Mental Illness: Biology, Medicine and Society

8 November *Print Media Academy*
Heidelberg Forum: Great Ideas of Biology, Paul Nurse, Royal Society

9–11 November *EMBL-EBI*
ELLS LearningLAB: Better Biology with Bioinformatics

11 November *EMBL Heidelberg*
Science and Society: Borderless Crime and Family Matters, Barbara Prainsack, King's College London

14–18 November *EMBL-EBI*
EMBO Practical Course: Computational Structural Biology – from data to structure to function

16 November *EMBL Heidelberg*
EMBL Distinguished Visitor Lecture: Leroy Hood, Institute for Systems Biology, Seattle

17–19 November *EMBL Heidelberg*
Conference: 13th International EMBL PhD Symposium; The Rhythm of Life: Cycles in Biology

25 November *EMBL Heidelberg*
MMPU's 9th Open Research Day: Molecular medicine lectures

29 November – 1 December *EMBL–EBI*
Conference: Functional Genomics and Systems Biology 2011

1–3 December *EMBL Heidelberg*
EMBO Molecular Medicine Conference: Molecular Insights for Innovative Therapies

5 December *EMBL Heidelberg*
EMBL Symposium: The Use of Zinc Finger Nucleases for the Development of Next Generation Cell Lines and Animal Models

For more details about these events and more, visit **www.embl.org/events**.

people@EMBL

Lindsey Crosswell has joined EMBL-EBI as Head of External Relations. This role takes Lindsey across Europe to engage Government Ministries and Funding Bodies in the work of EBI and specifically with the ELIXIR project. She has extensive experience from her roles managing Government and Public Affairs for BP's exploration in sub-Saharan Africa and as Head of External Relations at Chatham House. Lindsey has an honours degree in French from the University of London.

Nina Papritz joins EMBL Heidelberg as personal assistant to the Associate Director Matthias Hentze. She brings with her 10 years' experience in project management and a degree in International Business Administration from the European Business School. Nina has spent the past 13 years studying and working in France, UK, Finland, Switzerland and Austria. Working at EMBL now offers her the best of both worlds: it means coming back home while still remaining in a multicultural environment.

Barry Whyte has joined EMBO as Head of Public Relations and Communications. Barry has spent more than 15 years working in life science communications in the United States and Europe. He has been responsible for the design and implementation of strategic communication programs for public and private sector enterprises, including not-for-profit research institutes and clients in the biotechnology industry. Barry holds Bachelor of Science and Ph.D. degrees in biochemistry from the University of Bristol.

Jean-Marie Bois retires

Beginning his career at EMBL Grenoble back in 1976**, Jean-Marie Bois** was one of the founder recruits at the outstation. He was in charge of scientific equipment maintenance and, in the early days, taking care of computing facilities. Over the years he contributed to important aspects of safety in the laboratory including the management of X-ray protection. Jean-Marie also served as an elected member of the Staff Association. After nearly 35 years of dedicated service, he now retires to spend time with his family and on his hobbies.

awards&honours

Chris Williams, a postdoc in the Wilmanns group at EMBL Hamburg, has been awarded first prize in a poster competition at the EMBO Conference 'Ubiquitin and ubiquitin-like modifiers: From functional modules to systems biology'. Chris's poster presented the crystal structure of an ubiquitin conjugating enzyme (E2) bound to a regulatory protein. Award criteria asked for posters to be clear, concise, well presented and attractive.

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