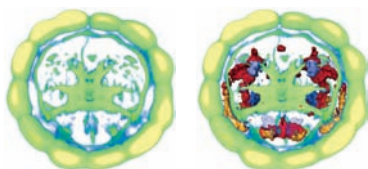


EMBL etcetera

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Thinking worms

The development of humans' higher thought processes might have a very ancient evolutionary origin, as recent work of Detlev Arendt's group suggests. Their research has found that brain structures in the unassuming marine ragworm *Platynereis dumerilii* are directly related to our own human brain.

EMBL scientists looked at deep regions of the ragworm's brain using a new technique called cellular profiling by image registration (PrImR). The discovery challenges the existing belief that such structures are only found in more evolved creatures. It means that the origins of the human cerebral cortex can now be traced back at least 600 million years.

The work appeared in the 2 September edition of *Cell* and was covered extensively by the international press, with reports by *Scientist*, *Scientific American*, *BBC Online* and many others.

See page 3



Young scientists win EIROforum prizes

The grand tour



New German ministerial governor visits EMBL Heidelberg, page 7

Science ahoy!

Giant waves, gale force winds and sleepless nights are just some of the challenges 15 scientists and crew are currently facing in the southern Atlantic onboard Tara, a 36-metre research schooner.

EMBL's own Steffi Kandels-Lewis is coordinating scientific logistics on the vessel and is responsible for getting samples from the expedition to 50 different laboratories the world over, together with other vital objectives. How does she manage it?

Find out more on page 5

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The science of fear

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Realising the construction of ELIXIR

Setting the pace

You could almost see the ideas floating in the air at Stromberg, Germany, on 15 and 16 September, as faculty from all EMBL sites met for their annual retreat.

“The striking thing is how quickly the technological toolbox has been expanding and diversifying over the past years.”

– Iain Mattaj, EMBL, Director General –

Presentations by the most recently appointed group leaders provided an

overview of their research interests and projects. These new arrivals have clearly taken the institute’s nature to heart, and are keen to take advantage of its unique environment: there was hardly a talk that didn’t mention collaborations, ongoing or planned, with other EMBL groups. And more will likely stem from the meeting itself, as this spirit spilled over into the coffee breaks and meal-times, which hosted animated discussions and side-meetings.

For all who took part, this was an excellent opportunity to discuss and get a feel

for the lab’s future tendencies, including the key concepts of the next EMBL programme, which EMBL’s Director-General, Iain Mattaj, summarised in his welcome address. “The striking thing”, Iain said, “is how quickly the technological toolbox has been expanding and diversifying over the past years.” Judging by the buzzing atmosphere of this retreat it is safe to say that, in terms of innovation and creativity, the EMBL faculty will certainly not be lagging behind.

– Sonia Furtado

Animated discussions took place between scientists of many disciplines during the coffee breaks and side-meetings



Flipping the fear switch

EMBL scientists discover the neural switch that controls fear

Fear is a series of chain reactions in the brain that can make you run, fight or glue you to the spot. EMBL scientists at Monterotondo have now identified a neural switch that controls fear and determines how mice respond to frightening stimuli.

In research published in *Neuron* on 25 August, the scientists say that learning how mice switch from passive to more active fear-coping strategies might be helpful for humans in adapting to the stress and unpredictability of modern life.

Led by Cornelius Gross in tandem with Angelo Bifone’s group at GlaxoSmith-Kline in Verona, the team used an innovative technique to control the activity of specific cells in the brains of mice that were experiencing fear. The mice were genetically engineered so that only these cells contained a chemical receptor for a specific drug. When they injected mice with that drug, it acted on the receptor and blocked the electrical activities of

those cells – allowing the researchers to find out how these cells are involved in controlling fear.

This technique was used to turn off a set of neurons, called type 1 cells, in the amygdala, a region of the brain known to be involved in responses to fear. To measure fear in mice, they trained them to associate a sound with an unpleasant shock: when the mice heard this sound, they would freeze.

“When we inhibited these neurons, I was not surprised to see that the mice stopped freezing because that is what the amygdala was thought to do. But we were very surprised when they did a lot of other things instead, like rearing and other risk-assessment behaviours,” says Cornelius. “It seemed that we were not blocking the fear, but just changing their responses from a passive to an active coping strategy. That is not at all what this part of the amygdala was thought to do.”

To find out what other parts of the brain were involved in these responses, the scientists used the functional magnetic resonance imaging (fMRI) scanning technique developed by Angelo’s team for use in mice. Together they found that the switch from passive to active fear was accompanied by activation of the cortex and that blocking this activation with the drug atropine could reinstate freezing behaviour and flip back the fear switch.

“This is a powerful demonstration of the ability of fMRI to resolve brain circuits involved in complex tasks, like processing of emotions and control of behavioural responses,” says Angelo, now at the Italian Institute of Technology.

The press release, which was also issued in Italian for the local press, was picked up by *Time magazine online*, which published the story under the headline ‘Understanding the frightened mind’.

Reach for the stars

Diva Tommei, predoctoral fellow in the Bertone Group at EMBL-EBI, spent her summer attending Singularity University's (SU's) three-month intensive Graduate Studies Program on the NASA campus at Moffet Field in Mountain View, at the heart of California's Silicon Valley.

Founded by Dr Ray Kurzweil, one of the world's leading inventors, thinkers and futurists, SU's mission is "to assemble, educate, and inspire leaders who understand and develop exponentially advancing technologies to address humanity's Grand Challenges."



Diva talks to fellow students, lecturers and luminaries from Silicon Valley about her SpaceBio Labs project

Diva, who was one of only 80 candidates selected from 1600 applicants, chose to take part in the To Boldly Stay team project, which focused on extending humanity's reach into the solar system. SU defines solar exploration as one of its Grand Challenges, along with sustainable water assets, food for cities, home energy use and upcycling waste products.

"Our challenge was to come up with a project that would affect one billion people in ten years using exponential technology," explains Diva. "I opted for the space project because, being on the NASA campus, we could take advantage of the infrastructure and benefit from researchers already working on space exploration."

Diva's team researched the possibility of bio-labs in space and the effects that long-term space stays would have on human physiology. Her faculty head for the project was Dan Barry, a physician and three-time astronaut with more than 700 hours spent in space.

"Attending SU this summer was the most amazing, intense experience of my life," she says. "I was happy to be able to educate people about my field of stem cell research, and also to learn so much from the other inspirational candidates who came from



Diva (far right, kneeling) visiting a NASA wind tunnel with her To Boldly Stay team members

35 different countries and from fields as diverse as literature, bio-tech, bio-informatics, medicine and business."

Diva will continue to work with a small group of colleagues on a bio-web application.

Worms with brainpower

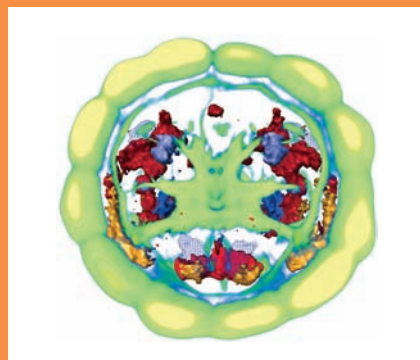
EMBL scientists have identified brain structures directly related to the human brain in a humble marine ragworm. This means we can now trace the origins of the human cerebral cortex back at least 600 million years, to when we last shared a common ancestor with this sea-dwelling invertebrate.

Detlev Arendt and Raju Tomer in Detlev's team at EMBL Heidelberg showed that the ragworm *Platynereis dumerilii* has a true counterpart of the cerebral cortex, or pallium, the part of the brain that makes humans capable of complex thought, language, music and many other skills. Their findings were published in *Cell* on 2 September and Detlev presented them to fellow scientists at the EMBO Meeting in Barcelona on 5 September.

The story caught the attention of the international press, from the Discovery Channel to *Scientific American* and BBC Online. EMBL released a German version of the press release alongside the cus-

tomary English one, and *Spektrum der Wissenschaft*, *Sciencexx* and the *Frankfurter Allgemeine Zeitung (FAZ)* all reported on the story.

"Two stunning conclusions emerge from this finding: first, the pallium is much older than anyone would have assumed, probably as old as higher animals themselves. Secondly we learn that it came out of 'the blue' – as an adaptation to early marine life," says Detlev who was interviewed by



German public radio Deutschlandfunk along with Raju.

To uncover the evolutionary origins of our brain, Raju developed a new technique, called cellular profiling by image registration (PrImR), which enables scientists to investigate a large number of genes in a compact brain and determine which are turned on simultaneously. He used the technique to take a deep look at regions of *Platynereis dumerilii*'s brains, called mushroom bodies, which are responsible for processing olfactory information.

"Comparing the molecular fingerprints of the developing ragworms' mushroom-bodies to existing information on the vertebrate pallium, it became clear that they are too similar to be of independent origin and must share a common evolutionary precursor," says Raju.

Detlev agrees, "The evolutionary history of our cerebral cortex has to be rewritten." Press coverage can be seen at www.embl.de/presscoverage.

Masters of their destiny

EMBL International PhD Programme (EIPP) Dean Helke Hillebrand participated in a master's open day in Helsinki in September, as part of a joint effort with the University of Helsinki and Sweden's Karolinska Institute to showcase to master's students what their PhD opportunities are once they graduate.

"Together with Erkki Raulo from Helsinki University and Matti Nikkola from Karolinska we developed the idea when we met in Helsinki earlier this year," says Helke. Last autumn a comparable event was held at Oslo University together with

EMBL's Norwegian partners of the Nordic Node Partnership.

"The day itself was very successful: we had a colourful mix of more than 60 students from various national backgrounds, who, during an informal get-together following the presentations, came to ask lots of questions about opportunities for further study.

"Students need to know that by applying to do their research at EMBL, they have a chance to go abroad while still remaining intensely connected with their home countries," says Helke.

EIPP Vital Statistics	
> 1000	applicants per year
500	students in total through EIPP since its inception in 1983
> 95	percent PhD completion success rate
80	nationalities represented in applicant pool
> 50	student intake per year
38	nationalities currently in the EIPP
10	percentage of EMBL alumni from EIPP



The lucky winners line up on the stage



Contestants enjoyed a varied programme



EIROforum prizes were presented by current EIROforum chair Dr Francesco Romanelli, Director General of EFDA-Jet

Young innovators in action

Reporting from Lisbon, *Marlene Rau* looks at the ideas on show at the 2010 European Union Contest for Young Scientists

Lisbon's Electricity Museum, located in a disused power station on the shores of the River Tejo was, for six days, buzzing with young people from across Europe and beyond, bringing along their scientific discoveries, enthusiasm, inventiveness and creativity. For them it was an opportunity to meet fellow science enthusiasts from 37 other countries, make friends and explore the world of science.

A total of 124 talented young scientists, aged 16 to 20, had come together to compete in the European Union Contest for Young Scientists 2010 (EUCYS) from 24–29 September. All of them first-prize winners of their national contests, they came to present a wide variety of projects, either individually or as a team.

The international jury had a tough decision to make in selecting the winners: topics ranged from ant ecology, nanotechnology and wastewater treatment through to curious ideas such as a gadget for identifying fraudulent drycleaners, algorithms for face recognition and an experiment look-

ing at whether internet addiction causes brain lesions. In the face of all this variety, the jury's task was to assess not only the projects, but also evaluate the students and the structure of their presentation. And that was no easy task.

Yet the fact that the winners shared EUR 51 500 in ten main prizes from the European Commission, plus four Portuguese prizes for health and energy projects of EUR 2500 each and 14 sponsored travel prizes to a range of scientific institutes and events – including seven one-week placements at the EIROforum organisations – meant that the most worthy projects were well rewarded.

Despite heated debates among the jury, the decision was made: the three first prizes went to Miroslav Rapcak and David Pegrimek from the Czech Republic, who computer-predicted a complete phase diagram of CO₂ nanoclusters; Márton Balassi and Dávid Horváth from Hungary, who developed an ecosystem simulation which can also be used for risk assessment; and Lukasz Sokolowski from Poland, who

studied the foraging strategy of the ant *Formica cinerea*.

An alternative set of awards was also given out at the final ceremony in 14 categories, including 'The Most Funny', 'The Most Enthusiastic' and 'The Most Portuguese' – which went to the Brazilian contestant. But above all, it was the contestants' scientific spirit that counted: "To meet other young scientists, to understand their projects and to share some ideas are our main goals during these days," as one participant put it wisely.

Of course even the most dedicated scientist needs an occasional break. The contestants took part in a varied programme, including quadrille dancing with costumed guides and satisfying their curiosity in the 'Explore' room, answering questions such as: 'can you touch a tornado?' and 'are all shadows just black and white?'

EUCYS is a great experience for everyone involved – and we're already looking forward to the 2011 edition in Helsinki, Finland.

Science on the high seas

EMBL's Steffi Kandels-Lewis tells *Charlotte Otter* how she embraces science on the open ocean



Steffi loading samples from Tara

On the first anniversary of her departure from France, Tara took to the waves on 5 September 2010 from Cape Town to sail across the Atlantic to Rio de Janeiro via Ascension Island. On board the 36-metre schooner are 15 scientists and crew whose job, as well as sailing the boat, is to take samples from the ocean to be shipped to 50 different laboratories around the world for analysis.

Getting these samples, which range from corals and zooplankton to RNA and DNA, from the boat to their destined labs is a potential logistics log-jam. The process is managed – with the help of countless spreadsheets, many cups of coffee and late nights – by scientific logistics coordinator Steffi Kandels-Lewis, who is based at EMBL Heidelberg.

Steffi, who is a molecular biologist by training, explains that her job is divided into two main parts: getting equipment that the scientists need onto the boat and getting the samples that they have gathered off the boat and flown around the world to the respective labs.

“I have to keep an overview of what they plan to sample, by speaking to all the coordinators in the various labs and by extracting information from the boat’s protocols. Once I know how many samples they plan to take, I know what equipment they need, from filters to chemicals to the right kind of vials. In order to be up-to-date with the current sample and material inventory, I stay in constant contact with the boat.”

Steffi must ensure that every sample is correctly packaged before they are flown around the world

Once Steffi has identified the materials required on board, she arranges for them to be shipped via courier to Tara’s next harbour. In parallel, she organises the collection of samples, a process that is delicate and complex given the sensitive nature of the samples themselves. Different kinds of samples require different kinds of storage and different kinds of shipping.

For example, DNA samples are stored in specific buffer and must be shipped on dry ice. Morphology samples are either fixed with formaldehyde, which means they can be shipped at room temperature, or paraformaldehyde, which means they must be shipped at -20°C . Nutrient, or seawater, samples are also stored at -20°C and shipped on dry ice. Some corals are bleached on board and shipped at room temperature, while others are fixed for genomic studies, kept in the freezer and shipped on dry ice.

When Tara docks, Steffi meets the boat, along with the courier company responsible for shipping sensitive materials. She en-

In her first year of exploration, Tara used:

15 000	membrane filter discs
10 500	plastic bottles (of various sizes)
7000	Cryovials
1200	glass bottles
60 l	of 37% formaldehyde
50 l	RNA Later
200 l	100% EtOH
10 l	Lugol
1.5 l	25% glutaraldehyde

... and 1800 kg of dry ice!

sures that every sample is correctly packaged. The courier company flies the samples to Frankfurt Airport. Steffi personally packages each sample for its respective lab. The samples are then driven to various labs in Europe and flown to labs in the USA.

Steffi’s job not only consists of managing shipments and spreadsheets; it also requires muscles. During her six weeks in South Africa, Tara underwent a refit at Simon’s Town, a naval base on the Cape Peninsula, before her big Atlantic crossing. Steffi unloaded everything off the boat and sent it for storage in Cape Town. Five weeks later, she inventoried every item and reloaded it onto Tara at her berth in Cape Town Harbour.

“I worked till midnight, loading those boxes back onto Tara,” she laughs.

Steffi’s job is also about communication, taking responsibility and attending to every detail. “It takes a week for a sample to get from Tara to the laboratory,” she smiles. “And there has never been a mistake – I make sure of that!”



Science in summer

Important research by EMBL scientists generated interesting news in August

In a study published in *Cell Metabolism* on 4 August, scientists in Matthias Hentze's group showed that a group of proteins called IRPs ensure iron balance in cells. Most organisms need iron to survive, and so do many individual cells. However, too much iron is toxic and can cause fatal organ failure.

The EMBL scientists demonstrated that IRPs are essential for cell survival. They maintain the iron balance, ensuring enough iron is available for mitochondria – the cell's energy factories – to function. "We have indications that this is probably a general process by which most cells control their iron content and secure mitochondrial iron sufficiency," said Matthias.

Bruno Galy, the staff scientist in Matthias' group who spearheaded the work, explained that in cells that cannot produce IRPs, the mechanisms for iron export and storage go into overdrive, while iron import is drastically reduced. This leads to iron shortage in the cells and mitochondrial malfunction.

In a second study, published in *Cell* on 6 August, Thomas Surrey's group revealed findings that help scientists to understand the fundamentals of cell division. "They show how molecules millionths of millimetres small can control the size of a structure about a thousand times larger than themselves," Thomas said.

His group uncovered the mechanism that keeps the overlap between microtubules emanating from each of the spindle poles constant during cell division. They found that a certain protein called PRC1 bundles together microtubules coming from opposite ends of the cell and attaches them to each other.

PRC1 then recruits a second protein, a molecular motor from the kinesin-4 subfamily, which controls the overlapping microtubules, preventing further growth at the ends once the overlap has reached a certain size. By protecting the overlap in a dynamic manner, these proteins ensure that the spindle itself does not collapse, thus ensuring normal cell division.

Old friends and a new look at the EMBO Meeting



Yusuf Akhter with the 'Poster of the Day'

EMBL was well represented as scientists flocked to Barcelona for this year's EMBO Meeting. Group leaders from Heidelberg and Monterotondo chaired

and gave talks to packed rooms, and EMBL PhD students and postdocs could be found networking, attending sessions and presenting posters. Among them was Yusuf Akhter, who was able to contact home-base in Hamburg with

"The new EMBL postcards, featuring scientific images and photos of the ATC, were greatly admired ..."

excellent news: "I've just told Matthias [Wilmanns] that our poster was selected as 'Poster of the Day' for Saturday," he proudly told us when he visited the EMBL stand.

The stand itself attracted compliments for its new, modernised look, and was abuzz with questions on all aspects of EMBL organisation and life. The new

EMBL postcards, featuring scientific images and photos of the ATC, were greatly admired, and questions about career opportunities abounded, with the EMBL Interdisciplinary Postdoctoral (EIPOD) programme raising the most interest. "We brought more EIPOD leaflets than last year, and we still ran out!" said Angela Michel, administrative officer in OIPA.

As you'd expect at a conference on molecular biology, many of the attendees were EMBL alumni, and came by the stand to reminisce, catch up with the latest news and reflect on the diverse topics covered at the Meeting. Vicky Schneider from the EBI took the opportunity to canvas opinions on whether to hold taster sessions for EBI resources, and on what topics, at next year's Meeting in Vienna.

EMBL Hamburg and EBI join hands

Thirty pre- and postdoc students from 15 different countries attended the first EMBO practical course, 'Computational Aspects of Protein Structure Determination and Analysis: from Data to Structure to Function', which was jointly run by EMBL-EBI and EMBL Hamburg.

The course, which took place in September and was held on the EBI campus, comprised talks on a number

of structure-determination techniques, including X-ray crystallography, SAXS, NMR spectroscopy, cryo-EM and practical hands-on sessions using a wide range of relevant data analysis packages and tools.

Rosemary Wilson, Hamburg's scientific training officer said: "It was important for us to make the students aware of the whole range of structural biology

techniques out there, the potentials and limitations of each and how they can complement each other."

James Watson, scientific training officer at EMBL-EBI, added: "The five days were very intense and I think everyone learnt a lot. For future courses we will aim to dedicate more time to each topic without losing the integrative and complementary aspect of the course."

A project of historical magnitude



EMBL Heidelberg in 1973

Scientists involved in the molecular biology revolution are aware of the transforming power of their discipline for society and history. Yet, the obsessive thrust towards future experiments has overshadowed the necessity to keep physical records of their discovery process, which is never as smooth as it appears in papers. In fact, unless somebody records it, the interesting twists and turns of a journey, and the

characters and ideas that helped along the way may never be known. The need to capture this wealth of information is even more immediate at EMBL, with its fast turnover of staff and rapid growth.

The EMBL alumni office and Association board are very aware of the gradual loss of valuable knowledge as they regularly come into contact with departing and former staff whose recollections of discoveries, facilities, events and people at EMBL are quite significant. These recollections and the photographs, notes and documents used to present them are not yet officially or centrally stored.

“Let’s not wait until memories have faded and papers be discarded at the end of a career before deciding to save our heritage.”

With this in mind the Chair of the Alumni Association board and CeMM Director, Giulio Superti-Furga, took great inspiration from Sydney Brenner and Richard J. Roberts who wrote in 2007 a seminal commentary in *Nature*, “Let’s not wait until memories have

faded and papers be discarded at the end of a career before deciding to save our heritage.”

At the 2010 reunion, Giulio announced that the Alumni Association is well connected to the community that has shaped EMBL from the beginning and is therefore well placed to begin an archival project that makes use of this large network of protagonists in EMBL’s history. The initiative was received with enthusiasm by all present and is supported by the EMBL Director General and other protagonists contacted so far.

To manage the initiative, a working group was formed which met in June to define the scope and potential of the project. This is a major undertaking, initially focusing on EMBL and its role in the history of European molecular biology. Its success relies heavily on good communication and extensive collaboration.

To this end, one of the most important tasks at this very initial stage of the project is to inform and involve EMBL, EMBO and their alumni, who will be contacted and invited to contribute at different stages of the project in 2011.

A penny or your thoughts...

This year we would like to invite the EMBL community (staff and alumni) to support two major initiatives through your pennies and/or time.

The John Kendrew Award remains the focus of the EMBL Alumni Association’s fundraising campaign, for which you donated EUR6000 last year bringing the total raised to EUR14 000 since the Award began in 2008 – thanks to the EMBL Pensioner’s Association. We are delighted with this achievement and are confident that with your support we can match and beat this record.

The Award aims to help former pre- and postdocs gain early recognition and opportunities within five years of leaving EMBL in pursuing challenging career paths, while also encouraging their efforts in science communication to the public. The winner serves as an ambas-

sador with the first task of presenting his/her post-EMBL success to current pre- and postdocs.

This Award symbolises what the EMBL Alumni Association stands for: supporting scientists in their careers, bringing together staff and alumni, and encouraging science communication. Furthermore, it has drawn attention to the Association’s services for the mutual benefit of staff and alumni. We hope that you recognise the value of this Award and support us in our efforts to secure it indefinitely. We will contact you in November with further information on how you can donate. In the meantime, you can find out about the award and its

donors at www.embl.org/kendrewaward.

Additionally, we invite you to donate your time and share your recollections in recording EMBL’s role in the history of European molecular biology (see above). We will write to you with specific details on how you can get involved at different stages of this project in 2011. In the meantime, we welcome volunteers and your feedback for this project.

– Giulio Superti-Furga



Photo: Hugo Neves

Romantics at heart

Heidelberg epitomises romance, from Café Knösel's famous praline to its fairytale castle overlooking the Neckar River. This August, two sets of EMBL alumni returned to the city to wed.

Congratulations to former Mattaj group visitor Colin Dingwall (an EMBL Alumni Association board member) and former Lamond group predoc Jacqueline Mer-moud who celebrated their Heidelberg wedding with numerous EMBL staff and alumni.

Congratulations also to Sabine Guth, former Valcarcel group predoc, and Clemens Gundel. Sabine now runs a lab at the Novartis Institute for Biomedical Research in Basel. We asked her about life after EMBL:

What were the biggest challenges when you moved from EMBL?

I felt isolated as the only one working on my topic and would have liked more people around to discuss results and ideas. Fortunately, Novartis now has an excellent postdoc programme, and there are many good seminars held in Basel and at Novartis itself. It's more difficult to collaborate with academic groups in industry, and it's a myth that we have unlimited funds!

Tell us about your current work.

My department focuses on musculoskeletal disease. I'm researching new orally available bone anabolic reagents to treat osteoporosis. I lead a large international and cross-functional team, and accompany projects from beginning to end. People don't realise how difficult it is to find new, safe and effective medicines, but I find it motivating to think that we could be making a difference to patients.

Do you have contact with EMBL staff or alumni?

I regularly visit my PhD supervisor Juan Valcarcel and his wife Fatima Gebauer in Barcelona. At their CRG labs I've met more former EMBL colleagues than back in Heidelberg! I'm also in touch with friends from my PhD year – though this is mainly social, apart from the odd scientific question.

What's life like in Basel?

Basel is a great city offering many museums and other cultural activities. In summer, people jump in the Rhine and swim with the current into the city centre; tourists are sometimes a little surprised to see people in bikinis and swimming costumes in the middle of Basel!



Sabine and Clemens on their wedding day in Heidelberg

We want to hear from you! Tell us about your personal or scientific achievements, an interesting event in which you are involved or give us feedback on alumni matters at alumni@embl.org.

Catching up in Barcelona



This year's EMBO Meeting, held in Barcelona in early September, provided an opportunity for nearly 30 current and former EMBL staff to catch up at the 6th annual gathering of the Iberian Chapter.

EMBL senior scientist Peer Bork kicked off the festivities with an energetic discussion of the latest EMBL news from the laboratory. He also

gave a quick overview of his current research projects.

Group Leaders and EMBL alumni Mayka Sanchez (Institute of Predictive and Personalized Medicine of Cancer), Lola Ledesma (Centro Biología Molecular Severo Ochoa) and Matthieu Louis (Center for Genomic Regulation), gave a glimpse into their highly creative

research projects, ranging from studying the role of sphingolipids in synapses to determining how flies distinguish odours.

Once the formal alumni session was over, participants were invited to continue catching up at the EMBO Meeting dinner reception.

This year's event was arranged by alumni Luis Serrano (Center for Genomic Regulation) and Sarah Sherwood (IRB Barcelona), who extend their thanks to everyone for coming, their institutes for funding refreshments, and EMBO for generously providing the venue and organisational help.

– Sarah Sherwood

Let's make it official



Bärbel Brumme-Bothe, the new head of the Life Sciences-Health Research department of the German Ministry for Education and Research, visited EMBL Heidelberg for the first time in late July. It was a chance for

her to acquaint herself with new scientific developments, meet senior scientists and see the ATC.

DG Iain Mattaj introduced Ms Brumme-Bothe to some of EMBL's latest research, while Hamburg outstation head Matthias Wilmanns updated her on the three new beamlines being built at the PETRA III synchrotron, for which the Ministry has provided significant financial support. Matthias explained the progress that has been made to date.

International Relations director Silke Schumacher briefed Ms Brumme-Bothe on projects being mapped out by the European Strategy Forum on Research Infrastructures (ESFRI). One of these is the ELIXIR project, a unique model for housing biomedical data across Europe. EMBL-EBI is coordinating ELIXIR, which is still in the

preparatory phase.

Ms Brumme-Bothe, who took up her new ministerial position in March, also had changes to report. Her department has officially moved to Berlin, whereas before it was split between the capital and Bonn. This means that new delegates will have to replace some of the present German delegates to EMBL Council, including Oda Keppler and financial adviser Paula Heppner.

After the updates, she lunched in the ATC's rooftop lounge with Iain, Matthias and Silke. Core Facilities director Christian Boulin, admin director Ralph Martens, EMBLEM deputy MD Martin Raditsch, EMBO Fellowship Programme deputy director Jan Taplick and EMBO Science and Society deputy director Gerlind Walton joined them. Ms Brumme-Bothe then visited DKFZ in downtown Heidelberg.

Warm welcome for new Council delegate



The new German delegate to the EMBL Council, Dr Jan Grapentin, took an introductory tour of EMBL Heidelberg in October.

Dr Grapentin, who is Head of Unit for life science research institutions within the German Ministry for Education and Research (BMBF), met with Director General Iain Mattaj and members of the Directorate before being given the grand tour of the site, including the ATC building and Core Facilities.

G'day Ms Evans!

Julia Evans, EMBL Australia Council Observer, gained valuable insight into EMBL research and culture during her first visit to EMBL Heidelberg in October.

Julia, who is General Manager of the Research Infrastructure Branch within the Australian Department of Innovation, Industry, Science and Research, visited as a representative of the Australian government, which became EMBL's first associate member state in 2008. The collaboration with EMBL is led by Monash University and involves the universities of Sydney, Queensland and Western Australia, and the Commonwealth

Scientific and Industrial Research Organisation (CSIRO).

After meeting members of the directorate, including DG Iain Mattaj, Julia was introduced to developmental biology group leader Marcus Heisler, who joined EMBL as part of the faculty development programme.

Julia learned more about the international PhD programme from Dean of Graduate Studies, Helke Hillebrand, before concluding her visit with a tour of the Core Facilities and ATC.

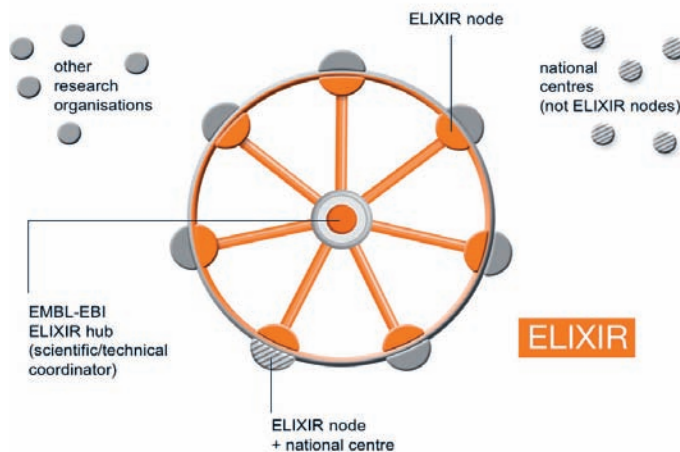


Summer at the ATC



The 30 participants of the RNZ Summer Tour were particularly impressed by the unique architecture of the ATC. For the third year running the local newspaper *Rhein-Neckar-Zeitung* organised an excursion to EMBL where their readers heard a talk by Beate Neumann called 'The cell – the basic unit of life'. The visit was rounded off by a wine and cheese reception in the rooftop lounge.

Realising the construction of ELIXIR



ELIXIR: scientific and technical structure

More than 70 funders and scientists, from 22 countries, got together at the Wellcome Trust Genome Campus on 11 and 12 October to discuss how ELIXIR – which will create a stable pan-European infrastructure for biological data – will be turned into a reality.

Life scientists are churning out data at previously unimaginable rates: next-generation sequencing machines, previously the domain of only a few major DNA sequencing centres, are rapidly becoming part of the biologist's essential toolkit, and other high-throughput technologies, such as new

methods for protein sequencing and imaging, may soon be in a similar position.

Since the beginnings of the EMBL data library in the early 1980s, biologists have relied on public databases to store, categorise and crosslink their data so that others can study it, compare it with similar information from other sources, and gain a better understanding of how living things work at the molecular level. It is easy to forget that these databases do not have elastic walls.

ELIXIR's plan is to share the task (and the cost) of looking after all this data throughout Europe. After a three-year consulta-

tion phase, ELIXIR's steering committee has agreed on a structure for ELIXIR that resembles a giant cartwheel, with the EBI at the hub and various nodes, spread throughout Europe, round the rim.

There have already been 53 expressions of interest for becoming an ELIXIR node from 23 countries. ELIXIR will set up a consortium of countries that are interested in joining now to develop a mechanism to decide which of these are best suited to Europe's needs for a stable biological data infrastructure, and then to work out how they'll be funded. The European Commission does not have significant funds for research infrastructures, so it is necessary to secure commitment from those national funders who realise the importance of biological data to the future economic prosperity of their countries, and are therefore willing to contribute to a pan-European effort. Brief reports from the funders present made it clear that some have already issued calls for national research infrastructures. In the words of Alf Game, chair of ELIXIR's funding work package, the next step is to form a 'coalition of the willing' to decide which nodes could ultimately form part of ELIXIR.

If your organisation is interested in becoming an ELIXIR node, suggestions are still being accepted. Please see www.elixir-europe.org for more information.

Variety is the spice of life's genetic blueprint

In September the EBI launched the Database of Genomic Variants archive (DGVA), a public archive of structural variation among genomes. DGVA makes it easier for researchers to understand how large-scale changes to the genome can affect our health. It also provides a platform for studying evolution and discovering which variations affect livestock productivity.

Large chunks of the genome differ between individuals of the same species – as a result of genetic insertions and deletions, for example – but the variation often has little or no apparent impact on the health of the organism. This discovery came as a complete shock to the scientific community in the mid-2000s, and has driven a plethora of studies into how structural changes to the genome affect an individual's characteristics (phenotype) and which changes are associated with disease.

Now, DGVA provides a much-needed, comprehensive catalogue of structural variation in the genome. The archive will exchange data with a companion database (dbVAR) at the National Center for Biotechnology Information (NCBI) in the US; both will benefit from

direct submissions from researchers. DGVA will link to the Ensembl genome browser as well as the EBI's search facility.

DGVA was developed by Paul Flicek's team at the EBI, together with the University of Toronto, and will be maintained in collaboration with the NCBI.

www.ebi.ac.uk/dgva

Accession	Genome	Variation Type	Variation Count
NA01	Human genome	Deletion	287
NA02	Human genome	Deletion	1425
NA03	Human genome	Deletion	1688
NA04	Human genome	Deletion	2062
NA05	Human genome	Deletion	155
NA06	Human genome	Deletion	2844
NA07	Human genome	Deletion	78
NA08	Human genome	Deletion	1025
NA09	Human genome	Deletion	791
NA10	Human genome	Deletion	200

Scientific 'speed dating' at postdoc symposium

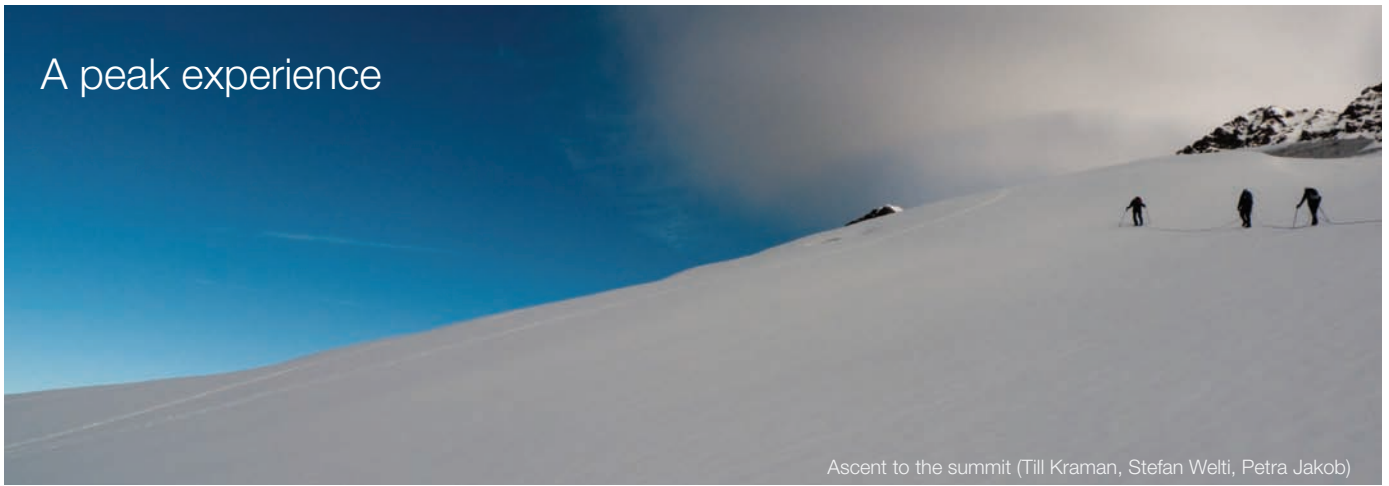
Imagine standing in a lecture theatre, face to face with someone you've never met before. A signal is given. You then have only six minutes to find out whether you have a future together – a scientific future, that is.

The EBI postdoc association, together with peers from other Cambridge-based research institutes, held a one-day symposium at the UK's Cancer Research Institute on 9 September and introduced a novel activity: a 'speed collaboration' game.

The players were 35 postdocs with diverse backgrounds and areas of interest. In a style similar to speed dating, the participants rotated between small groups and took turns discussing their research, seeking common ground with other postdocs.

The game was a fun and effective way to hear about many people's research, as well as a great way to socialise. We recommend giving speed collaboration a try: it may be just what you need to liven up your next scientific meeting!

A peak experience



Ascent to the summit (Till Kraman, Stefan Welti, Petra Jakob)

Loaded with crampons, pick-axes, ropes and other mountaineering equipment, nine intrepid members of the EMBL Alpine Club and their guide, Till Kraman, ventured onto the permanent ice of Switzerland's Upper Grindelwald glacier for three days in September.

According to Toby Mathieson, the 1000m ascent to the Gleckstein hut (2317m) on the first day "was very challenging" but worth it for the amazing scenery, including a close-up of the famous Eiger.

The second day began in total darkness as the team made a summit expedition to the Rosenegg peak (3470m). "It was an exhilarat-

ing feeling on top; definitely worth all the effort to get there!" says predoc Christoph Meyer. Postdoc Andreas Kaufmann agrees: "The tiredness was easily forgotten due to the excitement!"

On the last day, they ascended the Chrinenhorn (2737m) to enjoy the formidable panorama one last time before heading down and back to Heidelberg.

The EMBL Alpine Club offers numerous other activities, such as mountain-biking, hiking or climbing. To find out more, contact alpine_info@embl.de

– Constanze Kaiser



First glimpse of the glacier (Andreas Kaufmann)

'Road to the sun!'

This phrase was probably the leitmotiv of this year's PhD retreat organisers, who brought some 100 EMBL PhD students to Portovenere in Liguria, Italy – a UNESCO World Heritage Site and a perfect example of harmony between humans and nature.

12 predocs had the difficult task of keeping the audience attentive while presenting their work. In this mission they were helped by jellyfish playing the role of coastguard and preventing any distracted attendees from taking a swim in the sea.

The selected speakers came from all outstations. They all managed to give impressive talks and in return got valuable feedback and advice on their work. Beside scientific sessions, walks along the coast allowed students to meet, mingle and make new friends. Maybe the retreat also helped to start new collaborations...

– Christopher Amourda



Photo: Federico Maria Rossi

O'zapft is!

Octoberfest, EMBL-style, saw scientists, staff, alumni and friends enjoy live music, German 'fest' food and traditional Bavarian games at EMBL Heidelberg.



Complexity: a guided tour

Leading complex systems scientist Melanie Mitchell reveals to *Karin Celius* the intimate links between computer programs and ideas of life and intelligence

How do consciousness, reasoning, creativity and emotions arise from single brain cells and their electrical and chemical interactions? Can this complex and adaptive behaviour be explained by general and basic principles? And can we get machines to become intelligent and lifelike using those same principles?

Melanie Mitchell, a professor of Computer Science at Portland State University, has always been interested in understanding how people think. Realising that it was impossible to understand the rise of intelligence or consciousness at the level of individual neurons, synapses and

the like, she entered the world of complex systems.

In nature and society we see many examples of huge numbers of simple elements interacting with no central control, yet collectively producing sophisticated adaptive behaviour far beyond the ability of any single or small group of component elements. Examples include the brain, insect colonies, the internet, the world wide web, economic markets, and human social networks. The science behind these networks and its various applications is significant for artificial intelligence (AI) researchers like Melanie.



Insect colonies are an example of huge numbers of simple elements interacting with no central control

Melanie feels that the idea of computation goes far beyond operating systems, programming languages or databases. She believes that computer programs are intimately linked to the ideas of life and intelligence. At present, Melanie's research involves looking at how people make analogies.

"People are good at seeing similarities between things," Melanie explains. "Computers are more literal-minded. I am interested in getting computers to make image analogies. At present, no computer programme can do that very well because existing image search programmes focus on text and not on the actual image." Her current line of work,



Melanie Mitchell

using computer vision, aims to get computers to understand images and video, something that AI has been working on for 50 years or so.

"AI brings with it so many interesting, open questions and so much public interest that I think it will continue to grow."

"AI brings with it so many interesting, open questions and so much public interest that I think it will continue to grow," Melanie says. Her recent publication *Complexity: a Guided Tour*, which she introduced during a Science and Society forum lecture at EMBL Heidelberg, does a wonderful job of explaining complex systems and their applications.

"Besides continuing my research in the area of AI, I would like to continue writing books about science for non-scientists," Melanie says. "In particular, a book about the current state and future prospects of the whole field of artificial intelligence would be interesting. This would be a fairly big and long-term project!"

awards&honours

Janet Thornton, Director of the EBI, has been recognised in The Times newspaper's 'Eureka 100', a list of the most important people in British science. The list comprises individuals who push the boundaries of scientific understanding and transform our lives through innovation.

Associate Director **Matthias Hentze** has been appointed honorary faculty member of the Victor Chang Cardiac Research

Institute (VCCRI) in Sydney, Australia, from 1 August 2010. The VCCRI is an independent biomedical research institute committed to excellence in research into heart disease and cardiovascular biology.

Postdoc **Elena Amendola**, of the Gross group in EMBL Monterotondo, has been awarded a grant from the International Foundation for CDKL5 Research (IFCR). This is the first grant bestowed by the

IFCR, which was formed in 2009 to fund global research into CDKL5, a rare X chromosome-linked genetic disorder.

Daniela Casarrubea, a predoc in the Hentze group, has been awarded the prize for the best scientific poster at the European Iron Club meeting in Nijmegen, The Netherlands. Daniela is researching a new model for understanding iron metabolism disorders.

⇒ The progress of the innovative **Reflect project**, an automated document management service being developed in the Schneider group at EMBL Heidelberg, has been assisted by the work of intern Kaur Alasoo. Kaur developed automatic links to Wikipedia from protein and chemical names on websites, enabling non-scientists to better understand online content.

⇒ A **fire alarm** triggered by 'smoke' in the main lab at EMBL-Heidelberg provided a test for the campus' 150-strong team of fire wardens.



Firemen also 'rescued' two brave ladies through the window of the sixth-floor as part of the planned fire drill. The Health and Safety Office and Building Maintenance

would like to thank everyone involved for their participation and commitment.

⇒ EMBL's HR department has revamped its **Training and Development (T&D) website**, making it more user-friendly and easier to navigate. Visitors can now see which courses are running and link to a description, as well as research training opportunities based on their own development path. Head of HR, Ulla Böhme, explains: "Staff can decide where they are on the career ladder, select the appropriate path and see the courses relevant to them." EMBL staff can also request courses by contacting Louise Carling or emailing td@embl.de. Browse the new-look website at intranet.embl.de/general_training

⇒ Brochures flew off the EMBL stand at the **Naturejobs event** (formerly Source) in London. Staff met young scientists interested in joining the collaborative and interdisciplinary environment provided by EMBL's PhD and postdoc programmes

(EIPP and EIPOD). It was also an opportunity for ambitious young people to learn about the advantages of using Quest, EMBL's online recruitment system.

⇒ Registration is now open for the following **EBI hands-on bioinformatics training course** to help you make the most of your data: 'Small Molecule Bioactivity Resources at the EBI' will be held from 14–18 February 2011 (registration deadline 14 January 2011). See www.ebi.ac.uk/training/hands-on to register and for programme details on courses to be held in 2011.

⇒ In early October, the new high-end **Titan Krios™ microscope** arrived at EMBL Heidelberg. The state-of-the-art microscope is the latest addition to the experimental facilities of the Structural and Computational Biology Unit, jointly led by Christoph Müller and Peer Bork. It will enhance EMBL's cryo-EM research potential, benefiting the work of the Briggs, Sachse and Beck groups and their collaborators.

First beam at EMBL@PETRA3

Following three-and-a-half-years of development, EMBL Hamburg has seen the first beams in its BioSAXS and MX beamlines that take X-rays from PETRA III, the high-brilliance synchrotron radiation source on the DESY site in Hamburg.

The first beam was successfully guided into the SAXS beamline on 15 July following a series of steps and tests in the weeks leading up to the milestone. On 17 September, the first beam was then also achieved on the MX2 beamline (see picture).

Stefan Fiedler, leader of the Instrumentation Team at EMBL Hamburg praised the quick progress made in successfully aligning the beamlines. "These last few weeks have proven that not only do we have a fine radiation source, but our equipment fulfils its functions and the parts of the complex optical system are working correctly together – that is, of course, great news," Stefan said.

The first users to benefit from the facility are expected at the BioSAXS beamline before the end of the year. In the near

future, they will be able to take advantage of the integrated EMBL facilities available for structural biology in the new PETRA III annex building. Key aspects of research – from high-throughput protein crystallisation to sample preparation and data processing – can be carried out under one roof, with synchrotron data collection and the evaluation of the data in terms of structural models enabling advancements in key areas of structural biology.

"After the long phase of preparation and planning, it is very exciting to finally see things coming together and the beamlines and the integrated facility surrounding it taking shape," said Thomas Schneider, coordinator of the EMBL@PETRA3 project.

The Hamburg team expects first beam on the third beamline (MX1) to be achieved before Christmas of this year. In parallel,

the team is working hard to install the components necessary for guiding the beam to the sample position so that first experiments with samples can be done.



A glimpse of a brilliant future: First beam on EMBL's MX2 beamline on Petra III.

Events

5-6 November EMBL Heidelberg

Conference: 11th EMBL/EMBO Science and Society Conference The Difference between the Sexes – from Biology to Behaviour

4-5 November EMBL-EBI Hinxton

Course: Genome and Protein Functional Annotation with InterPro (IMPACT) 2010

13-16 November EMBL Heidelberg

Course: Targeted Genome Editing using Zinc Finger Nucleases

13-16 November EMBL Heidelberg

EMBO Conference Series: From Functional Genomics to Systems Biology

22-25 November EMBL Heidelberg

Winter Council Meeting 2010

23 November EMBL Heidelberg

Meet Your Council Delegate Over Lunch

24-25 November EMBL Heidelberg

Course: Microinjection into Adherent Cells

26 November BioQuant Heidelberg

Perspectives for Translational Medicine in Heidelberg: The MMPU contributes to the 625 year celebrations of Heidelberg University by organizing a special one day event.

1-2 December EMBL Grenoble

Heads of Units and Senior Scientists Meeting

7 December EMBL Heidelberg

Course: Microinjection Techniques in Developmental Biology

12-18 December EMBL-EBI Hinxton

EBI/Wellcome Trust Workshop: Proteomics Bioinformatics

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

people@EMBL



John Marioni is a new a group leader in the area of computational and evolutionary biology at the EBI. John completed his PhD in the Computational Biology group at Cambridge University. Before joining EBI, he was a postdoc in the University of Chicago's Department of Genetics.



Martin Jechlinger is a new group leader at EMBL Monterotondo. He gained his PhD at the University of Vienna from where he went on to studying relapses of cancer in New York. He is working on oncogene dependence using a conditional breast cancer mouse model from which he derives primary cells for a 3D in vitro approach.



Kiran Patil has joined EMBL Heidelberg as group leader in Structural and Computational Biology. Previously, Kiran spent seven years at the Technical University of Denmark, first as a PhD student and then as assistant professor.



Bruno D'Orazio has joined EMBL Heidelberg as the new head of the Scientific Equipment Maintenance Service Bruno is no stranger to EMBL, having worked in the electronic workshop from 1985 to 1990. For the past 20 years he worked for Merck Sharp & Dohme in Rome.



Pia Schreiner has joined EMBL's human resources department. She has a Psychology degree from the Johannes Gutenberg University in Mainz and several years' experience in HR management in international environments. Before joining EMBL, Pia worked at Benteler Automotive for six years.



Mary Todd Bergman takes over Louisa Wood's responsibilities as a project leader on the EBI's Outreach Programme. Formerly a science writer, producing communications materials for the European Commission in Brussels, Mary will be handling EBI publications, press releases and other outreach activities.



George Zarkadakis joins the EBI's Outreach Programme as external relations officer. George has a doctorate in artificial intelligence and a professional background in IT, science communications and publishing; he launched popular science magazine, *Focus*, in Greece in 2000.



Chloë Balharry joins EMBL Heidelberg as communications officer following a similar role at Southampton Solent University. She will focus on corporate publications and online media. She looks forward to communicating and promoting the work of the EMBL community, exploring Germany and learning the art of ceramics.



Adam Gristwood joins EMBL Heidelberg as communications officer. He previously worked as senior editor for *Public Service Review* and now takes on the role of editor of *EMBL&cetera*, as well as working on other key EMBL publications. He looks forward to embracing life at EMBL, starting with the alpine club.

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