EMBL &cetera

11

July 2002

Newsletter of the European Molecular Biology Laboratory
published by the Office of Information and Public Affairs

Outstations to play key role in integrated projects

Grenoble and Hamburg are set to participate in a structural genomics initiative called SPINE, and Monterotondo will play a leading role in a large integrated project called EUMORPHIA which will take a functional genomics approach to the mouse. Both are being funded under the EC's integrated projects for functional genomics, one of the last major activities of Framework Programme 5. The ARP/wARP team at the Hamburg Outstation is also receiving support as part of an NIH-backed structural genomics initiative.

page 2

Healthy turnout for EBI's first database day

The EBI held a "Database Day" and barbeque on June 17. 150 people, mostly EBI staff, got together to exchange information and ideas about the growing number of databases and services offered by the EBI. Cath Brooksbank summarizes what was said in a report on the meeting.

page 4

Register now!

EMBL/EMBO Conference
on Science & Society
8-9 November, 2002, Heidelberg

Infectious Diseases: Challenges, Threats, and Responsibilities

www.embl.de/Conferences/SciSoc02

Quantum mechanics and the World Cup

Did you know that most of history's greatest physicists have been foaming-at-the-mouth football fanatics? That most of their discoveries were made while watching the World Cup? Wilford Terris, our correspondant from the outskirts of Rome, gives us the whole story in this issue's column, *from the sister sciences*.

page 12

It's blue: Annual Report 2001-2002

EMBL's latest annual report appeared in time for the summer Council meeting and is now available from the Office of Information and Public Affairs in Heidelberg. To get your copy, come by the office at v328 or check the website at www.embl.de/ExternalInfo/oipa/.

Summer fun at the EMBL-Staff Association party

Bouncing in castles, riding bulls and dancing in the dark. That's what EMBL was up to on Saturday, June 8, at the annual summer party organized by the Staff Association at the main Laboratory in Heidelberg. We'll give you a glimpse of the fun on page 13.

page 13

Contents

ARP/wARP accelerates at Hamburg thanks to boost from the NIH

The ARP/wARP project at the Hamburg Outstation has just been awarded a grant from the NIH which will provide $700,000 over the next four years to further develop the software.

ARP/wARP was designed by Victor Lamzin in Hamburg and Anastassis Perrakis, at the National Cancer Institute (NKI) in Amsterdam and formerly of the Grenoble Outstation. First released in 1998, the software automates the process of building molecular structures from X-ray diffraction patterns. It is being used in over seven hundred laboratories throughout the world.

Creating a new structure depends on relating data from a new molecule to an extremely accurate, pre-existing model. "For protein crystals that diffract to two angstroms or lower, which today is a normal modest resolution, this is a tedious and time-consuming process, Victor says. "It requries building a model that is often subjective and relies heavily on a great deal of experience on the part of the user. A few years ago it took Peter Metcalf half a year to refine a structure. It now takes ARP/wARP half an hour to do that same job."

Improvements in the technology surrounding crystallography have opened the field to many more users; researchers with less experience are coming to the beamlines with their protein crystals. And structural genomics initiatives hope to dramatically increase the number of structures that will be solved in the next few years. The NIH and the European Union are backing these efforts with significant amounts of funding. EMBL's Outstations in Hamburg (at DESY) and in Grenoble (at the ESRF), as well as research groups at the NKI, recently received grants to participate in an EC-funded project called SPINE. Shortcuts and automated approaches such as ARP/wARP will be a necessary component of high-throughput work at the beamlines.

"We currently have a relatively redundant collection of about 17,000 structures in the protein databases," says Charles Edmonds, Programme Administrator at the National Institutes of General Medical Sciences; Edmonds is responsible for a portfolio of grants funded by the NIGMS for technology development to support the Protein Structure Initiative (see www.nigms.nih.gov/funding/psi.html). "Our goal is to collect 10,000 more non-redundant structures over the next ten years, with a focus on filling out the catalogue of known protein structure families. Currently we are putting an emphasis on the development of technical approaches, and in about three years we plan to move more to a production phase."

The proposal to continue ARP/wARP's development received what Edmonds calls "resounding success" in peer review. "It's an example of investigators who have initiated really original research in areas that we think are unique and important," he says. "This was obviously critical in securing NIH funding for a project that doesn't include any American researchers."

Lamzin and Perrakis plan to refine and extend the capabilities of the software. They plan to improve ARP/wARP's ability to deal with structural information at lower resolutions but also to make it easier to use by non-experts. About half of the structures that are currently determined lie between 2.2 to 2.3 Angstroms in resolution.

About two-thirds of existing protein structures have been determined to a resolution of around 2.3 Å or higher. At this level, the individual atoms that make up the structure can be distinguished fairly well from one another. "At that resolution," Lamzin says, "ARP/wARP can deal with the experimental data very well. Thus ARP/wARP can be used on about two-thirds of the structures that are currently being produced. What we want to achieve is to push the software requirements to the limits – down to a resolution of 2.7 Angstroms, maybe even 3.0. This will capture at least nine out of ten of the structures submitted to the protein data bank."

– Russ Hodge

Come celebrate Hamburg's Groundbreaking Ceremony on August 20, 2002!

The Hamburg Outstation at DESY is expanding to create a high-throughput crystallization facility and to give adequate space for our structural genomics activities. All EMBL staff and alumni are invited to take part in the groundbreaking festivities. Check the Hamburg homepage soon for details.

– Matthias Wilmanns

French Academy of Sciences honors EMBL Director-General and alumnus

EMBL Director General Fotis C. Kafatos has been elected as a foreign associate of the French Academy of Sciences, in the field of "Animal and Plant Biology." In awarding this prestigious honor, the Academy states: "The work of Fotis Kafatos has relevance for different domains of integrative biology, notably zoology, physiology, ecology, evolution and development, and most recently, parasitology. He has played a pioneering role in the development of new concepts and tools in the areas of developmental biology, physiology, genetic regulation, and the evolution of complex organisms. He was one of the first to introduce molecular biology into the field of development, and made a major discovery in the field of gene expression during development in a complex organism. In addition, he has played a pioneering role in the introduction of genetics, genomics, and cellular biology into the study of the major vector of malaria. Fotis Kafatos is one of the most respected international biologists due to his contributions in integrative biology. He has served as an advisor to several French ministers of Research and Higher Education." Fotis received his award at a ceremony at the Academy in June

In a separate award, Fotis was also conferred a *Docteur Honoris Causa* by the Université Louis Pasteur in Strasbourg in March.

EMBL Alumnus Riccardo Cortese, who led the Gene Expression Programme during the 1980s, was also named as a Foreign Associate to the French Academy of Sciences this year. The Academy cited his numerous accomplishments, particularly in biomedically-relevant applied sciences. He left EMBL to found and direct the IRBM (Istituto di Ricerche di Biologia Molecolare) in Pomezia, near Rome.

Grenoble and Hamburg join structural protemics integrated project

SPINE, which stands for Structural Proteomics in Europe, is a Europe-wide consortium for structural genomics put together under the EC Framework 5 call for proposals for integrated projects in functional genomics. It groups together about 15 laboratories all over Europe in an ambitious programme, not only to bring Europe up to American and Japanese standards in technology for high-throughput structure determination, but also to use those technologies to determine structures of proteins relevant to human health. The contract will start on October 1, 2002. The total amount of money is 13.7 million Euros for three years. The basic structure is a series of nodes; one of which consists of the EMBL Outstation and the ESRF. Our job is to develop instrumentation for synchrotron radiation for high-throughput structure determination; the programme will also help us to establish our own infrastructures for protein production and crystallization, which we will then apply to problems of human health. The whole project is co-ordinated by David Stuart in Oxford and there are other nodes, for instance in York, the Weizmann Institute, Strasbourg, Stockholm, Munich and Marseille. This links very well with the plan we have in Grenoble to develop the site for structural genomics work.

Hamburg is also a node in the SPINE project. In addition to participating from the synchrotron radiation point of view, they have collaborating groups in protein technologies, such as with the Odensee group of EMBL alumnus Matthias Mann, in mass spectrometry. The EBI is also included because bioinformatics has a very important role to play in structural genomics. They will combine bioinformatics related to target selection with the dissemination of results, setting up websites and integrating all the data that will come out.

This will bolster current activities locally, and the whole network will coordinate methods and synchrotron usage across Europe. Users should find similar equipment in different places. A big part of the network is to make sure that good practices spread.

It will help things like our automatic crystal sample changer; high-throughput structure determination means getting samples efficiently through the system and automating and robotising everywhere that you can: all the way from gene cloning to the crystal data collection.

It also fits in locally with developments we have been planning in Grenoble: basically, to make the Grenoble site a European focus for structural genomics. We have Europe's best synchrotron at the moment and it will naturally be a focus for data collection. We want to extend that by building two more beamlines for the purposes of high-throughput structure determination, and additionally to establish protein production and crystallization facilities so that we have the whole pipeline of activities on the site. Currently no single institute in Grenoble has the resources to do this themselves, so we're coming together in what's called the Partnership for Structural Biology, or PSB. This now includes the ESRF, the EMBL, the ILL – those are the international institutes. It also includes the nearby French Institut de Biologie Structurale (IBS). Each institute will contribute some money to help construct a new building adjacent to the Grenoble Outstation; this will house infrastructures for protein production and crystallization. We are very pleased that the French CNRS has agreed to contribute to this development on the common site via the vehicle of the IBS.

There are two aspects to the PSB: one is the development of infrastructures for high-throughput structure determination, including building the two new beamlines, bringing the total of ESRF beamlines dedicated to protein crystallography to seven. The first of the two new beamlines should be available at the end of 2003 and the second one a year later. Secondly, EMBL with the IBS will set up the infrastructure for protein production and crystallization facilities. The third infrastructure of the PSB is to set up a deuteration facility – devoted to the labeling of proteins with deuterium, heavy hydrogen. This is of particular use for neutron scattering which is, of course, what's done at the ILL.

The scientific programme of the PSB will involve each institute's in-house interests, but the common projects will be based around the EU structural proteomics project. We will target viral proteins, mainly the Epstein-Barr Virus proteins, also human proteins and bacterial targets that are interesting for drug design purposes or understanding disease.

– Stephen Cusack

Briefing on the EMBL Council meeting, summer 2002

EMBL Council held its annual summer meeting in July in Heidelberg. Themes discussed were the ongoing Scientific Programme; the recruitment of a number of senior scientific and administrative personnel, as well as other faculty; the development of core facilities; structural genomics initiatives at EMBL; and the need for a new building at the EBI. Other topics included partnership agreements with European institutions, Science and Society, Outreach Activities, and OIPA publications. Council also approved an important Partnership Agreement linking EMBL-Grenoble with the ESRF, ILL and Institut de Biologie Structurelle (see SPINE story above).

The Finance Committee approved the introduction of a salary scale for Grade 1 and confirmed authority for EMBL's taking a loan to cover the implementation of ILOAT Judgments. Approval was given for the cost-variation index to incorporate the recurrent cost of the ILO-mandated salary increases in the future baseline. The Committee also discussed personnel figures and the ongoing review of staff rules and regulations (Staff Association article, page 8). Salary and Pension adjustments were approved. The Committee and Council accepted proposed increases for Germany, and then used them according to standard procedures, to make adjustments for the other duty-station countries, and to restore purchasing power parity (a matter to which Council, Management and the Staff Association are firmly committed).

The resulting 2002 salaries and allowances will now include the following adjustments, effective July 1, 2002: France 4.2%; Germany, 4.9%; Italy, 2.9%, UK, 2.4%. In compliance with EMBL Pension Scheme Rules Article 36, pensions will be adjusted by the consumer price index (France, 2.1%, Germany, 3.1%; UK, 2.0%).

More information on the Council meeting can be found at www.embl.de/info/dg110702.html.

From proliferation to integration: the EBI Database Day

Visitors to the EBI will find that it's growing — both in personnel and the number of databases and services it provides. Around 150 members of the EBI staff got together on database day, June 17, not only to keep each other up-to-date on what's going on, but also to discuss future developments. How are we serving biologists now, and what will we be doing differently in the future?

Genes to genomes

'In the beginning', explained Günter Stösser, 'Was the EMBL data library'. The first ever nucleotide sequence database, now known as EMBL-Bank, incorporates, organizes and distributes DNA and RNA sequence information — from small fragments of genes to whole genomes. The three public databases of its kind (GenBank in the USA and DDB in Japan) exchange data on a daily basis. Data come from three main sources: submissions from individual scientists, the genome projects, and the European Patent Office. Whole genomes are making an increasingly important contribution to EMBL-Bank's content, and new tools for assembling and representing them are under development.

EMBL-Bank is a 'primary' sequence database: the authors own the data and modifications and updates to their database entry have to be authorized by the original submitters. By contrast, ENSEMBL, discussed by Ewan Birney, is a secondary database that takes genome sequence information from EMBL-Bank and adds comprehensive, computer-generated annotation.

ENSEMBL's purpose is to make available complete (or near complete) metazoan genomes along with consistent and comprehesive information on genes and gene functions, predicted by computer methods. It allows molecular biologists to make the most of genomic information without needing specialized bioinformatics knowledge. For example, researchers can make queries such as 'find me all the protein kinases in the mouse genome that are linked to a human disease,' and ENSEMBL will export them into a spreadsheet. Improvements to ENSEMBL's gene-prediction algorithms are constantly being made and quality-controlled: a recent comparison with manual gene prediction revealed ENSEMBL's automated method to be 75–90% accurate. Another feature of ENSEMBL is its portability: users can download the ENSEMBL software, populate it with their own data and analyse it remotely.

There are several efforts across the globe to collect information on human sequence variation, particularly single nucleotide polymorphisms (SNPs). But although millions of SNPs have already been collected, Heikki Lehväslaiho explained that less than 4% of them have been verified to exist in human samples. Heikki is working with the ENSEMBL team to build SNP information into ENSEMBL, and with the Human Genome Variation Society to develop a standardized way of representing SNPs and publishing new SNP information online.

Express yourself

Microarrays are now generating vast amounts of data on gene expression, creating the need for a repository for this information. Alvis Brazma's microarray informatics group has now developed a database, ArrayExpress, to store it. ArrayExpress accepts three different types of submissions: experiments, array designs, and protocols, and a data submission tool called MIAMExpress allows users to submit all three types of data. Data query and analysis tools are being developed, but in the meantime the group is working on populating the database. In the future, the group is hoping to integrate ArrayExpress with other databases, and perhaps — when there's sufficient data out there — develop a database on top of ArrayExpress that describes which genes are expressed in different cell types.

Preparing for the proteomics revolution

As we move from cataloguing sequences to finding the functions of every cellular protein, protein databases are becoming increasingly essential. The EBI hosts two protein sequence databases, SWISS-PROT and TrEMBL. Maria Jesus Martin explained that TrEMBL is mainly populated by automatically translated sequences from coding sequences in EMBLBank. TrEMBL is the feeder database for SWISS-PROT, whose curators add information on protein function, post-translational modifications, the protein's domain structure, and any disease associations, for example. This high level of annotation, which makes SWISS-PROT the 'gold standard' of protein databases, has slowed its growth rate. Improvements to the automatic annotation in TrEMBL make it more useful by bringing it closer in quality to SWISS-PROT, as well as diminishing the manual annotation required to bring a TrEMBL entry to SWISS-PROT standard. Despite the benefits of automation, all TrEMBL annotation is submitted to a 'sanity check' by a curator before being released. Automatic annotation procedures have been developed to enhance the annotation of complete proteomes — about 25% of TrEMBL entries.

Nicky Mulder described InterPro, an integrated resource of protein families, domains and functional sites. InterPro takes all the major databases that recognize diagnostic signatures in related proteins, finds all the overlapping signatures, and puts them in a manually curated single entry. It is highly linked to the other databases and makes use of terms from the Gene Ontology database (GO, see below). Future plans include extending InterPro to include three-dimensional structure information.

From sequence to structure

Kim Henrick described some of the challenges that the molecular structure database, MSD, is overcoming. MSD is a primary database with additional, derived information: the MSD team collaborates with the US-based Research Collaboratory for Structural Bioinformatics (RCSB) consortium, which maintains the Protein DataBank (PDB), to ensure that there is a single, internally consistent resource for protein structures. MSD contains information on the experimental protocols used to determine a protein structure, as well as the structural data itself. One aim is to produce meaningful three-dimensional models of homologous proteins of unknown structure. Other areas of development include new tools for searching the database and for doing structural comparisons.

Finding the right words

How can the curators of different databases ensure that they're describing the same thing consistently? Midori Harris described the Gene Ontology (GO) Project, which aims to provide controlled vocabularies for sharing information about genes. GO has three main goals: first, to compile structured vocabularies describing specific aspects of molecular biology in any organism (biological process, molecular function and cellular component); second, to use GO terms to annotate gene products in collaborating databases; and third, the development of tools to facilitate both of these tasks. The GOA project at the EBI aims to annotate every entry in SWISS-PROT and TrEMBL with GO terms, and eventually to produce annotation sets for entire proteomes, using a combination of automatic and manual annotation. The GO consortium also supports the development of open ontologies in areas not covered by its existing vocabularies.

The future

One of the next important stages in proteomics will be to catalogue all protein–protein interactions, but this task is far from trivial. Henning Hermjakob explained protein–protein interaction

data, especially from high-throughput proteomics projects, are noisy and incomplete; there's a desperate need for cross-validation and comparative analysis of different datasets, but at present the data are fragmented and collected in different ways. The IntAct project aims to define standards for the collection of protein–protein interaction data, and provide a database that's compliant with them. In the long term, IntAct will cooperate with other providers of protein–protein interaction data to provide a central, synchronized resource for protein–protein interactions.

Integration was one of the biggest buzzwords at database day, so it was only fitting that the day closed with a presentation from Paul Kersey on Integr8 — a project that will provide a 'gene-centric', integrated view of complete genomes. This is far from straightforward because data are incomplete; there's lots of redundancy, and different databases have overlapping collections of data. Integr8 is part of a broader thrust to enable researchers to exploit the entire palette of EBI information in a seamless way.

Although each of the EBI's databases has a unique function, they are united by a set of principles; perhaps the most important of these is the development of standards that will allow biologists everywhere to make sense of the flood of biological data that began with whole-genome analysis.

– Cath Brooksbank

New phenotyping funds for Monterotondo

As mouse biologists develop an increasingly sophisticated palette of tools to manipulate the genome, we are challenged to identify and characterize the genes involved in complex diseases. Together with the large-scale phenotype-driven and gene-driven mouse mutant screens currently being pursued, the field will soon be saturated with new lines of mice carrying one or more altered genes. But how to detect the effects of each mutation on mouse physiology? Although advanced mouse genomic technologies are being actively pursued in laboratories around the world, a coordinated effort amongst these groups to develop the necessary tools for their analysis has been lacking.

In response to the growing need for a standard set of mutant phenotyping strategies, a consortium of European mouse biology centres, including the EMBL Mouse Biology Programme, recently received funds from the EC to support an integrated project, entitled "Understanding Human Molecular Physiology and Pathology Through Integrated Functional Genomics in the Mouse Model" (with EUMORPHIA as an acronym). Nearly a dozen groups around Europe have joined this concerted focus on phenotyping, to develop and standardise protocols, and to search for novel phenotyping methods.

Phenotyping platforms are not only vital for the identification and characterisation of disease models, but they will play an important role in toxicological and pharmacological studies as well. As Coordinator Steve Brown (MRC-Harwell) points out, we are still some way from developing standardised protocols for the comprehensive evaluation of every body system. It is vital that all the potential variables in phenotype testing (environment, operating procedures etc.) are exposed, and that the assessment of mutants delivers similar outcomes wherever testing takes place.

Development of a standardised, comprehensive battery of new phenotyping methods will allow mouse biologists to mine in depth the relationship between genes and disease. The EMORPHIA consortium overlaps another international group, the International Mouse Mutagenesis Consortium, which aims to coordinate development of new large-scale methods to enhance existing mutagenesis technologies, as well as the introduction of novel approaches. Together these groups propose the long-range goals of producing at least one heritable mutation in every gene in the mouse genome, identifying every gene that affects key traits of biomedical interest, establishing an infrastructure for archiving and distributing mutants, and enhancing the informatics and database support for these endeavours. Training – developing a wider skills base in mouse genetics, mutagenesis, phenotyping and pathology – is an important mandate of the EUMORPHIA project.

To standardise and implement streamlined ways in which the functional effect of mutations in the mouse genome can be quickly and accurately pinpointed, different groups of the EUMORPHIA consortium will take on different aspects of phenotyping mouse mutants. The EMBL Mouse Biology Programme will direct aspects the project involving central/peripheral nervous system and skeletal muscle systems, and gene expression assays, and will also contribute to cardiovascular exploration, and the standardization of pathology workups for mouse variants. Together with our CNR neighbors who are responsible for directing behavioural phenotyping, the EUMORPHIA collaborative effort will bring a dynamic new facet to research at Monterotondo. The EC funds have also enabled the recruitment of a new staff scientist, Dr.Anne-Cecile Trillat, who will concentrate on nervous system phenotypes, having recently headed up a similar effort in a US company. Her project in Monterotondo will involve correlating measurements of behaviour and physiology with genotype for new mouse strains.

Working together in a consortium will offer us advantages in the way we do research. The effects of mouse mutations can be so surprising and unexpected that no one person can provide the necessary expertise for their accurate analysis. Within the EUMORPHIA consortium we can look at a mouse and assess whether it's kidney, its heart, its liver, its sexual reproduction, its behaviour and its capacity to form tumours are affected by one particular mutation.

Although the EUMORPHIA effort brings together some of the best groups in European mouse biology, it is meant to be a pilot project to test the hypothesis that we can send a mouse to the equivalent of a medical emergency room setting, and back it up with specialized tests to provide an informative diagnosis. A broader initiative will be necessary to take mouse models of human disease through to therapy and maybe even cure.

Of course, human patients are easier to phenotype because they can provide verbal information and case histories. But as we learn more about gene function, it is clear that differences in genetic backgrounds between individuals, as well as environmental factors, can profoundly modify the presentation of a particular mutation. Current biomedical research is providing a wealth of information on the effects of these factors on mutations in the outbred human population. The genetically homogeneous backgrounds of inbred mice limit the variance of these modifying genes, and provide a powerful starting point for tracking down the identity of genetic modifiers that may alter the nature and/or severity of defects in humans. The EUMORPHIA project will allow us to get much more deeply involved in a particular phenotype – among other things, we'll waste less time finding it in the first place.

– Nadia Rosenthal

News from EMBL's International PhD Programme

Graduation day. Nineteen graduating PhD students received their diplomas and a rose as part of EMBL's annual Lab Day celebration on June 10. The official ceremony was followed by a celebratory dinner and party organized in honour of the new graduates.

Two EMBL PhD students have been awarded joint degrees by EMBL and Universidad Autonoma de Madrid. On April 29, Antonio Giraldez from Steve Cohen's lab in EMBL's Developmental Biology Programme successfully defended his thesis, "Regulation of Wingless gradient formation by Torero: A novel secreted enzyme that modifies proteoglycans," to become EMBL's fourth PhD student to be awarded a joint degree. Antonio will take up a postdoctoral position at the Skirball Institute of Biomolecular Medicine in April next year. Michel Bagnat, former student in Cell Biology and Biophysics Programme and now at the MPI in Dresden, quickly followed suit on May 20. Michel focused his work at EMBL on the role of lipid rafts in protein sorting and cell polarity in yeast *Saccharomyces cerevisiae*.

New partnership agreement signed. On June 20, the University of Lisbon in Portugal signed a partnership agreement with EMBL. PhD students will now be able to receive joint degrees from the two institutions. The University of Lisbon joins the growing list of universities that have agreed to award joint degrees with EMBL. They are the Universities of Nijmegen, Madrid, Lisboa Nuvoa, Heraklion, and Strasbourg, Eotvos Lorand University in Budapest, and the Université Jospeh Fourier in Grenoble. Plans for a partnership agreement with the University of Heidelberg are well underway, and we hope to announce the final arrangement soon.

Web watch. The official EMBL International PhD Programme webpages have a new look! Log on to and check out the latest information. You will also find a link to the new internal predoc website (http://forums.predocs.org/). The site contains the latest information on events and activities of interest to EMBL predocs, an archive of administrative documents and communications from the committee, as well as a forum for discussion and exchange of ideas. You will also find links to debates on Science and Society topics.

The EMBL graduation committee with this year's graduates.

And, **don't forget to register for the 2002 PhD student symposium,** to be held at the Main Laboratory in Heidelberg on November 14-16. The theme of this year's edition is *Membranes and Compartments in Biology* and will cover topics ranging from the origin of life to supracellular architectures. Confirmed speakers include Roderick MacKinnon from Rockefeller University, Kai Simons from the MPI in Dresden, and Gunnar von Heijne from Stockholm University. For a full programme and on-line registration, see http://symposium.predocs.org.

EMBO Teachers Workshop draws a crowd

An international practical workshop for biology teachers, organized by EMBO, was held on 5-6 July 2002 at the EMBL Heidelberg. The EMBO course focused on "Cells, molecules and modern biology." 120 participants from 14 countries took the chance to update their knowledge in modern molecular biology via lectures from leading researchers of various fields (stem cell research, brain research, the life cycle of the vaccinia virus, structural biology, etc.), and performing hands-on experiments that can be transferred into classroom biology teaching. As a response to positive feedback, a further international EMBO Teachers Workshop will take place in Heidelberg in 2003, followed by national workshops at the EMBL outstations at Hinxton and Hamburg.

– Steffi Denger

from the Szilárd Library

The Video Club has moved its collection of videos and DVDs to the Szilárd Library. All videos have been fully integrated into the library check-out system: you can now search for your favourite video through the web catalogue, reserve on-line, and make suggestions for additions to the collection. Use the library's new *SDI service* to create your own personalized account (http://library.embl-heidelberg.de/login-personal.html, see EMBL*&cetera* 10 for details), and check the status of your rentals. The registration deposit is €13 per person, returnable upon your departure from EMBL. Rental fee is €1 per night or weekend.

The EMBL Video Club committee is Ken Goldie, Chris Roome, Chenna Ramu, Ann Thüringer, Regina Herhoff, David Venzke, Emma Black and Lena Reunis.

Calling all alumni! Sign up now for the Alumni Association

Most people who've spent part of their careers at EMBL still feel a strong attachment to the Laboratory and would like to keep in touch. Some would like to take an active role in its future growth and development. The list of EMBL alumni represents an impressive group that has enormous potential to make a difference in science, particularly in Europe.

For these reasons and many others, we recently founded an official Alumni Association. We're delighted that so many people have already expressed an interest in joining, and we hope that all of our former staff and employees, students, members of SAC and Council, and others who have worked at EMBL for a significant period of time will become members. Joining is free of charge!

Members will get regular updates on events and activities throughout the Laboratory. The Association will allow you to meet old friends, to forge ties between EMBL and your current institute, and to help shape the future of the Laboratory.

To join, all you need to do is fill in the on-line registration form; simply follow the link to "ALUMNI" from the EMBL homepage (www.embl.de).

If you are still in touch with some of your former EMBL friends, and you think they may not have gotten the word, please pass this message along to them. Our database of alumni is growing, but it's still not complete.

We hope to hear from you very soon!

Angus Lamond
President of the EMBL Alumni Association e.V.

I'm already getting mails and newsletters... does that mean I'm a member?

⇩

No, not unless you've registered at the website since July, 2002.

⇩

How do I join?

⇩

Go to
www.embl.de/alumni
and click on the link to Register!

The Matti Saraste Fellowship Programme

an interview with Luis Serrano, Coordinator of EMBL's Structural and Computational Biology Programme

EMBL AND THE STRUCTURAL AND COMPUTATIONAL BIOLOGY PROGRAMME HAVE TAKEN SOME SPECIAL INITIATIVES TO REMEMBER MATTI SARASTE WHO PASSED AWAY A YEAR AGO. COULD YOU TELL US ABOUT THESE?

The first event was a special Matti Saraste Memorial Symposium, held on May 18th of this year. It was a scientific meeting, organized mainly by Klaus Scheffzek from Matti's group, that involved speakers who either worked closely with Matti, or who worked on the topics that he was most fascinated by, such as membranes and lipid domains.

We also wanted to create something more permanent to commemorate Matti, and this is the Matti Saraste Fellowship Fund. It was officially launched in May, and announced at the Matti Saraste Memorial Symposium.

WHAT IS THE GOAL OF THE FUND?

Matti very actively supported creating opportunities for young scientists from countries who do not, or cannot, provide strong support for basic research. We plan to award the fellowship to one or more excellent students from countries whose basic research is underfunded, giving them the opportunity to carry out their doctoral studies within EMBL's International PhD Programme. Matti's friends and colleagues, both at EMBL and elsewhere, are invited to contribute to the fund.

WHAT LEVEL OF SUPPORT ARE YOU HOPING TO SECURE?

Our goal is to establish a fund large enough to generate sufficient income from interest each year to support at least one fellowship. We estimate that €1,000 would support one day of PhD fellowship on a permanent basis. The fund itself will be managed by the EMBL Alumni Association.

WHAT IS THE ADVANTAGE OF HAVING THE FUND MANAGED BY THE ALUMNI ASSOCIATION?

We want the fund to be independent of EMBL to ensure that the principle behind it remains intact, and that is to create opportunities for students from countries where basic research is underfunded. Through the Alumni Association, donations will be anonymous and can be tax deductible in Germany, and wherever else this proves possible. People wishing to donate should see the bank deposit details below. Peer Bork and I will be happy to answer any questions in-house staff might have.

The response has been very positive so far. Many of Matti's friends and former colleagues from across the world have expressed interest in contributing. Now we hope that the fund will gather momentum so that we can award the first Matti Saraste Fellowship as soon as possible.

– Sarah Sherwood

Please deposit your donation in the following account.

Account Name:	EMBL Alumni Association e.V
Account No:	0169615
BLZ/BSB:	672 700 03

A copy of your deposit form should also be sent to the Fund secretary, Janice Walker, with the name and address of the depositor. This information will be used exclusively to send tax exemption receipts when these are available (expected in early 2003 for contributions made in 2002) and will then be destroyed.

Janice Walker
Matti Saraste Fellowship c/o Lamond Lab
Division of Gene Regulation & Expression
Wellcome Trust Biocentre
University of Dundee
Dow St.
UK- Dundee DD1 5EH

from the Staff Association

Staff Association elections. Balloting was held on June 18 in Heidelberg for the Heidelberg committee and EMBL boards, and during the week of June 17 at the outstations for the EMBL boards. For the first time, eligible EMBL staff members from all duty stations were able to run for one of the joint staff-administration boards: StAC (Standing Advisory Committee), JAAB (Joint Advisory Appeals Board) and JADB (Joint Advisory Disciplinary Board).

The results: elected to the Heidelberg committee were Sean Bourke (EMBO, administration), Avi Epstein (floating), and Michael Hübner (pre-docs). The positions for ancillary and post-doc remain unfilled for lack of candidates. If you are interested in running for one of these positions in a by-election, please contact the Staff Association (staff@embl-heidelberg.de).

Elected as regular members to StAC were Christine Gemünd, Gareth Griffiths, Frieda Glöckner and Tom Cord, and as alternates Craig Panner, Thomas Heinzmann, Kevin Leonard and Jorma Tapola. All are from Heidelberg except Craig Panner, who represents Monterotondo. Elected to the JAAB were Bodil Holle and Anne Walter (alternate); and to the JADB, Doros Panayi and Tom Cord (alternate), all from Heidelberg. Thanks to all who voted! We hope to have an even better turnout next year.

ILO salary case comes to an end. The Staff Association is pleased that the long crusade for back pay is over. Council voted to award back pay with interest and a salary-level increase from 1995 onward. Most current and former staff members have already received their awards from the Lab. The Staff Association was also able to convince the Administration to include Grade 1 staff in the awards, who had been excluded for technical reasons. If you are a former staff member of EMBL who had a contract with the Lab between July 1995 and the present, and if you have not been contacted about possible back pay, please write or e-mail Petra Seethaler (seethale@embl-heidelberg.de) in the Personnel Section with a copy to us in the Staff Association (staff@embl-heidelberg.de). Petra can inform you as to whether you are eligible for back pay from the judgment.

Working groups continue. The Staff Association continues to meet with the Administration on a regular basis to clarify the current Rules and Regulations and to consult on the future of the health insurance scheme (HIS). The clarification exercise is meant to identify passages in the current Rules and Regulations that are vague, incomplete, out-of-date or open to misinterpretation. The first working group has discussed the following sections so far: home, annual, special and maternity leave; residential category; and non-residence allowances. Other sections, such as family and dependent children allowances, are still under discussion or will be discussed later this year. The working group on the HIS has also met several times to discuss whether to continue the current in-house health coverage scheme or to outsource it to an insurance company with experience in serving international organizations. Meetings have also been held with Intermedex on improving current service, particularly to the outstations. As the contract with Intermedex runs until 31 December 2004, no decisions have yet been made. All changes to either the Rules and Regulations or the HIS must be approved by Council.

2nd annual Summer Party. Another rousing success! Some said it was even better than last year…. The Staff Association would like to thank all the organizers for the weeks of preparation beforehand. And we especially want to thank the canteen and cafeteria staff for once again giving up their chance to enjoy the staff party with their families by cooking and serving the rest of us mounds of delicious food and drink (did you see that 4 m^2 strawberry cake?!). We hope to see more folks from the outstations next time!

– Ann Thüringer

Innovation Works™ by EMBLEM

Celebrating its third anniversary in May 2002, EMBL Enterprise Management Technology Transfer GmbH (EMBLEM) is forging ahead. With over 70 patent applications, and more than 25 copyrights and trademarks, our intellectual property portfolio is growing steadily. The innovative value and market potential of the inventions created by EMBL-scientists is exemplified in the high licensing ratio of our patent portfolio and in the currently more than 80 satisfied licensees of EMBL-technologies. Last year alone, we submitted over 25 new patent applications/copyrights and concluded 50 new license contracts.

Although we take pride in our achievements, we know that our success in commercialising EMBL-technologies relies on the innovative spirit and lateral thinking of the EMBL scientific community. We would like to take this opportunity to thank those of you who have contributed to our success.

We look into the future with confidence. The establishment of the EMBL Technology Fund (ETF) to seed-, and early-stage finance spin-out companies from the EMBL-environment, but also in the EMBL Member States, is another central pillar of the EMBL technology transfer and commercialisation concept.

In the truly European spirit of the Institute and in our mandate to promote pan-European technology transfer, both EMBLEM and the ETF are open to EMBL alumni and to inventors in the EMBL Member States. In our Innovation Works™ concept we are happy to assist you in topics ranging from invention development and intellectual property protection through to marketing and commercialisation whether via a license contract or in the form of a new start-up company.

Enclosed with this edition of EMBL*&cetera* is a brief overview of the activities of EMBLEM. We look forward to working with you. Questions? Please visit us at www.embl-em.de

– Gabor Lamm

the EMBO corner

When going through the archives in EMBO recently, I came across a booklet prepared in 1966 by Raymond Appleyard who was my predecessor's (John Tooze) predecessor. In it the programme for EMBO was outlined. It makes interesting reading not least for the manner in which the topic of the future EMBL was presented. However the point which was new to me on reading this document was the view of the EMBO Council in 1966 that it was very timely to provide EMBO research grants. The proposal was relatively detailed and involved transnational interaction, a level of funding which would not be greater than 10 - 15% of the national investment of research in the area, the linkage of the funding to the provision of practical courses, *etc*. Today, almost 40 years later, this topic has moved itself to the top of the EMBO agenda. Not all aspects are retained, but the desirability of EMBO acting as an agent to support research directly through grant awards is being strongly promoted at present as an extension of its now well-established fellowship, courses and workshop programme.

The start point towards this new impetus, as far as I was concerned, was a reflection on the future directions of the organization as I prepared a 9-year programme for the EMBC (the intergovernmental conference that supports many of EMBO's activities). A document of that nature is some place between a wish list and a strong request. The analysis that I performed is that fundamental (i.e. basic) research needs increased support in Europe and this support is unlikely to come from the Framework programmes. It has always been difficult to get support for fundamental research in Europe and we all have promised at some stage to cure cancer or its equivalent in some grant application. However recent developments have added to the urgency to establish a programme to support fundamental research. The scientific rational is that the new high-throughput approaches contribute much but would be significantly more effective if linked to scientists working on particular biological problems (*i.e.* using the hypothesis driven approach), and the reciprocal is also true. Mixed approaches to important problems are therefore possible and timely. The experiments which have been performed within the context of the Framework Programmes, in which a very large number of groups that are compatible on paper are funded to work together but in reality rarely do so, points to the need for a reappraisal of scale which is necessary to achieve success. Again, two groups working with a genuine mutual interest in the results will surely be more effective than 40 that meet occasionally.

There is another reason why the thoughts of 1966 are appropriate today. We know (and the politicians remind us) that we are moving into a knowledge based economy. It follows that knowledge is required and the rate of generation of knowledge has to be increased. We also know from multiple examples from the establishment of recombinant DNA technology through to the development of the microwave oven, that the most incisive developments come from unexpected research areas. It follows that research in a knowledge driven economy perhaps is best if it is not overly directed. Again, it seems therefore that much more research with the goal of achieving an understanding of biology is timely and that it should be performed in a "bottom-up" science driven manner and that a new Research Programme would be needed. If the research is simply an acceleration of linear paths that have already been followed, it will not fulfil the hopes and promises that such a programme would carry. It must be at the edge, risky and requiring the highest level of expertise. An EMBO Research Award Programme would work towards achieving all of these goals and would make the decisions on a firm scientific excellence basis. There would be no second criterion. Whether this plan reaches a successful conclusion, of course depends on the decision that is made by those who control finances. Intriguingly the proposal to expand EMBO's activities to include research funding (as one person remarked, a HFSP for Europe) comes at a time when many different groupings are discussing the establishment of a European Research Council. This would view Europe as one entity and would focus on fundamental research of a high level. The similarity, if not the identity, of that proposal with the one outlined above is not coincidental. As we know from science very often many people are moving forward on the same topic at the same time when new approaches seem possible. The reality, which may be an advantage in the long term is that the EMBO programme, if it reaches its full potential, would *de facto* be a European Research Council for Molecular Biology. Those that established the EMBC 30 years ago would rightly feel that they had shown amazing foresight in doing so, following again on the wise advice of those who founded EMBO. The discussions on the future EMBO Programme are currently very active and I will share the outcome with you in the future either by a report in EMBO corner … or better by inviting applications in the future for an EMBO Research Award!

– Frank Gannon

from the Administration

ILO Judgments

The ILO judgment on pay has now been implemented and staff received the amounts due in April. Due to an oversight, back pay in respect of paid overtime was excluded from the calculations and will be paid as soon as possible. There was also some doubt about whether Grade 1 staff should be included in the award and their back pay has been delayed as a result. It will be paid to them now as soon as possible.

Of the two pension appeals, the ILO upheld Council's basis of calculating pension increases; see the report on the Council meeting for information (page 3). The judgment dealing with the right to transfer in rights from other pension schemes (now no longer available) is in course of implementation and is on time according to the timetable imposed by the ILO.

Science & Society

Life Sciences in Transition

EMBL Science and Society featured in the Journal of Molecular Biology

A special issue of Journal of Molecular Biology dedicated exclusively to EMBL Essays on Science and Society was published at the beginning of July this year. These essays grew out of efforts at our institute to promote communication on the social, ethical, and political issues that surround rapid change in the life sciences. A 'Science and Society Program' was launched at the EMBL in the spring of 1998. From the start, the aim of this special initiative has been to help promote an on-going debate about, and reflection on, how modern-day biological and biomedical sciences affect society, and the reciprocal. It has allowed the authors of the essays, leading academics in the humanities and in the social sciences as well as in a wide range of life sciences, to come to the EMBL with important messages.

The essays in the collection bear witness to the co-existence of a fascinating plurality of perspectives on social and ethical issues relevant to the life sciences. A close reading of them reveals that fundamental differences in views vary not only, as often believed, between those inside and those outside of the life science community, but also, in fact, between members of that community itself. The degree of divergence in outlook internal to the scientific community, as encountered in these essays, may be taken as a sign that the life sciences find themselves at the present moment in the midst of a transition.

For editorial purposes the essays that make up this volume have been grouped into five thematic parts. The first, *Assessing the future of the biosciences*, is composed of four essays that specifically illustrate the implications of this transition phase in the history of the biological and biomedical sciences. The visions offered us in this first part span the whole field from the mostly utopian to the mostly dystopian. The first two essays are distinctly appreciative of current developments. Modern biology has opened up revolutionary new frontiers for future developments in biomedicine (F. Kafatos). We may even be witnessing a qualitative break in the history of evolution of life where 'man has just taken the future of nature into his own hands' (H. Markl). The third essay (S. Rose) introduces a more sobering and relativizing assessment of change and continuity that has accompanied the genetic/genomic turn in the modern biosciences. From yet another point of view (D. Callahan) some applications of progress in biomedical research are furthermore liable to turn into Pyrrhic victory for society.

The second part of the volume, *Biosciences and basic values*, is made up of four essays focusing on the processes that have resisted or facilitated the introduction of new bio-knowledge and technologies into our societies and cultures. Why, and in what sense, do such developments raise new ethical questions, and to what extent do our societies dispose of regulatory mechanisms to cope with them (J. Mittelstrass, S. Jasanoff)? When basic dilemmas arise in biomedical research, as for instance the exceedingly difficult question of the moral status of the human embryo, some would argue that society would be best put to rely on its experts – scientists, lawyers, and philosophers – to settle the argument (A. Colman & J. Burley). Their services should be used ad hoc to arbitrate each time disturbing qualms are detected in society obstructing the progress of science. Others favour the basic transcendental values on which they refuse to compromise whatever cost-benefit arguments may be wielded by the would-be-experts (D. Bruce).

The third part of the collection, *Genomics and the globalisation of biology*, is made up of five essays that converge on genomics. The first two are concerned with some historical instances of the uses that have been of made of human genetics to this date. One (B. Müller-Hill) pursues the prospects of 'The New Biology' resulting in 'New Eugenics.' Another (M. Olson) relates a personal account of helping to launch the Human Genome Project just to see it turn into a battlefield of clashes of public and private interests. The third essay in this section (S. Hilgartner) follows with a critical rethinking of intellectual property issues accompanying the commercialisation of the biosciences in general and of human genomics in particular. The last two essays within this part of the book then pursue how genetics-turned-genomics, along with the applications that may grow out of it, fit into the moral landscape of our mostly desacralized Judeo-Christian civilisation (A. Mauron, P. Rabinow).

In the fourth section, *Science (mis-) communication*, attention turns towards how science reaches and affects its diverse audiences. The first of these essays consists of a visionary assessment of how present-day means of quality control in science, the peer-review system, will most likely have to evolve to adapt to the revolutionary new technologies for electronic communication at our disposal (P. Campbell). The second essay contains a passionate plaidoyer by a prominent biologist and science communicator for the importance of keeping clear the distinction between science and the uses that can be made of science (L. Wolpert). The author argues that the popularity of science among the public suffers from a pernicious collapsing of this distinction. The third essay closes this part with a refreshingly humorous assessment of the nature of the cultural conflict that commonly arises when scientists get involved in communicating science to the public (V. Parry).

Finally, the last part of the issue is entitled *Rethinking reproductive technologies*. Here, our last two authors (C. Djerassi, M. Strathern) lead us back to the future, analysing how the first post-war biotechnologies, oral contraceptives and new reproductive technologies, have affected and will continue to affect basic human relations and organisation of society.

We hope that the plurality of perspectives inherent in this collection of science and society essays will serve to inform the readers in an unbiased and reasonably representative fashion. May it serve as our modest contribution to the on-going collective quest for carving out the most beneficial ways for the life sciences to evolve symbiotically with the societies that foster them.

– Halldór Stefánsson

Gene Sequencing Facility open for business

We would like to announce that the EMBL Sequencing Facility is now ready to take your samples. Services are available to all scientific groups at Heidelberg and at the Outstations. We are located temporarily in Room 604 of the main building at EMBL Heidelberg.

The Facility is able to sequence plasmid DNA and PCR products with unlabelled primer, as well as FITC or CY5 labelled primers. By default all sequencing is carried out on the Capillary Sequencer, however should the need arise a gel based system is available. Samples can be submitted as purified DNA or bacterial culture.

We also have the capacity to purify your plasmid or PCR products, including large-scale projects. Self purified DNA will be accepted but should meet several parameters before we sequence. Additionally, in the Genomics Core Facility, we can carry out real time PCR (QPCR) experiments as well as preparation of SAGE libraries.

Charges: €17 for one single pass reaction, regardless of who purifies the sample. One repetition for adjustment of conditions, troubleshooting, etc., will be done free of charge.

For larger sequencing projects we would like you to come and discuss the options such as cost and schedule so that the project can be optimised to both of our capabilities.

For more information, please contact Vladimir Benes, Monika Benesova, Richard Carmouche, David Ibberson or Silvia Sauer at genecore@embl-heidelberg.de, or come by the lab.

Thanks! The Gene Core Team

A whole in one: EMBL acquires new instrument in collaboration with febit

EMBL now has a new microarray platform - geniom, one - in collaboration with the biotech company **febit ag**, Mannheim. "It is a benchtop instrument for performing gene expression profiling and genotyping experiments," Vladimir Benes says. “The instrument is currently housed in the Genomics Core Facility.”

In contrast to current methods which require several instruments for the different steps of creating and analysing DNA microarrays, geniom® one is an automated system which integrates the entire process. It performs the synthesis of oligonucleotide microarrays, hybridization, washing and imaging. "We are currently validating the technology for gene expression profiling in three biological contexts, collaborating with the groups of Juan Valcárcel, Fotis Kafatos, and Tommy Nilsson."

One important difference to other methods is that the oligonucleotides are synthesized and hybridized in a special microfluidic chip, the DNA processor™. "The benefits of this method also include the compactness of the instrument and its integration of several different applications," Vladimir says. "It offers a researcher great versatility and flexibility in the design of a microarray experiment. The goal is to develop geniom® one into a 'Genomics PC' where the scientist can make decisions by mouse click to edit very quickly the content of the DNA processor™."

febit has developed geniom, one since 1998 and will launch it in 2003. EMBL was chosen as the first official beta test site. "It's a recognition of both the quality of our work and the wish to test the new technology in the context of highly challenging biological projects," Vladimir says.

febit's home page can be found at www.febit.de. Those interested in using the technology should get in touch with the Genomics Core Facility.

Geniom® One

EMBL to open Grants Office in Heidelberg

Last month the European Commission received over 15,000 responses to its call for "Expressions of Interest" – the first step in deciding what types of projects will be funded under Framework Programme 6. Most EMBL groups seem to have participated in two or more of these, suggesting that we may soon be up to our ears in applications. It’s a necessary activity, particularly for new group leaders hoping to bolster the staff of their labs, but it’s not everybody's favorite pastime. Given the importance of obtaining funding from the EC and other sources, EMBL has decided to start a Grants Office and staff it with a manager (check the "Jobs" link on the EMBL homepage).

Finding funds for a project requires a good knowledge of possible sources of money, keeping up with open calls for proposals, and a knowledge of the current scientific and political climate, not to mention familiarity with those dreaded forms, or the ability to write a good proposal. There are hundreds of funding sources in Europe and abroad, and a researcher needs to know where to apply and what the chances of success are. Collecting this expertise in a central office should be an economical way of saving us all a lot of time and effort. Those interested in the manager position should apply before July 26; EMBL hopes to fill the post as soon as possible.

from the sister sciences

The Quantum Mechanics of Watching the World Cup

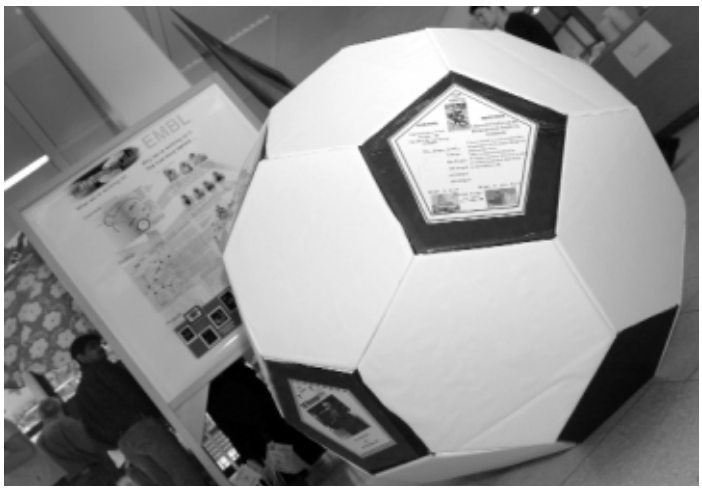
An interview with Wilford Terris, author of The Secret Football Writings of the Great Physicists

WHAT DOES PHYSICS HAVE TO DO WITH FOOTBALL?

A little-known fact of science is that most of history's great physicists have been rabid, head-knocking football fanatics. In fact, most of their major theoretical discoveries were made while watching the World Cup. And recently, football has become the driving metaphor for cosmology as well as biology; it's redefining our notions of the future of the universe.

HOW DID THIS MOVEMENT BEGIN?

The early historical record is vague. Still, there's strong evidence that telescopes were introduced in seventeenth-century Florence so that people could watch the 1608 World Cup from villas overlooking the stadium. One can only assume that during half-time, having nothing better to do, you watched girls or pointed them up at the sky. Jan Smølmø (University of Stockholm) has convincingly demonstrated that the persecution of Galileo began because a telescope was used to level an offsides penalty against the Vatican team. Needless to say, the archives of the Roman Catholic Church haven't been very forthcoming about this.



There is evidence to suggest that the Nebreda lab had the World Cup on their minds while they were preparing their exhibit for Lab Day.

As for Isaac Newton... He was a frothing-at-the-mouth Manchester United fan, and by his time the World Cup was the preferred model system for understanding physics. Newton's early treatise, "On the Heade Balle," shows a clear rejection of Aristotle's ideas, which had dominated science for two thousand years, and it also contains the earliest formulation of Newton's laws of motion. If you don't mind, I'll just read this short passage:

> *The Ancients claim that a Moving Bodie, such as the Balle, is said to possesse a Desire to reach its intended Goale. Yet we see that in many matches of the Englishe Teame, the Balle seems to lose this Desire altogether, and quite often it flies any Whiche Waye and in a quite unpredictable Direction. However, carefull Observations revealle something that may be of practical use to Coaches: once kicked, a Balle will alwayes continue in a Straight Line, unless it collides with the Foote or Heade of the Player who interposes Himself in this Line of Flighte, or perhaps with a flying Birde. At some Pointe, the Balle necessarily returns to the Grounde, which implies that it is being pulled by a Force – perhaps tiny, invisible Fairies.*

IN YOUR BOOK YOU SAY THAT THOMAS YOUNG WAS ACTUALLY ON THE ENGLISH NATIONAL TEAM.

Now you're jumping to the early 1800s, when Young created the classic "two-slit" experiment to show that light behaved more like a wave than a particle. You shine a light at a board with two slits and look at the pattern that is cast on a detector plate behind it. If light were made of particles, there would be two bright lines on the plate, but instead you get the sort of pattern that interfering waves would make. Well, Thomas Young was a goalie on the English team. After a particularly horrible performance in the

books @EMBL

RNA Motifs and Regulatory Elements

A new book by P. Bengert, T. Dandekar, D.H. Ostareck and A. Ostareck-Lederer

One of EMBL's great advantages is that it provides an excellent environment for collaborative research and partnerships bringing together scientists from different fields with specific mutual interests in certain subjects. A typical example comes from the field of gene expression, where many scientists are committed to understanding the function of RNA in the processing of genetic information. The immensely growing information and knowledge about RNA structures and functions, as well as the role of catalytic RNA in evolution reflected in the emerging acceptance of the concept of an "RNA world" has resulted in a number of monographs covering the different aspects of the RNA field.

In 1998, Thomas Dandekar (Structural and Computational Biology Programme) and Sharma (Gene Expression Programme) tackled the topic RNA motifs and regulatory elements in a book called "Regulatory RNA." The new 2002 edition not only reflects a shift in emphasis further to the motifs and their implications, but was also necessary to keep up with the pace of this rapidly expanding field. The authors (including Dirk Ostareck and Antje Ostareck-Lederer from EMBL's Gene Expression Programme, and P. Bengert, a specialist in RNA motif searches) have made an effort to cover the data extensively and included latest results.

The book alerts the reader to the importance of regulatory RNA elements for the many different fields of life. The knowledge on regulatory RNA structures and elements already available is concisely summarised and catalogued. Selected interesting RNA elements are analysed in detail regarding their dynamics, regulation. As dominant topics of current research in molecular biology, areas such as RNA mediated regulation of gene expression, DNA/RNA array data analysis, ribozymes, splicing or telomerase in aging are covered.

In addition to the biological information, computational and experimental methods and tools to search for new interesting regulatory RNA structures are explained and compared to stimulate further research in this exciting research area.

– Thomas Dandekar

World Cup final – in which he was unable to block the penalty shots – he devoted his life to physics, trying to come up with a physical proof that the ball could pass to the right and left of his body at the same time. Nobody believed him, of course, but this went on to become one of the classical problems in quantum mechanics.

AND THE WORLD CUP CONTINUED TO HAVE AN IMPACT ON RELATIVITY THEORY AND QUANTUM MECHANICS?

Oh yes. Einstein's famous thought experiments arose out of the fact that in 1904, he was stuck on the train heading to Bern when the World Cup began. If only the train were moving at the speed of light, he reasoned, he could be home before the game started. This raised all kinds of questions in his mind: for example, whether the clocks in Bern and Paris ought to be showing the same time. He was unable to calculate the time dilation effect properly, so during the trip he kept resetting his watch. He steadfastly believed that he arrived home an hour before his departure, and for the rest of his life he kept his wristwatch set an hour earlier than everyone else's, which explains why he was always late for his appointments. It also explains his secret involvement in a plot to repeal Greenwich Mean Time.

YOU BOOK ALSO CLAIMS THAT THE FAMOUS "SCHRÖDINGER'S CAT" PARADOX BEGAN WITH FOOTBALL.

Erwin Schrödinger may have been a brilliant physicist, but he was completely incapable of programming a video recorder. He also developed a pathological hatred of cats. You know, in the final published form of his paper, he described a cat in a box with a vial of poison and a single atom of uranium. The cat is left in the box for a length of time until the uranium atom is equally likely to have decayed or not. If it decays, it trips a Geiger counter that breaks open the vial of poison. Schrödinger says you can't know whether the cat is alive or dead; it's in an indeterminate state somewhere in the middle until someone opens the box. He actually tried this with his wife's cat, and for months and months he refused to believe that the cat was dead, although the rest of his family couldn't stand the stench and moved out on him.

But the real origin of the theory is that the World Cup was being played half-way around the globe, and Schrödinger's students kept missing class. He told them it was perfectly all right to videotape the games and watch them the next day instead of staying up all night. If you sealed the videotape up in a box and didn't watch it, he said, the outcome of the game would remain in an "indeterminate state." There would be no winner and no loser. People found this horribly upsetting, of course. "The football players would all go home – they'd know who won," they said. So Schrödinger wrote a letter to the international football federation suggesting they lock all the players in boxes as well. This led to his short stay in a psychiatric clinic; when they let him out, he began torturing cats.

YOU SAID THAT THERE ARE IMPLICATIONS FOR COSMOLOGY?

Indeed. Is the universe going to expand forever, and burn out, or will it collapse on itself? Will the Americans ever regard soccer as the Queen of all sports? The two questions are dependent on each other, and there are experiments going on right now, at the supercollider at CERN, to determine the answer. The mathematics suggests that they'll need to build a much larger machine, perhaps a magnitude more powerful and costing tens of billions of Euros, to come up with a solution. But this is a pittance compared to what's spent on football players' salaries.

WE'VE HEARD THAT YOUR NEXT BOOK WILL BE ABOUT BIOLOGY.

Human DNA is made of four bases and there were 32 teams going into the World Cup. Can this be a coincidence?

– interview by Russ Hodge

Note: Wilford Terris is Professor Emeritus of Genetics and a physics enthusiast, currently living outside of Rome. His book will be appearing shortly.

Hot town, summer in the city...

... Back of my neck getting dirty and gritty
Been down, isn't it a pity
Doesn't seem to be a shadow in the city

Well duhhhhh, someone tell Lovin' Spoonful that it's because everyone's up at EMBL for the annual Staff Association summerfest!

Saturday, June 8 won't soon be forgotten by EMBL families and friends. The staff association did a bang-up job of organizing a day jam-packed with excitement. There were pony rides, bouncing castles, face painting, balloons, juggling, puppet and magic shows for the kids, and mechanical bull riding, music, and dancing into the night for the grown-ups. And food and drink galore!

Suspense mounted in the evening as the *Waldpiraten* charity tombola took center stage. Ticket holders anxiously awaited the winning numbers for the more than 200 prizes generously donated by local shops and businesses as well as by EMBL staff. Fotis Kafatos and Tom Cord were on hand to draw the winning numbers. The lucky winners walked away with grand prizes, including a €500 travel voucher, tickets to the Hockenheim Formula One race in July, and a hot air balloon trip over the Rhein Neckar Valley. And in the end, the real winners were not EMBL staff, but kids at the Deutsche Kinderkrebsstiftung's *Waldpiraten* camp, which is located across the street from EMBL. Proceeds from the tombola - a whopping €5,725 - will be used to build an outdoor theater at the camp.

– Sarah Sherwood

kids @EMBL

Catching "quarks" with the kinderhaus kids

Arriving at the creek, Flora and Marcel use their fishing poles to catch a fish.

Dangerous crossings need a lot of concentration.

We follow the water uphill to its source. Teamwork!

After lunch we follow the creek downstream. Stepping through the water is no problem thanks to gumboots.

Trying to see where the water comes out.

All that exercise really makes you hungry.

On Tuesday, March 19, 2002, Helga Duczek and a group of kids from the EMBL kinderhaus set off on an adventure through the woods near the Main Laboratory in Heidelberg. Their mission? To learn the secrets about the wonderful world of nature that surrounds them, and how to protect it, and maybe even to catch a "quark" or two.

We end up at a big pond. Look, there are baby frogs in there! Since "Kaulquappen" or "tadpole" is terribly hard to pronounce, the kids simply call them "Quarks".

Which method is more efficient?

Trying to catch quarks. You can use a fishing pole...

Now you may ask where this mysterious place is located. Well, it's not too far away, but we won't tell. Top secrets like this must be protected. Got you curious? Would you like to see it for yourself? Just come with us on our next expedition!

– Helga Duczek & the Kinderhaus explorers

...or a bug jar.

Keeping up with the times

On May 29, a group of seniors visited the Main Laboratory in Heidelberg. The group are former Anglicists from the University of Heidelberg who meet up once a year to visit local companies and institutions to catch up on new developments in the arts and sciences. Stefanie Denger and Andrew Moore lead the round-table discussion on bioethics, a topic the group was particularly interested in.

The demand for guided tours of the EMBL is growing. The groups who visit the laboratory are from very different backgrounds with the majority being high school or university students.

We would like to take this opportunity to thank all groups who have participated in these visits in the past and look forward to their continued support.

– Claudia Lindner

Couldn't be without it!

Could you imagine life without mobile phones, cars, CD players, TV, refrigerators, computers, the Internet and the World Wide Web, antibiotics, vitamins, anaesthetics, vaccination, heating, nappies, nylon stockings, glue, bar codes, metal detectors, contact lenses, modems, laser printers, digital cameras, videogames, play stations?

Technology is everywhere and used by everyone in today's society, but how many Europeans suspect that without studies on the structure of the atom, lasers would not exist, and neither would CD players? Most do not realise that most things they couldn't be without have required years of fundamental research.

To fill in this knowledge gap, leading Research Organizations in Europe (EIROFORUM), with the support of the research directorate of the European Commission, have joined forces to inform Europeans how technology couldn't be without science, and how science can no longer progress without technology.

The project is called *Sci-Tech - Couldn't be without it!* and invites all Europeans to vote online in a survey to identify the top ten technologies they can't live without. It shows them through a dynamic and entertaining Web space where these top technologies really come from, and it reveals their intimate links with research. Teaching kits are being developed to explain to students how their favourite gadgets actually work, and how a career in science can contribute to inventions that future generations couldn't be without.

The results of the survey will be presented as a series of quiz shows live on the Internet during the Science Week, from 4 to 10 November, 2002. Visit the *Couldn't be without it!* website at http://www.cern.ch/sci-tech.

Meet Intermedex

Intermedex Staff. (clockwise from left) Don McPhee, Inge Müller, Artemis Tsoupas, Waltraud Grützner

In the March edition of *EMBL&cetera*, the Staff Association informed you of a change of management at Intermedex in Heidelberg. Much more has happened since, and we would like to use this opportunity to briefly introduce ourselves and outline some of changes that have been implemented.

Who is Intermedex?
Intermedex GmbH was founded in 1979, as a health insurance clearing house for diplomatic missions and international organisations. Since 1979, Intermedex has been committed fully to the administration of the EMBL Health Insurance Scheme, handling approximately 10,000 EMBL Health Insurance claims each year.

Intermedex is perceived by most people as an insurance company, which is not the case! Our function is to evaluate and process health insurance claims and provide information to persons insured under the EMBL Health Insurance Scheme on issues connected with medical insurance.

How to contact us. Visit our website www.intermedex.de, or come by our offices on the ground floor of the Hotel ISG in Heidelberg-Boxberg (open 8:00 to 16:00). You can also contact us by email, phone (06221-380538) or fax (06221-380590) if you have questions or require advice on your health insurance coverage!

We understand that there is a large demand for information on the extent of medical coverage provided by the EMBL Health Insurance Scheme. Intermedex is presently working with EMBL to produce an updated EMBL Health Insurance Scheme brochure, which we will make available on our website. In the meantime, please contact us if you have any questions.

As a German registered company, Intermedex is legally bound to the data protection regulations laid down by German law. These are very stringent regulations and we can assure you that your medical records and any consultations you have with us are kept strictly confidential.

– Don McPhee, Intermedex GmbH

22 years, one month and thousands of hirings later, Ann Cooper retires

HOW DID YOU ARRIVE AT EMBL'S DOOR?

I first came to EMBL in April 1980, as an English teacher. Many of the staff were local and they needed English to be able to work in an international scientific setting. I gradually did more and more work for the Personnel Section. Most of the documents were in German at the time, and I did a lot of translating and other tasks related to administration. Through this I gained insight into the working of the personnel section. In 1989, I was asked to come and work on recruitment. I enjoy working with people and the work in the Personnel Section is very varied and challenging, you never know what is going to crop up in the course of a day.

WHAT IS THE BIGGEST CHALLENGE YOU HAVE HAD HERE AT EMBL?

EMBL has grown so much over the years, from about one hundred, when I first arrived, to over one thousand people. I suppose the biggest challenge for a long time was dealing with the growing amount of work, with little increase in the level of staffing in the Section and managing it all within the provisions of the Staff Rules and Regulations. From a recruitment perspective, we have had a unique challenge. Many people from the Member States would like to work at EMBL, and I've always felt it is very important to make every post open and available to the best applicants from these countries.

Another challenge has been working day to day with the knowledge that the Personnel Section has not always been very popular in some quarters, despite our efforts to provide a good service.

THE EMBL COMMUNITY IS A UNIQUE AND DIVERSE ONE. WHAT KINDS OF ACTIVITIES HAVE YOU SEEN THROUGH THE YEARS THAT HAVE BROUGHT THE STAFF TOGETHER?

There have been several. One event that really brought the community together was when the Dolly story broke. Journalists would call up and wanted to know what EMBL people thought about it. It was decided to hold a whole day of talks down in the Operon, to which the entire staff was invited. EMBL scientists explained in fairly simple terms their view of the whole thing. The Operon was crowded with people. The scientists formed a panel in the front, grabbing the microphone from one another. It was a very lively atmosphere. Any time when people are really interested in a topic, they do go and listen and discuss. Soon after that the Science and Society Forum was formed. I was the administration representative on that for the first three years.

An activity that I was involved in for several years was the annual trip to London for the in-house English language students. Konrad Müller got permission from Sir John Kendrew, the Director-General at the time, just as long as we didn't take the whole lab with us! He also stipulated that a visit to the British Museum be included. I would take about 40 members of staff each year. We travelled by coach in the early days and later by air. The rest of the lab would stand outside and wave us off as we left. The trips were great fun. Each day we had a programme of activities, with a mixture of sightseeing and culture, finishing in the pubs in the evenings.

Since the lab has grown so much in size there have been fewer activities that bring staff together from all levels at EMBL. A new possibility offered itself last year with the *Waldpiraten* project, across the fields from EMBL. The site is being developed to create a summer camp for kids with cancer as well as facilities for lectures and weekend seminars for families. In April last year, hundreds of EMBL staff volunteered for the clean-up day at the camp, which turned out to be an incredible event. That was a super way of getting people from all over the lab together. Interest in the project continues and there was a lot of support for the tombola at the EMBL summer party in June, where over €5,000 was raised for the *Waldpiraten*.

WHAT HAS PART OF EMBL HAS MEANT THE MOST TO YOU?

All the people I have got to know here over the years, and the exciting atmosphere. Of course, a lot of people have met their life's partner here. I can remember inviting one half for an interview, then later on the other one… Sometimes it seemed more like a marriage agency!

AFTER 22 YEARS AND ONE MONTH, WHAT'S NEXT?

I've always wondered whether work is a kind of escapism from real life. Your day is structured for you. You know what you have to do from morning to night. When we are in the thick of work we dream about how wonderful it will be when we can stop, but I'm not so sure it will be that easy. Now that I have retired I am really looking forward to the freedom and to have more time with my family. One thing for sure is that I want to continue to be active and do something useful. I want do more than just concentrate on my hobbies and I will, for example, continue to work with the *Waldpiraten* project. This year, while the camp is being built, it will be a question of raising money, Next year, the camp will open and hopefully EMBL volunteers can be involved in more active ways. And I have been asked to set up an exchange system with children in England and Ireland, using the *Waldpiraten* camp and similar camps there. I am looking forward to it all!

– interview by Sarah Sherwood

Do you know where your friends and colleagues who used to work at EMBL are now? Send them a note telling them how they can get their own copy of EMBL*Ecetera*. All they have to do is send an email to

info@embl-heidelberg.de

people @EMBL

Nick Goldman joined the EBI as a Group Leader in June. Nick did his PhD in 1992 at the University of Cambridge, UK, and postdoctoral work at the National Institute for Medical Research, London, and the University of Cambridge. He has been a Wellcome Trust Senior Fellow since 1995. At the EBI he and his group will develop improved methods for the analysis of DNA and amino acid sequences to study evolution.

Kristina Helwig is the new legal adviser at EMBL. Trained as a German lawyer at the Universities of Saarbruck, Lausanne and Munich, she served as inhouse legal counsel of an American corporation based in Luxembourg. Therafter she worked for several years as General Counsel and Senior Officer Human Resources in an international company based in Neu-Um, Germany. Her main functions at EMBL will be to advise management and the Staff Association on all relevant legal matters, ranging from international contract law, the law of international organizations to commercial and license (intellectual property) law, as well as international labour law issues. Kristina very much enjoys working in an international environment. In upcoming issues, she says, the goal will be to find solutions which are both legally sound and pragmatic. In her spare time Kristina's most exciting hobby is taking care of her 3-year-old daughter.

Birgit Quasten joined EMBL's personnel section in March, taking over from Ann Cooper as the head of recruitment. Birgit last worked at the *Forschungszentrum Karlsruhe*, first as an advisor helping with recruitment and contracts, dealing with the different issues which emerge in a Personnel Section, and then in the legal department working on collaboration contracts. She studied law at the Universities of Giessen and Freiburg, and brings to EMBL her many years of experience with the legal aspects of recruitment. When she is not helping people arrive at the lab, she enjoys hiking and cycling through the Karlsruhe forests.

Faculty appointments: Thomas Surrey and François Nedelec have been appointed team leaders in the Cell Biology and Biophysics Programme at the Heidelberg Main Laboratory.

EMBL &cetera is published by the Office of Information and Public Affairs
EMBL, Meyerhofstrasse 1,
D-69117 Heidelberg

Tel. +49 6221 387 252; fax 387 525
e-mail: info@embl-heidelberg.de

Editor: Sarah Sherwood; Associate Editor: Russ Hodge; Design: Sarah Sherwood, Russ Hodge

Contributors: Catherine Brooksbank,Vladimir Benes, Stephen Cusack, Thomas Dandekar, Steffi Denger, Frank Gannon, Gabor Lamm, Angus Lamond, Claudia Lindner, Don McPhee, Nadia Rosenthal, Halldór Stefánsson, Ann Thüringer

Photographic support: EMBL Photolab

Printed on recycled paper by ColorDruck, Leimen

Would you like to contribute to the next issue of EMBL&cetera?
Just send a message to info@embl-heidelberg.de.
Deadline for submissions is August 16, 2002

Who's new?

In the Cell Biology and Cell Biophysics Programme: Julien Colombelli (Stelzer), Daniel Gerlich (Ellenberg), Barkha Madan (Stelzer), Richard Magdeburg (Bastiaens), Manuel Mendoza (Brunner), Pascale Peyron (Griffiths), Mika Toya (Brunner); in the Developmental Biology Programme: Sabine Fischer (Neumann), Johan Kreuger (Cohen), Dirk Schmidt (Treier), Heidi Snyman (Arendt), Patrick Steinmetz (Arendt), Sebastien Szuplewski (Cohen); in the Gene Expression Programme: Karsten Beckmann (Hentze), Daniel Gerlich (Ellenberg), Patrick Hundsdörfer (Hentze), Andreas Lingel (Izaurralde), Sascha Mendjan (Akhtar), Mayka Sanchez (Hentze); in the Structural and Computational Biology Programme: Nagore Astola (Leonard), Barbara Di Ventura (Serrano), Jesper Ferkinghoff-Borg (Serrano), Mark Isalan (Serrano) Martin Ploss (Böttcher), Bernd Simon (Sattler); in Additional Research Activities: John Randall Clayton (Kafatos), Stephan Meister (Kafatos), Mike Osta (Kafatos); elsewhere at EMBL Heidelberg: Christa Hubert (Administration); at the EBI: Guy Cochrane (Apweiler), Ruth Eberhardt (Apweiler), Alexander Fedotov, Peter McLaren (Apweiler), Xavier Fustero Benavento (Jokinnen), Catherine Brooksbank, Ujjal-Kumar Das, Christopher Lewington (Apweiler), Shiri Freilich (Thornton), Nick Goldman (Group Leader), Susan Jones (Thornton), Roman Laskowski (Thornton), Paul Matthews (Thornton), Irene Nooren (Thornton), Thomas Oldfield (Thornton), Leon Goldovsky (Ouzounis), Eleanor Namlyn (Ouzounis); at the Grenoble Outstation: Bruna Kwiatkowski, Clemens Grimm (C. Müller); at the Monterotondo Programme on Mouse Biology: Hiedi Arling (Rosenthal), Joshua Downer (Rosenthal), Christian Fasci (Rosenthal), Rodolphe Lopez (Nerlov), Thomas Pedersen (Nerlov), Susanne Pedersen (Minichiello), Michele Pelosi (Rosenthal), Pietro Pilo Boyl (Witke), Peggy Kirstetter; at EMBO: Sebastian Guest, Uta Mackensen, Sara Quirk