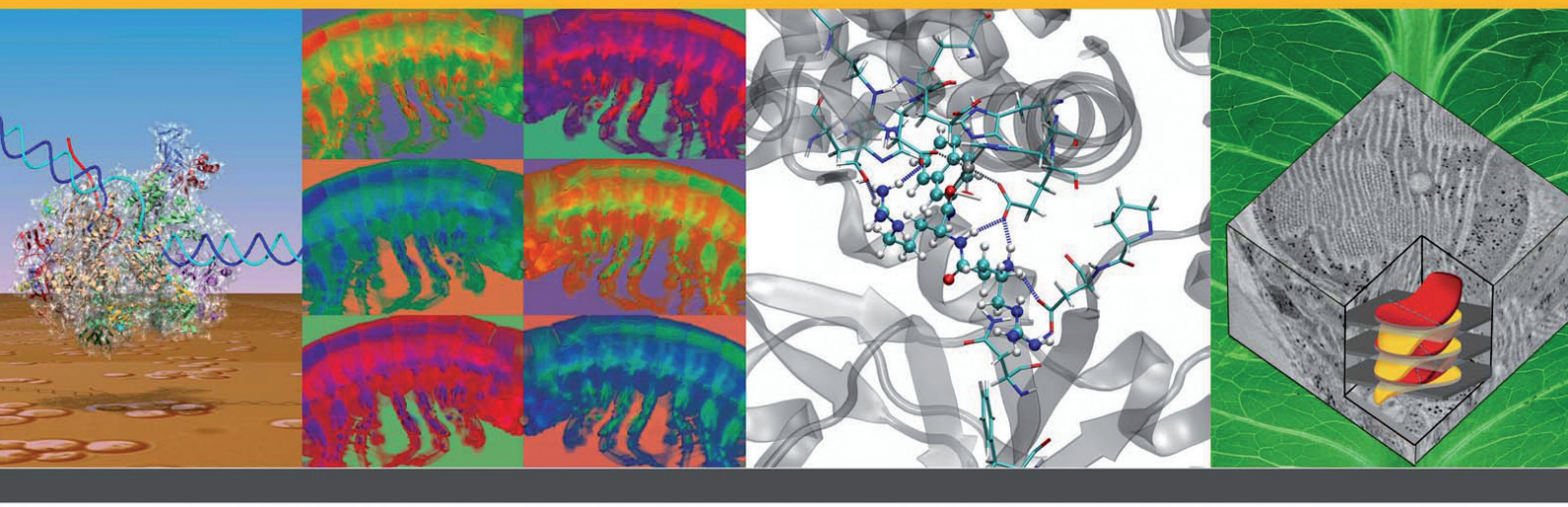
Science as Art



"Art is incredibly valuable as a medium for the communication of complex scientific ideas in a readily accessible format.

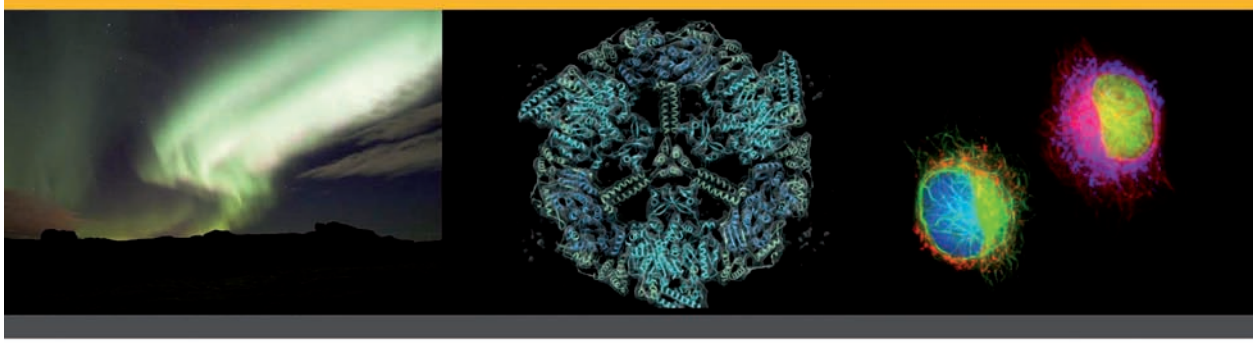
Art and images can bypass many of the distracting effects of jargon and technical expressions that regularly constrain attempts to communicate science verbally.

An image can be striking and beautiful, or ugly and provocative, but regardless it can draw the viewer's attention. The viewer can think about what is being portrayed and why it was made the way it was, without feeling that: "I can't contribute to this debate because I don't understand what they are talking about and I don't recognize the words they are using."

Angus Lamond

(in "Designs for Life: A Collaborative Project", Dundee University Press, 2009)

Welcome and Introduction



This brochure is a collection of posters which were prepared as an exhibition for the EMBL staff-alumni reunion on 8th March 2010.

The aim of the exhibition was to put faces to the alumni statistics, and to provide an impression of the diversity of the science careers our alumni pursue in the EMBL member states at all career levels: from postdoctoral fellows to major science policy makers.

The current scientific work of a variety of our alumni are represented on the posters, which are organized alphabetically by member state. Countries with many alumni are presented on two to three posters, while those with fewer alumni have been grouped together as Scandinavia, Portugal & Spain, and new member states. The collection shows the diversity of alumni distribution around the world, from Germans in Australia and Finnish in France to Greeks in the United Kingdom.

The posters contain images ranging from microscope tomograms, graphics and illustrations to visual metaphors. Each scientific image is accompanied by a brief biography and photograph of the scientist and a description of his / her selected image.

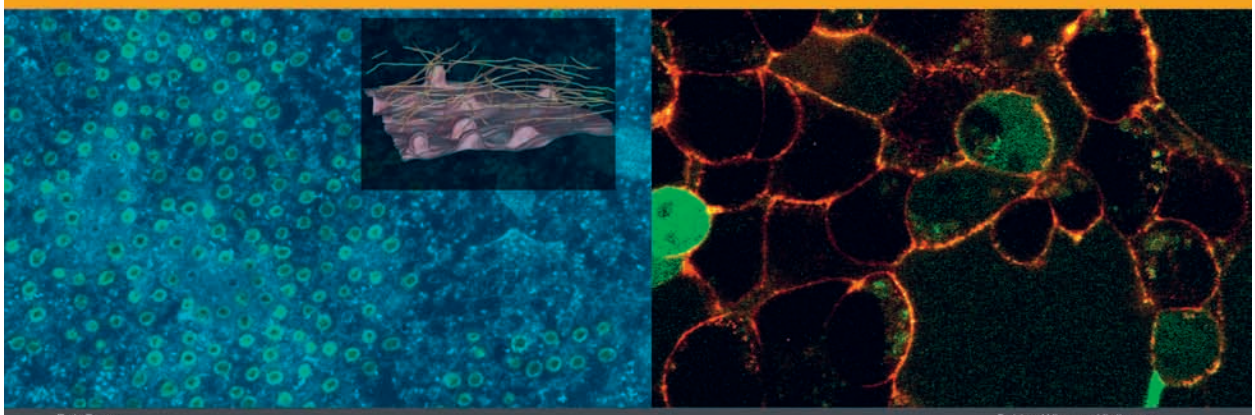
Institute and companies with the largest alumni numbers are listed at the bottom of the posters.

We hope you enjoy this brochure as much as we did putting together the exhibition, which remains on display at the top of the B Helix in the EMBL ATC building in Heidelberg.

Maj Britt Hansen, Freddy Frischknecht and Mehrnoosh Rayner

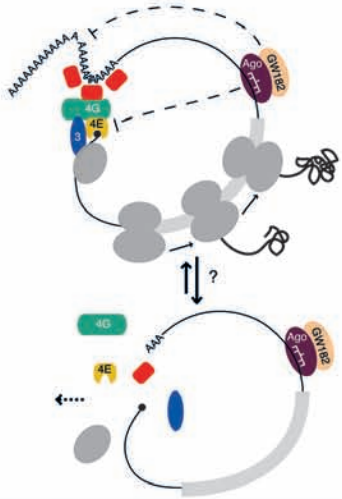
This exhibition was put together by Freddy Frischknecht, Maj Britt Hansen and Mehrnoosh Rayner. We would like to thank all the exhibitors, Ellen Dearden, Vienna Leigh, Petra Riedinger, Udo Ringeisen, Marietta Schupp and the Alumni Association board members for their contributions.

Australia

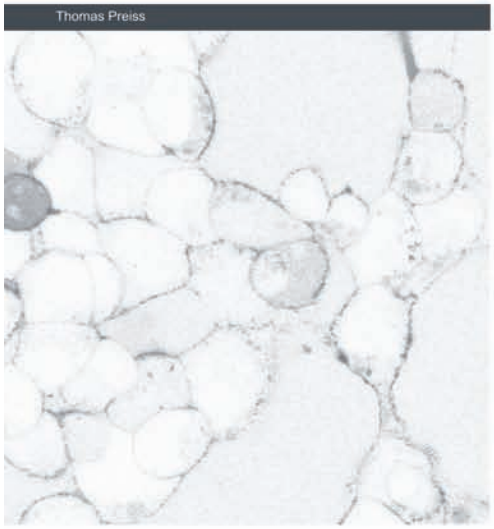


Rob Parton

Sabina Wimmer-Kleikamp



Thomas Preiss



Institutes with largest numbers of alumni:

Monash University, Victoria; La Trobe University, Melbourne; University of Melbourne; University of New South Wales; University of Queensland; University of Sydney; University of Western Australia; Victor Chang Cardiac Research Institute, Sydney

SYDNEY

Sabina Wimmer-Kleikamp

Now: Head of the Cellular Imaging Group at the Centre for Vascular Research, Sydney University; Conjoint Lecturer, The University of NSW, Sydney
Then: Postdoc, Bastiaens Group, Cell Biology & Biophysics, 2006-2007

At EMBL, Sabina analysed conformational changes of transmembrane receptors with fluorescence lifetime imaging and electron microscopy. Her research interests are now cell-to-cell communication and redox signalling with a focus on advanced imaging technologies.
The image shows "Receptor clustering and cellular oxidants". Stimulation of cell surface receptors (red) causes the rapid assembly of receptor clusters and formation of the cellular oxidant H_2O_2 (green) in the cytosol, but mostly colocalised with receptors (yellow) on the plasma membrane and in vesicles.

BRISBANE

Rob Parton

Now: Group Leader and Professorial Research Fellow, IMB, University of Queensland, Brisbane, Australia
Then: Postdoc and then Staff Scientist, Griffiths Group, Cell Biology and Biophysics, 1987 to 1996.
Also: Fellow of the Australian Academy of Science

Since leaving the EMBL in 1996, Rob has continued his research on caveolae, nano-scale pits which cover the surface of many mammalian cells. This has lead him into a diverse range of areas including the study of lipid storage and obesity, Ras-mediated transformation, prostate cancer, liver regeneration, and muscular dystrophy. To understand the role of caveolae in these processes, the Parton laboratory has undertaken fine structural analyses and molecular dissection of caveolae using a range of methods and model systems, including cultured cells, zebrafish, mice, and bacteria. The image shows a pseudo-coloured electron micrograph of the surface of a human fibroblast with caveolae highlighted in yellow, and 3D reconstructions to show how caveolae interact with the cytoskeleton.

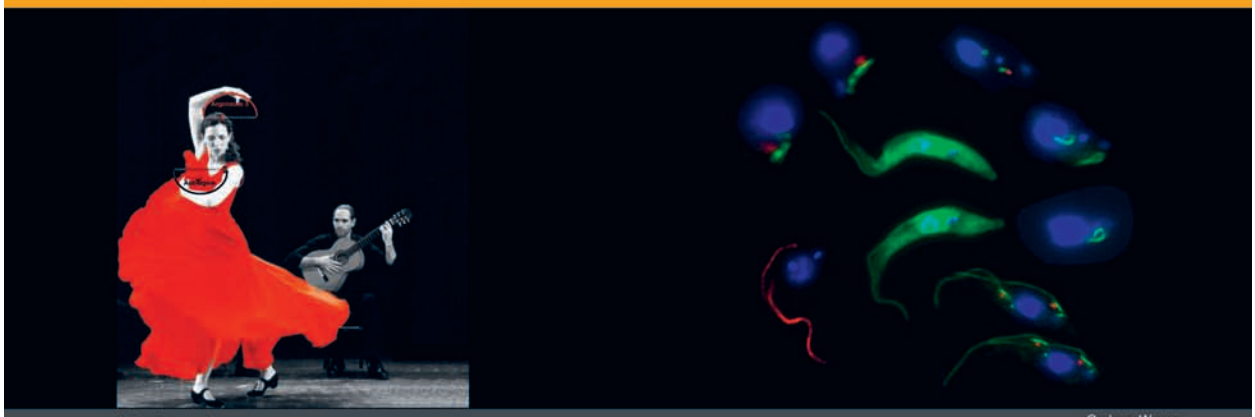
NEW SOUTH WALES

Thomas Preiss

Now: Head RNA Biology Laboratory, Victor Chang Cardiac Research Institute; Conjoint Associate Professor, University of New South Wales
Then: Postdoc, Hentze Group, Gene Expression, 1995-2002

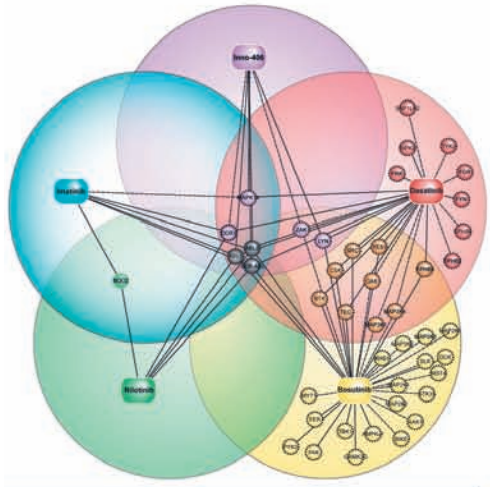
At EMBL, Thomas developed his interest in the mechanisms and transcriptome-wide patterns of eukaryotic mRNA translation. He was also involved in the development of cell-free translation extracts and a novel tethered-function approach now commonly used in RNA Biology. Thomas was a member of the team who manufactured the first microarrays at EMBL which he used to measure transcriptome-wide changes in mRNA translation. His group at the Victor Chang Cardiac Research Institute has devised transcriptome-wide methods to measure mRNA poly(A) tail lengths and found extensive correlation between tail length and other physical and functional mRNA characteristics. Thomas' group also works on the miRNA mechanism and determined that they target functions of two key players in mRNA closed-loop formation, the mRNA cap and poly(A) tail.
The image shows the mRNA closed-loop model of translation initiation and how microRNAs repress translation and stimulate mRNA decay.

Austria

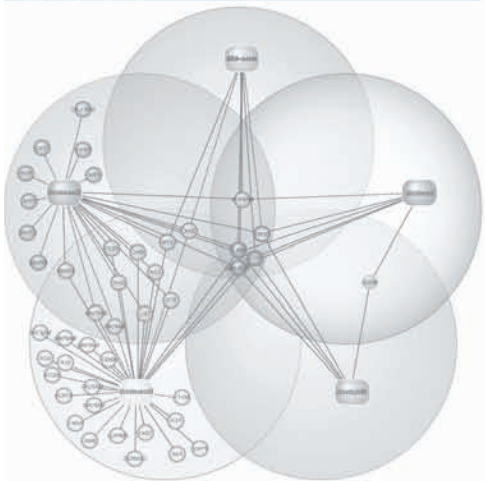


Julius Brennecke

Graham Warren



Giulio Superti-Furga



Center for Molecular Medicine of the Austrian Academy of Sciences, Vienna; Institute of Molecular Biotechnology of the Austrian Academy of Sciences, Vienna; Max F. Perutz Laboratories, Vienna; Medical University of Vienna; Research Institute of Molecular Pathology, Vienna; University of Applied Sciences, Hagenberg; University of Salzburg; University of Vienna

Julius Brennecke

Now: Group Leader, Institute of Molecular Biotechnology (IMBA), Vienna
Then: Predoc, Developmental Biology, Cohen Group, 2001-2006
Also: John Kendrew Award Winner 2009

Julius studied microRNA pathways in flies at EMBL. During his postdoc at Cold Spring Harbor Laboratories he focused on siRNAs and piRNAs, the two other small RNA classes in Drosophila. This led to the discovery of the molecular backbone of a transposon silencing system, which acts like an RNA based genome immune system.
The image shows two key findings: 1. piRNAs are generated from heterochromatic regions that consist mostly of transposon fragments. One of these regions is called the "flamenco" locus as mutations lead to the activation of gypsy elements. 2. piRNA biogenesis involves an amplification loop in which the proteins Aubergine and Argonaute 3 actively participate by cleaving reciprocally sense and antisense transposon transcripts.

VIENNA

Giulio Superti-Furga

Now: Director, Center for Molecular Medicine of the Austrian Academy of Sciences, Vienna
Then: Team Leader, Developmental Biology, 1991-2004
Also: EMBO Member

At EMBL, Giulio investigated structure-function relationships of the c-SRC and c-ABL tyrosine kinases. In Vienna, his lab combines molecular biology and proteomics with chemistry and bioinformatics in an interdisciplinary approach to generate a comprehensive "systems-level" understanding of pathological processes. The focus is on leukemia and immunity. Chemistry is used as a research tool to identify targets of drugs and map the drugs to networks; and to probe regulatory interactions with designed compounds. In close collaboration Giulio's lab also investigates the molecular mechanism behind challenging unexplained observations on drugs and on pathological events.
The image shows drug-target interaction networks in Chronic Myeloid Leukemia.

VIENNA

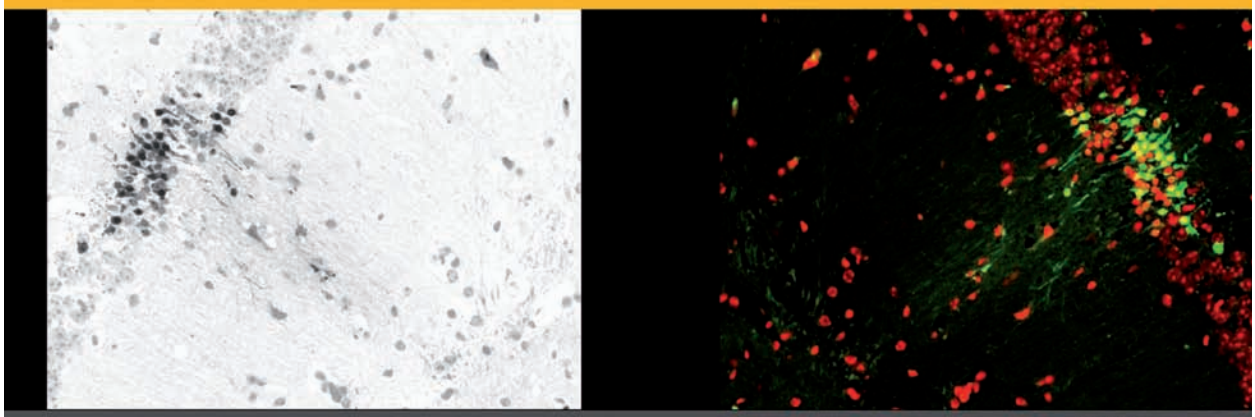
Graham Warren

Now: Director, Max F. Perutz Laboratories, Vienna
Then: Unit Head, Cell Biology & Biophysics, 1977-1985
Also: EMBO Member

Graham's interest in the Golgi started at EMBL and continues at the Max F. Perutz Laboratories where his group study Golgi duplication in the protozoan parasite *Trypanosoma brucei*, the causative agent of African sleeping sickness. Having only a single Golgi makes the process of duplication easy to follow, and will hopefully allow him and his team to understand duplication at the molecular level.
The image shows *Trypanosoma brucei* structures. Clockwise: ER exit site; probable flagellar pocket neck; bilobe, basal bodies and flagellum; flagellum; bilobe and Golgi. Middle: procyclic cells expressing a Fluorescent Protein.

VIENNA

Belgium



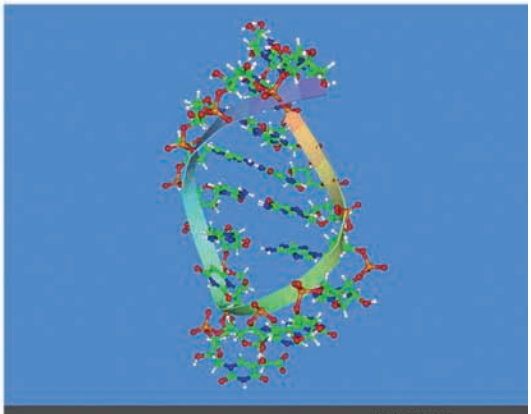
Carlos Dotti

Carlos Dotti

Now: Professor, Leuven University – VIB 11
Then: Group Leader, **Cell Biology & Biophysics**, 1988-2001
Also: EMBO Member

LEUVEN

At EMBL, Carlos worked on the mechanisms involved in the generation and maintenance of the polarized organization of neurons, both the architectural process and biochemical pathways. At Leuven University, Carlos' group is still working on polarity, by defining the mechanisms that fully differentiated neurons use to maintain a normal organization and function in the aged brain. The group hopes to get closer to understanding why and how particular genetic mutations or even environmental insults produce, in some of us, neurodegenerative disease.
The image shows a micrograph corresponding to mouse hippocampal neurons expressing GFP-Cyp46, the enzyme responsible for the removal of cholesterol from brain cells.



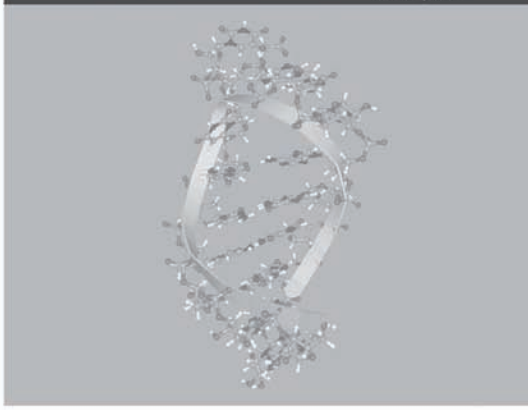
Brian Sproat

Brian Sproat

Now: Managing Director, Chemconsilium, Booischot
Then: Group Leader, Genomics Biochemical Instrumentation, 1984-1994

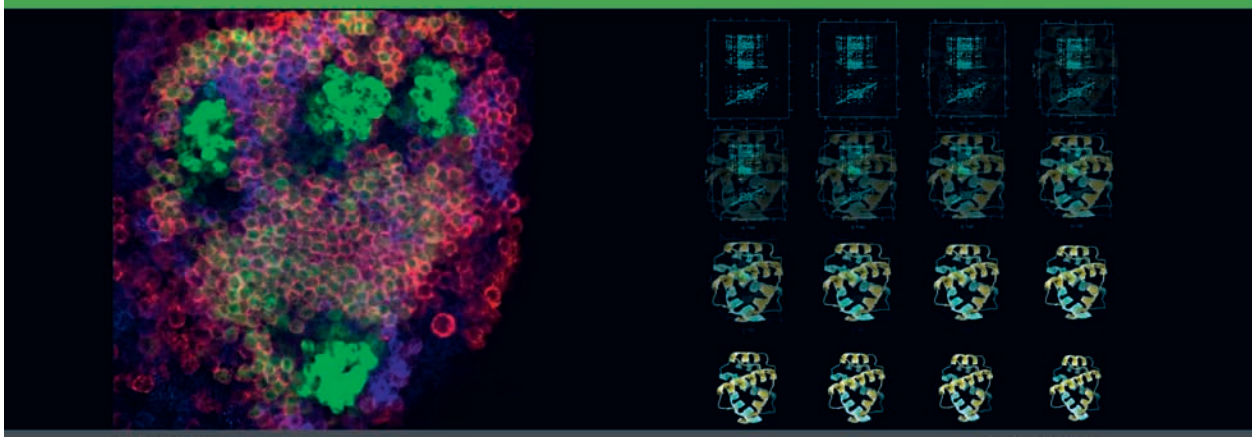
BOOISCHOT

Brian's work at EMBL concerned the synthesis and use of modified oligonucleotides in molecular biology. After leaving in 1994, he continued in the fields of ribozymes, aptamers and siRNA with particular interest in synthesis method development and in delivery methods for *in vivo* use.
Depicted is the NMR structure of the anticodon stem loop 17mer RNA of *E. coli* $tRNA^{Val3}_{UAC}$-cmo^5U_{34} ; m^6A_{37}, resulting from a collaboration between Brian's group at IDT for the RNA synthesis, the group of Paul Agris (NCSU, USA) for the NMR and the group of Andrzej Malkiewicz (Lodz, Poland) for hypermodified nucleotide synthesis.



European Commission, Brussels; Flemish Institute for Biotechnology, Brussels; Ghent University; UCB Pharma, Brussels; Université Libre de Bruxelles; University of Leuven

France



Florence Besse

Cameron Mackereth

Pascal Hingamp

MARSEILLE

Pascal Hingamp

Now: Assistant Professor and Lecturer, Luminy Science Faculty, Mediterranean University, Marseille
Then: Database Curator, Stoesser Group, EBI-Hinxton, 1998–1999

Introduced to DNA sequence annotation at EMBL-EBI, Pascal went on to Marseille University to develop the "Annotathon", a bioinformatics teaching approach that throws students at the research deep end. Students work out from which organism unknown ocean metagenomic DNA fragments come from, and what biological function they may have. In addition to bioinformatics proficiency, students experience the authentic research process of weighing arguments and building hypotheses.
The word cloud describes the Annotathon. Metagenomics - environmental DNA sequencing of intestinal tracts, car windshields or open oceans - is responsible for a data deluge that will require legions of bioinformaticians to transform into knowledge.

PESSAC

Cameron Mackereth

Now: Group Leader, European Institute of Chemistry & Biology (IECB), Pessac
Then: Postdoc, Sattler Group, Structural & Computational Biology, 2003-2007

After a postdoc in the group of Michael Sattler, Cameron continues to use NMR spectroscopy within his own group at the IECB in Bordeaux, France, where he studies the atomic details of proteins and nucleic acids.
The images show an abstract progression from initial data in the top left in which distances between hydrogen nuclei in the protein are measured, to the final 3D model of the protein derived in part form the combined hydrogen distances. This particular protein was investigated in conjunction with the X-ray crystallography group of Sebastien Fribourg, another EMBL alumnus who leads a group also at the IECB in Bordeaux.

NICE

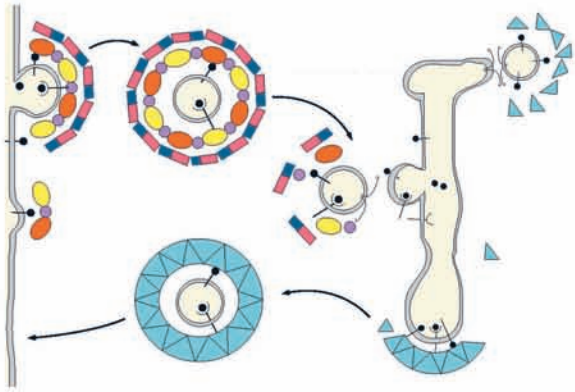
Florence Besse

Now: Group Leader, Institute of Developmental Biology & Cancer, Nice
Then: Staff Scientist, Ephrussi Group, Developmental Biology, 2003-2008

At EMBL, Florence studied how mRNA molecules are kept translationally silent while being transported to specific locations within oocytes. She also got interested in understanding how neuronal cells differentiate. Florence is now combining genetics, biochemistry and microscopy to discover the molecular mechanisms underlying mRNA transport and translation in neurons, using the fruitfly (*Drosophila melanogaster*) as a model system. With this work, she hopes to identify conserved factors controlling axon growth.
The image shows a close-up of a *Drosophila melanogaster* adult brain. A conserved mRNA transport factor (red) is expressed in a specific subtype of neurons involved in olfactory learning and memory (green and blue).

Centre d'Immunologie de Marseille Luminy; CNRS,; Commissariat à l'Energie Atomique, Grenoble; Ecole Superieur de Biotechnologie, Strasbourg; European Institute of Chemistry and Biology, Pessac; European Science Foundation, Strasbourg; European Synchroton Radiation Facility, Grenoble; INSERM; Institut Curie, Paris; Institut de Biologie Structurale, Grenoble; Institut Jacques Monod, Paris; Institut Pasteur, Paris; Institute of Developmental Biology of Marseille-Luminy; Institute of Genetic and Biology Molecular and Cellular, Illkirch; Joseph Fourier University, Grenoble; Mediterranean University, Marseille; University of Nice; University of Paris; University of Rennes; University of Strasbourg

France



Marja Makarow

Michael Sieweke

Carlo Petosa

Now: Group Leader, CNRS IBS / MMIP, Grenoble
Then: Staff Scientist, Cusack Group, Grenoble, 1997–2008

GRENOBLE

At EMBL, Carlo studied the structural biology of transcriptional regulation and of nucleocytoplasmic transport. His current work looks at how these processes are subverted during infection by oncogenic viruses.
The image shows two snapshots of a B lymphocyte against a backdrop of Epstein-Barr virus (EBV) particles: one latently infected by EBV (left), the other bursting with replicating virus (right). The switch from latency to lytic replication is triggered by a viral transcription factor, Zta, whose structure bound to a CpG-methylated viral promoter element reveals how EBV exploits host-driven epigenetic modification of the viral genome.

Michael Sieweke

Now: Associate Professor, Centre of Immunology of Marseille Luminy, Marseille
Then: Staff Scientist, Graf Group, Developmental Biology, 1991-1999

MARSEILLE

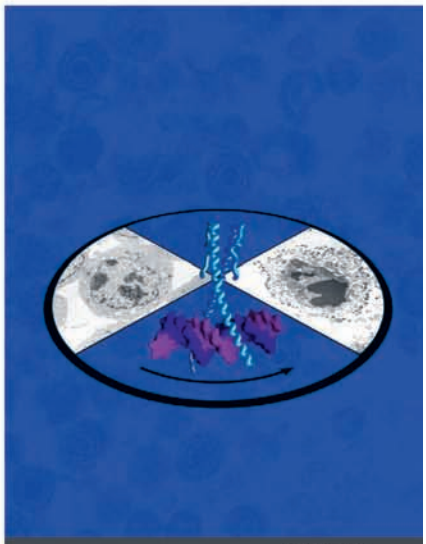
At EMBL, Michael investigated how transcription factors control blood cell development. At CIML he focused on macrophages, a specialized blood cell that clears bacteria. Like other specialized cells, mature macrophages cannot divide. By contrast, stem cells can be amplified indefinitely. Michael's recent work showed that such self-renewal can be re-activated in macrophages. Importantly self-renewing macrophages maintained cell type specific function and were not tumorigenic. The finding holds promise for the generation of large quantities of functional mature cells for cell replacement therapy in regenerative medicine without stem cell intermediates.
The image shows an artistic view of self-renewing macrophages by Simon Bradbrook, Nature Reviews Immunology.

Marja Makarow

Now: Chief Executive Officer, European Science Foundation, Strasbourg
Then: Postdoc, Simons Group, Cell Biology & Biophysics, 1981-1983

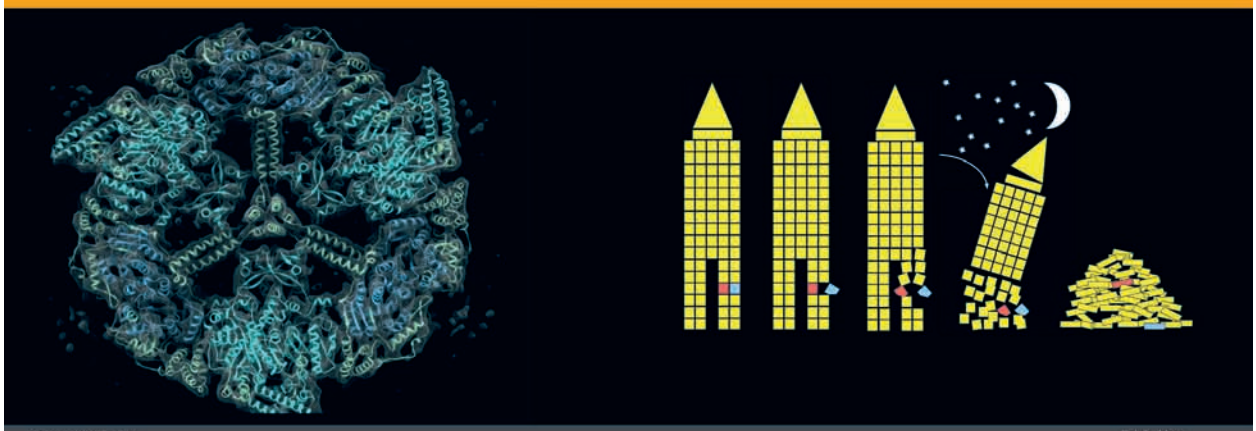
STRASBOURG

Marja completed a postdoc at the EMBL with Kai Simons, before returning to Finland to investigate mechanisms of intracellular protein traffic in yeast. After becoming delegate of Finland to the EMBL Council and the EMBC, her tasks in science policy started to increase. In 2003, she became Vice-President of the University of Helsinki, and later member of both the Research Policy Council of the Prime Minister of Finland, and the independent advisory body for the EU Commissioner of Research. She has served as referee for many funders, including the ERC, and run research assessments of universities. In 2006 she was mandated to establish the EMBL-partnered Institute of Molecular Medicine Finland, and in 2008 a new university (Aalto University). Since 2008 she is Chief Executive of the European Science Foundation in Strasbourg.



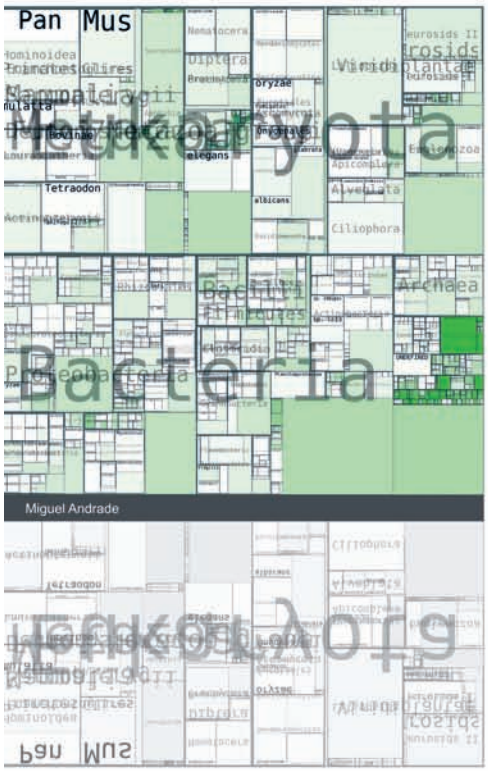
Carlo Petosa

Germany



Werner Kühlbrandt

Ed C. Hurt



Miguel Andrade

Bayer Schering Pharma AG, Berlin; DKFZ, Heidelberg; Free University Berlin; Heidelberg University; Max-Delbrück Centre for Molecular Medicine, Berlin; MPI Biochemistry, Martinsried; MPI Biophysics, Frankfurt; MPI Molecular Cell Biology & Genetics, Dresden; MPI Molecular Genetics, Berlin; MPI Molecular Physiology, Dortmund; MPI Neurobiology, Martinsried; Sanofi-Aventis, Frankfurt; Technical University Dresden

Werner Kühlbrandt

Now: Director, MPI of Biophysics, Frankfurt
Then: Group Leader & Senior Scientist, Structural & Computational Biology, 1988-1996
Also: EMBO Member

FRANKFURT

Werner left EMBL in 1997 to become a director at the MPI of Biophysics in Frankfurt where his department continues to study the structure of membrane proteins and other macromolecular complexes by high-resolution electron cryo-microscopy.
The image shows the group's recent EM map (translucent surface) of yeast fatty acid synthase determined by electron cryo-microscopy of single particles at 5.9Å resolution, with the fitted X-ray structure in colour. The synthase is a giant multi-enzyme complex that performs sequential synthesis of fatty acid chains, which are used as membrane components and for energy storage in all living organisms.

Miguel Andrade

Now: Group Leader, MDC, Berlin
Then: Postdoc, Bork / Sander Groups, Structural & Computational Biology / EBI-Hinxton, 1994-2003

BERLIN

Miguel worked at EMBL Heidelberg and EBI-Hinxton in the analysis of the first complete genomes and in data-mining methods to associate functions to genes and proteins. After EMBL, he worked on the analysis of high-throughput data of gene expression, yeast-two-hybrid, and EST libraries, with a focus on finding genes related to stem-cell pluripotency, cancer and neural disease. His passion remains sequence analysis!
The figure reflects a view of the protein sequence database. The size of the nested rectangles represents the amount of protein sequence clusters for a given taxonomic range and the hue the average of the cluster size in the range.

Acknowledgements: Image - Gareth Palidwor, Ottawa Hospital Research Institute; Manuscript -Perez-Iratxeta et al. EMBO reports, 2007 8:1135-1141

Ed C. Hurt

Now: Professor, University of Heidelberg
Then: Group Leader, Cell Biology & Biophysics, 1986-1995
Also: EMBO Member

HEIDELBERG

For the past 20 years, Ed has conducted research on the structural and functional analysis of the yeast nuclear pore complex (NPC) and the mechanisms of nuclear export. These projects were initiated when he was a group leader at EMBL. The groups investigations have led to the molecular analysis of the nuclear pore complex, one of the largest macromolecular assemblies in the eukaryotic cell. The image schematically depicts how the group dissected the nuclear pore complex by genetics (called 'synthetic lethality screens') that enabled them to specifically damage nuclear pore proteins (red and blue brick) with a collapse of the entire 'cellular building'.

Germany

Bodo M. H. Lange

Markus Grabenbauer

DORTMUND

Markus Grabenbauer

Now: Group Leader, MPI for Molecular Physiology, Dortmund
Then: Postdoc, Hoenger Group, Cell Biology & Biophysics, 2002-2006

Markus became fascinated by the Golgi apparatus at EMBL. To study this complex membrane system, he developed a correlative light and electron microscopic technique using photo-oxidation through green fluorescent protein (GFP). While working in Andy Hönger's group, he started the first cryo-EM study on native mammalian Golgi. In 2006, Markus moved to the MPI of Molecular Physiology in Dortmund, where former EMBL group leader Philippe Bastiaens is now Director of the Department of Systemic Cell Biology. In the last 3 years, Markus built from scratch an EM facility for routine EM, cryo-electron tomography, and correlative microscopy including highest-end instrumentation and advanced preparation techniques.

BERLIN

Bodo M.H. Lange

Now: Group Leader, MPI for Molecular Genetics, Berlin
Then: Postdoc, Gonzalez Group, Cell Biology & Biophysics, 1997-2003

Bodo started his postdoctoral work at EMBL in 1997 in Cayetano Gonzales' laboratory with the first proteomic characterisation of the Drosophila centrosome. The current research focus of his group is the regulation of cell proliferation applying functional genomics approaches to basic questions in developmental biology and molecular medicine. Bodo's group demonstrated, for the first time, the interaction of the spindle checkpoint component with centrosome proteins. The image shows a Drosophila SL2 cell that, after depletion of the cdc20 protein, results in aberration of spindle and centrosome organisation.

HEIDELBERG

Freddy Frischknecht

Now: Group Leader, University of Heidelberg
Then: Predoc, Way Group, Cell Biology & Biophysics, 1996-2000

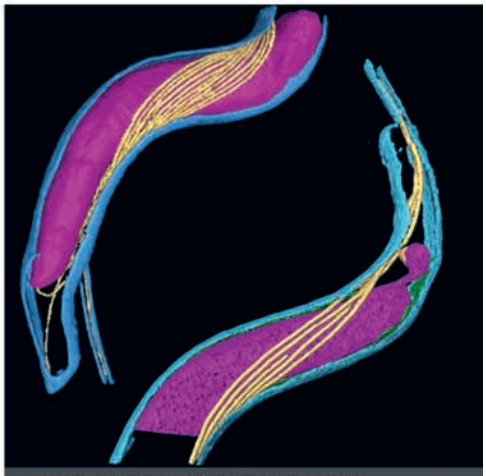
Marek Cyrklaff

Now: Group Leader, University of Heidelberg
Then: Staff Scientist, Leonard Group, Structural & Computational Biology, 1986-2000

Reinhard Wallich

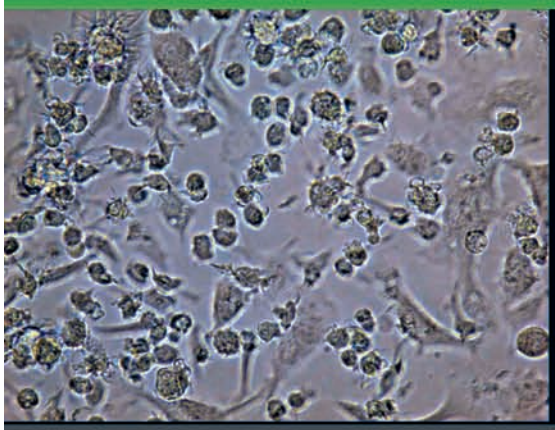
Now: Professor, University of Heidelberg Medical School
Then: Postdoc, Rolf Müller Group, Developmental Biology, 1986-1988

After leaving EMBL, Freddy and Marek met at an ELSO meeting in Nice and, both talking their cherished Emblish started a collaboration on the structural analysis of malaria parasites. At EMBL Freddy worked on the cell biology of vaccinia virus infection before moving to Paris to study malaria parasites, and Marek used cryo EM on various samples including vaccinia, which he investigated using cryo-tomography at the MPI in Martinsried. At Heidelberg University they teamed up with alumnus Reiner Wallich to work on Borrelia, the causative agent of Lyme disease – transmitted by ticks in the Heidelberg forests. The image shows a 3D model of one end of a Borrelia spirochete. Flagella: yellow; cytoplasm: magenta; spirochete specific outer membrane: blue.

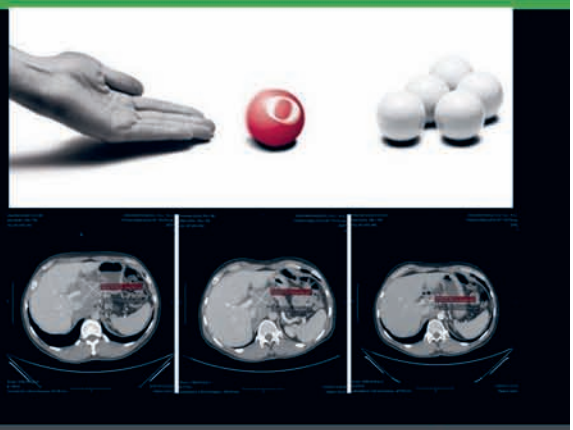


Marek Cyrklaff, Reiner Wallich and Freddy Frischknecht

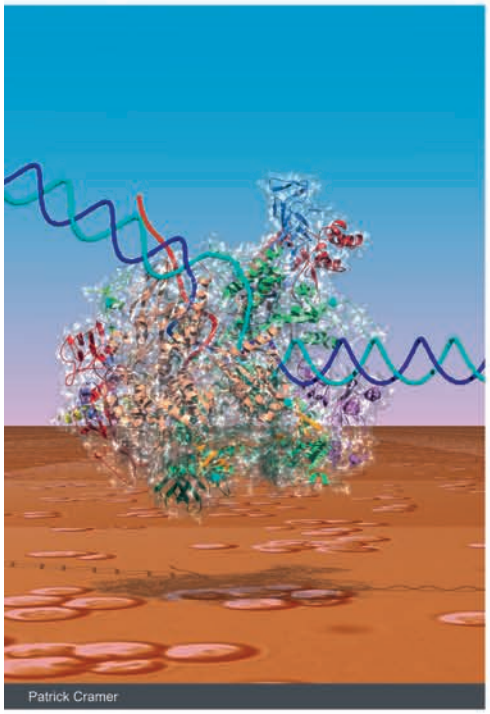
Germany



Renata Stripecke



Patrick A. Baeuerle



Patrick Cramer

Patrick Cramer

Now: Director, Gene Center & Dept of Biochemistry, Ludwig-Maximilians-University, Munich
Then: Predoc, Christoph Müller Group, Grenoble, 1995-1998
Also: EMBO Member

MUNICH

At EMBL Grenoble, Patrick studied how proteins bind DNA to activate the transcription of genes in Christoph Müller's group. To understand the process of transcription, he then joined the laboratory of Roger Kornberg at Stanford University where he could solve the structure of the RNA polymerase II core enzyme that transcribes DNA into messenger-RNA. After his return to Europe in 2001, Patrick's laboratory in Munich elucidated many aspects of transcription. As a result, they now have a movie of the transcribing polymerase and can roughly understand how the beginning of a gene is found.

Renata Stripecke

Now: Professor, Department of Hematology, Medical School Hannover
Then: Predoc, Hentze Group, Gene Expression, 1990-1994

HANNOVER

Following her PhD at EMBL on mechanisms of gene regulation, Renata spent 13 years in Los Angeles, USA, first as a postdoc and then Assistant Professor at USC and UCLA. As Professor in Hannover, she leads the programme Lymphatic Cell Therapy. Her task is the rational genetic manipulation of the immune system for the cure of chronic diseases. Her international laboratory reflects her life-experience on mobility. Renata has two children, who are growing with her career development.
The image depicts Self-differentiated Myeloid derived Antigen presenting cells Reactive against Tumors ("SMART-DCs"). SMART-DCs are in process development to be used as cellular vaccines in the treatment of cancer.

Patrick A. Baeuerle

Now: Chief Scientific Officer, Micromet Corporation, Bethesda and Munich
Then: Predoc, Huttner Group, Cell Biology & Biophysics, 1986-1987

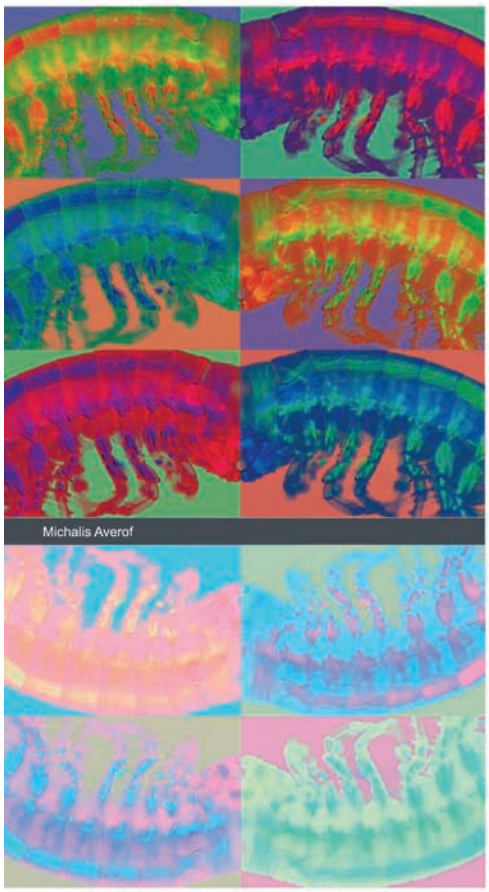
MUNICH

At EMBL, Patrick dealt with tyrosine sulfation of proteins, a covalent modification of secretory proteins. As postdoc with David Baltimore at the Whitehead Institute, group leader at the Gene Center in Martinsried, professor and chairman at Freiburg University Medical School, and Director Drug Discovery at Tularik Corporation, South San Francisco, Patrick worked on transcription factor NF-kB, a central regulator of the immune response. He is now Chief Scientific Officer of Micromet Corporation, focussing on the development of novel antibody-based therapies for treating cancer patients with the help of the body's T cells."
The image on top shows a man-made antibody (hand) redirecting a patient's T cell (red) against cancer cells (white). The lower images show a CT scan of a tumor next to the liver before treatment (cross on left panel), and 4-8 weeks after treatement with a T cell-engaging antibody (middle and right panel).

Greece

Zoi Lygerou

Michalis Averof



Michalis Averof

Michalis Averof

Now: Research Associate, IMBB-FORTH, Heraklion, Crete
Then: Postdoc, Cohen Group, Developmental Biology, 1995-1997
Also: EMBO Young Investigator

HERAKLION

While working at EMBL, Michalis explored the origin of wings, a key evolutionary innovation of insects, by comparing the expression of regulatory genes among crustaceans and insects. After establishing a lab in Crete, he and his colleagues developed genetic tools that allow them to label cells and to study the function of genes in new species of interest. They use these tools to explore the diversity of animal development, morphology and physiology of animals.
The image shows a crustacean expressing a fluorescent protein in muscles.

Zoi Lygerou

Now: Lecturer, School of Medicine, University of Patras, Greece
Then: Predoc, Seraphin/Mattaj Groups, Gene Expression, 1991-1996
Also: EMBO Young Investigator

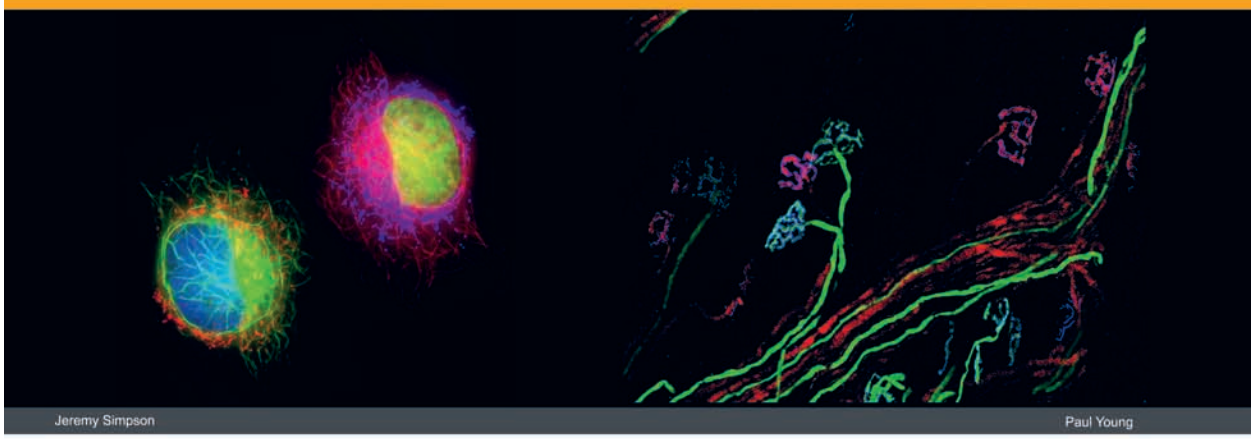
PATRAS

At EMBL, Zoi worked on nuclear riboenzymes. Following a postdoctoral position with Paul Nurse in London on cell cycle control, she returned to Greece and set up a laboratory in the Medical School of Patras, where she studies complexes safeguarding genome integrity. Zoi maintains close links with EMBL, working with the Stelzer Group.
The image shows nuclei of live cancer cells, subjected to localized DNA damage by laser microsurgery. Proteins rush to the site of damage to form dynamic multi-subunit repair complexes (in red and green, DNA in blue).

Acknowledgement: Image by V. Roukos, PhD student in the Lygerou lab, in collaboration with the Stelzer and Bastiaens laboratories at EMBL.

Center for Research and Technology Hellas, Thessaloniki; Institut Pasteur Hellenique, Athens; Institute of Molecular Biology & Biotechnology, FORTH, Heraklion, Crete; University of Athens; University of Crete; University of Ioannina; University of Thrace, Alexandroupolis

Ireland



Jeremy Simpson

Paul Young

Paul Young

Now: Group Leader, University College Cork
Then: Predoc, Saraste and Gautel Groups, Structural and Computational Biology, 1996–2000

As an EMBL predoc, Paul characterized interactions between the sarcomeric proteins titin, alpha-actinin and obscurin. He then switched fields to study synapse formation at Duke University, where he characterized a synaptic ubiquitin ligase - LNX1 and developed "SLICK"- a technique that facilitates genetic manipulation of fluorescently labeled single neurons in vivo. Paul currently heads a research group at University College Cork.
The image shows that the choline acetyltransferase, stained in red, has been deleted in a subset of green fluorescently labelled motor axons using SLICK. Synapses are stained in blue. Knock-out synapses appear cyan and wild-type synapses pink in the merged image.

CORK

Frank Gannon

Now: Director General, Science Foundation Ireland, Dublin and Trinity College Dublin
Then: EMBO Director, EMBL Group Leader and Senior Scientist, Directors Research, 1994-2007
Also: EMBO Member

Frank's 'scientific image' is his photo on this poster which shows him in a suit and tie. This is Frank's life after EMBL, although he points out that he occasionally dressed respectably at EMBO for his non-research activities. Frank is now Director General of the major science funding agency in Ireland - Science Foundation Ireland, which covers not just molecular biology but all areas of research. His new position requires much more interaction with industry than was the case at EMBO. The job has had plenty of challenges which apparently reverses the ageing process: he points out that "each challenge brings rejuvenation and so I expect to become younger as the years go on."

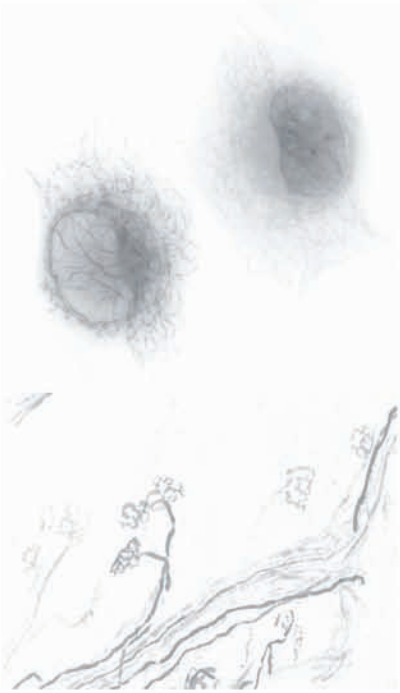
DUBLIN

Jeremy 'Jez' Simpson

Now: Professor, University College Dublin (UCD)
Then: Scientific Project Manager, Pepperkok Group, Cell Biology & Biophysics, 1999-2008

At EMBL, Jez used high-throughput fluorescence microscopy-based approaches to catalogue newly identified proteins in mammalian cells. He is continuing this work at University College Dublin with particular focus on understanding the relationship between internal membrane organelles and the cytoskeleton, and how all these structures are maintained through the life of a cell.
The fluorescent microscopy image, 'Twins' shows aspects of the internal architecture of a cultured mammalian cell. Visible are the nucleus, microtubule cytoskeleton and the mitochondria. The cell has been replicated and re-coloured for artistic purposes.

DUBLIN

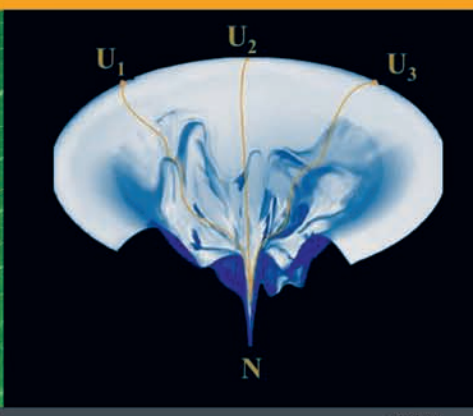


University College Dublin; University College Cork; National University of Ireland, Galway

Israel

Danielle Melloul

Ziv Reich



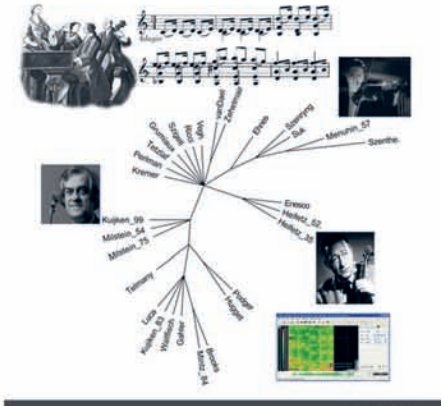
Ziv Reich

Benny Chor

Now: Faculty Member, School of Computer Science, Tel Aviv University
Then: Visiting Scientist, Goldman Group, EBI-Hinxton, 2006-2007

TEL AVIV

At EMBL-EBI, Benny explored mathematical aspects of phylogenetic reconstruction methods, as well as properties of DNA sequences at the level of complete genomes. In Israel, his research continues along these lines. He has explored methods for constructing gene networks, using gene expression data based on a large number and variety of experimental conditions. Benny is also looking at the unexpected outcomes of whole genome based phylogenies.
On a different note, Benny is exploring the applicability of phylogenetic methods to understanding relations among musical performances. The tree in the image shows the preliminary results. Benny is also investing a lot of effort into Computer Science education at high schools.



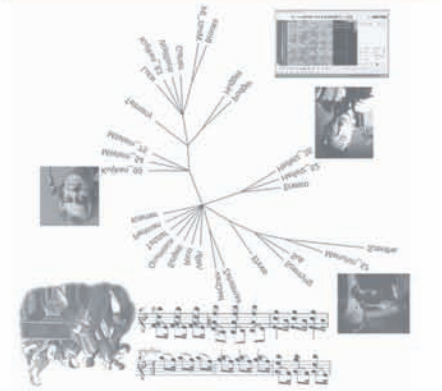
Benny Chor

Ziv Reich

Now: Group Leader, Weizmann Institute of Science, Rehovot
Then: Postdoc, Argos Group, Structural & Computational Biology, 1990-1991
Also: EMBO Young Investigator

REHOVOT

At EMBL, Ziv's research topic was protein folding. At the Weizmann Institute, his group is working on the structure and principles of operation of large transport systems, and the way proteins fold and bind. One transport system his group studies is the machinery that mediates the exchange of material between the nucleus and the cytoplasm. A second is the oxygenic photosynthetic apparatus present in cyanobacteria, algae and higher plants.
Currently, they are interested in the shape and ruggedness of the free energy landscapes that underlie protein folding and binding, as shown in the images.



Danielle Melloul

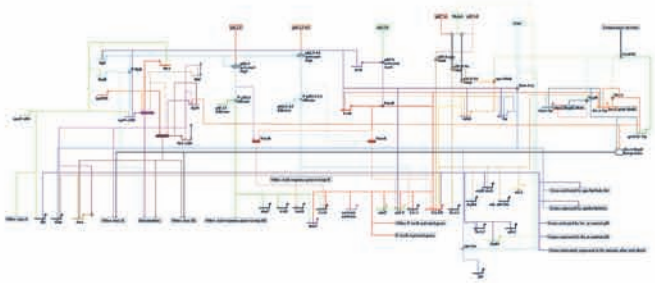
Now: Senior Lecturer in Endocrinology, Hebrew University, Hadassah Medical Center, Jerusalem
Then: Postdoc, Ansorge Group, Instrumentation, 1982

JERUSALEM

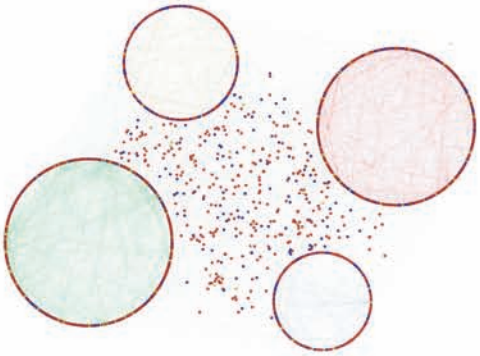
The major focus of Danielle's lab is to evaluate the *in vivo* role of the pro-inflammatory transcription factor NF-kB in ß-cells. They therefore generated a transgenic mouse line, where NF-kB activation is specifically inhibited in ß-cells by the expression of a non-degradable IkB transgene. They have reported, using this model, that inhibition of the NF-kB pathway protects *in vitro* islets from cytokine-induced apoptosis and *in vivo* from multiple low dose streptozocin-induced diabetes along with reduced intra islet lymphocytic infiltration. These results underscore the key role played by NF-kB in ß-cell destruction.

Hebrew University; Hadassah Medical Center, Jerusalem; Tel Aviv University; Weizman Institute of Science, Rehovot

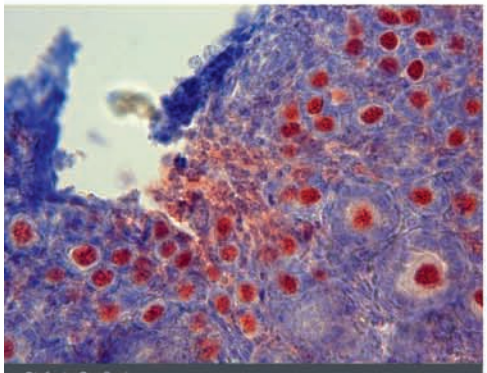
Italy



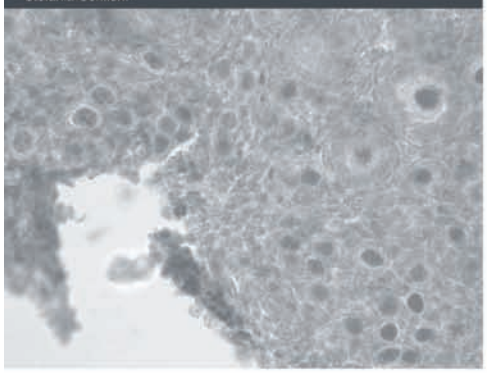
Alberto Danielli



Francesca Ciccarelli



Stefania Gonfloni



Center for Advanced Studies, Research and Development in Sardinia, Pula; European Institute of Oncology, Milan; International Centre for Genetic Engineering and Biotechnology, Trieste; Istituto di Genetica Biochimica ed Evoluzionistica, Pavia; Istituto di Ricerca di Biologia Molecolare P. Angeletti, Pomezia; Istituto Superiore di Sanità, Rome; San Raffaele Scientific Institute, Milan; University of Bologna; University of Milan; University of Naples "Federico II"; University of Padova; University of Palermo; University of Pavia; University of Rome "La Sapienza"; University of Rome "Tor Vergata"; University of Turin

Francesca Ciccarelli

Now: Group Leader, European Institute of Oncology (IEO), Milan
Then: Postdoc, Bork Group, Structural & Computational Biology, 2001-2005

MILAN

At EMBL, Francesca worked on the characterization of protein domains, traced the evolutionary history of genes and gene families and contributed to the first phylogeny of the tree of life based on the sequence of nuclear genes. At IEO, her group uses a combination of computational and experimental methods - mostly high-throughput sequencing - to unravel genetic and genomics determinants of cancer. They recently found that cancer genes are mostly singletons and encode protein hubs, as shown in the image. Using ultra-deep sequencing, Francesca's group succeeded in quantifying genomic instability also in non-tumoral tissues of cancer patients, showing that those individuals have a constitutional mutation rate higher than normal.

Stefania Gonfloni

Now: Researcher, University of Rome "Tor Vergata"
Then: Postdoc, Superti-Furga Group, Developmental Biology, 1996-1999

ROME

At EMBL, Stefania studied structure-function relationships of Src tyrosine kinases. After moving to New York (USA) she became a "salt bridge" across the Atlantic Ocean between EMBL (Giulio Superti-Furga's group) and the Rockefeller University (John Kuriyan's group) and thus instrumental for generatine the autoinhibited c-Abl structure. She also contributed to the discovery of another key feature of Src regulation. In Italy, Stefania identified a novel nuclear substrate of c-Abl, TAp63, which is highly expressed in female germ cells.This led to the discovery that c-Abl inhibitors could be used to protect fertility during cancer treatment.
The image shows an ovarian section from P5 mice stained with antibody to p63 (red) and with hematoxylin (light blue) showing the oocytes of the follicle reserve. The rate of decline of these oocytes determines the reproductive lifespan.

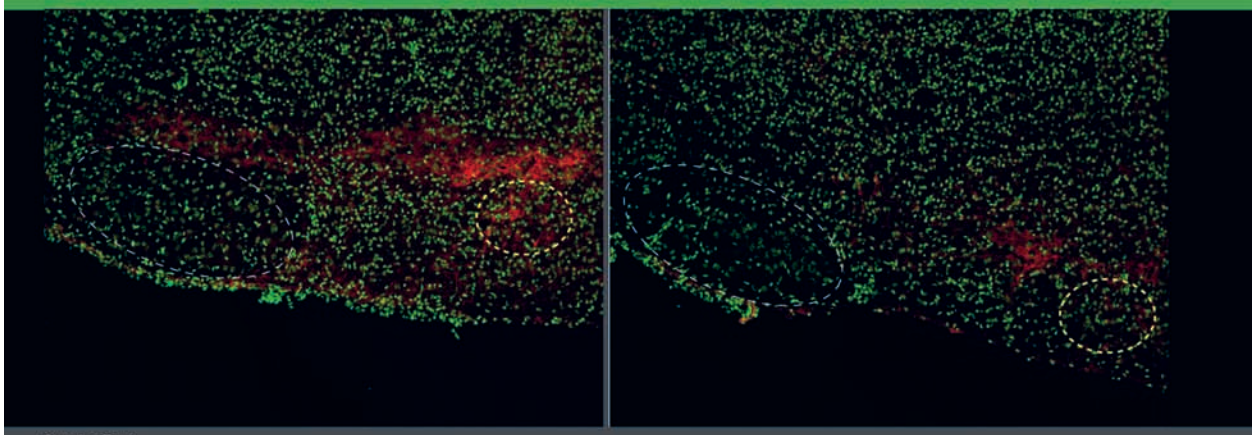
Alberto Danielli

Now: Scientific - Research Associate, University of Bologna
Then: Predoc, Kafatos Group, Director's Research, 1997-2001

BOLOGNA

At EMBL, Alberto dissected countless *Anopheles gambiae* mosquitos, the vectors of malaria, in the search for genes involved in mosquito immune-responses and in the transmission of *Plasmodium* parasites. At the University of Bologna, he works on transcriptional regulation with particular focus on metal sensing and stress responses in the human gastric pathogen *Helicobacter pylori*. He and his colleagues have implemented ChIP-chip and transcriptome analyses to address genome-wise the dissection of the *H. pylori* regulatory circuits, contributing to the detailed understanding of the transcriptional regulatory network of this widespread infectious agent.
The image shows a shallow circuit with few regulators and extensive horizontal connections responsible for life-lasting colonization of the gastric epithelium.

Italy



Giuseppe Testa

Giuseppe Testa

Now: Director of the Laboratory of Stem Cell Epigenetics, European Institute of Oncology (IEO), Milan
Then: Predoc, Stewart Group, Gene Expression, 1997-2001

At EMBL, Giuseppe pioneered genome engineering strategies for disease modeling. Following his postdoc at the TU Dresden/MPI-CBG, Giuseppe became head of the Stem Cell Epigenetics laboratory at IEO (Milan), combining advanced technologies to study the epigenetic regulation of cell fate. His lab investigates how the methylation of histones, the proteins around which DNA is wrapped, regulates stem cell function in normal development and in cancer. The image shows the elucidation of a complex neurodevelopmental disorder (affected neurons in red) caused by a subtle imbalance in histone methylation, underscoring the importance of this pathway for tissue formation.
In parallel Giuseppe trained in Bioethics and Science and Technology Studies (STS) at Manchester University and the Harvard Kennedy School of Government, which brought him to co-found an innovative PhD program at his institution that combines science at the bench with epistemology, bioethics and STS.

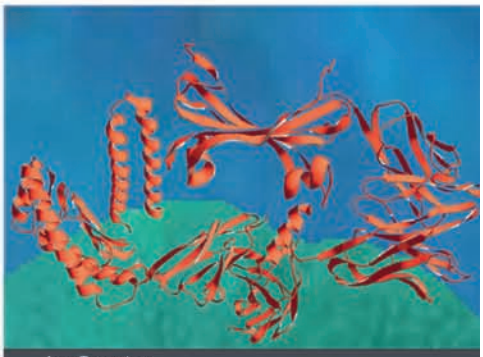
MILAN

Anna Tramontano

Now: Professor, University of Rome "La Sapienza", Department of Biochemical Sciences
Then: Staff Scientist, Lesk Group, Structural & Computational Biology, 1988-1991
Also: EMBO Member

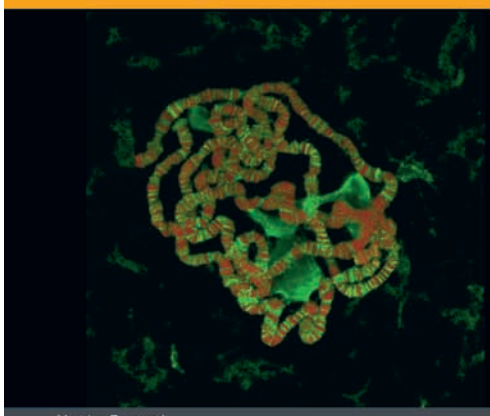
Anna was a member of the EMBL Biocomputing programme when she became fascinated by the beauty of protein structures. After leaving EMBL, she joined Merck Research Laboratories in Pomezia near Rome where her EMBL experience was instrumental for her work on protein design and for the analysis and understanding of viral proteins. In 2001, she moved back to academic research where she teaches Biochemistry and Bioinformatics and leads an interdisciplinary, international and very active group of young scientists.
The image shows the beauty and complexity of protein structures (freely adapted from "La dance" by Henry Matisse).

ROME

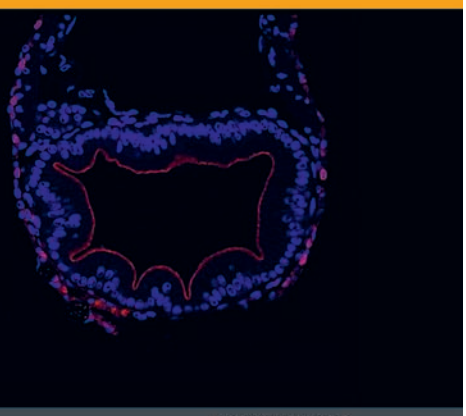


Anna Tramontano

Netherlands



Maarten Fornerod



Anna-Pavllina Haramis

AMSTERDAM

Anna-Pavllina Haramis

Now: Junior Group Leader, Netherlands Cancer Institute, Amsterdam
Then: Predoc, Zeller Group, Developmental Biology, 1993-1997

At EMBL, Anna-Pavllina studied vertebrate limb pattern formation using mouse genetics. She and her colleagues are now studying control of metabolism during development in zebrafish. They are particularly interested in the mechanisms that couple coordination of cell growth with availability of nutrients in the environment, since these pathways are also being exploited by tumor cells to promote cancer growth. They are studying zebrafish mutants with deregulated metabolism to tackle these issues.
The image shows *in vivo* analysis of intestinal and gall bladder lipid metabolism of zebrafish larvae at day five of development.

AMSTERDAM

Maarten Fornerod

Now: Group Leader, Netherlands Cancer Institute, Amsterdam
Then: Postdoc, Mattaj Group, Gene Expression, 1996-2000

At EMBL, Maarten studied transport between the cell nucleus and cytoplasm. This transport takes place through nuclear pore complexes that are embedded in the nuclear envelope. After leaving EMBL, he began studying the relation between the nuclear pore complex and chromatin function.
The image shows Drosophila polytene chromosomes stained for nuclear pore complex component Nup50 (green) and the DNA dye DAPI (red). The components of the nuclear pore complex interact with chromatin away from the nuclear periphery, inside the nucleoplasm. Maarten's group found that nucleoporins can stimulate expression of developmental and cell cycle genes by this type of interaction.

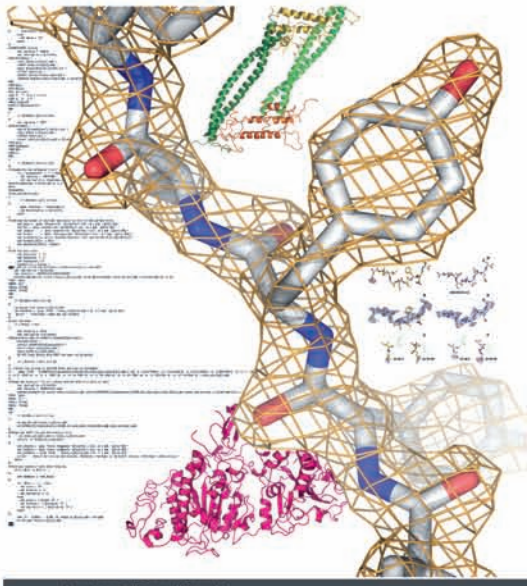
AMSTERDAM

Anastassis 'Tassos' Perrakis

Now: Group Leader in Structural Biology, Netherlands Cancer Institute, Amsterdam
Then: Predoc, Wilson Group, Hamburg, 1993-1996; and later Staff Scientist, Cusack Group, Grenoble, 1997-2000
Also: EMBO Young Investigator

Tassos lives a double scientific life as an X-ray crystallographer developing new methods and solving new structures of biomedical interest.
The orange 'chicken-wire' in the image shows electron density - the results of X-ray crystallography. Their software, ARP/wARP (an ongoing collaboration with Victor Lamzin's group at EMBL-Hamburg), was used to create the protein model inside.
The 3D structures in the image include a model of the Cdt1: Geminin complex, a protein switch that helps to make sure that DNA is replicated only once before cells divide; structures of antigen presenting molecules; and Tassos group's brand new structure of an exciting drug target for cancer, inflammation and multiple sclerosis therapy.

Photo: This is one of his older home-group members, looking at antigen presentation. He looks like Tassos a few years back.



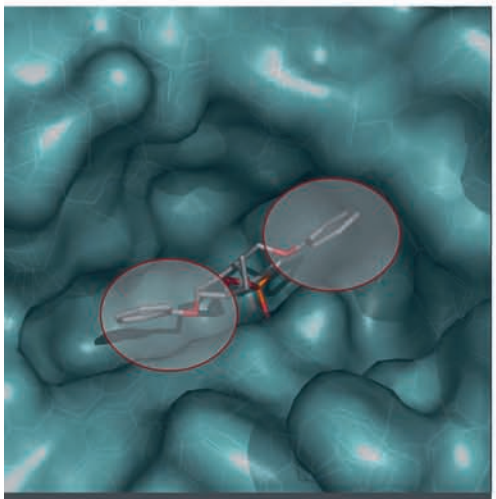
Anastassis 'Tassos' Perrakis

European Patent Office, Rijswijk; Leiden University Medical Center; Netherlands Cancer Institute, Amsterdam; Nijmegen University; Utrecht University

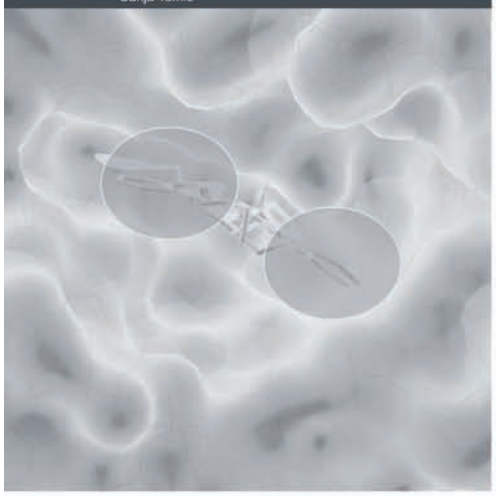
New members

Rebekka Valsdóttir

Evelyne Friederich



Sanja Tomic



Iceland: Vestia ehf., Reykjavik; Croatia: Institute Rudjer Boskovic, Zagreb; Luxembourg: University of Luxembourg; Australia: University of Melbourne; Monash University, Clayton, Victoria

LUXEMBOURG

Evelyne Friederich

Now: Professor; Head of the Life Sciences Research Unit, University of Luxembourg
Then: Postdoc, Huttner Group, Cell Biology & Biophysics, 1985-1989

At EMBL, Evelyne studied tyrosine sulfation of secretory proteins. She went on to be a research assistant at the Pasteur Institute Paris, a Research Director at the French CNRS, a senior scientist at the Curie Institute Paris and a group leader at the Public Research Center for Health. She is currently a professor in Cell Biology and head of the Life Sciences Research Unit at the University of Luxembourg. Evelyne significantly contributed to the understanding of how actin-binding proteins control the assembly of the actin cytoskeleton and epithelial cell morphogenesis. She combines cell biology with bioinformatics and high throughput genomics to gain a systems view of regulatory networks of genes, including miRNAs, in epithelial cell plasticity. The image shows a global view of transcription factor and miRNA regulatory networks visualized by Mir@nton (Antony Le Béchec)

ICELAND

Rebekka Valsdóttir

Now: Associate Director, Vestia ehf., Reykjavik
Then: Predoc, Nilsson/Karsenti Groups, Cell Biology & Biophysics, 1998-2003

During her time at EMBL, Rebekka worked on the role of small G proteins in cell organization. She worked as a postdoc at the Wellcome Trust Centre for Cell Biology in Edinburgh, studying the mitotic checkpoint proteins Bub and Madand and also completed an MBA before moving back to Iceland. For the past two years Rebekka has worked as a financial analyst which has been very interesting and challenging given the current economic turmoil, both in Iceland and in the world. Just like her EMBL days though, she feels that she's in the right place at the right time.
The photograph of the Aurora Borealis (Northern Lights) in Iceland was taken by Rebekka.

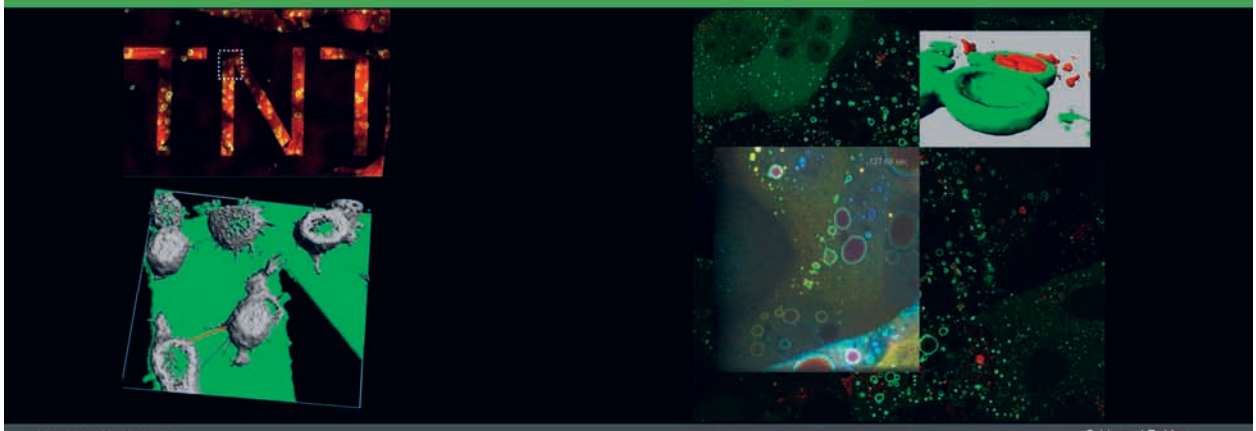
CROATIA

Sanja Tomic

Now: Senior Scientist, Institute Ruđer Bošković, Zagreb, Croatia
Then: Postdoc, Wade Group, Structural & Computational Biology, 1996-1998

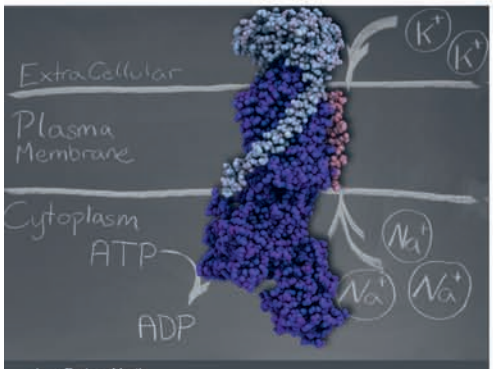
At EMBL, Sanja worked on models for classifying small molecules and for predicting specificity between DNA and nuclear receptor factors. Her research focuses now on biomacromolecules and their complexes. She studies the influence of mutations and environmental conditions on protein 'behavior', trying to quantify relationship between structural characteristics and activity. In her group, Sanja also models enzyme catalyzed reactions and develops parameters for metals in proteins as well as tools to study protein structure and flexibility.
The image shows two enantiomers of a secondary alcohol bound into the *Burkholderia cepacia* lipase (BCL) active site.

Scandinavia

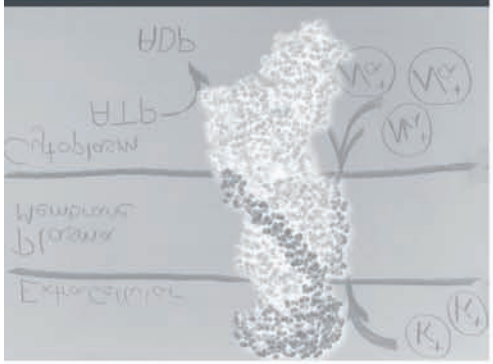


Hans-Hermann Gerdes

Oddmund Bakke



Jens Preben Morth



Jens Preben Morth

Now: Assistant Professor, Aarhus University
Then: Predoc, Tucker Group, Hamburg, 2001-2005
Also: John Kendrew Award winner 2010

DENMARK

Preben's knowledge of and interest in structural biology took shape at EMBL Hamburg, studying bacterial two-components systems. This particular type of signalling is common to bacteria, where, upon external stimulus, an internal transcriptional response is triggered. As a postdoc at Aarhus University he determined the structure of the sodium-potassium ATPase, or sodium pump for short, an enzyme found in the plasma membrane of all animals. The work taught him to keep going even when success seemed unachievable.
The molecular model in the image shows the complete atomic structure of the hetero-trimeric sodium pump, 'a' subunit (purple), 'b' subunit (blue) and 'g' subunit (red).

Oddmund Bakke

Now: Professor, University of Oslo
Then: Visiting Scientist, Dobberstein Group, Cell Biology & Biophysics, 1988-1990

NORWAY

Oddmund started as a biophysicist at the Norwegian Institute of Technology and CERN, Geneva. He then moved to study cell biology at Trondheim. The specialized techniques needed for this led him to the Dobberstein Group at EMBL for their expertise on membrane proteins. Here, Oddmund started with SRP and ended with the model protein – invariant chain – chosen for its membrane topology. As Professor at the University of Oslo, Oddmund's studied the endosomal pathway and immune molecules. He has re-visited EMBL for further training and use of imaging equipment, and head's an imaging platform in Oslo.
The image shows live fusion and fission of endosomes. Some endosomes are enlarged due to expression of CD74, invarian chain. Green: EEA1-GFP, Red: Acidic compartments stained with lysotracker. Left – z direction color coding of EEA1-GFP. Top right, data rendering using Imaris.

Images: F. Skjeldal and OB.

Hans-Hermann Gerdes

Now: Principal Investigator, University of Bergen
Then: Staff Scientist, Huttner Group, Cell Biology & Biophysics, 1987-1991

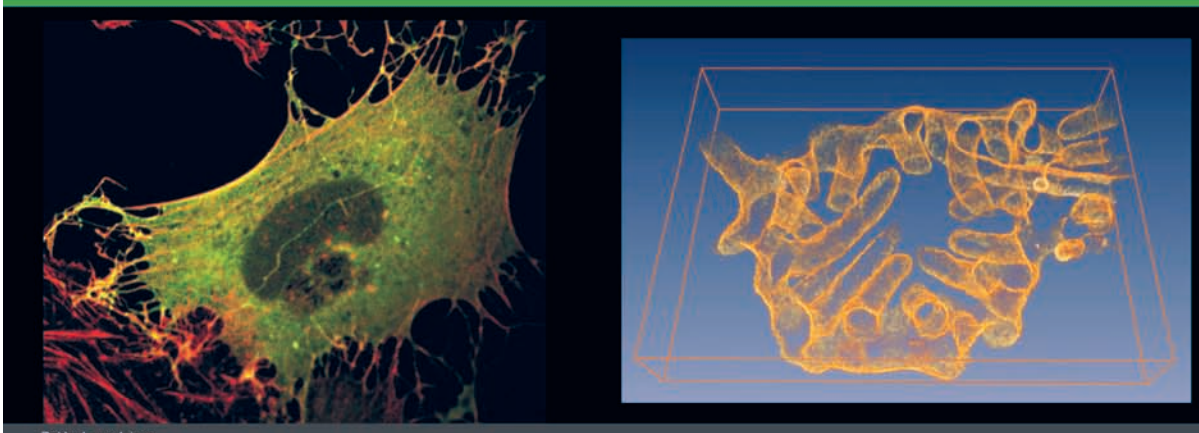
NORWAY

At EMBL, Hans-Hermann worked on secretory granule biogenesis and thereafter as a group leader at Heidelberg University on the trafficking of these organelles. In 2003, he joined the Department of Biomedicine at Bergen University as professor where he is focusing on basic research and clinical relevance of tunneling nanotubes (TNTs), the underlying structure of a previously unrecognized route of cell-to-cell communication.
For the image, rat pheochromocytoma-derived PC12 cells were grown on micro-patterned surfaces and imaged by 3D fluorescence microscopy. The TNT image shows cells (green) attached to adhesive pattern consisting of the 3-letter code 'TNT' (red). The 3D image reconstruction visualizes TNT-connectivity between cells. The TNT (red) bridging cells hovers above the substrate.

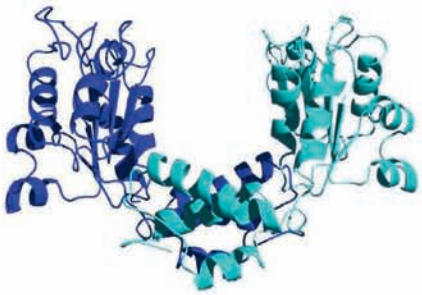
Image courtesy: N. Bukoreshtliev and I.R. Mondragon

Denmark: Aarhus University; University of Copenhagen; University of Southern Denmark, Odense
Norway: University of Bergen; University of Oslo; Norwegian Radium Hospital, Oslo
Sweden: Karolinska Institute, Stockholm; Umeå University; Uppsala University
Finland: National Public Health Institute, Helsinki; University of Helsinki; University of Oulu; University of Tampere; University of Turku

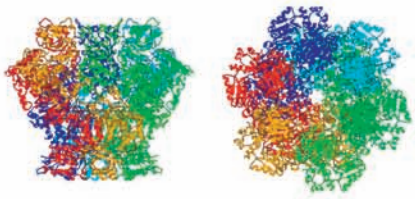
Scandinavia



Pekka Lappalainen



Uwe H. Sauer



FINLAND

Pekka Lappalainen

Now: Group Leader, Institute of Biotechnology, Helsinki University
Then: Predoc, Saraste Group, Structural & Computational Biology, 1991-1995
Also: EMBO Young Investigator

At EMBL, Pekka applied structural and biochemical approaches to examine the substrate-binding domain of cytochrome oxidase. During his postdoctoral work at Berkeley, USA, Pekka became interested in the actin cytoskeleton. Pekka's group at Helsinki University examine how the dynamics of the actin cytoskeleton and plasma membrane are regulated during cell migration and morphogenesis. They recently discovered that actin-binding proteins missing-in-metastasis and IRSp53 can directly tubulate phospholipid-rich membranes to induce the formation of plasma membrane protrusions in cells, as shown in the image. They now study how this novel membrane deformation activity contributes to cell morphogenesis and invasive migration of cancer cells.

SWEDEN

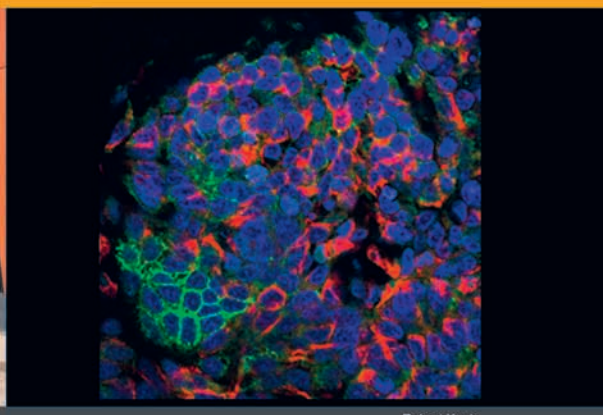
Uwe H. Sauer

Now: Associate Professor, Department of Chemistry and Computational Life Science Cluster, CLiC, Umeå University, Sweden
Then: Predoc, Suck Group, Structural & Computational Biology, 1991-1995

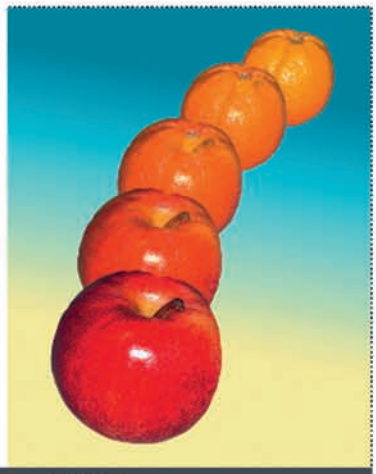
At EMBL, Uwe focused on the crystal structure determination of the bi-functional protein DCoH, the first co-factor known to enhance the DNA binding ability of a transcription factor. His postdoc project at Uppsala University dealt with structural aspects of thermophilic and mesopholic protein stability. Subsequently he accepted a group leader position at Umeå University, where he was involved in setting up a Biocrystall-ography and Bioinformatics lab. Currently his group develops bioinformatics tools, with the aim of elucidating protein folding and stability and understanding folding diseases.
Simultaneously, they determine crystal structures of proteins such as DmpR (see image), and combine their high resolution structural work with low resolution Small Angle X-ray Scattering, SAXS, and biochemical approaches in order to obtain the full picture of the action of this protein.

Spain

Kypta, a double life



Robert Kypta



Thomas Graf

DERIO

Robert Kypta

Now: Group Leader, CIC bioGune, Derio
Then: Predoc, Courtneidge Group, Developmental Biology, 1987-1991

At EMBL, Robert studied Src family tyrosine kinases. He did a postdoc at UCSF working on tyrosine phosphorylation in neurons and continued this as a group leader at the MRC LMCB, UCL. In 2001 he moved to Imperial College and in 2005 he set up a new laboratory at CIC bioGUNE in Bilbao. His group studies how Wnt and GSK-3 signals regulate cancer and stem cell growth and differentiation, focusing on models of prostate cancer progression and neural differentiation.
The image shows a field of differentiating embryonal carcinoma cells expressing the neural stem cell protein nestin (red) and Wnt-11 (green). Cell nuclei are in blue.

BARCELONA

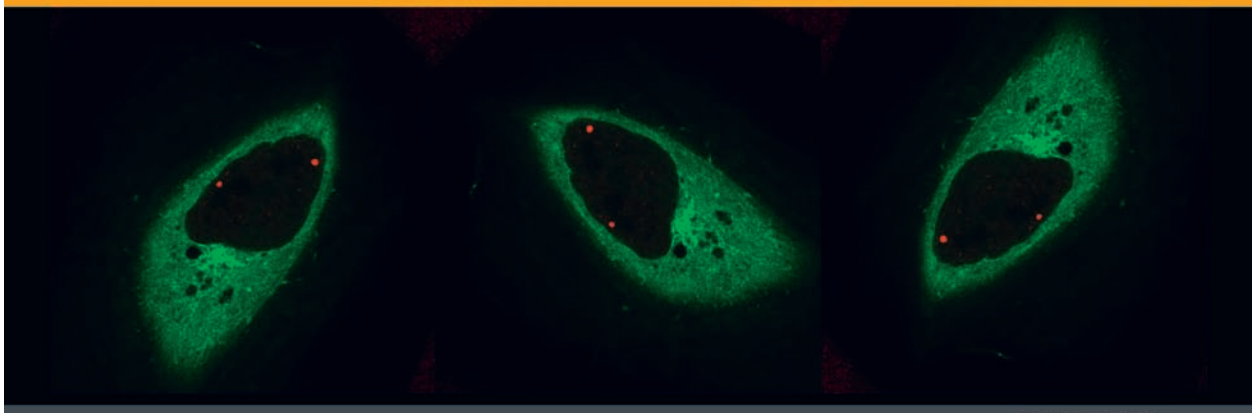
Thomas Graf

Now: Differentiation and Cancer Programme Coordinator, Centre for Genomic Regulation (CRG), Barcelona
Then: Head of Unit, Developmental Biology, 1983-1998
Also: EMBO Member

Thomas' group discovered that a single transcription factor (C/EBPa) can reprogramme B cells into functional macrophages within days at high efficiencies. The image, which he designed, illustrates the conversion process. During reprogramming the cells up or downregulate thousands of genes, show dramatic changes in cytoarchitecture and set up entire new signalling systems and machineries (inflammatory response, phagocytosis, motility etc.), essentially making a new cell within an old cell. Thomas' group started their reprogramming work at EMBL in the 90s, extended it in New York and continued it in Barcelona, where he has been since a bit over 3 years.

Andalusian Centre for Developmental Biology, Seville; Barcelona Science Park; Center for Genomic Regulation, Barcelona; CIC bioGUNE, Derio; Instituto de Biomedicina de Valencia; Instituto Gulbenkian de Ciencia, Oeiras; Spanish National Cancer Research Centre, Madrid; Spanish National Research Council, Barcelona; University of Barcelona; University of Lisbon; University of Madrid; University of Valencia

Spain/Portugal



Maria Carmo-Fonseca

BARCELONA

Juan Valcarcel

Now: Group Leader, Center for Genomic Regulation, Barcelona
Then: Group Leader, Gene Expression, 1996-2002
Also: EMBO Member

At EMBL, Juan's group worked on Sex-lethal, a *Drosophila melanogaster* RNA binding protein that is expressed only in females, and how this induces female-specific patterns of alternative splicing. They also studied proteins that control programmed cell death by regulating alternative splicing of apoptosis-related genes. After their move to the newly opened CRG, Juan's group became interested in how the activity of splicing factors can control cell proliferation and how chromatin organization can influence splice site recognition and alternative splice site choice. Juan's group maintain collaborations with EMBL groups like Ellenberg's and Bork's and hold long-standing collaborations initiated at EMBL with alumni like Sattler (Munich), Macias or González (Barcelona).
The image, by artist Luisa Lente, shows nucleosome positioning on exons which allow co-transcriptonal splice site selection. This is from a collaboration with the Roderic Guigó Group at the CRG.

Juan Valcarcel

LISBON

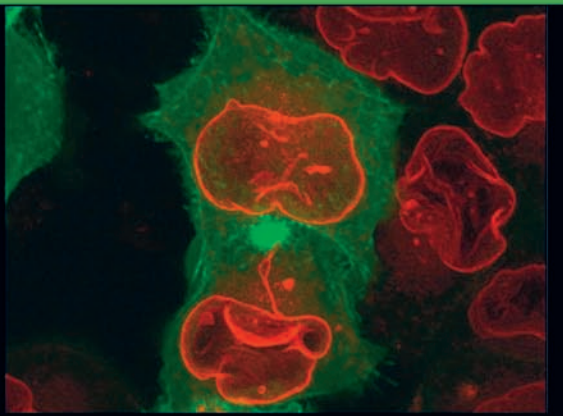
Maria Carmo-Fonseca

Now: Professor of Cell & Molecular Biology; Director of the Institute of Molecular Medicine, University of Lisbon Medical School
Then: Postdoc, Hurt / Lamond Groups, Cell Biology & Biophysics, 1989-1992
Also: EMBO Member

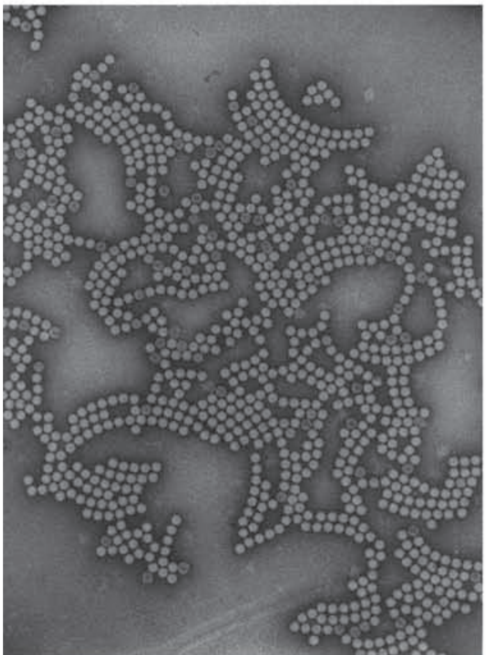
Ever since her postdoc years at EMBL, Maria has been interested in using emerging microscopy tools to understand how spatial organization within the highly crowded eukaryotic nucleus contributes to gene expression control. Her group discovered that some faulty RNAs never make it to the cytoplasm because they remain stalled at the site of transcription, and the team has since been interested in further dissecting the molecular mechanisms involved in this surveillance process. The group has also developed methods to measure the dynamics of spliceosome assembly, splicing and transcription in life cells.
The image shows snurportin (a nuclear import adaptor for spliceosomal snRNAs) distributed through the cytoplasm (green staining), and two Cajal bodies (a compartment involved in snRNP maturation, stained red) in the nucleus.

Switzerland

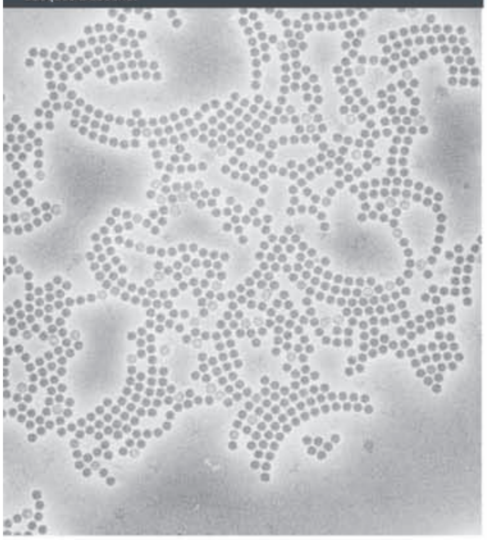
Wilhelm Ansorge



Daniel Gerlich



Jacques Dubochet



LAUSANNE

Jacques Dubochet

Now: Professor emeritus, University of Lausanne
Then: Group Leader, Structural & Computational Biology, 1978-1987
Also: EMBO Member

Water is the most abundant biological material but only dry specimens could lead to useful electron microscopical observations. Jacques' group at EMBL found how water can be vitrified and observed at very low temperatures in 1981. The consequence was the widespread application of the thin film vitrification method (EMBL, 1984) to all kinds of biological molecules. Later at the University of Lausanne, Jacques' group worked on developments such as cryo-negative staining, illustrated in the image with a solution of TBS-virus (Marc Adrian, 1998), and CEMOVIS (cryo-em of vitreous sections, 2004) which extends cryo-em to bulky specimens or tissues. At Lausanne, Jacques has also developed a unique curriculum »Biology and Society».

ZURICH

Daniel Gerlich

Now: Assistant Professor, Swiss Federal Institute of Technology, Zürich
Then: Postdoc, Ellenberg Group, Gene Expression, 2002-2005

At EMBL, Daniel studied nuclear architecture and mitotic chromatin dynamics. His group now studies the underlying control mechanisms of faithful cell division, which is fundamental for all living organisms, as errors can lead to cell death or cancer. Daniel's group develops methods for automated microscopy and computational image analysis. With this, they address how human cells coordinate chromosome segregation with cytokinesis and how they re-organize during the transition from the mitotic to the interphase state.
The image shows a control mechanism that senses chromosome segregation errors (red) to stabilize the cleavage furrow by cytoskeletal structures (actin, green). This delays completion of cell division until chromosome bridges eventually resolve. This mechanism protects cells against tetraploidization, a genetically unstable state that can lead to cancer formation.

LAUSANNE

Wilhelm Ansorge

Now: Professor, Ecole Polytechnique Fédérale Lausanne (EPFL)
Then: Head of Unit, Instrumentation, 1979-2005
Also: EMBO member

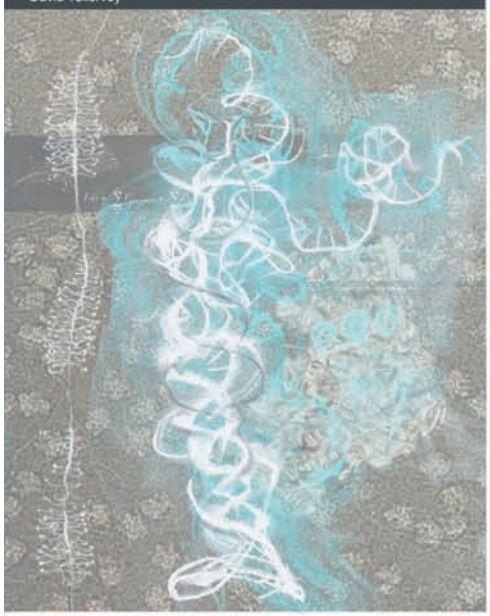
Among the many achievements of Wilhelm's group at EMBL, was the production of the first automated DNA sequencer, which was commercialised by Pharmacia-Amersham. The technique was used for determination of the first human gene locus (HPRT) 60 kb sequence in 1992, proving feasibility of the technology for analysis of complex genome projects. The group also participated in sequencing the genomes of yeast, *Arabidopsis*, *Drosophila* and *Anopheles* and generated the first whole genome gene chip with 52.000 cDNAs. Already in 1991 Wilhelm submitted one of the first patent applications for a DNA sequencing system without gels similar to those used today in the so called next-generation systems. At EPFL he continues his work on innovative DNA analysis and generating other genomics tools.
The image shows randomly generated DNA sequence (spot the errors).

Ecole Polytechnique Fédérale de Lausanne; Friedrich Miescher Institute for Biomedical Research, Basel; Hoffmann La Roche Ltd., Basel; Novartis Pharma AG, Basel; Swiss Federal Institute of Technology, Zurich; Swiss Institute of Bioinformatics, Geneva; University of Basel; University of Geneva; University of Lausanne; University of Zurich

United Kingdom

Angus Lamond

David Tollervey



David Tollervey

Now: Wellcome Trust Principal Fellow, Wellcome Trust Centre for Cell Biology, Edinburgh
Then: Group Leader, Gene Expression, 1988-1997
Also: EMBO Member

EDINBURGH

During his time at EMBL, David studied how eukaryotic cells make ribosomes – the heart of the protein synthesis machinery and major components of all cells. Since moving to Edinburgh, he has identified key enzymes, notably the exosome complex, that process the mature ribosomal RNAs from longer primary transcripts. It turns out that the exosome also plays major roles in the maturation, turnover and quality control of many different types of RNA. Recently they have used systems biology approaches involving kinetic labeling and mathematical modeling to gain new insights into the ribosome synthesis pathway. The image shows trees, models and ribosomes by Alison Pidoux.

Angus Lamond

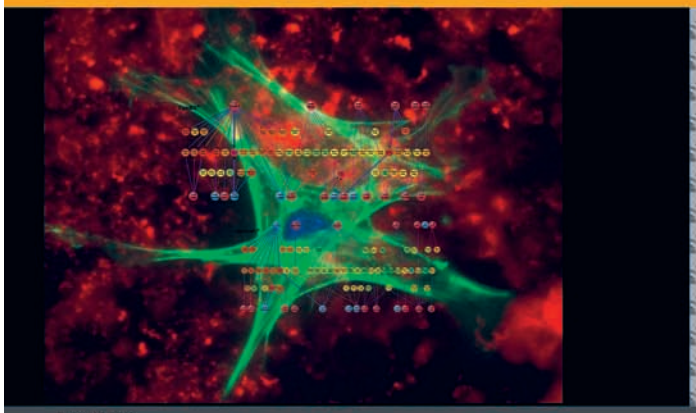
Now: Professor, University of Dundee
Then: Group Leader & Senior Scientist, Gene Expression, 1987-1995
Also: EMBO Member

DUNDEE

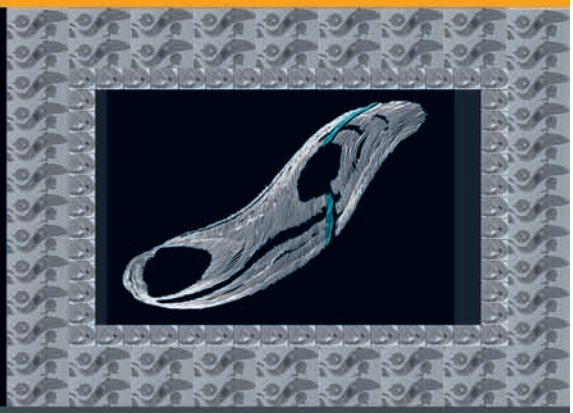
At EMBL, Angus worked on nuclear RNA processing. His current research is carried out in the field of cell biology and is aimed at understanding how genes in mammalian cells are controlled.
The image «Map of a Lifetime» explores what remains of the human origins of the tumour cells that Angus' group grows in the laboratory. The image is based on fluorescence microscopy images of HeLa cell chromosomes. using a new methodology recently developed by Angus' group. This technique measures the degree to which the chromosome strands are compacted or condensed by the level of interaction between fluorescent probes attached to proteins on the chomosomes. The degree or level of chromosome compaction is reflected by colour coding in these images.

Cambridge University, Cancer Research UK, London; Diamond Light Source, Didcot; Imperial College London; Institute of Cancer Research, London; King's College London; MRC Laboratory of Molecular Biology, Cambridge; National Institute for Medical Research, London; Oxford University; Royal Society of Edinburgh; University College London; University of Birmingham; University of Bristol; University of Dundee; University of Edinburgh; University of Glasgow; University of Liverpool; University of Manchester; University of Sussex, Brighton; University of Warwick, Coventry; Wellcome Trust Center for Human Genetics, Oxford; Wellcome Trust Centre for Cell Biology, Edinburgh; Wellcome Trust Sanger Institute, Cambridge; Western General Hospital, Edinburgh; University of York

United Kingdom



Rune Linding



Johanna Hoog

Johanna Hoog

Now: Postdoc, University of Oxford
Then: Predoc, Antony Group, Cell Biology & Biophysics, 2003-2007

OXFORD

At EMBL, Johanna's PhD thesis yielded the first electron tomographic reconstruction of a complete eukaryotic cell. She is now studying *Trypanosoma brucei*, a uni-cellular parasite that is transmitted by tsetse flies and causes African sleeping sickness. The image shows a frame made by thin section electron micrographs, illustrating *T. brucei* cells in longitudinal section (outer frame) and a flagella pocket (inner frame). By using high resolution methods such as electron tomography, Johanna will make 3D reconstructions of its entire sub-pellicular microtubule cytoskeleton (center panel). This cytoskeleton consists of ~100-200 parallel (white) and four anti-parallel microtubules (petrol).

Rune Linding

Now: Team Leader, Institute of Cancer Research (ICR), London
Then: Predoc, Gibson/Russel Groups, Structural & Computational Biology, 2000-2004

LONDON

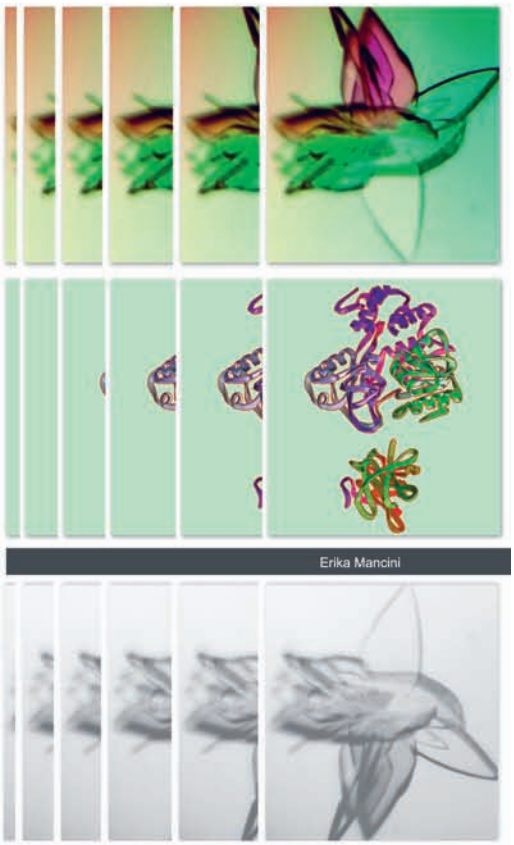
At EMBL, Rune pioneered computational signalling biology by developing tools like *ELM*, *GlobPlot* and *DisEMBL* for analysing post-translational modifications and intrinsic protein disorder. His postdoctoral work in Toronto and Boston (SLRI and MIT) pioneered Integrative Network Biology and led to the discovery of the importance of contextual kinase specificity. At ICR his lab unraveled systems-level models of JNK and EphR kinase networks; demonstrated a link between specificity and oncogenecity of kinases and introduced the concept of Network Medicine. Rune founded the Integrative Network Biology initiative (INBi) at the ICR which aims to block cancer metastasis.
The image shows the first systems- and cell-specific network models of contact-initiated signaling between two distinct cell types.

Erika Mancini

Now: Group Leader and Royal Society University Research Fellow, University of Oxford
Then: Predoc, Fuller Group, Structural & Computational Biology, 1996-2000

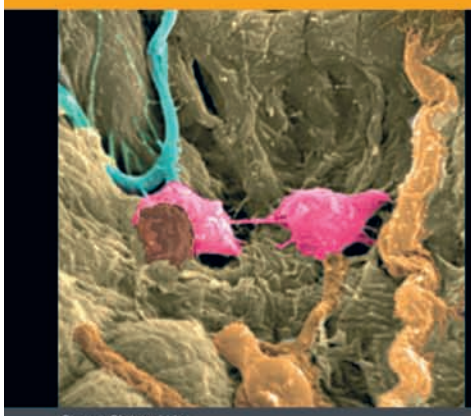
OXFORD

At EMBL, Erika determined a 9Å resolution cryo-electron microscopy reconstruction of Semliki Forest Virus, using a combination of image processing and atomic structure fitting. As an EMBO postdoctoral fellow at Oxford University, Erika worked on viral helicases and packaging ATPases. Erika's group is now interested in chromatin remodelling ATPases, trying to dissect how they remodel the nucleosome. Their tools are X-ray crystallography in combination with Cryo-EM, NMR and SAXS.
The image shows a crystal and the atomic structure of NS3 from Murray Valley encephalitis virus (MVEV). MVEV and its close relatives, Dengue virus and West Nile virus, are the causative agents of serious human diseases including hemorrhagic fever, meningitis and encephalitis.

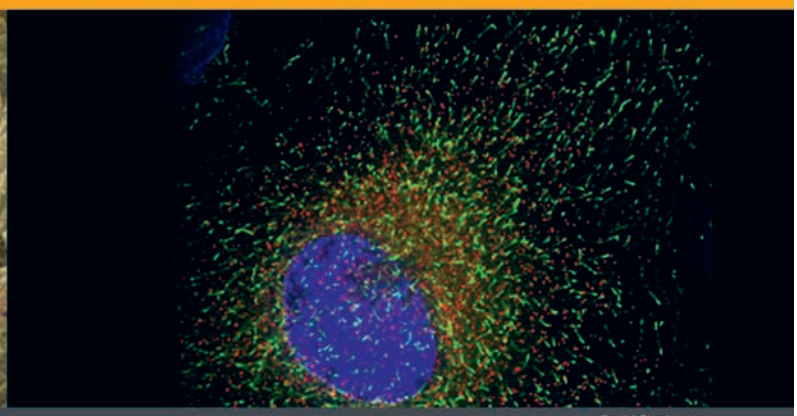


Erika Mancini

United Kingdom



George Christophides



David Stephens

Fotis Kafatos

LONDON

Fotis Kafatos

Now: Immunogenomics Chair, Imperial College London (ICL)
Then: Director General, EMBL, 1993-2005
Also: EMBO member

George Christophides

Now: Reader in Infection and Immunity, Imperial College London (ICL)
Then: Staff Scientist, Kafatos Group, Directors Research, 2000-2005

At EMBL, Fotis' group focused on the characterization of the mosquito immune system and how this responds to the malaria parasite. They also pioneered the field of mosquito genomics and transcriptomics. At ICL, Fotis and George's groups operate along an equally ambitious research agenda that aims to dissect the mosquito immune system and provide new insights into how these immune reactions can be used in the fight against malaria and other vector-borne diseases. The findings of both groups have led to the identification of distinct evolutionary dynamics of the various modules of the mosquito immune system and provided new insights into the mechanism of mosquito complement activation against invading malaria parasites.
The image shows a pseudo-colouring of a transmission electron micrograph of a mosquito midgut infected with malaria parasites. The parasite that appears in brown is killed and enclosed into a melanin capsule. The mosquito blood cells hat are largely responsible for this immune response appear in red as resting on the basal midgut wall. Muscle cells stretching across the midgut are coloured with orange and part of the mosquito respiratory organ (trachea) appears in cyan.
In addition to his research, Fotis has been the President of the European Research Council (ERC) and Chairman of its Scientific Council from 2005 until 2010. The ERC is the first European funding body set up to support investigator-driven frontier research; its Scientific Council sets the scientific policy of the ERC.

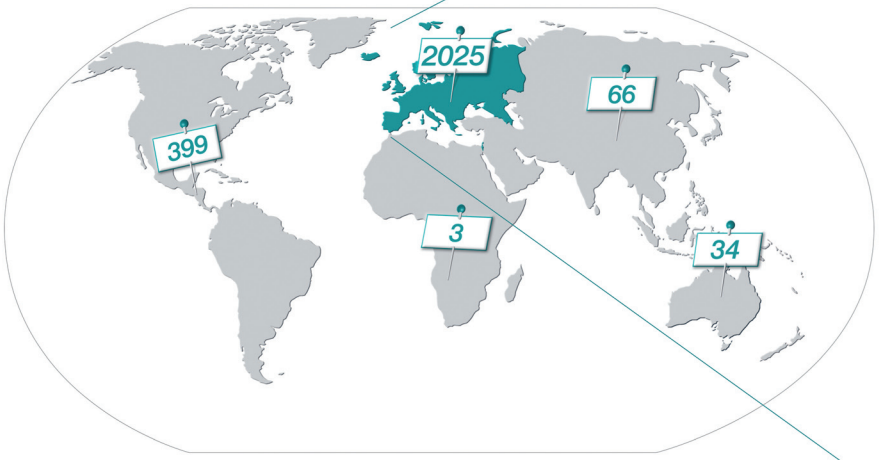
BRISTOL

David Stephens

Now: Research Fellow, University of Bristol
Then: Postdoc, Pepperkok Group, Cell Biology & Biophysics, 1999-2001

As an EMBO Fellow in Rainer Pepperkok's lab, David used advanced cell imaging methods to investigate the mechanisms by which secretory cargo is exported from the endoplasmic reticulum in mammalian cells. Since starting his own lab at the University of Bristol, David has continued to study membrane trafficking, notably the role of microtubules in this essential process.
The image shows a typical mammalian cell labelled to reveal the nucleus (blue), cargo exit sites on the endoplasmic reticulum (red), and the growing ends of microtubules (green). The image was taken by Pete Watson, while a postdoc in David's lab.

EMBL ALUMNI



No. of alumni in 5 continents