

# EMBLetc.

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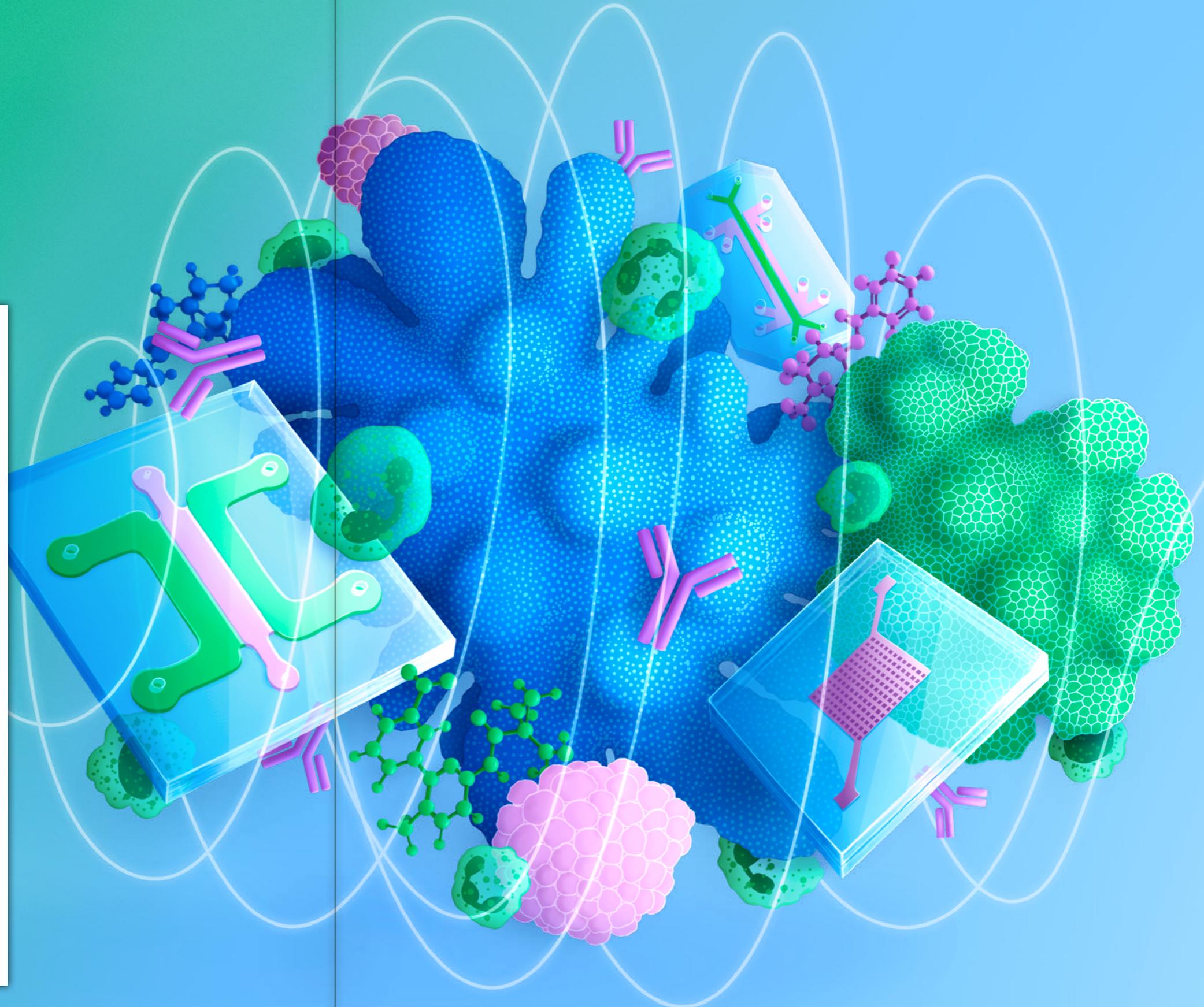


## Organs-on-chip: new horizons for disease research

EMBL Barcelona researchers are studying  how tissues develop both in healthy and diseased states using organoids and 3D multicellular systems to mimic human organs and their functions.

Our body is influenced greatly by the context within which it lives. The food we eat, the air we breathe, and the environment around us, all affect the way our body functions and responds to challenges. Researchers at EMBL Barcelona aim to understand the importance of such context in disease development.

To achieve this, they are increasingly making use of groundbreaking technologies like organs-on-chip and organoids, which have the potential to revolutionise the way we study, diagnose, and treat diseases.





## A trip down memory lane

**EMBLetc.**, the online magazine of Europe's life sciences laboratory, celebrates its 24th birthday with its 100th issue. [→](#)

*EMBLetc.* began its journey as a black-and-white printed newsletter in 1999, with the goal of providing “news about services, staff, science and society” to EMBL staff and alumni. On the occasion of *EMBLetc.*'s 100th issue, we took a quick look at the last 24 years of the organisation's history through the lens of its issues. And we found a set of common themes that came up again and again in its pages.



Image credit: Creative Team/EMBL



## Behind the scenes of innovation

EMBL Grenoble technology teams provide a sneak peek into their latest collaborative project in structural biology services. →

Have you ever wondered how groundbreaking new scientific technologies come into being? Or how scientists and engineers work together to push the frontiers of innovation? We caught up with several members of EMBL Grenoble's technology-related teams, who opened their doors to give us a sneak peek into this process of innovation. Their skills and collaborative strengths are demonstrated aptly by one of their latest projects: the complete automation of an integral step in X-ray crystallography, a technique used by scientists worldwide to determine the 3D structures of proteins and other macromolecules.



Image credit: Stuart Ingham/EMBL

## ALUMNI SPOTLIGHT: VELI VURAL USLU

### Merging science and theatre

Veli Vural Uslu, winner of the 2023 John Kendrew award, chats about his journey in science and his adventures in science communication. →



Veli Vural Uslu completed his PhD in the Spitz Group at EMBL Heidelberg from 2009 to 2015, including a short stint



as a bridging postdoc. Today, he is the writer, director, and organiser of various science-themed theatre plays, and the founder of TAP (The Awesome Potatoes) Science Theater Heidelberg, where he has trained and worked with 70 scientists from 34 countries since 2015. Here, he discusses some of his early inspirations and why he believes science communication is an important skill for every scientist.





## In pictures: the story of TREC

EMBL's newest expedition attempts to answer some of the biggest questions in planetary biology, and will help scientists find solutions to pressing global concerns. →

With the ambitious aim of examining life along European coasts, EMBL's planetary biology flagship expedition Traversing European Coastlines (TREC) launched officially in March this year. A press conference in Paris on 8 March 2023 introduced the project to audiences in Europe, along with its aim of studying coastal ecosystems and their response to the environment, on scales from molecules to communities. TREC was made possible with the help of generous support from EMBL member states as well as many institutions, donors and sponsors. We take a quick look at some of the defining moments that have shaped its journey so far.



Image credit: Vincenzo Lullo/EMBL

## Visualising biology: new tools of the trade

EMBL researchers are pushing the frontiers of big data analysis in biological imaging, allowing scientists to gain a many-layered and multidimensional view of organisms, tissues, and cells in action. →

Biological imaging reveals to us the wonderful inner worlds of living organisms, bringing into sharp focus all their quirks, oddities, and moving pieces. EMBL has long been a world leader in this field, spearheading advances in imaging technology at the same time as making imaging services accessible to the wider scientific community.

With progress in imaging technology, however, comes the problem of handling the huge datasets that such methods inevitably produce. Researchers across EMBL have been collaborating to find a solution to this 21st-century problem, and the tools they are developing will help researchers across the world share, analyse, and collaborate on imaging data for years to come.



Image credit: Arendt group/EMBL

## ALUMNI SPOTLIGHT: DESMOND HIGGINS

### The story of Clustal: democratising sequence alignments



Desmond Higgins, 2023 Lennart Philipson Award winner and bioinformatics pioneer, discusses his time at EMBL, his research developing sequence alignment tools, and 20th-century bioinformatics. →

Des Higgins, who joined the EMBL Data Library in 1990 and then worked as a postdoc and staff scientist at EMBL-EBI from 1994 to 1996, is the primary creator of the Clustal package for multiple sequence alignment, a groundbreaking technology in this area of bioinformatics. Clustal was the first software that enabled scientists without any prior bioinformatics knowledge to perform multiple sequence alignment on any computer. The technology was freely shared with the world from day one, and allowed advances in many fields, from evolutionary biology to cancer research and vaccine design.



## Can the effects of the environment cross generations?

Scientists at EMBL Rome are developing new paradigms to study the impact of diverse environmental factors on reproduction in mammals and disease risk in their progeny. →

One of the most fundamental questions in biology is how our basic traits are transmitted across generations – from parents to offspring. At present, we know very little at the molecular level about how epigenetic factors delivered by the egg or sperm cells can cause intergenerational changes. The groups of Jamie Hackett and Ana Boskovic at EMBL Rome are trying to elucidate the molecular mechanism(s) of intergenerational epigenetic inheritance by focusing on different steps of the process and using complementary approaches.



## Terra Incognita: exploring new horizons in scientific ethics

EMBL's upcoming Science & Society conference sets the stage for a deep dive into the ethical considerations surrounding the use of technology and organoids in life science research, as well as other ethics-related questions of importance. →

*Science* – the systematic investigation of nature, *technology* – the application of the knowledge so gained for human benefit, and *ethics* – the principles that govern moral conduct, have always been closely intertwined concepts. The ethics surrounding scientific research, therefore, form part of the bedrock of modern research endeavours and ensure that the highest standards are maintained as we extend the frontiers of human knowledge. Recognising the importance of this field, particularly in the context of current global concerns and challenges, EMBL's next Science & Society symposium will examine the breadth of ethical issues in the life sciences through the lens of molecular biology research.



Image credit: Aleksandra Krolik/EMBL

## Janet Thornton retires: a pioneer in structural bioinformatics

In recognition of Janet Thornton's retirement, we look back at some of her biggest accomplishments in shaping the field of bioinformatics. →

Professor Dame Janet Thornton is one of the world's pioneers in structural bioinformatics. Her incredible career and active voice on many topics, including science in Europe, open data, and women in science, have inspired scientists the world over. As the Director of EMBL's European Bioinformatics Institute (EMBL-EBI) between 2001 and 2015, Thornton led the growth of the institute from 160 to over 600 people. She currently leads a research group at EMBL-EBI, studying the biology of proteins and ageing, and is a leading voice in the scientific community, having undertaken leadership and governance roles in the Royal Society, European Research Council, ELIXIR, and many other organisations. In recognition of Thornton's upcoming retirement in summer 2023, we reflect on some of her highlights and achievements during her time at EMBL.



Image credit: Philip Mynott Photographer





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