The Environmental Research Initiative (ERI): harnessing the power of the life sciences

Be part of the solution to save our planet

To sustain life on Earth, we must protect our most vital resource – the environment – and safeguard the ecosystems which connect plants and animals and also provide what humans need to live – clean air to breathe, safe water to drink, and healthy food to eat. With climate change exacerbating society's challenges at an unprecedented rate, we need to join together and act with great urgency because the future of humanity depends on it.

Life science is a key driver to find solutions

Science must lead the way forward. From microbes that can degrade pesticides or plastic to marine plankton that removes CO2– these are just examples of how the life sciences – the study of living organisms – can help us find novel solutions to our most pressing environmental challenges. There is still a gold mine of potential solutions to be discovered by molecular biologists.

Empowering the brightest minds

Although the challenges are big, the idea behind ERI is simple: we aim to recruit truly pioneering scientists to tackle some of the biggest environmental challenges using any aspect of modern biology, and empower them to realise their scientific ideas with EMBL's unrivaled research expertise and cutting-edge technologies.

European Molecular Biology Laboratory (EMBL)

Europe-wide, global impact, infinite curiosity.

EMBL is Europe's flagship laboratory for the life sciences. As an intergovernmental organisation with 27 member states, EMBL currently employs more than 1800 people with more than 110 independent research groups and service teams covering the spectrum of molecular biology at six sites in Barcelona, Grenoble, Hamburg, Heidelberg, EMBL-EBI Hinxton, and Rome.

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Building on success

Supported by the Friends of EMBL and other generous citizens, ERI already enabled environmental research projects in 2021 that combine scientific creativity and the latest technologies to combat pollution from nanoplastics, pesticides, and artificial hormones. These were 1-year pilot projects led by EMBL scientists who succeeded in developing new protocols and methodologies – further catalysing environmental research at EMBL. With additional resources, these projects will be expanded, paving the way for novel and sustainable science-based solutions for the planet.

Fighting pesticide pollution with microbes

This project enabled studying microbes that degrade pesticides by first establishing a chemical library of 1033 agricultural pesticides – a unique research resource not previously available. EMBL scientists developed advanced analytical methods and large-scale field protocols for the development of bioindicators. This new information may lead to the use of microbes as a biological way to better remove pesticide contamination, monitor pesticide pollution, and design greener chemicals. ERI support also helped to secure further funding (the EMBL ARISE Fellowship) to continue this project through 2024. (Budget used so far: €32,000) **Watch the video.**

Tackling plastic pollution

This project uses advanced molecular biology technology at EMBL to better understand the impact of nanoplastics. Combining an X-ray technology called small angle scattering and biophysical techniques, EMBL scientists have successfully established a 'tool set' to take a closer look at the size and shape of nanoplastics. With this new information, we can analyze nanoplastics in 'real life samples' such as water from the rivers, oceans, and in physiological relevant solutions such as blood. This will help us to better understand what happens when nanoplastics enter the ocean and our bodies, and the potential threats to our marine ecosystems and to human health. (Budget used so far: €19,000) **Watch the video.**

Cleaning wastewater polluted from artificial hormones

This project focused on improving the detection and identification of artificial hormones polluting wastewater through advanced computations. With EMBL's state-of-the-art technology, EMBL scientists developed a computational pipeline – a series of data processing calculations that may help improve the detection of artificial hormones in wastewater. Next steps include testing real-world samples from a local wastewater treatment plant and more diverse compounds, e.g. steroids, which will increase the validity and performance of the computational pipeline. (Budget used so far: €12,000) **Watch the video.**

Join us for a healthier planet

Philanthropic seed funding is already enabling a number of exciting ERI catalyst projects. We are now seeking further visionary partners – philanthropists, foundations, and corporations – to scale up this initiative.

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Support the Environmental Research Initiative

New environmental research opportunities in 2022

EMBL

Microbial mats: the ocean's natural vacuum cleaners

The ocean covers about 70% of the Earth's surface and is home to about one million species. However, pollution is a major threat to the ocean and its diverse ecosystems. One of these natural ecosystems known as microbial mats – multi-layered communities of microorganisms in the ocean – possess the remarkable ability to degrade pollutants such as oil, microplastics, and even some heavy metals. New spatial -omics techniques at EMBL can help us better understand how these 'natural vacuum cleaners' break down chemical pollutants from the oceans, making it possible to design microbial mats that target specific pollutants. This way, they could be produced and deployed, at no additional cost to the environment. (Required budget: €48,000/12 months; Budget used so far: €28,295) Watch the video.

Plankton: a tool for monitoring marine pollution

Marine pollution is caused by various human activities impact like from agricultural pesticide application, release of industrial byproducts, manufacturing of pharmaceutical and personal-care products, as well as shipping discharges. It is highly toxic to aquatic organisms and has a huge impact on ecosystems, the seafood chain, and human health. Plankton, tiny organisms carried by tides and currents, are known to act as 'gatekeepers,' controlling the very first step of accumulation of pollutants in marine organisms. However, we do not yet know which plankton species absorb which specific pollutants and how, and what effect it has on the plankton communities themselves. EMBL's cutting-edge analytical methods can help be deployed to develop plankton-based indicators which can be used to monitor marine pollution and the health of marine ecosystems. (Required budget €18,500/12 months) Watch the video.