

## 15 PhD Marie-Curie Studentships in Functional Metagenomics:

Keywords: *Functional Metagenomics, Computational Biology, Protein Engineering, Directed Evolution, Bioinformatics and Enzyme Mechanism*

MetaExplore is a Marie Curie Doctoral Network set up to provide young researchers with hands-on research experience and formal training in directed evolution, protein engineering, bioinformatics, chemical biology and mechanistic enzymology.

Metagenomic DNA - collections of all DNA from natural sources - is a valuable untapped reservoir of functional molecules. The objective of MetaExplore is to explore new strategies for harvesting novel enzymes and biocatalysts from environmental sources. The endeavour is based on a powerful combination of sequence-based and functional metagenomic approaches and our training programme equips young researchers with computational and experimental skills to integrate both productively.

(i) **On the experimental side:** screening large and diverse metagenomic DNA libraries (environmental DNA from polar regions, hot environments, soil, marine & fresh-water and gut libraries) will be carried out using ultrahigh-throughput technologies will lead to the discovery novel proteins with useful functions

(ii) **On the computational side:** unprecedented availability of sequence data (e.g. >3 billion ORFs in the database MGnify) and machine learning will provide systematic insights via in silico sequence interpretation using custom-made algorithms. The MetaExplore network will harnessing the diversity of nature and the power of machine learning and AI:

(iii) Together the experimental and in silico projects will provide a better **fundamental understanding** of how existing enzymes evolved and how enzyme mechanisms can be manipulated by protein engineering.

(iv) **Applications:** We explore the use the enzymes identified as outlined above for green technology applications of biocatalysis (microplastics degradation, glycobiology or fine chemical synthesis) and in healthcare (bacteriocidal reagents or therapeutic enzymes). Industrial partners will help to generate practical impact in biotechnology.

This Network brings together twelve leading academic and industrial groups with diverse and complementary skills. The range of methodologies represented in *MetaExplore* allows an integrated approach combining *in silico* structural and sequence analysis with experimental high-throughput screening and selection methods (droplet microfluidics and lab-on-a-chip technologies, robotic liquid handling, phage display) with subsequent systematic kinetic and biophysical analysis. The unified efforts of leading stakeholders in the field of metagenomics from across Europe will provide a uniquely powerful multidisciplinary training environment to train the next generation of creative researchers and facilitate the uptake of new technologies into applied research through the exploration and sustainable exploitation of biodiversity.

To apply please contact the individual network partners in whose group you would like to work directly ([metaexplore.eu](https://metaexplore.eu)). Please apply by 12 January 2026, enclosing a CV, a full transcript of your university courses, a cover letter describing your interests and contact details of two referees.

The processing of applications has started on the 20th of October 2025 and will continue until all positions in the network are filled.

**Eligibility Criteria for the MSCA doctoral candidates:**

- can be of any nationality
- must not have resided or carried out their main activity (work, studies, etc.) in the country of the recruiting partner for more than 12 months in the three years immediately preceding the recruitment date.
- must not have a doctoral degree at the date of their recruitment and will be enrolled in doctoral programme during the project

**Funding - The EU provides support for each recruited researcher in the form of:**

- a living allowance
- a mobility allowance
- if applicable, family, long-term leave and special needs allowances
- research, training and networking activities
- management and indirect costs