

Advancing bio-based solutions through extremophile research

A project to channel biology's most resilient adaptations



Untapped potential

Extremophiles are specialised organisms that produce **unique molecules** to survive in challenging habitats. Their genetic traits offer **valuable tools for biotech**, enabling the development of stable molecules for harsh industrial conditions.



Smarter bioprospecting

XTREAM will use **high-precision tools** to efficiently discover resilient extremophiles and their adaptations.



Sustainable discovery

We will streamline biodiscovery with innovative methods that **reduce environmental impact** and **accelerate innovation**.

XTREAM in numbers



13 partners



7 countries



4 years



4.5M€
budget

Find out more!



xtream-project.eu



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Partners



Watch our project video!



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XTREAM

Harnessing the power of aquatic extremophiles

From extreme habitats to groundbreaking discoveries

Our work spans across diverse ecosystems to uncover untapped resources.



Arctic polar regions

- ↓ Temperature
- ↓ Nutrient availability



Acid drains

- ↓ pH
- ↑ Metal concentration
- ↑ Pollutant concentration
- ↑ Oxidative damage



Deep sea sponges

- ↓ Temperature
- ↑ Pressure
- ↓ Nutrient availability



Geothermal springs

- ↑ Temperature



Marine solar salterns

- ↑ Salinity
- ↑ UV light exposure

Targeted sampling

Most extremophiles live in environments that are **hard to reach**. This makes sampling slow, expensive, and environmentally disruptive. We will combine **cutting-edge tools** with sustainable practices to **maximise access while minimising impact**.



Conventional sampling to identify promising strains



Legacy samples to reduce new extraction



Drones and remote sensing to reach remote areas



Optimising biodiscovery

Our approach integrates **innovative methodologies** to identify **promising molecules** such as tolerant enzymes, specialised metabolites and antimicrobial compounds.



Multiomics and advanced spectrophotometry to reveal adaptive traits



Computational models and AI for molecular discovery



Metabolic engineering for efficient bioprocess design



Microfluidics to streamline organism screening

Transforming the bio-based industry

We deliver extremophile-based solutions that **speed up biodiscovery**, support sustainable biomanufacturing, and embed ethical practices in innovation—ensuring a responsible path **toward greener industries**.



Biomedicine



Personal care products



Green industry



Agriculture & food



Nutraceuticals