A small window to the future of our oceans: genomic divergence, plasticity and microbiome shifts in marine invertebrates along natural pH gradients

Fact Sheet

Project Information

DIVERGEN

Grant agreement ID: 101105400

Funded under
Marie Skłodowska-Curie Actions (MSCA)

DOI
10.3030/101105400

Total cost
€ 0,00

EU contribution
€ 165 312,96

Start date 1 September 2023
End date 31 August 2025

Coordinated by
UNIVERSITAT DE BARCELONA
Spain

Objective

Ocean acidification (OA) is a global problem caused by the rapidly increased CO2 emissions to the atmosphere since the Industrial revolution. Ocean acidity is predicted to increase from 100% to 150% by 2100, which will affect half of the marine biodiversity. The resilience, adaptive and survival potential of marine organisms to OA can highly vary among species, and the broader implications for ocean ecosystems are far from known. In this sense, marine CO2 vents, which generate pH gradients over short geographical distances, provide a perfectly designed natural laboratory to study the long-term effects of OA and to look into the future of our oceans. The project aims to understand the biological strategies of
calcifying marine species to overcome the effects of OA, using a keystone echinoderm widely distributed across a current natural gradient of pH. We will use an innovative and multidisciplinary approach combining transcriptomics and metagenomics together with physiological and ecological data to provide a deeper understanding of the adaptation and plasticity of echinoderms. This proposal will focus on different biological characteristics that determine the potential of the species to survive and adapt to changing environments and generate important knowledge about 1) intra- and inter-specific processes to cope with rapid environmental change, 2) adaptative evolution versus phenotypic plasticity in the biological responses of organisms, 3) larval microbiome to modulate responses to environmental stresses and 4) the vulnerability of the different life phases of organisms to climate change. This information will allow us to understand the buffering systems and adaptation strategies used by the species, predict the resilience of organisms to OA and finally, fill a relevant knowledge gap in ecological genomics.

**Fields of science**

natural sciences > biological sciences > marine biology

natural sciences > biological sciences > genetics

natural sciences > biological sciences > ecology > ecosystems

natural sciences > earth and related environmental sciences > atmospheric sciences > climatology > climatic changes

natural sciences > biological sciences > microbiology

**Keywords**

Ocean acidification, Climate change, Next-generation sequencing, metabolism, metagenomics, microbiome, marine invertebrates, larvae, symbionts, adaptation, phenotypic plasticity

**Programme(s)**

HORIZON.1.2 - Marie Skłodowska-Curie Actions (MSCA)

**Topic(s)**

2 of 4
Call for proposal

HORIZON-MSCA-2022-PF-01

See other projects for this call

Funding Scheme

HORIZON-TMA-MSCA-PF-EF - HORIZON TMA MSCA Postdoctoral Fellowships - European Fellowships

Coordinator

UNIVERSITAT DE BARCELONA

Net EU contribution

€ 165 312,96

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Region

Este > Cataluña > Barcelona

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation  
Website  
Participation in EU R&I programmes  
HORIZON collaboration network

Other funding

€ 0,00

Partners (1)
UNIVERSIDAD DE LA LAGUNA

Spain

Net EU contribution

€ 0,00

Address

Padre herrer a s/n
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Region

Canarias > Canarias > Tenerife

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation
Website
Participation in EU R&I programmes
HORIZON collaboration network

Other funding

€ 0,00

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European Union, 2023