

Sustainable Exploitation of bio-based Compounds Revealed and Engineered from natural sources



48
MONTHS

15 PARTNERS

7.787.818 €

9 COUNTRIES

SECRETed is a H2020 project funded under the FNR-11-2020 topic, aiming to fully exploit aquatic biotechnology for the production of novel industrial products for the pharmaceutical, cosmetics, agrochemical, marine and chemistry sectors. The SECRETed project aims to develop novel molecules with tailor-made properties by the combination of biosynthetic genes of amphiphilic compounds (biosurfactants and siderophores) produced by marine and extremophilic microorganisms.

OBJECTIVES

- To unlock the potential of marine and extremophilic bacteria for the development of tailor made amphiphilic molecules.
- To screen and detect Biosynthetic gene clusters for the synthesis of biosurfactants and siderophores based on 4 different aquatic microbial collections.
- To develop a genomic and chemical database including siderophore and biosurfactant production pathways and gene clusters, as well as their chemical structures and physiochemical properties.
- To formulate a 'mix and match' modelling pipeline, where 'mixing' of modular genetic elements is 'matched' with tailor-made compounds.
- To characterize compounds and optimize production and purification methods.
- To develop and validate a mathematical model for production process.
- To demonstrate proposed solutions and developed microbial strains in pilot plant scale (TRL-6).
- To assess environmental, economic and social perspectives of the proposed solutions.

WORK PACKAGES

WP1: Ethics requirements - IDE R&D

WP2: Microbial collections screening - MATIS

WP3: Databases integration and Industry-driven designs - IDE R&D

WP4: Systems metabolic engineering for microbial platform optimization - USE

WP5: Lab-scale fermentation and chemical characterization of compounds - UoA

WP6: Pilot systems for process optimization - BBEP

WP7: Proof of concept for end users' applications - SE

WP8: Sustainability assessments - Blue Synergy

WP9: Communication, dissemination and exploitation - EXELISIS

WP10: Management and Coordination - IDE R&D

STATE OF THE ART



Microbial collection screening



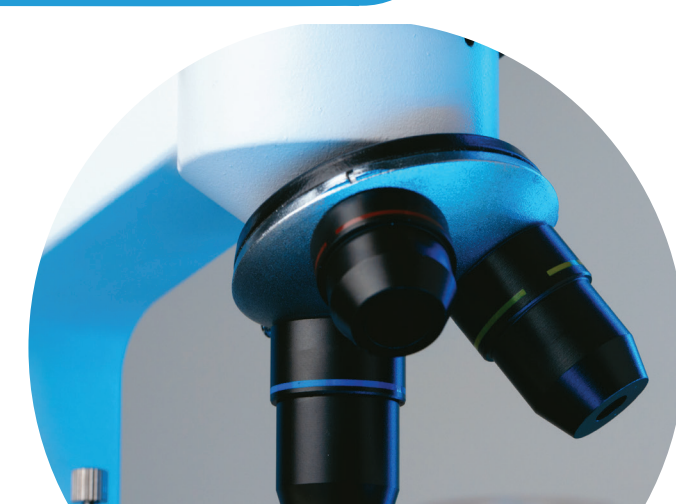
Machine Learning for new-to-nature molecules



Model-based biodiversity expansion



Biotechnological exploitation



Scalability and demonstration

IMPACT

- Developing novel natural, sustainable, eco-friendly, cheaper and readily accessible products with significant bioactive properties for the pharmaceutical, cosmetic, agrochemical, marine and chemistry sectors.
- Sustainable exploitation, cultivation and processing of promising organisms.
- Public-private cooperation in European biotechnology by integrating 'green' (plant), 'blue' (marine) and 'white' (industrial).
- Reduce the pressure on harvesting wild populations and increase knowledge about biodiversity potential.

idener.ai

Pharma Mar

Accuplex
Diagnostics

matís

Stazione Zoologica Anton Dohrn Napoli

HELLENIC REPUBLIC
National and Kapodistrian University of Athens
EST. 1837

EBERHARD KARLS
UNIVERSITÄT TUBINGEN

BLUE SYNERGY

Bio Base Europe
Pilot Plant

sphera
Encapsulation

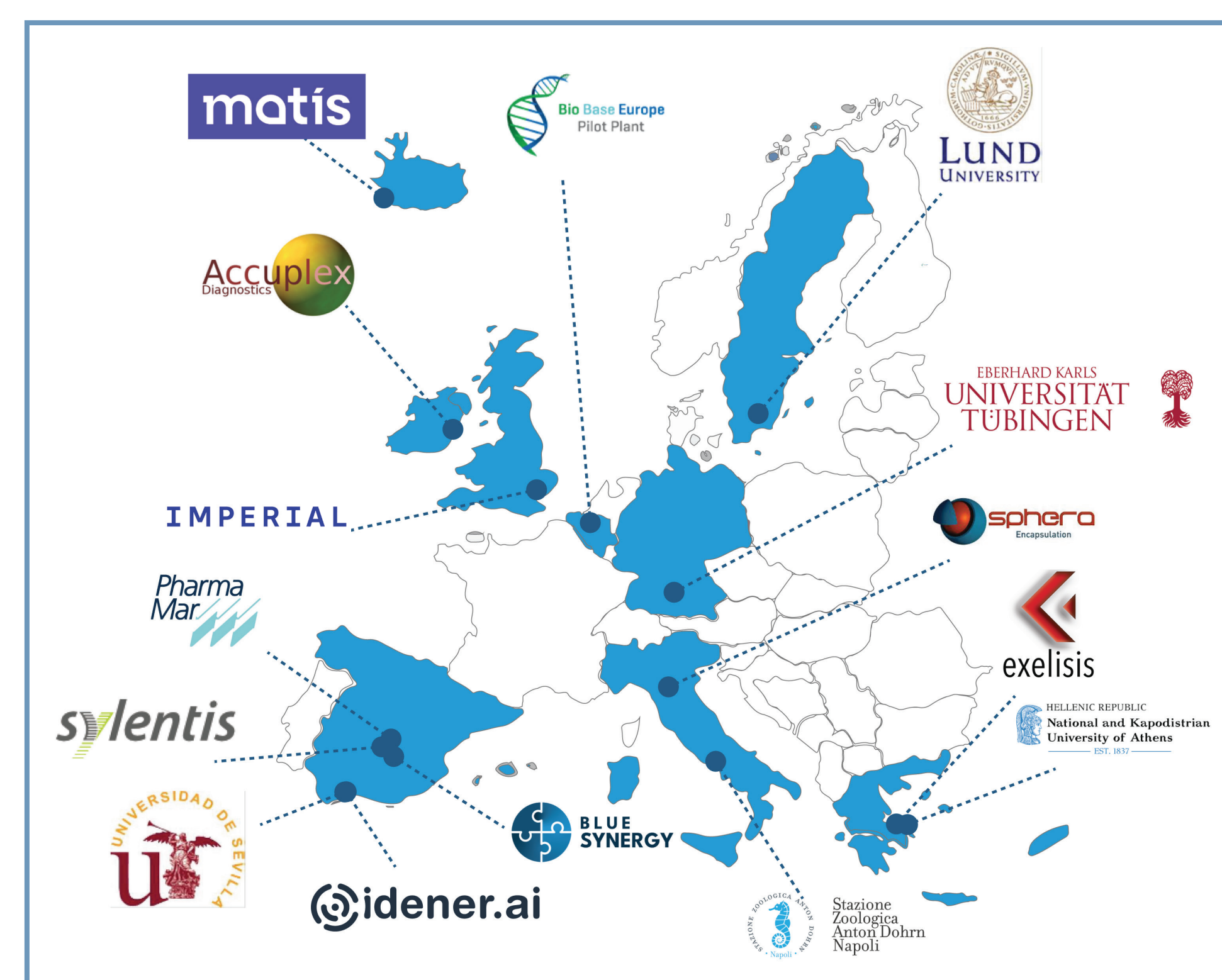
IMPERIAL

UNIVERSIDAD DE SEVILLA

LUND UNIVERSITY

exelisis

sylentis



The SECRETed project has received funding from the European Union's Horizon 2020 research and innovation programme under the Grant Agreement No. 101000794

PROJECT WEBSITE:

