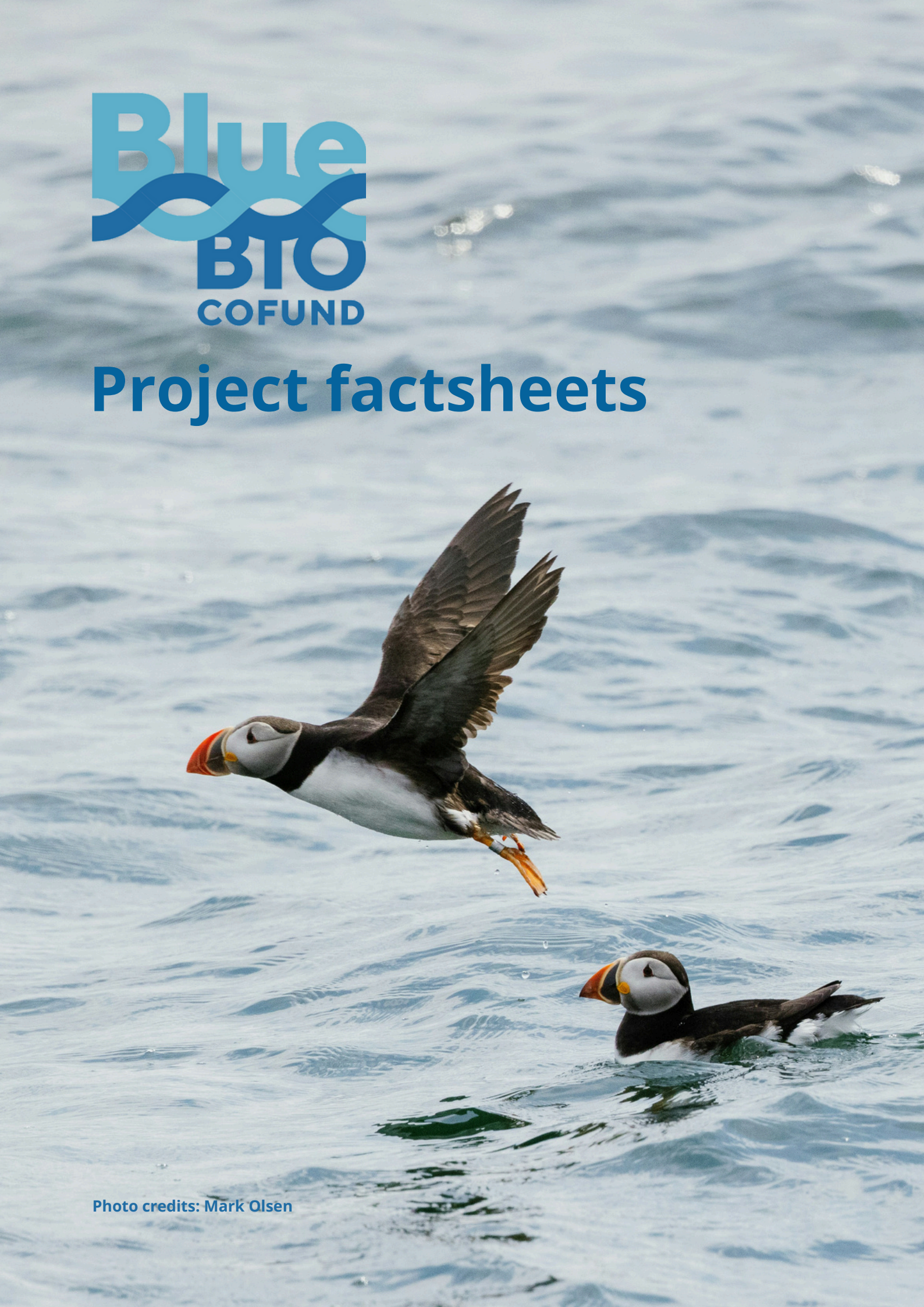
Project factsheets



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AQUAHEAL3DII

3D Printed Biomarine Wound Healing Accelerant

About the project

This project combines all renewable, marine sourced products to create a 3D printed wound healing medical device. We will incorporate Regenics' bioactive substances from unfertilized salmon roe, HTX, into a topical wound healing dressing (class III medical device) for chronic hard-to-heal wounds. The components of the entire wound-healing device have a marine origin. The bioactive ingredient, HTX, is a patented (EPO patent granted December 2018) purified heat-stable component of unfertilized salmon roe cytoplasm; HTX has strong skin regenerative and anti-inflammatory activity. The project will deliver a 3D printed, bioactive, clinical safety-tested dressing, ready for clinical study in patients.

No dressings with integrated skin regenerating and anti-inflammatory properties are available. Therefore, Regenics' wound healing innovation is ground-breaking in advanced wound care. HTX has skin regenerative effects demonstrated in human explanted skin; these results have led to significant interest from one of the top 5 global wound healing companies in 2015. A successful project will provide a unique opportunity for the consortium to sign licensing agreement(s) with one or more of these companies. This will create jobs in the marine and healthcare sectors. HTX is versatile allowing inclusion in wound devices – including, patches, 3D-printed patches, sprays and creams. The present consortium will create a bioactive wound-healing patch with entirely renewable marine organisms: the patch is composed of 3D printed alginate and cellulose from seaweed and tunicates; the backing to the patch, alginate, originates from seaweed; and the bioactive HTX originates from salmon roe. The consortium consists of academic and industry partners that are leaders in their respective fields; having a history of academic and industrial success.

This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.

Blue BIO COFUND

Project Overview

CALL 1 | 2019

Project Coordinator:
Karin Giljam, Oslo, Norway

Project Partners:
- Dr. Andy Makin, Citoxlab, Lille Skensved, Denmark
- Dr. Maria Lundin-Johnson, RISE Research Institutes of Sweden. Bioscience and Materials, Gothenburg, Sweden

Keywords:
All-marine sourced product, 3D printing, wound healing, bioactive, Class III Rule 13 medical device

Priority Area:
Exploring new bioresources

Funding granted:
1.009.462 euros *

* The exact amount of granted funds may change after completion of national contracts.

AquaHealth

Microalgae Microbiomes – A natural source for the prevention and treatment of diseases in aquaculture

Project Overview

CALL 1 | 2019

About the project

Aquaculture is one of the fastest growing food sectors in the world. In order to guarantee continuous, efficient and sustainable production and to safeguard the growth of this important sector, its protection from biological threats is crucial.

Within the AquaHealth project, an international consortium of highly experienced partners will assemble and apply an advanced meta'omics toolbox on the natural synergy of microalgae and microbial consortia associated with fish to discover and validate novel bioactive and prebiotic candidates for sustainable use in preventing and treating disease in land-based aquaculture systems. Targeted classes include biofilm and microbial pathogens inhibiting enzymes, peptides and small molecules, and antiviral drugs such as reverse-transcriptase inhibitors. This primary objective will be addressed in seven work packages.

Project Coordinator:
Kerstin Kuchta, Germany Hamburg University of Technology, (TUHH), Institute of Environmental , Technology and Energy Economics (IUE), Hamburg, Germany

Project Partners:
Dr. Massimo Pizzol, Aalborg University (AAU PLAN), Department of Planning, Aalborg, Denmark
Prof. Wolfgang Streit, University of Hamburg (UHH), Microbiology and Biotechnology, Hamburg, Germany
Dr. Alexander Wentzel, SINTEF AS, by its institute SINTEF, Industry, Dept. Biotechnology and Nanomedicine, Trondheim, Norway
Dr. Stefan Hindersin, Sea & Sun Technology GmbH (SST), Microalgae, Germany
Prof. Jeppe Lund Nielsen, Aalborg University (AAU BIO), Chemistry and Bioscience, Denmark

Keywords:
Sustainable aquaculture, microalgae microbiomes, precautionary disease treatment, bioactive

Priority Area:
Exploring improvements in fisheries and aquaculture

Funding granted:
1.986.100 euros *

This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.

* The exact amount of granted funds may change after completion of national contracts.

AquaTech4Feed

Novel sustainable aquaculture technologies for the production of innovative feeds for improved fish stocks

About the Project

The aim of AquaTech4Feed is to formulate novel fish feed from alternative proteinaceous biomass sources, such as algae, duckweed, insects and microbiomes (bioflocs) in order to improve fish production and product quality. AquaTech4Feed will develop a novel sustainable aquaculture production process based on the production of proteinaceous feed utilizing aquaculture wastewater and wastes.

The production process will consist of a closed recirculation system for recycling of nutrients and water for improved biosafety. New technologies and methods will be applied in order to ensure that the novel feeds are safe to be utilized in the feeding process. The project includes feeding trials with lumpfish, salmon and sea bream in order to assess fish production and to define production and quality benchmarks. The project of a duration of 36 months will be implemented from 8 partners from 6 countries (Greece, Malta, Germany, Italy, Spain and Ireland) consisted of 2 SMEs, 3 research institutes, and 3 universities. More specifically the partners participating in this project are: (1) Hellenic Agricultural Organization - Demeter (HAO), Greece, (2) G-Fish (SME), Greece, (3) L-Università ta' Malta (UM), Malta, (4) Istituto Sperimentale Italiano Lazzaro Spallanzani (SPA), Italy, (5) Bantry Marine Research Station (BMRS), Ireland, (6) Teagasc Food Research Centre (Teagasc), (7) University of Almeria (UAL), Spain and (8) ATB Potsdam (ATB), Germany.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

The Cofunded Call | 2020

Project Partners:

- **Giorgos Markou**
  Hellenic Agricultural Organization –Demeter Institute of Technology of Agricultural Products, Lycovrisi, Greece
- **Prof. Vasilis Valdramidis**
  L-Università ta' Malta, Food Sciences and Nutrition Faculty of Health Sciences, Mater Dei Hospital, MSD 2080 Msida, Malta
- **Dr. Katia Parati**
  Istituto Sperimentale Italiano, Lazzaro Spallanzani, Aquaculture, Rivolta, d'Adda, Italy
- **Dr. Julie Maguire**
  Bantry Marine Research Station, Bantry, Ireland
- **Dr. Oliver Schlüter**
  ATB - Leibniz-Institut für Agrartechnik, Quality and Safety of Food and Feed, Potsdam, Germany
- **Prof. Francisco Javier Alarcón López**
  University of Almeria, Dpt. Biology and Geology, Carretera de Sacramento s/n. La Cañada de San Urbano, Almeria, Spain
- **Prof. Brijesh Tiwari**
  Teagasc Food Research Centre, Ashtown, Dublin, Ireland
- **Mr. Giannis Gerontidis**
  G-FISH, Kastori Lakonias, Greece

Keywords:

novel feed,
nutrient recycling,
aquatic plants,
insects,
bioflocs.

Priority Area:

Exploring improvements in fisheries and aquaculture.

BESTBROOD

Identification of broodstock performance indicators and markers to boost the aquaculture of emerging fish species.

About the Project

Appropriate broodstock management is essential for supporting reproductive function and reliable and consistent production of gametes and high-quality eggs, critical for the rapid increase in juveniles supply and turn aquaculture into a profitable industry. In all species commercialized to date, this has been the first significant challenge to overcome and it is still so for many emerging species.

The BESTBROOD project aims to build upon state-of-the-art from previous EU and National projects and, evolve biotechnologies that significantly improve broodstock management methods and enhance reproductive performance of selected emerging species (Senegalese sole, greater amberjack, spotted wolfish and lumpfish). All these species are in an early commercial stage, but all have showed suitability for farming, high economic value and market demand. To create the BEST BROODstocks the project plans to: 1) develop genetic markers and bio indicators; 2) create knowledge on the best rearing conditions; 3) improve the control of the maturation cycles; 4) test hormonal therapies and artificial fertilization methods and; 5) reduce dependence on wild fish for egg production. As a result, the BESTBROOD will lead to a more stable and predictable supply of high volumes of high-quality eggs for the production of juveniles to meet market demands for sustainability, and increase Europe's aquaculture competitiveness.

The BESTBROOD brings together a multi-disciplinary consortium of partners with established expertise in fish breeding and reproductive biology to develop, validate and up-scale to the industry new tools and technologies and ensure research efforts are targeted to overcome the main reproductive bottlenecks affecting the project's focus species. The BESTBROOD Multi-Actor Approach (MAA) is oriented to the needs and demands of the aquaculture industry, improving knowledge exchange, innovation, communication and dissemination and thus increasing the final impact of the projects.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

The Cofunded Call | 2020

Project Partners:

- **Dr. Jorge Galindo-Villegas** Nord University, Faculty of Biosciences and Aquaculture, Bodø, Norway
- **Dr. Atle Foss** Akvaplan-niva, Aquaculture Innovation and New Species, Fram Centre, Tromsø, Norway
- **Dr. Constantinos Mylonas** Hellenic Centre for Marine Research Institute of Marine Biology, Biotechnology & Aquaculture
- **Dr. Manuel Manchado** Instituto Andaluz de Investigación y Formación Agraria, Pesquera, Alimentaria y de la Producción Ecológica (IFAPA), Centro IFAPA El Toruño, Spain
- **Prof. Aldo Corriero** University of Bari Aldo Moro, Department of Emergency and Organ, Transplantation, Section of Veterinary Clinics and Animal Production, Valenzano (BA), Italy
- **Mrs. Chara Laina** Argosaronikos SA, DELIGIANNI & TELAMONOS, SALAMINA, Greece
- **Mr. Ricardo Zerolo Andrey** Cultivos Piscícolas Marinos S.A. (Cupimar), Hatchery. Salina San Juan Bautista, Cadiz, Spain

Keywords:

aquaculture,
emerging species,
reproductive biotechnology,
broodstock,
reproductive performance.

Priority Area:

Exploring improvements in fisheries and aquaculture.

BIOSHELL

Recycling crustaceans shell wastes for developing biodegradable wastewater cleaning composites

About the Project

Wastes from agriculture and fishery cause harmful effects on the environment and implicitly on humans. But, many of these wastes can be recycled. One of the current global issues refers to minimizing waste production, effective wastewater treatment, biosafe food production, and reducing hazards from the exposure to pathogens. Most of the threatening microorganisms especially emerging pathogens (EPs) derive from wastewater. Moreover, antibiotics residues present in wastewater lead bacterial pathogens to develop antibiotic resistance genes (ARGs). In addition, heavy metals are among the most harmful non-microbial pollutants due to their toxicity to humans.

BIOSHELL aims at synergistically solving economic, environmental and health problems. The project focuses on utilizing the wastes from sea food preparation such as crustacean carcasses in the development of innovative and efficient inorganic-organic functionalized hydrogel nanocomposites, suitable to facilitate the sustainable wastewater purification technologies about heavy metals retention, antibiotics elimination, EPs and ARGs removal. Objectives: Functional biopolymer-based hydrogels starting from valorized crustacean's shell wastes will be developed both for the metal and antibiotics retention in waters as well as for anti-bacterial treatment. These competitive materials will be ion imprinted polymers (IIPs) or molecularly imprinted polymers (MIPs). They will benefit from new synthesis methodologies applied for chelating the chitosan nanocomposites and for the chemical graftingof the bactericidal hybrid surfaces.

The development of new approaches for the valorization of crustacean wastes, by the new functionalized biohydrogels, will improve the on-site wastewater treatment in EU. The regeneration of new bio-based agents is also targeted. Results: (i) 6 scientific papers in ISI rated journals; (ii) 2 patent applications; (iii) attend prestigious Symposia (6); (iv) 3 workshops and 2 Invention Salons; (v) website.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

The Cofunded Call | 2020

Project Partners:

- **Dr. Tanta-Verona Iordache**
  The National Institute for Research & Development in Chemistry and Petrochemistry-ICECHIM, Bucharest, Romania.
- **Dr. Andreea Olaru**
  S.C. EDAS-EXIM S.R.L.,R&D and Quality Departments, Bucharest, Romania
- **Prof. Artur Valente**
  University of Coimbra, Faculty of Sciences and Technology, Department of Chemistry, Coimbra, Portugal
- **Dr. Alexandre Craveiro**
  Brinova Bioquimica Lda, ID&T, Évora, Portugal
- **Dr. Lisa Paruch**
  NIBIO – Norwegian Institute of Bioeconomy Research Division of Environment and Natural Resources, Aas, Norway

Keywords:

Recycling,
crustacean shells,
functionalized chitosan,
biodegradable cleaning composites,
wastewater.

Priority Area:

Exploring new bioresources

BIOZOOSTAIN

Sustainable utilization of zooplankton as by-products

About the Project

The main objectives of BIOZOOSTAIN is to fully process valuable ingredients, such as astaxanthin, chitin, polyunsaturated omega-3 fatty acids, wax-esters and enzymes from marine zooplankton, such as Calanus finmarchicus, which are taken ashore and introduced as a side raw material or by-catch during pelagic fishing.

The aim is to use these ingredients to develop new high quality products for the food supplement, cosmetic and nutra-/pharmaceutical markets in a sustainable and ethical way. Novel processing methods will be compared to traditional methods to obtain optimized processing lines for environmentally friendly and sustainable utilization of the zooplankton as bycatch and attain a zero waste goal in the process of pelagic fisheries. Novel high quality product prototypes for human consumption (foodfirst) from sustainable zooplankton will be developed within the project, based on their physicochemical, sensory, bioactivity and metabolomic/ FoodOmic characteristics these prototypes may have on the human body upon consumption. The feasibility and environmental impact of the production of these prototypes will be assessed by life cycle assessment (LCA) and their market introduction will be prepared.

Prediction tools for identification of catching hot-spots and times for the pelagic species and their by-catch will be developed, as well as spectroscopic prediction tools for processing optimization. The innovation potential of the BIOZOOSTAIN project is both very high and ambitious, but also realistic based on the current knowledge and excellence of the project consortium.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

The Cofunded Call | 2020

Project Partners:

- **Prof. Ólafur Ögmundarson**
  University of Iceland, Faculty of Food Science and Nutrition, Reykjavik, Iceland.
- **Dr. Sigrún Jónasdóttir**
  DTU Aqua, Lyngby, Denmark.
- **Mr. Stefán Eysteinsson**
  Matis ohf., Food and Biotech R&D, Reykjavik, Iceland.
- **Prof. Ólafur Sigurjónsson**
  Icelandic University Hospital (LSH), Reykjavik, Iceland.
- **Prof. Francesco Capozzi**
  Universita' di Bologna, Dept. of Agricultural and Food Sciences – DISTAL, Bologna, Italy.
- **Prof. Jose Manuel Barat Baviera**
  Universitat Politecnica de Valencia, Department of Food Technology, Valencia, Spain.
- **Mr. Klaus Henrik Kristoffersen**
  FF Skagen Magangement, Skagen, Denmark.
- **Mr. Sindri Karl Sigurðsson**
  Síldarvinnslan (SVN), Research and Development, Fjarðabyggð, Iceland.

Keywords:

Sustainability,
zooplankton,
by-products,
quality prediction tools,
foodomics.

Priority Area:

Exploring new bioresources

BlueCC

Commercial exploitation of marine collagen and chitin from marine sources

Project Overview

CALL 1 | 2019

About the project

Over the coming decades, the world will witness increased competition for limited and finite natural resources, e.g. to feed the 9 billion global population by 2050 and to handle changed demographics. An aging population requires new solutions to add life quality to those extra years, in fighting aging diseases and related processes. Bio-waste is estimated at up to 138 million tons per year in the EU.

Additionally, there are large amounts of underutilised animal species, such as invasive marine species causing devastation to local ecosystems. These two issues represent not only problems, but also opportunities for innovative actions in the EU to better develop what is currently wasted or underutilised.

The BlueCC project aim to take underutilised species such as invasive marine species, by-catch and cleaner fish from the aquaculture industry, to develop new marine ingredients and products, with significantly reduced impact on the environment. The specific focus will be on sustainable exploitation of collagen and chitin resources produced by jellyfish, starfish and cleaner fish, and invasive crabs respectively.

To succeed with product development of research-intense products such as chitin and collagen, we will apply a strong emphasis on market needs and insights throughout the project. BlueCC will be carried out by an interdisciplinary team and is divided into six main work packages addressing market driven concept development, sustainable chitin, chitosan and collagen demonstrators, health effects as well as characterization of novel marine ingredients and finally, commercialisation feasibility in an RRI framework.

Altogether, BlueCC will in a sustainable and efficient manner exploit underutilized marine raw materials, from laboratory to prototype demonstration, to reach collagen and chitin-based bioactive demonstrators with potential commercial uses reaching the Technology Readiness Level 7.

Project Coordinator:
Runar Gjerp, Solstad Nofima Marine biotechnology, Tromsø, Norway

Project Partners:
- Dr. Johan Robbens, Flemish Research Institute for Agriculture, Fisheries and Food, Merelbeke, Belgium
- Dr. Donatella de Pascale, National Research Council, Institute of Biochemistry and Cellular Biology, Naples, Italy
- Prof. Katleen Raes, Ghent University, Department of Food Technology, Safety and Health Kortrijk, Belgium
- Dr. Stefan Rasche Fraunhofer, Institute for Molecular Biology and Applied Ecology IME Plant Biotechnology, Aachen, Germany

Keywords:
Valorisation, Functional food, invasive species, by-catch

Priority Area:
Exploring new bioresources

Funding granted:
1.940.882 euros *

This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.

* The exact amount of granted funds may change after completion of national contracts.

CASEAWA

Advanced Materials using Biogenic Calcium Carbonate from Seashell Wastes

About the project

The project "Advanced Materials using Biogenic Calcium Carbonate from Seashell Wastes" (CASEAWA) aims at producing chemically and physically functionalized biogenic calcium carbonate particles (FbCCP) using fishery industry waste seashells from mussels and oysters (7 Mton/year). FbCCP will be used in polymeric compounds and to obtain nano-apatites, as representatives of application in the industrial world and as biomaterials.

CASEAWA will produce FbCCP that preserve the inorganic/organic composite nature of seashells and will take advantage of the organic matric presence. The latter is absent in geogenic calcium carbonate and cannot be entrapped within the calcium carbonate by synthetic procedures. The organic matrix represents the additional value of the seashells resulting from 3.5 M year evolution to achieve high performing functional properties (e.g. resistance to fracture).

CASEAWA is organized in six work packages (WPs). WP1 regards the handling procedures of waste seashells and their grinding applying by specific grinding aids. The functionalization, blending and characterization of the micro-bCCP will be carried chemically in WP2 by polymeric molecules and physically in WP3 by graphene. WP4 will produce and characterize nano-apatites from nano-FbCCP for regenerative medicine. WP5 will use FbCCP for the production of strengthened and conductive Levirex® compounds. WP6 will take care of management and dissemination activities of CASEAWA.

CASEAWA consortium includes University of Bologna (WP1-2, 6), University of Konstanz (WP3,5,6), Spanish National Research Council (WP4,6) and Finproject industry (WP5,6). Their cooperation will ensure CASEAWA success covering the value chain of the waste seashells with a starting TRL2 up to a TRL5.

CASEAWA is a clear example of circular economy, since seashells are a valuable biomaterial; it improves the sustainability of the aquaculture industry and provides secondary economic benefits to shellfish growers and processors.

This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.

Blue BIO COFUND

Project Overview

CALL 1 | 2019

Project Coordinator:
Prof. Giuseppe Falini, Alma Mater Studiorum – Università di Bologna, Chemistry "Giacomo Ciamician", Bolognia, Italy

Project Partners:
- Dr. Jaime Gómez Morales, Consejo Superior de Investigaciones, Científicas, Instituto Andaluz de Ciencias de la Tierra, Armilla, Spain
- Prof. Helmut Cölfen, University of Konstanz, Germany
- Dr. Gabriele Maoloni, FINPROJECT SPA, ASCOLI PICENO, Italy

Keywords:
Waste Seashell, biogenic calcium carbonate, functionalized materials, biomaterials, polymer industry

Priority Area:
Exploring new bioresources

Funding granted:
533.083 euros *

* The exact amount of granted funds may change after completion of national contracts.

DIGIRAS

Optimizing land-based fish production in next generation digital recirculating

Project Overview

CALL 1 | 2019

About the project

Recirculating aquaculture systems (RASs) have been developed for land-based production of sea- and freshwater species. These systems are designed to provide high biomass production while reducing resource usage and maximizing control of operational parameters.

However, only a few of these parameters are systematically monitored, and currently applied analysis techniques are often insufficiently sensitive, slow or laborious. Consequently, the full potential of RASs for more sustainable food production remains unexploited. The over-all goal of the DIGIRAS project is to develop innovative and data-driven solutions for digitalization of future RAS technology in order to increase environmental compatibility, fish health and productivity. The project intends to reach this goal by systematic acquisition of relevant water quality data, parameterization of fish behaviour, developing new biological and chemical sensors and efficient water treatment technology. DIGIRAS will strive to integrate all generated data towards decision support and predictive tools for next generation digital RAS operation. In DIGIRAS, R&D institutions with strong competence in (micro)biology and chemistry, fish health, video monitoring/machine learning and advanced water treatment technology will join forces with industrial partners from the fish farming and RAS-technology sector. Together, this consortium will contribute to improve land-based fish farming technology significantly, with respect to animal health, production conditions, environmental benefits and sustainability. Moreover, DIGIRAS aims at contributing to more sustainable growth in the aquaculture sector by developing new technologies, and thus, generating new jobs in infrastructural less developed areas in Europe.

In DIGIRAS, 6 R&D institutions and 5 industry partners (1 external contributor) from 5 participating European countries will collaborate for 36 months with a total funding budget of 1.68 Mio € (project budget 1.94 Mio €).

Project Coordinator:
Dr. Roman Netzer, SINTEF Ocean Environment and New Resources, Trondheim, Norway

Project Partners:
- Prof. Ane Nødtvedt Norwegian University of Life Sciences, Oslo, Norway
- Prof. Jörn Kalinowski Bielefeld University Center for Biotechnology –CeBiTec, Bielefeld, Germany
- Prof. Yu Ri Park Lappeenranta University of Technology Department of Green Chemistry, Mikkeli, Finland
- Dr. Begoña Espiña, International Iberian Nanotechnology Laboratory, Braga Portugal
- Mr. Bjørn Erik Sørvig, LetSea AS Torolv Kveldulvsons Sandnessjøen, Norway
- Mr. Peter Zeller, FRESH Völklingen GmbH, Völklingen, Germany

Keywords:
RAS, Aquaculture, Water quality, Machine Learning, Digitalization

Priority Area:
Exploring improvements in fisheries and aquaculture

Funding granted:
1.679.465 euros *

This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.

* The exact amount of granted funds may change after completion of national contracts.

ImprovAFish

Improving aquaculture sustainability by modulating the feed-microbiome-host axis in fish

Project Overview

CALL 1 | 2019

About the project

As the human population surges towards 10 billion, the production and consumption of aquaculture products such as fish is expanding. Efficient and environmentally sustainable practices are therefore required to ensure long-term food security. To solve these challenges, attractive solutions include developing new feed ingredients and better broodstock genetics to improve fish production and welfare.

Intriguingly, it has been shown that both feed and host genetics can modulate the microbiome of animals and thus influence its integral connection to host phenotype. The ambitious aim of ImprovAFish is to decipher the intimate functional coupling along the feedmicrobiome-host axis in an applied context, with the emphasis on a promising 'next generation' functional feed ingredient (beta- mannan) that is known to promote beneficial microbiota in production animals, including promising preliminary data in fish.

Our approach is to jointly analyze how diet affects the metabolic function of the host and its microbiome as a single unit of action, using a novel and powerful framework called "holo-omics". This entails monitoring how changes in enzymes and metabolites produced by microbiota, correlates with uptake and metabolism of nutrients in the gut and liver of the fish. By doing this across life stages, different feeds and with recordings of key performance indices, we aim to identify exploitable interactions between specific feed components and microbiome functions that can be used to improve fish phenotype. In addition, associations between broodstock genetic variation, microbiome composition and diet will be determined, which will facilitate selection for fish with preferred gut microbiota. Ultimately ImprovAFish will facilitate optimization of improved and sustainable feeding strategies that are specifically tailored to host genetics (or vice versa), with an emphasis on socially responsible outcomes facilitated by a dedicated Responsible Research and Innovation process.

This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.

Project Coordinator:
Prof. Phillip Pope, Norwegian University of Life Sciences (NMBU), Department of Animal and Aquacultural Sciences, Aas, Norway

Project Partners:
- Prof. Thomas Gilbert University of Copenhagen (UCPH), Department of Biology Copenhagen, Denmark
- Prof. Stefan Bertilsson, Swedish University of Agricultural Sciences (SLU), Department of Aquatic Sciences and Assessment, Uppsala, Sweden
- Dr. Thomas Moen, AQUA GEN AS, KYRKSÆTERØRA, Norway
- Dr. Olav Kraugerud Cargill (EWOS Innovation AS), Dirdal, Norway
- Dr. Clare Shelley-Egan, Oslo Metropolitan University (Oslo Met), Work Research Institute, Oslo, Norway
- Prof. Ines Thiele National University of Ireland, Galway (NUIG), School of Medicine, University, Galway, Ireland

Keywords:
Prebiotic fibers, brood stocks, host-microbiome interactions, holobiont, multi-omics

Priority Area:
Exploring improvements in fisheries and aquaculture

Funding granted:
1.684.085 euros *

* The exact amount of granted funds may change after completion of national contracts.

InEVal

Increasing Echinoderm Value Chains

About the project

Sea stars, Sea urchins and Sea cucumbers are abundant marine biomass resources that are under developed. Throughout Europe, these Echinoderms are wastefully exploited, disregarded and discarded. Researchers and industry partners in the InEVal project will advance high quality Bioeconomic products and services from echinoderm biomass. InEVal addresses societal demand for new solutions to current challenges for human food, aqua feeds and ecosystem services by:

1. Up-valuing bycatch sea stars from Irish and German inshore shellfish fisheries to highly processed supplements for Salmon, shrimp and Seabass diets using milling, washing and enzymatic fermentation.

2. Improving low-value sea urchins from heavily impacted sea urchin barrens to high quality food for humans for high value niche markets in novel land-based enhancement systems under optimal holding conditions.

3. Seeding and harvesting sea cucumber for site remediation at aquaculture sites that are enriched with nutrients. Sea cucumbers perform a valuable and sustainable site remediation service followed by their utilisation as a high value human food resource.

InEVal's novel products and services serve expanding markets and the industry partners will ensure realistic new value chains are established. Production methodologies will be developed to secure regular supply, as required, to surveyed and confirmed target customers, i.e. to diet formulators at just-in-time standard; to sea urchin consumers outside normal gonadal seasonal bounds; to environmentally aware sea cucumber consumers; and to aquaculture operators aiming to remediate fallowed sites efficiently and sustainably. The InEVal project develops realistic value-added, innovative products and services for the bioeconomy from echinoderm bioresources. Focusing on value and sustainability at every step along the value chain, these

This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.

Project Overview

CALL 1 | 2019

Project Coordinator:

Dr. Matthew Slater, Alfred Wegener Institute, Helmholtz Center for Polar and Marine Research Aquaculture, Bremerhaven Germany

Project Partners:

- Dr. Colin Hannon Galway Mayo Institute of Technology Marine & Freshwater Research Centre, Galway, Ireland
- Dr. Philip James, Nofima Tromsø Aquaculture Production Division, Tromsø, Norway
- Dr. Peter Krost, Coastal Management and Research GbR, Mussel Aquaculture, Kiel, Germany
- Mr. Brian Tsuyoshi Takeda Urchinomics Sjoegata, Ulsteinvik, Norway
- Dr. Jon Eirik Brennvall , Statsnail AS Steinvikveien, Oksvoll, Norway
- Dr. Jamie Downes Marine Institute Aquaculture Marine Institute, Rinville, Oranmore, Galway Ireland
- Mrs. Laura Gutierrez ALGAFRES, S.L. FOLGUEIRA 3 CAMBRE, Spain
- Mrs. Máire Ní Einniú, Udaras na Gaeltachta, Gaillimhe, Ireland

Prof Piero Addis University of Cagliari, Department of Life Science and Environment, Cagliari, Italy

Keywords:
Marine Bioresources, Sea Cucumber, Sea Star, Sea Urchin, Ecosystems services

Priority Area:
Exploring improvements in fisheries and aquaculture

Funding granted:
1.522.996 euros *

* The exact amount of granted funds may change after completion of national contracts.

MARIKAT

New catalytic enzymes and enzymatic processes from the marine microbiome for refining marine seaweed biomass

About the project

The technological objective of MARIKAT is to unlock the potential of microbiomes in providing tools for emerging biorefineries of Europe to establish an unique marine bioresource, seaweed polysaccharides as a feedstock. Enzymatic refining of macroalgal polysaccharides to added value products on industrial scale is near to non-existent today – robust enzymatic tools are lacking. MARIKAT entails retrieval, evaluation and industrial development of enzymes identified in novel marine microbial genomes and metagenomes. Enzymes will be developed for different steps of a biorfinery seaweed value chain, from enzyme aided fractionation of the biomass, to conversion of different components to value added derivatives. Besides carbohydrate active degrading enzymes various auxiliary enzymes will be targeted e.g. enzymes for removing or changing substituent patterns of polysaccharides, e.g. sulfatases for de-sulphating recalcitrant polysaccharides; and modifying enzymes such as trans glucosidases that can add sugar moieties to different oligo-saccharides and aglycones. MARIKAT will provide enzymes and expand the range products that can be derived from seaweed to include added value products such as highly bioactive oligosaccharides, rare sugars, novel polyphenol derivatives and food grade surfactants from seaweeds. Advanced methods will be used to define the structural determinants of bioactivity in various enzymatic products, and the applicative potential of enzymes in modification and synthesis of synthetic pharmaceutical oligosaccharides will be evaluated. The targeted markets are food (specifically the food beverage and the health food markets); pharma and the skin-care industry. The developed enzymes and enzymatic processes will be introduced to the market through commercial channels within the consortium, partners networks as well as through outreach and dissemination to stakeholders and potential third-party collaborators and clients.

This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.

Blue BIO COFUND

Project Overview

CALL 1 | 2019

Project Coordinator:
Gudmundur Hreggvidsson, Matís, Reykjavik, Iceland

Project Partners:
- Prof. Anne Meyer, Technical University of Denmark (DTU), Department of Biotechnology and Biomedicine, Lyngby, Denmark
- Prof. Eva Nordberg Karlsson, Lund University (ULUND), Div Biotechnology, Dept Chemistry, Lund, Sweden
- Dr. Paraskevi (Voula) Polymenakou, (HCMR), Hellenic Centre for Marine Research, Institute of Marine Biology, Biotechnology and Aquaculture, Heraklion, Greece
- Prof. Ioannis Pavlidis, University of Crete (UOC), Department of Chemistry, Heraklion, Greece
- Prof. Lene Lange, LLa – Bioeconomy –SM, Valby, Denmark
- Dr. Stefan Ulvenlund, Enza Biotech AB (ENZA) (External contributor), Lund, Sweden
- Mr. Olavur Gregersen, Ocean Rainforest (ORF) (External contributor), Faroe Islands

Keywords:
Enzyme development, marine polysaccharides, enzymatic refining, (meta)genomic bioprospecting

Priority Area:
Exploring new bioresources

Funding granted:
1.359.182 euros *

* The exact amount of granted funds may change after completion of national contracts.

MedSpon

Characterization of new antibiotic principles against WHO priority pathogens of sustainable produced marine sponges for nutraceutical applications

About the project

Marine sponges are receiving increasing public, economic and scientific interest as source of bioactive compounds representing pharmaceutical potential. As sessile organisms sponges have developed chemical defence mechanisms to avoid the covering of algae, bacteria and infectious microorganisms. Regarding the development of new drugs, secondary metabolites are of special interest. Project objectives will address the discovery of new sources from sponge secondary metabolites especially of Chondrosia reniformis and Axinella polypoides in collaboration with the detection of convenient recirculating aquaculture system conditions for sponge fragments to build up a sustainable source for sponge biomass.

In both sponge species novel nucleosidase enzymatic activity was detected, an ATP N-glycosidase and ATP polymerase, respectively. The first enzyme converts adenosine-5'-triphosphate into adenine and ribose-5-triphosphate, which possibly functioning as messenger substances. Project objectives will focus amongst others on the antimicrobial activity of sponge extracts as well as new antibiotic principles in marine sponges against WHO priority pathogens.

Considering the production of secondary metabolites can change during the life cycle of the species (e.g. reproductive period, food availability) vigorous wild populations of the target species will be studied at Italian field sites to assess habitat specifications and providing information for ex-situ cultivassions. Successful mass production of sponges in land-based aquaculture with recirculating technology under controlled environment is aspired. To examine adequate rearing conditions related to amount and content of bioactive compounds, additional tests on abiotic factors and nutrition are conducted. Formation potential of bioactive compounds and microbial communities associated with different sponge species/rearing conditions will be verified with molecular techniques.

This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.

Blue BIO COFUND

Project Overview

CALL 1 | 2019

Project Coordinator:
Joachim Henjes, Alfred Wegener, Institute Helmholtz Centre for Polar and Marine Research, Aquaculture Research, Bremerhaven, Germany

Project Partners:
- Mrs. Athanasia Balafouti, SpongiPharm EPE Administration, Athens, Greece
- Dr. Wolfgang Schatton, KliniPharm GmbH, R&D, Eschborn, Germany
- Prof. Carlo Cerrano, Polytechnic University of Marche, Department of Life and Environmental Sciences, Ancona, Italy

Keywords:
Sponge, aquaculture recirculation systems, antimicrobial activity, nutraceutical

Priority Area:
Exploring synergies across sectors

Funding granted:
758.321 euros *

* The exact amount of granted funds may change after completion of national contracts.

MINERVA

Marine Innovation using Novel Enzymes for waste Reduction and Valorisation of Algal biomass

Project Overview

CALL 1 | 2019

About the project

MINERVA aims to valorise underutilised seaweed biomass sustainably produced across Europe, to develop new high-value products and reduce waste in current processes. It will add value to brown algal biomass presently used at low efficiency, focused on bulk Ascophyllum (wild-harvest) and Saccharina (cultivated), in addition to other regionally important niche species of commercial potential, based on principles of waste reduction and 'food first' for new products within the blue bioeconomy.

Novel, environmentally friendly algal compounds will be developed to address identified consumer needs in food, cosmetics, biomedical and aquaculture industries. This will be achieved via 1) new extraction methods aiding purification of bioactives, and 2) omicsbased approaches on unexplored marine microbial sources to develop new enzymes for application to a wide range of marine biomass. Novel algal extracts will be provided to partners (including SMEs) with expertise in algal biology/ biochemistry, food fibres and ingredients, seaweed-based cosmetics, the development of novel antifouling agents for aquaculture and biomedical applications.

Anticipated outputs are: novel enzymes with food and health applications; novel food fibres; active algal compounds for cosmetics and aquaculture (antifouling agents); integration of algal components into hydrogels and encapsulation.

All partners are experienced in marine innovation using algal biomass, and strong collaborative links exist to ensure integration of complementary expertise, effective workflow and high potential for exploitation of outputs. Industry participation including end-user testing and dissemination activities will support near-to-market evaluation of results.

MINERVA will further develop Europe's research capacity by training early stage researchers in marine biotechnology within the consortium and create a focal point for marine bioresources research in Europe to maintain its leading position in this rapidly emerging area. Project management, dissemination and communication, will be underpinned by RRI principles.

This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.

Project Coordinator:
Dr. Dagmar Stengel, National University of Ireland, Galway Botany and Plant Science, Ireland

Project Partners:
- Prof. Alan Dobson, University College Cork, Ireland
- Dr. Sarah Hotchkiss, CyberColloids Ltd, Ireland
- Prof. Johan Svenson, RISE Research Institutes of Sweden Chemistry and Materials, Gothenburg, Sweden
- Mrs. Rosa Jonsdottir, Matis ohf., Research & Innovation, Reykjavik, Iceland
- Dr. Hordur Kristinsson, UNA, Reykjavik, Iceland

Keywords:
macroalgae, valorisation, waste reduction, novel enzymes, biorefinery

Priority Area:
Exploring new bioresources

Funding granted:
1.097.064 euros *

* The exact amount of granted funds may change after completion of national contracts.

PlatiSea

Novel enhanced bioplastics from sustainable processing of seaweed

Project Overview

CALL 1 | 2019

About the project

Conventional plastic materials are made from non-renewable resources and their pollution presents a global threat to marine environments. The EU recently voted for a complete ban of the most common single use plastics by 2021 which has significantly stimulated the interest in bio-based and biodegradable materials, particularly in the food packaging and service industries. However, bioplastics still face challenges related to sustainability of the feedstock, low biodegradability and/or recyclability and unsatisfactory properties, limiting their applications and widespread implementation. The main objective of PlastiSea is to develop novel bioplastic materials based on cultivated and wild underutilized species of brown algae. The project will thus provide an innovative and sustainable bioplastic substrate with promising properties, and simultaneously add value to a growing seaweed industry in Europe. The seaweed biomass will be processed to obtain polysaccharide-rich fractions, employing various degrees of refinement toward single-use biodegradable materials for food industries as well as higher-value applications in the biomedical and cosmetic sector. Novel bioplastic substrates will be developed with a focus on competitive structural properties and biodegradability, primarily toward single-use food packaging that is seldom recycled. Structuring technology will be developed toward pilot-scale production and future industrial-scale implementation after the project's end. Importantly, the value chain from raw material to finished products will be evaluated from an environmental and economic perspective to identify and address challenges and opportunities in scaling and ensure a sustainable pipeline for value creation. The PlastiSea consortium consists of partners from Norway, Sweden, Denmark and Spain, and combines research expertise with industrial innovation to achieve the goals of the project and fulfil the visions of the Blue Bioeconomy.

Project Coordinator:
Dr. Øystein Arlov, SINTEF AS, Biotechnology and Nanomedicine, Trondheim, Norway

Project Partners:
- Mrs. Maren Sæther, Seaweed Energy Solutions AS, Trondheim, Norway
- Mr. Guy Maurice, B'ZEOS, Oslo, Norway
- Dr. Pere Castell, AITIIP TECHNOLOGICAL CENTRE, Zaragoza, Spain
- Dr. Massimo Pizzol, Aalborg University, Aalborg, Denmark
- Prof. Qi Zhou, KTH Royal Institute of Technology, School of Engineering Sciences in Chemistry, Biotechnology and Health, Stockholm, Sweden

Keywords:
Brown algae, bioplastics, biorefinery, alginate, cellulose

Priority Area:
Exploring new bioresources

Funding granted:
1.454.160 euros *

This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.

* The exact amount of granted funds may change after completion of national contracts.

RASbiome

Microbial management in RAS for sustainable aquaculture production

Project Overview

CALL 1 | 2019

About the project

In the RASbiome project, we aim at improving the sustainability of fish production in freshwater recirculating aquaculture systems (RAS) by introducing new and innovative approaches for microbiological water treatment. We will implement two fundamentally distinct biological water treatment strategies, new to RAS, to improve the management of nitrogen compounds. The first strategy involves anaerobic ammonia-oxidizing (anammox) bacteria, and results in almost complete removal of nitrogen from the water. Compared to current treatment methods for nitrogen removal in RAS, this strategy excludes the need for external organic carbon; it entails reduced energy consumption, and reduced CO2 production. The second strategy takes advantage of bioflocs formed by heterotrophic bacteria, assimilating nitrogen. This approach allows for harvesting nutrient rich microbial biomass, and is therefore compatible with recovery and recycling of nitrogen from in

RAS water. These new biological water treatment approaches will be implemented in well- considered treatment designs for optimized microbial and chemical water quality. The project is highly multidisciplinary, involving experts from Belgium, Denmark, and Norway in fields of environmental engineering, biotechnology, microbiology, microbial ecology, and aquaculture. Industry partners, including two large commercial producers of salmon smolt and rainbow trout, play a crucial role in the project. We expect the proposed project to promote sustainable fish production by improving fish welfare and productivity due to stable and optimized chemical and microbiological water quality, by reducing environmental impact through nitrogen removal from discharged water, and finally, by reducing operational costs.

Thus, the project contributes in developing European aquaculture in a direction characterized by the 3R principle: reducing, reusing and recycling of waste material.

This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.

Project Coordinator:
Ingrid Bakke, NTNU Norwegian University of Science and Technology, Department of Biotechnology and Food Science, Trondheim Norway

Project Partners:
- Mr. Per Bovbjerg Pedersen DTU, Hirtshals, Denmark
- Prof. Peter Bossier, Ghent University, Dep Animal Science and Aquatic, Ecology, GENT, Belgium
- Mr. Arne Bækgaard,Assentoft aqua Aps, Stakroge Fisk production, Randers SØ, Denmark
- Mr. Ola Staveli,Lerøy Seafood AS, Hellandsjøen, Norway
- Mr. Christian Rønning, KRÜGER KALDNES AS, Sandefjord, Norway

Keywords:
RAS, microbiomes, anammox, heterotrophic-nitrogen-assimilation, microbial-management

Priority Area:
Exploring new bioresources

Funding granted:
1.087.284 euros *

* The exact amount of granted funds may change after completion of national contracts.

SIDESTREAM

Secondary bio-production of low trophic organisms utilizing side streams from the Blue and Green sectors to produce novel feed ingredients for European aquaculture

Project Overview

CALL 1 | 2019

About the project

To what extent is it possible to process and use nutrients from aquaculture and agriculture waste? Which novel organisms and approaches are best suited? Can these organisms serve as ingredients for feed stuff? How suitable and safe are feed ingredients produced on waste? What is the market potential and economic feasibility of feed ingredients produced following sustainable circular principles?

SIDESTREAM addresses these questions to push forward the frontier for production of high value compounds by utilization of low trophic marine invertebrates and bacteria, which will be reared on waste streams, following circular principles. Several industries are in demand for high value compounds such as marine-originated lipids, proteins and pigments such as astaxanthin. Omega-3 long-chain (≥C20) polyunsaturated fatty acids (ω3 LC-PUFA) are marine lipids that are abundant in fish oils and fish meals ("marine ingredients"). Use of ω3 LC-PUFA in aquafeeds ensures both growth and health of farmed species and their nutritional value for consumers. Aquaculture is by far the largest consumer of marine ingredients thus requiring novel high nutritional quality ingredients to critically ensure sustainable expansion. Additionally, there is a trend towards natural bioactive compounds such as astaxanthin as a natural bioactive stimulant (nutraceutical), which adds value to the resulting feed.

SIDESTREAM partners have shown that polychaetes and crustaceans can produce ω3 LC-PUFA de novo. Such striking capacity will be exploited in SIDESTREAM. We will take side streams from aquaculture, agriculture and biogas sectors, and produce polychaetes and gammarids on the solid phase and bacterial astaxanthin on the liquid phase. Biomasses will be processed and tested as feed ingredients for fish and shrimp during all life stages. SIDESTREAM cutting-edge approach will enable value creation from resources hitherto considered as waste, allowing for innovation and sustainable use in aquaculture.

This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.

Project Coordinator:

Arne Malzahn, Norway, Sintef Ocean Environment & New Resources, Trondheim, Norway

Project Partners:

- Dr. Óscar Monroig, Consejo Superior de Investigaciones Científicas, Instituto de Acuicultura Torre de la, Ribera de Cabanes, Cabanes, Spain
- Dr. Hilke Alberts-Hubatsch, Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, Germany
- Prof. Volker F. Wendisch, Bielefeld University Biology & Center for Biotechnology Universitaetsstr. 25, 33615 Bielefeld, Germany
- Dr. Katerina Kousoulaki, Nofima AS Nutrition and Feed Technology, Tromsø, Norway
- Dr. Massimo Perucca, Project s.a.s, Buttigliera Alta, Italy
- Prof. Luisa Valente CIIMAR – University of Porto, Matosinhos
- Mr. Håvard Wollan Biokraft AS (External Contributor), Trondheim, Norway

Keywords:
Secondary bio-production, circularity, sustainable ingredients, essential nutrients, pigments

Priority Area:
Exploring new bioresources

Funding granted:
1.870.700 euros *

* The exact amount of granted funds may change after completion of national contracts.

SNAP

Seaweeds for Novel Applications and Products

Project Overview

CALL 1 | 2019

About the project

Future bio economy requires marine products to meet increased needs for food, feed, materials and products. Seaweed is an underutilized resource in Europe with a great potential to be part of the solution for a future blue-bio economy with increased value creation and industry development. The SNAP-project is product and innovation focused, where the aim is to develop novel products and applications by upgrading and modification of five different polysaccharides from selected brown and red algae. To obtain this, a consortium consisting of 2 companies, 5 universities, and 1 research institute, all with extensive infrastructure, competence and history in seaweed and marine polysaccharide research and innovations, is established. SES is a Norwegian leading seaweed aquaculture and processing company, and DuPont has extensive experience in seaweed utilization and is a major manufacturer of high-quality hydrocolloids from brown and red algae.

Tallinn University (TLU) has expertise in processing, isolation and utilization of valuable compounds from a wide range of seaweeds. The Royal Institute of technology (KTH) has extended expertise in plant and seaweed polysaccharide structural elucidation and development of polysaccharide-based products, especially functional and structural biomaterials and composites. The Norwegian University of Science and Technology (NTNU) and SINTEF have worked on characterization and chemoenzymatic tailoring of seaweed-based polysaccharides for decades and University of Trieste (UNITS) have their expertise in making advanced biomaterials from marine biopolymers. University of Bremen (UB) holds expertise in discovery, characterization and use of biopolymer-modifying enzymes. The project is expected to deliver new key information regarding polysaccharide structure function relationships, highly defined chemoenzymatic functionalized oligomers and polysaccharides and novel “blue” biomaterials targeting selected markets and applications.

This project has recieved funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement no. 817992.

Project Coordinator:
Mr. Håvard Sletta, SINTEF AS, Biotechnology and Nanomedicine, Trondheim, Norway

Project Partners:
- Prof. Finn Aachmann, NTNU Norwegian University of Science and Technology, Trondheim, Norway
- Prof. Vincent Bulone, Kungliga Tekniska Högskolan,(KTH),School of Engineering Sciences in Chemistry, Stockholm, Sweden
- Dr. Rando Tuvikene, Tallinn University, School of Natural Sciences and Health, Tallinn, Estonia
- Mrs. Maren Sæther, Seaweed Energy Solutions AS , Trondheim Norway
- Mr. Christian Klein Larsen FMC BioPolymer AS, Alginate and Carrageenan R&D, Sandvika, Norway
- Dr. Jan-Hendrik Hehemann, MARUM – Center for Marine Environmental Sciences, University of Bremen, Germany
- Prof. Ivan Donati, University of Trieste, Department of Life Science, Trieste, Italy

Keywords:
Brown algae, red algae, polysaccharides, biomaterials

Priority Area:
Exploring new bioresources

Funding granted:
1.570.500 euros *

* The exact amount of granted funds may change after completion of national contracts.

SuReMetS

From Sustainable Resources to novel marine nutraceuticals for the management of Metabolic Syndrome

About the Project

The SuReMetS project will develop novel marine ingredients from various resources such as underutilized material from fisheries and microand macroalgae (seaweed) targeting the management of metabolic syndrome (MetS). To achieve this; novel enzymes to better process the material and access the valuable ingredients will be investigated in parallel.
The potential beneficial human health effects of marine nutraceuticals are well established, and in particular, consumption of marine ingredients can help prevent MetS. The chronic and complex nature of MetS, makes it challenging to employ a single drug for long-term medication, hence the development of marine nutraceuticals can represent a safer and a better long-term option. The project will involve transdisciplinary approaches combining basic biosciences, public health efforts including education and industry, to provide a better balance between how the research community and industry can develop new biomarine products meeting the needs and expectations from end-users as well as the community. SuReMetS is an innovative marine biotechnology project applying state-of-the-art methods and development of new technologies, combining research with high potential for commercialization of marine resources.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

1st Call | 2019

Project Partners:

- **Jeanette H. Andersen**
  UiT-The Arctic University of Norway, Biosciences, Fisheries and economics.
- **Prof. Alan Dobson**
  University College Cork, School of Microbiology, Ireland.
- **Prof. Dick FitzGerald**
  University of Limerick, Biological Sciences, Ireland.
- **Mr. Jason Whooley**
  Bio-marine Ingredients, Ireland Ltd Research and Development Unit-9, Lough Egish Food Park, Ireland.
- **Prof. Wolfgang Streit**
  University of Hamburg, Microbiology & Biotechnology, Hamburg, Germany.
- **Dr. Sebastian Lippemeier**
  BlueBioTech, GmbH, Hafentörn 3, 25761 Büsum, Germany.
- **Mr. Jaran Rauoe**
  Marealis Innovation AS, Tromso, Norway.

Keywords:

Marine nutraceuticals, novel marine ingredients, enzymatic extraction, metabolic syndrome.

Priority Area:

Exploring new bioresources

Funding granted:

1.601.817 euros *

* The exact amount of granted funds may change after completion of national contracts.

BlueBioChain

Novel biorefinery supply chains for wastewater valorization and production of high market value bio products using microalgae

About the Project

BlueBioChain will develop (TRL2) and apply (TRL5) a holistic biorefinery platform bridging the gap along the blue bioeconomy value chain, from biomass to products and markets and consumers. The project will last 24 months and will provide an intelligent wastewater valorization system using microalgae for the pilot production of 3 categories of high market value products, namely a) cosmeceuticals (skin cream), b) food additives (food coloring agents for novel, convenient meat, and dairy analogues) and c) zero-waste aquaculture farms (aquafeed for fish/arthropods feed); thus, addressing three major global challenges of the future; sustainable waste management, tackling water scarcity and lack of food for the growing global population. Without any doubt, one of this project's great strengths lies in its consortium. BlueBioChain consortium is made up of 8 partners from 5 geographically distributed EU countries (Belgium, Denmark, Greece, Iceland, and Malta) covering 3 Universities (Technical University of Denmark, KU Leuven, Malta University), 3 Research centers (Hellenic Agricultural Organisation- DEMETER, Center of Research and Technology-Hellas, Matís), 1 SME (EcoResources) and 1 Industry (KMC). It unites the necessary multidisciplinary knowledge, expertise, skills, and resources to constitute a complete value chain of actors for capitalizing on the opportunities of developing novel biorefinery platforms for waste water valorization and production of high market value bio-based products using microalgal biomass creating ultimate synergies for developing circular bioeconomy concepts.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

1st Additional Call | 2021

Project Partners:

- **Dr. Panagiotis Kougias**
  Hellenic Agricultural Organization, Demeter, Soil and Water Resources Institute.
- **Dr. Konstantinos Kontogiannopoulos**
  EcoResources PC.
- **Dr. George Banias**
  Centre for Research and Technology Hellas, Bio-Economy and Agri-Technology.
- **Prof. Irini Angelidaki**
  Technical University of Denmark, Chemical and Biochemical Engineering.
- **Prof. Jan F.M. Van Impe**
  KU Leuven, Chemical Engineering, Division BioTeC+, to be funded via fwo-Vlaanderen.
- **Prof. Vasilis Valdramidis**
  Malta University, Food Studies & Environmental Health.
- **Mr. Mathias Greve-Poulsen**
  KMC Kartoffelmelcentralen Amb, R&D.
- **Dr. René Groben**
  Matís.

Keywords:

blue value chain,
wastewater valorisation,
microalgae cultivation,
nutrient upcycling,
food-feedcosmeceuticals

Priority Area:

Advancing the supply systems in the blue bioeconomy value chains

MARIGREEN

Sustainable utilization of MARIne resources to foster GREEN plant production in Europe

About the Project

The MARIGREEN project will valorise residual materials from the BLUE sector, of which many are currently poorly utilised, by treating them with appropriate technology and applying in agriculture (GREEN sector). Significant amounts of fertilisers applicable in organic growing are required to achieve 25% organic farmland in EU by 2030, as proposed in the F2F strategy. The project will study available residual materials from fish capture, brown algae industry, mussel industry and organic aquaculture. Relevant materials will be provided by five Scandinavian industry partners. The materials will be chemically characterised and compounds with potential biostimulant effects on crop plants will be investigated, while concurrently checking for possible biotoxicity. The chemically profiled effects of these materials on plant growth will be assessed, both in a pre-processing state and after appropriate treatment is applied, e.g. extraction and/or composting. The project also includes an innovative treatment of organic fish waste from aquaculture, which will expedite approval of such materials in growing media. Adjoining the effort is a study on impregnation technology to utilise biochar, which is in itself useful for soil amendment, after impregnation with extracts of BLUE materials as a carrier of nutrients and other valuable compounds into agricultural soil. To proof the concept, promising materials (assessed from chemical characterisation) will be tested in real growing conditions in greenhouse and field. The logistics and related costs required for establishing a relevant value chain for producing fertilisers and/or biostimulants will be assessed by interviewing collaborating industry partners and surveying potential customers. The project will mobilize human resources across national borders to promote researcher skills and competencies and create coherent dissemination actions delineating conditions, interests and potential opportunities in the BLUE and GREEN sectors.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

1st Additional Call | 2021

Project Partners:

- **Dr. Oana Cristina PARVULESCU**
  University "Politehnica" of Bucharest (UPB), Chemical and Biochemical Engineering.
- **Dr. Anne-Kristin Løes**
  Norwegian Centre for Organic Agriculture, (NORSØK).
- **Prof. Athanasios Salifoglou**
  Aristotle University of Thessaloniki (AUTh), Chemical Engineering.
- **Dr. Violeta Ion**
  University of Agronomic Sciences and Veterinary Medicine (USAMV), Research Center for Studies of Food Quality and Agricultural Products.
- **Dr. Carlos Letelier**
  DTU, Aqua.
- **Prof. Max Nielsen**
  University of Copenhagen (UC), Department of Food and Resource Economics.
- **Prof. Sigbjorn Tveteras**
  (NORCE) Norwegian Research Centre, Social Science.
- **Mr. Thomas Eilkær**
  Norlex, Systems A/S.
- **Mr. Kevin Salbuvik**
  Fjordlaks AS.
- **Mrs. Inger Lise Berg**
  Algea AS.
- **Mr. Emil Eliassen Folland**
  Sigurd Folland AS.
- **Mr. Magne Hoem**
  Snadder & Snaskum AS.

Keywords:

BLUE value chain,
BLUE biomass,
fertilisers,
biostimulants,
supply systems

Priority Area:

Advancing the supply systems in the blue bioeconomy value chains

Microalgae in IT

Microalgae based, safety-tested and optimized fish feed value chain by using Interdisciplinary R&D and IT solutions

About the Project

The Microalgae In IT project aims to develop and demonstrate an innovative and cost effective circular blue bioeconomy model where carbon dioxide from flue gas and nutrients from agri-food residues are used for enhancing microalgae growth in the controlled cultivation environment in photobioreactos. The system will be designed to be applicable also in the Nordic climatic conditions, as together with flue gas it makes use of the utility's excess heat.

Microalgae are known for their high nutritional properties and yield per hectare. This can be further increased when the growth medium is enriched with CO2, but the few pilot projects on this struggle with achieving the required biomass quality, i.e. purity for use as fish feed, and further to more valuable applications. Before the gas enters the bioreactor, we apply alternative pre-filtering technologies, and compare the outcomes with biomass grown on unfiltered flue gas. As we expect to have some potentially toxic substances in the raw biomass, at least when the filters are not used, we thereafter apply several alternative after-treatment approaches in order to detect which of them are applicable for further purifying the microalgae biomass. We follow the properties of the micro algae throughout the value chain, incl. conduct live trials on rainbow trout. The trials indicate the microalgae-based feed supplement's effect on fish microbiome, growth, and end product quality.

For reliable tracking of potential hazardous substances throughout the value chain, we develop sensors and data analyzing methods, as well as algorithms that give automatic warnings, hence IT is an integral part of the methodological approach. Throughout the project we consider economic, environmental and societal aspects that may support or hinder the adoption of this novel approach. The project is conducted by the Estonian University of Life Sciences and Power Algae Llc (Estonia), Matís (Iceland), and University of the Azores (Portugal).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

1st Additional Call | 2021

Project Partners:

- **Prof. Timo Kikas**
  Estonian University of Life Sciences, Institute of Technology.
- **Mrs. Liina Joller-Vahter**
  Power Algae OÜ.
- **Dr. Vitor Gonçalves**
  University of the Azores, Faculty of Biology.
- **Mrs. Elisabet Eik Guðmundsdóttir**
  Matis, Biotechnology.

Keywords:

fish feed,
microalgae,
valorization of waste streams,
toxicity tests,
safety and transparency.

Priority Area:

Advancing the supply systems in the blue bioeconomy value chains

MuMiFaST

Mussel Mitigation Feeds and Supply System Technological Development

About the Project

The MuMiFaST project gathers European expertise on the value chain related to undersized non-uniform mussel biomass compared to mussels produced for human consumption. As either a new industry utilizing undersized mussels, or as one focused on maximizing production of heterogeneous mussel biomass, this marine bioresource can be produced sustainably, and exhibits promise in use as a high quality animal feed and in nutritious value-added food products. The primary needs for innovation in this industry are related to post-harvest preprocessing and processing of large volumes of heterogeneous mussels to a quality standard suitable for the aquaculture feeds industry.
In this project the partners will develop advancements in the supply system of blue bioeconomy value chains of mitigation mussels between TRL3-6, providing proof of concept of new perspectives on waste reduction and utilization of the entire biomass towards production of highly quality ingredients for the aquaculture feed industry.
Application of this undersized mussel model in a wider European context will be explored through the partner organizations here and broad stakeholder engagement.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

1st Additional Call | 2021

Project Partners:

- **Prof. Jens Kjerulf Petersen**
  DTU Aqua, Section for Coastal Ecology, Danish Shellfish Centre.
- **Prof. Cathal O'Donoghue**
  National University of Ireland, Galway, Socio-Economic Marine Research Unit.
- **Dr. Ramya Preethi Surendran**
  NORCE Norwegian Research Center Environment.
- **Mr. Klaus Astrup Nielsen**
  Hedeselskabet / Blå biomasse A/S.
- **Dr. Jessica Jaxion-Harm**
  TripleNine Group.
- **Prof. Bojan Hamer**
  Ruđer Bošković Institute (RBI) Center for Marine Research (CMR)
- **Mr. Bjørn Aspøy**
  Smart Farm AS.
- **Dr. Harald Sveier**
  Lerøy Seafood Group ASA.

Keywords:

Bioextractive proteins,
mussel mitigation,
marine lipids,
processing wastes utilization.

Priority Area:

Advancing the supply systems in the blue bioeconomy value chains

PROFIUS

Preservation of underutilized fish biomasses for improved quality, stability and utilization

About the Project

The aim of PROFIUS is to address challenges in the supply chain related to lumpfish (roe and carcass) and tuna side-streams by developing preservation solutions for maintaining quality and improving utilization of the entire biomass. Improved preservation methods will be developed to enhance quality and shelf life of lumpfish roe and thereby reduce waste. A major bottleneck for success of further utilization of the side-stream from tuna is their short shelf life. PROFIUS will study the processes responsible for the chemical and microbial deterioration of these side-streams and develop strategies to prevent them. Furthermore, PROFIUS will look into new applications of lumpfish and tuna side-streams including logistics and development of gelatin extraction processes for lumpfish and development of fish feed based on tuna side-streams.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

1st Additional Call | 2021

Project Partners:

- **Dr. Ann-Dorit Moltke Sørensen**
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- **Mr. Tamás Bardócz**
  AquaBioTech Group, Research, Development and Innovation Department.
- **Prof. Turid Rustad**
  Norwegian University of Science and Technology, Biotechnology and Food Science.
- **Dr. Niels Bøknæs**
  Royal Greenland Seafood A/S, Corporate Quality Department.
- **Prof. Hjörleifur Einarsson**
  University of Akureyri, Faculty of Natural Resource Sciences.
- **Mr. Halldór Ólafsson**
  Sjávarfíftæknisetrið BioPol ehf.

Keywords:

Lumpfish,
Lumpfish roe,
Tuna,
food ingredients,
feed.

Priority Area:

Advancing the supply systems in the blue bioeconomy value chains

QualiSea

Enhancing and controlling the quality of cultivated seaweeds for large-scale production and a sustainable supply chain to food and feed markets

About the Project

QualiSea aims to solve bottlenecks for further growth in European seaweed farming, and for the implementation of seaweed as a raw material for food, feed, materials, and higher-value products. Seaweed cultivation in Europe is yet in its infancy, and the production volumes are small. The dominating application is as food and feed, with only a limited degree of processing. For a growth of the industry, the markets must be expanded. This requires a stable and reliable supply of biomass with a predictable, stable, and traceable quality.

The production is currently distributed on a high number of small farms, and the seaweed are processed, or packed and frozen, close to its point of harvest. Increased production volumes will imply larger and/or an increased number of farms and increased transport distances, which in turn may entail need for initial or intermediate stabilisation.

The project will address current and future supply chain challenges related to maintaining biomass quality from harvesting to processing. Standardised conditions for transport and storage will be established. To enable a year-round supply of biomass to the processing facilities, new acid-based preservation methods will be developed. Preserved biomass will be assessed as food and feed ingredients to identify anticipated beneficial effects of the acid preservation. Instrumental methods for quality control and tracking will be assessed. Logistic models for operational planning and decisions, and a supply chain management model for strategic planning and decisions, will be developed based on existing models for the fish farming industry, and for biorefineries handling land-based biomass, respectively.

QualiSea will focus on food and feed applications, as these are the main markets for European cultivated seaweed today and is expected to represent a substantial market share also on a longer term. However, the results and outcome will be highly relevant for other applications of the biomass.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

1st Additional Call | 2021

Project Partners:

- **Mrs. Inga Marie Aasen**
  SINTEF Industry, Biotechnology and Nanomedicine.
- **Mr. Sverre Marvik**
  Anteo AS.
- **Prof. Rando Tuvikene**
  Tallinn University, School of Natural Sciences and Health.
- **Mrs. Maren Sæther**
  Seaweed Energy Solutions AS.
- **Dr. Geert Bruggeman**
  Nutrition Sciences NV.
- **Prof. Maria Guðjónsdóttir**
  University of Iceland, Faculty of Food Science and Nutrition.

Keywords:

Seaweed,
preservation,
tracing,
supply chain optimization,
food and feed properties.

Priority Area:

Advancing the supply systems in the blue bioeconomy value chains

SMARTCHAIN

Smart solutions for advancing supply systems in blue bioeconomy value chains

About the Project

SMARTCHAIN will develop approaches and tools for sustainable utilisation, production planning, logistics optimisation, and traceability to facilitate transfer of bio-resources from catch/production throughout the value chain of fisheries and aquaculture products. Automated sorting and quality characterisation along with optimising production planning will reduce waste from processing while the blockchain technology will increase the transparency in the supply chain. Project will also look into upscaling the production of high value marine ingredients from co-streams from pelagic industry. Sustainability indicators and circularity criteria will be applied to assess the performance of the system solutions.

SMARTCHAIN has defined three case studies from aquaculture and fisheries value chains including Norway, Iceland, Denmark and Romania. Industry actors representing their sectors will be involved in implementation and application of the development of technologies and models through the case studies achieving a TRL between from 4 to 6. In addition, an advisory group will contribute with insights into the existing bottlenecks and technology gaps in the bioeconomy sector. SMARTCHAIN simulation framework will enable assessment of the end-to-end effects and potentials of the project and enlighten policy makers, businesses, investors, entrepreneurs, institutions, stakeholders, and citizens about potential trade-offs. Furthermore, SMARTCHAIN will generate European added-value and knowledge transfer through validated comparison of developed concepts across partner countries and facilitate collaboration across the different sectors. Focus of the project is also on development of replicable technologies and tools that can be applied to other food supply chains. Lastly, SMARTCHAIN will contribute to capacity building by creating awareness, opening opportunities for academic researchers and reach out to a broad spectrum of various stakeholders across countries.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

1st Additional Call | 2021

Project Partners:

- **Rita Vasconcellos L. d'Oliveira Bouman**
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- **Dr. Zouhir El Marsni**
  Seagarden AS, R&D.
- **Dr. Gudrun Olafsdottir**
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  Faculty of Industrial Eng., Mechanical Eng. & Computer Science.
- **Prof. Allan Larsen**
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- **Dr. Sigurdur Bogason**
  MarkMar ehf, Research.
- **Mr. Torfi Þorsteinsson**
  Brim, Community Relations.

Keywords:

Production planning,
Automated processing,
End-to-end logistics,
Transparency,
Circularity

Priority Area:

Advancing the supply systems in the blue bioeconomy value chains

SuMaFood

Sustainable preservation of marine biomasses for an enhanced food value chain

About the Project

SuMaFood is a 7-way transnational partnership between 3 industrial partners, 3 universities, and 1 R&D research institute from Greece, Norway, Romania, and Spain, respectively. In addition, the project Consortium has four associated partners that will contribute with biomass to the project and through their involvement in an External Industry Advisory Board. SuMaFood will be coordinated by SINTEF Energy Research (Norway).

The project addresses innovative utilization of marine biomasses and by-products and will demonstrate how such resources can be made available and attractive to the consumers, thus adding value to the biomass food chain. Two demo cases at TRL 6, one for a salmon slaughter plant and another for seaweed, will be established to demonstrate waste reduction, extend product ranges, enhance product quality and stability, and to provide unique products in a growing marine food chain.

The main objective of SuMaFood is to develop and demonstrate eco-innovative preservation solutions for marine biomasses. The target products are marine biomass powders that can be used as food (including re-structured and health nutrition products), ingredients, or feed. The project addresses techniques for separation and fractioning of fish residues and preservation techniques of marine biomasses in terms of energy efficiency, product quality and stability, and shelf-life prolongation. Three novel drying technologies will be applied to marine biomasses in the project and compared for cost efficiency and product quality. The project reaches out to downstream stages of the blue biomass value chain by investigating novel techniques of active packing and formulation using antioxidants; preservation methods tailored to prolong shelf-lives and promote enhanced consumer acceptance. By demonstration of enhanced utilization of marine biomasses, SuMaFood will contribute to valuable growth an increased sustainability in European blue bioeconomy value chains.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

1st Additional Call | 2021

Project Partners:

- **Sigurd Sannan**
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  Thermal Energy.
- **Dr. Ignat Tolstorebrov**
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- **Prof. Liviu Gaceu**
  Transilvania University of Brasov, Eco-biotechnologies and Equipment for Food and Agriculture,
  Faculty of Food and Tourism.
- **Mr. Aritz Lecuona**
  EKONEK Innovación en Valorización de Subproductos S.L., R+D.
- **Prof. Petros Taoukis**
  National Technical University of Athens,
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- **Mr. Frode Blålid**
  Nuas Technology AS
- **Dr. Costas TROULOS**
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  Technology Transfer Office.

Keywords:

Fish residues,
Seaweed,
Marine powders,
Biomass waste reduction,
Efficient sustainable production

Priority Area:

Advancing the supply systems in the blue bioeconomy value chains

TACO ALGAE

Total Value Chain Optimization of seaweeds Furcellaria lumbricalis, A bioeconomical ALGAE demonstration

About the Project

TACO Algae will take a circular economy approach to evaluate two different red algae species in existing SMEs. The first one is currently harvested wild, while the other is cultured in a sustainable new cultivation system. The circular economy approach focuses on supply chain optimization and minimization of waste. Optimizations are performed with respect to extraction, characterization and utilization of red pigment, protein, lipids, carrageenan and bioactive compounds. The goal is to utilize all constituents and most importantly to find an optimal processing approach to yield the highest amount of the most valuable product, and then valorize the remaining components in the best way. As the pigments are currently viewed as the highest value component, we will first extract pigment with highest stability and investigate methods to obtain a colorant that can be utilized both in aqueous and lipid-based food products. The pigment quality, stability and suitability for integration in various product matrixes will be investigated. The lipid fraction will be characterized with respect to fatty acids composition to evaluate valorization, while carrageenan as already been marketed as texturizer and algae has also been used as biostimulants. Finally, bioactive compounds e.g. polyphenols will be investigated with respect to composition and antioxidative capacity. Life cycle assessment will be used to evaluate the most economically, societal and environmentally sustainable process, both with respect to order of isolation, volume of biomass to different markets, seasonal possibilities for biomass valorization, as well as the effect on societal infrastructure and the impact on the environment. The overall goal is to reduce waste, increase local competence based work places and ensure sustainable utilization of biological resources.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

1st Additional Call | 2021

Project Partners:

- **Dr. Kjetil Elvevold**
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- **Mr. Tanel Ilmjärv**
  Vetik OÜ.
- **Dr. Trine Kastrup Dalsgaard**
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  Food Science.
- **Mr. Antonio Cortés**
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  de compostela, Biogroup.
- **Prof. Francesco Romagnoli**
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  Institute of Energy Systems
  and Environment.
- **Mr. Bjarni Bjarnason**
  Hyndla ltd.,
  Research & Development

Keywords:

Seaweed,
biorefinery,
sustainability,
innovation,
processing.

Priority Area:

Advancing the supply systems in the blue bioeconomy value chains

TraceMyFish

Traceability and Quality Monitoring
throughout the Fish Value Chain

About the Project

TraceMyFish aims to advance supply system in three geographically distributed blue bioeconomy value chains, by designing and implementing a iFishManagementSystem that will allow the tracking and tracing of safety and quality-critical information across the links of the targeted value chains. Moreover, the TraceMyFish iFMS will establish a secure, trust-enabled data infrastructure, which will collect, preprocess and analyze data coming from innovative, portable sensing devices of different nature and modality (spectral imaging, variegating IoT sensors) and informing specialized AI models and architecture that will enable timely risk prediction to different value chain actors. The examined fish products will carry smart barcodes that, in communication with the iFMS, will carry safety information related to each product and will allow stakeholders and consumers to easily and reliably access this information at any time.

To realize its goals, TraceMyFish brings together highly experienced research and industrial partners, bringing their expertise in all different scientific and technical disciplines critical for the project: risk and quality assessment for fish products, food microbiology and nutritional analysis, development and testing of spectral devices, data management and processing, and machine learning and data science.

Furthermore, and in order to maximize the impact of the project and its results, TraceMyFish will devise and implement a comprehensive plan comprising a wide variety of dissemination, communication and Human Capacity Building activities. These will allow the focused and organized outreach to stakeholders and the general public, strengthening their understanding on the importance of fish safety and showcasing the means to ensure it. Additionally, they will strongly infoorm and steer the TraceMyFish business plan, which will set the framework for exploiting and commercializing the TraceMyFish iFMS and its core components.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

1st Additional Call | 2021

Project Partners:

- **Dr. Panagiotis Zervas**
  SCiO.
- **Prof. George-John Nychas**
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  Department of Food Science
  and Human Nutrition.
- **Prof. Jørgen Lerfall**
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  and Technology,
  Department of biotechnology
  and food science.
- **Dr. Nette Schultz**
  Videometer A/S
- **Prof. Maria Guðjónsdóttir**
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  Faculty of Food Science
  and Nutrition.
- **Dr. Hildur Inga Sveinsdóttir**
  Matis.

Keywords:

quality monitoring,
tracing,
barcoding,
spectrometry,
artificial intelligence.

Priority Area:

Advancing the supply systems
in the blue bioeconomy
value chains

BIORAS_SHRIMP

Improvement and innovation of a BIO-secure Recirculating Aquaculture System for SHRIMP and additional biomass circular production

About the Project

The development of sustainable, productive, climate-neutral and resilient farming systems is, nowadays, an obliged way to provide consumers with affordable, safe, traceable, healthy and sustainable food, while minimizing pressure on ecosystems. The improvement and innovation of land-based integrated multi-trophic aquaculture systems, perfectly goes in this direction since it allows to produce high quality seafood and valuable environmental services. The high demand of shrimp for human consumption has led to rapid expansion of production all over the world. During the last decade, an increasing interest to shrimp culture has arisen also in Europe, due to the increasing demand for freshly harvested, sustainably produced shrimps and to the application of highly intensive closed recirculating aquaculture (RAS} and biofloc (BFT} systems. This project aims to develop and test an innovative bio-secure, land based sustainable shrimp culture model to minimise waste, enhance productivity and recover energy and nutrient for additional biomass production, in view of a circular economy process. The application of the bio-system principles (food first, sustainable yields, cascading approach, circularity and diversity} is at the backbone of the research approach and methodology proposed. The expected results are: Set-up of a clear water RAS for shrimp culture with improved technology and husbandry efficiency; Development and test of a hybrid RAS-BFT farming system; Installation and validation of an innovative RAS effluent treatment system; test and validation of an Artificial Intelligence based water quality monitoring system; Development and test of innovative protocols for effluent solid waste and residual water reuse and valorisation; Exploration of new bio-resources deriving from the additional biomass produced. All outcomes have high industrial and commercial impact on several economic sectors while addressing global challenges, making the EU more sustainable and competitive.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

2. Additional Call | 2022

Project Partners:

- **Dr Vincenzo Zonno** Universita del Salento
- **Dr Bente Foereid** NIBIO
- **Mr Tamas Bardócz** AquaBioTech Group
- **Prof Paola Nieri** University of Pisa
- **Mr Giacomo Maniscalco** Biotecna s.r.l.
- **Mrs Maria Dolores A. Gambin** The Department of Fisheries and Aquaculture (DFA) Aquaculture Directorate
- **Dr Niccoló Bassi** Biosyntex s.r.l
- **Dr Dinesh Kaippilly** Kerala University of Fisheries and Ocean Studies Aquaculture
- **Dr Gabriele Omini** Omini Pharma srl amministrative
- **Prof Albert K.D. Imsland** Akvaplan-niva AS Aquaculture

Keywords:

Recirculating aquaculture, waste valorization, bio-products

Priority Area:

Sustainable and resilient biomass production and processing.

BIVALVI

Advancing European bivalve production systems

About the Project

Bivalves provide consumers with high value essential nutrients such as omega-3 fatty acids and iodine. The environmental footprint of bivalve production is low. However, the technological development of the European bivalve production sectors lie far behind other aquaculture sectors. BIVALVI aims to advance bivalve production in Europe in a sustainable way by combining genetics and reproductive technologies with improved health and production management.

BIVALVI focuses on blue mussel, Manilla clams and Pacific oysters, the bivalve species with the highest production in Europe. BIVALVI combines technology and social sciences to enhance the impact and acceptability of bivalve production, aligning it with the six fundamental principles of RRI. Work-packages will characterise the health and reproduction status and immune functions of diploid and triploid bivalve stocks (WPI); survey and optimise farming management systems (WP2); advance breeding programmes and map diesease resistance genes (WP3); and support sustainable quality stocks through stakeholder and ecosystems services studies, a study on organoleptic properties of triploids and developing non-invasive and high-throughput recording systems (WP4).

An important added value of BIVALVI is the close co-operation between R&D and the bivalve industries in Ireland, Italy and Norway. NE and S&S are partners and other industries are represented through their associations. The multidisciplinary qualifications of the R&D partners NOFIMA, UCC and UNIBO are complementary, showing the importance of European cooperation for the developments in BIVALVI. An advisory board with representatives from industry, state agencies, branding and policy makers will provide guidance, strategic oversight and ensures practicality of developments, in order to maximize the relevance and impact of BIVALVI. Moreover, the technology transfer between species and countries and the extensive dissemination program will ensure the impact of BIVALVI.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Project Overview

2. Additional Call | 2022

Project Partners:

- **Dr Anna Sonesson**
  Notima AS
- **Prof Alessio Bonaldo**
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- **Mr Leonardo Aguiari**
  Naturedulis s.r.l.
- **Dr Sharon Lynch** UUniversity College Cork
  School of Biological, Earth and Environmental Sciences, Aquaculture and Fisheries Development Centre & Environmental Research Institute
- **Mr Magne Hoem** Snadder og Snaskum AS

Keywords:

Bivalves Health Management Selective breeding Ecosystem

Priority Area:

Sustainable exploration of the aquatic environment and biological resources

Traceability and regulatory constraints

BlueGreenFeed

Synergy of blue and green sectors for resilient biomass production and processing to develop sustainable feed ingredients for European aquaculture

About the Project

Aquaculture production is one of the most effective ways to produce animal protein and this sector has a high potential for sustainable jobs creation and growth. However, a major challenge is the urgent need for nutritious and sustainable feed resources. BlueGreenFeed will focus on producing new feed ingredients, that can to some extent replace soy proteins. The project aims to increase resource utilization in bio-based industries and contribute to the transition to a sustainable blue economy - in line with EU's Bioeconomy and Circular economy strategies.

BlueGreenFeed aims for value increase and profitability for the industry by finding new markets for underutilised green co-streams by converting them into nutritional and sustainable feed ingredients. The project will explore ways to pre-treat and process feathers and grass pulp to increase their digestibility and bioavailability for use in feed for low trophic animals such as insects (house crickets and meal worms) and aquatic invertebrates (gammarid shrimps and polychaete worms). The ability of these organisms to grow and bio-convert the nutritionally poor substrates into nutritious biomass will be tested. The nutritional value of these organisms and their suitability as aquafeeds in fish feeding trials will be evaluated. Economically feasible and sustainable ways for bio-upgrading low value side streams into high value proteins and lipids for feed industries will be proposed after in depth economic and sustainability analysis.

The inter-disciplinary BlueGreenFeed team consists of research experts (SINTEF, Taltech, Aarhus University, MATIS, University of Iceland}. working in close cooperation with active industrial partners, representing each sector in the value chain ranging from grass processing
(Vestjyllands Andel), via the feather generating industry (Norsk kylling}. to insect producers (Bugimine, Montasjen) and a fish feed company (Laxa).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Project Overview

2. Additional Call | 2022

Project Partners:

- **Dr Rasa Slizyte** SINTEF OCEAN AS
- **Prof Søren Krogh Jensen** Aarhus University
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- **Dr Stefan Eysteinsson** Matis Icelandic Food and Biotech R&D
- **Dr Ólafur Ögmundarson** University of Iceland
- **Mr Gunnar Orn Kristjansson** Fodurverksmidjan Laxa hf
- **Mrs Kine Ariela Egseth** Montasjen AS
- **Dr Kristian Knage-Drangsfeldt** Vestjyllands Andel

Keywords:

Priority Area:

Sustainable and resilient biomass production and processing.

EuFish_SustainableGrowth

European fisheries enhancement through "Omic" characterization and innovative seafood production from underutilised fish species

About the Project

Sustainable fisheries management is an essential aim to the future health of our oceans. This process could assist marine ecosystems recovery from overfishing, through a sustainable approach to biodiversity. The depletion of traditional fish stocks has led to a new fisheries policy with management measures based on sustainable exploitation of fish species usually considered underutilized. EuFish_SustainableGrowth aims to re-evaluate underutilized European fish species by developing species-specific fingerprints. The presence in the consortium of industrial partners allow to obtain innovative seafood products to promote the consumption of neglected fish/rest raw materials and novel aquaculture feeds to recover fish waste. The expected outcome of the project is to encourage more responsible and sustainable fishing and to launch on the market new seafood and feed products achieving “zero waste”. The main goals of this research proposal are:

- A multidisciplinary study of underutilized fish species with studies of ecology, biogeography, molecular species identification, microbiota composition, nutritional and sensorial properties, and chemical contamination.
- Innovative fish-based food and feed to be launched into the market.
- A web portal for sharing with stakeholders, SMEs, and consumers to promote underused fish species.

EuFish_SustainableGrowth intends to strengthen the economic and social development of European activities related to the fishing industry, with a respectful approach to biodiversity and environmental sustainability.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

2. Additional Call | 2022

Project Partners:

- **Prof Tiziana Pepe**
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- **Dr Ásta H. Pétursdóttir**
  Matis
- **Dr Paolo Sordino**
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  Grímur kokkur

Keywords:

Fingerprint, underutilized fish species, waste recovery, innovative fish products, blue growth

Priority Area:

Sustainable and resilient biomass production and processing.

ImPrESsIVE

Improved Processing to Enhance Seafood Sidestream Valorization and Exploration

About the Project

The main aim of the IMPRESSIVE project is to improve the extraction of added value compounds such as LC MUFA-, PUFA-rich oils, bioactive peptides and chitosan from underutilized seafood side streams (fishery and crustacean) in terms of yield and quality by using emerging non-thermal technologies as advanced pre-treatments (pulsed electric field, high pressure, ultrasound, etc.) for further applications in the food and nutraceutical industries. The consortium will gather researchers with multidisciplinary background and expertise from 4 European countries along with manufacturing companies to optimize the recovery of bioactive ingredients. The project will use different eco-friendly chemical and enzymatic processes to separate, extract and purify protein, lipid, and polysaccharide fractions from seafood side streams. The obtained compounds will be characterized and analyzed for bioactivity and bioavailability, health promoting properties (antioxidant, anti-inflammatory, hypocholesterolemic and anti-diabetic activities,etc.), and further tested in food and nutraceutical products as new ingredients aiming to enhance the nutritional profile and quality of the end-products. Consumer studies will be conducted to assess consumer acceptance of the new products.

Life cycle analyses will be performed to develop techno-economically optimized and sustainable production systems for improved recovery of bioactive compounds from seafood side streams and their use in different applications.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

2. Additional Call | 2022

Project Partners:

- **Dr Janna Cropotova** Norges Teknisk-naturevitenskapelige universitet NTNU
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- **Prof Pietro Rocculi** University of Bologna
- **Prof Brijesh Tiwari** Teagasc
- **Dr Revilija Mozuraityte** SINTEF Ocean
- **Mr Stig Jansson** Nordic Pharma Inc AS
- **Prof Raivo Vilu** Center of Food and Fermentation Technologies
- **Mr Roberto Casali** Ecopesce srl

Keywords:

seafood side streams, innovative technologies, bioactive compounds, proteins, lipids.

Priority Area:

Sustainable and resilient biomass production and processing.

RightFish

Reducing environmental impact and greenhouse gas emissions in commercial fisheries

About the Project

RightFish will develop generic methodologies that will improve our ability to design and develop low impact towed fishing gears.

It will advance the state of the art in the design of commercial trawl gears by establishing criteria for small scale modelling that incorporate the contact forces associated with fishing gears being towed over the seabed.

It will apply these approaches in two case studies, which characterise European demersal trawl fisheries, and demonstrate the environmental and economic benefits that can be achieved. These gears will be more fuel-efficient, disturb fewer carbon-rich sediments and penetrate less into the seabed. Accordingly, they will ensure that marine resources are managed and harvested in a sustainable way that maintains ecosystem integrity and resilience and reduces greenhouse gas emissions.

They will also have reduced fuel costs and are likely to lead to increased fishing opportunities, improved market access and higher prices. Hence, they will contribute to sustainable production in the Blue Bioeconomy. They will allow the development of transparent, certifiable and traceable standards and processes which can be used to establish consumer trust and increase marketing opportunities.

The consortium comprises industrial and academic experts in the design and development of commercial trawl gears, of the assessment of the technical and capture processes of fishing gears and of the environmental and socioeconomic performance of fisheries.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

2. Additional Call | 2022

Project Partners:

- **Prof Barry O'Neill**
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- **Dr Emilio Notti**
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- **Mr Einar Skaftason**
- Hampiðjan
- **Mrs Ingunn Marie Holmen**
  SINTEF Ocean

Keywords:

low impact fishing gear, economically and biologically sustainable fisheries, consumers willingness to pay

Priority Area:

Sustainable and resilient biomass production and processing

Traceability and regulatory constraints

Seasoil

Value creation and ecosystem services of European Seaweed industry by reducing and handling potentially toxic elements from breeding to soil

About the Project

The overall project aim is to promote value creation, including ecosystem services, and further expansion of the seaweed industry in Europe. It will fill knowledge gaps on Potential Toxic Elements (PTE) in farmed sugar kelp and As in collected bladderwrack and fucus, in addition to impact of using seaweed material in soil on elemental uptake in crop plants and Carbon Sequestration and Storage (CSS). SeaSoil takes a holistic value chain approach according to the RRI framework, and will:

1) Estimate heritabilities and genetic correlations in contents of Cd, As and I in sugar kelp (Saccharina latissima) from two areas in Norway, and evaluate potential selection response of their reduced contents. Estimate the phenotypic correlation between PTE concentrations, growth rate and biofouling in farmed sugar kelp (WP2)

2) Study the impact of seaweed application rate and water saturation on the As dynamics in soil to determine chemical reactivity and potential bioavailability of labile As using a grass field experiment (WP3)

3) Estimate the potential of seaweed amendments for CSS in agricultural soils (WP3)

4) Study the impact of seaweed production on the environment (primarily climate change) using LCA, and conducting a cost-benefit analysis of the seaweed industry, including ecosystem services (WP4)

5) Study the economic feasibility, and regulatory incentives, for production and use of (residual) biomass from farmed seaweed (WP4)

6) Ensure multi-actor approach and integrated cooperation, communication and human capacity building in line within Responsible Research and Innovation (RRI) (All 5 WPs).

The project mobilises a total of 12 partners (including five industry partners) from five countries (Norway, Denmark, Ireland, Croatia and Estonia), covering a broad range of disciplines and expertise, to ensure food and feed safety of seaweed products and realise the potential of the seaweed value chain to support the European circular bioeconomy.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

2. Additional Call | 2022

Project Partners:

- **Dr Ingrid Olesen** Nofima
- **Dr Åsgeir Almås** Norwegian Universtiy of Life Sciences Faculty of Environmental Sciences and Natural Resource Management
- **Dr Anne-Kristin Løes** Norwegian Centre for Organic Agriculture
- **Dr Mathieu Lamande** Aarhus University Agroecology Pisa
- **Dr Colin Hannon Galway Mayo** Institute of Technology Marine & Freshwater Research Centre
- **Dr Harald Sveier** Ocean Forest AS
- **Dr Karin Kauer** Estonian University of Life Sciences Chair of Soil Science
- **Dr Vladimir Ivezic Sveuciliste u Osijeku** Fakultet agrobiotehnickih znanosti Osijek Agroecology
- **Mr David Murrin** Oilean Glas Teoranta
- **Mr Geraldine Ward** Feamainn an Chosta Thair Teoranta
- **Dr Ariadna Szczybelski** Nutrimar AS Research and Development
- **Mrs Inger Lise Berg** Algea AS

Keywords:

potentially toxic elements, genetic parameters, seaweed, carbon sequestration, soil organic matter

Priority Area:

Sustainable and resilient biomass production and processing.

DigiRAS

Development of a real-time fish-behaviour analysis tool for early-warning applications in aquaculture systems (RT-FIBEAN)

About the Project

The overall aim of this research is to develop an automated system for real-time detection of changes in fish behaviour via machine vision and machine learning to reveal unfavourable environmental changes before the fish is severely harmed. We have so far developed an underwater camera system with the corresponding processing algorithms for fish behaviour tracking and obtained results after testing in demo-scale have been highly promising, including, clear data trends on detected behaviour changes of Atlantic salmon smolt in response to H2S exposure, representing a stressor with high relevance in commercial land-based aquaculture. However, with the current implementation of the data processing pipeline we are not able to achieve real-time processing of the incoming video data, which currently only allows for retrospective analyses. In order to evolve the demonstrated technology to become operational useful for the industry,real time processing is necessary, allowing for quick decisions to maintain best possible fish welfare. Therefore, improving the developed machine learning-supported stereo camera system and processing algorithm is a necessary step towards commercialisation of the stereo camera and its processing algorithm. The current implementation of the data processing pipeline is based on an existing open-source neural network architecture, this architecture detects the region of interest of the objects. We believe that a key-point based detection algorithm will need less resources for processing and has therefore high potential to allow for real-time processing of fish behaviour video data.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

3. Additional Call | 2023

Project Partners:

- **Mr Bjarne Kvæstad Bouman**
  SINTEF Ocean

Priority Area:

Business and commercialisation preparation

MARIGREEN_TECB

Workshop in the use of FT-IR for evaluating humification in marine-based composts

About the Project

The MARIGREEN project aims at upgrading poorly utilized residual materials from the BLUE value chain for application as fertilizers and biostimulants in organic agriculture. MARIGREEN_TECB consists of a capacity-building and knowledge-transfer workshop bringing together PhD candidates affiliated with MARIGREEN and experts in composting, humic substances, Fourier Transform Infrared spectroscopy (FTIR) analysis, chemical analysis, and horticulture. The workshop is organized by the Norwegian Centre for Organic Agriculture (NORSØK) where marine-based composts and fertilizers for the MARIGREEN project are being made, and will be held at the University of Agronomic Sciences and Veterinary Medicine (USAMV) in Romania where the products are being analyzed and tested in field trials. Among the topics to be discussed is utilizing FTIR for the determination of humic acid (HA) content in raw materials and mature compost. HA content and the ratio between HA and fulvic acid (FA) are often used as indicators for compost maturity and quality. Traditional analysis involves chemical extraction and is time-consuming and costly. FTIR analysis takes only a few minutes per sample and is a valuable method for rapidly measuring the level of humification (i.e., completeness of decomposition) and evaluating product quality, which saves time and money for both researchers and composting practitioners. However, interpretation of the spectra requires special competence and the aid of statistical tools, competence that MARIGREEN partners do not possess. This project will add impact to MARIGREEN by transferring valuable knowledge about process optimization for making marine-based composts and fertilizers and about novel methods for determining compost quality. It will also be an oppotunity for young researchers from MARIGREEN to build their professional network.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

3. Additional Call | 2023

Project Partners:

- **Mr Joshua Cabell Bouman**
  Norwegian Centre for Organic Agriculture
- **Dr Violeta Alexandra Ion**
  University of Agronomic Sciences and Veterinary Medicine
- **Prof THANOS SALIFOGLOU**
  Aristotle University of Thessaloniki

Priority Area:

Training, exchange and capacity building

MARIKAT-BCOM

MARIKAT-BCOM, Blue-Bio Seaweed-based products from successful research and innovation to commercialization

About the Project

Based on coordinated and integrated collaboration MARIKAT Business and University partners:

1. IP Filing patent applications, to ensure priority date and technology protection of both seaweed processing and seaweed-based products (Matis; LL-BioEconomy)

2. Up-Scaling. Producing 10-100 folds upscaled samples of business-selected MARIKAT-achieved innovations (new valorization of Laminarin, Fucoidan, and Ulvan) (Matis, DTU, Lund)

3. Product Performance. Based on market relevant information from MARIKAT business partners (viz. business knowledge about markets and end-user and business2business preference and care-abouts), conducting product-performance tests; led and performed by MARIKAT company* partners, technically guided by MARIKAT RTD and University partners (Matis, Lund, DTU and LL-BioEconomy)

4. Regulatory.Updating and confirming “no regulatory obstacles” for the new blue bioeconomy products (Matis; LL-BioEconomy)
5. Business Plans. MARIKAT Business partners, CRODA International Plc (Ulvan), Oceanium (Fucoidan) and , Oceanium & Ocean Rainforest & lminarin derivatives , Enzymes commercialized through enzyme-webpage run by MATIS; assisted by technical knowledge and insight (for both product and process)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

3. Additional Call | 2023

Project Partners:

- **Prof Gudmundur Hreggvidsson** MATIS ohf
- **Prof Anne S. Meyer** Technical University of Denmark (DTU)
- **Prof Eva Nordberg Karlsson** University of Lund
- **Prof Lene Lange** LI-bioeconomy

Priority Area:

Business and commercialisation preparation

MINERVA_TECB

JUNO: Justification for Using Natural Optimizers of plant health

About the Project

Project title: JUNO: Justifying Use of Natural Optimizers of plant health/
Project acronym: MINERVA_TECB

JUNO directly amplifies MINERVA (lead PI Prof Stengel, University of Galway) impacts by 1) adding value to seaweed extracts prepared during MINERVA by a) increasing knowledge of other activities that the extracts are likely to possess through screening and characterising them for plant hormones and/or the ability to upregulate endogenous plant hormone levels and b) by identifying the mechanism through which MINERVA extracts improve plant resilience by identifying whether elements of the plant immune system are upregulated in response to treatment with the extracts. Both elevating TRL of MINERVA outputs. JUNO also adds value to MINERVA by 2) amplifying and diversifying dissemination strategeries. Communication and dissemination plans include a) extending networks, with the Associate Partner increasing the country reach within Europe of MINERVA and JUNO, b) open access publications that include new information generated by JUNO about MINERVA extracts. JUNO will additionally generate videos that will be made publically accessible and will be designed to support acceleration of BlueBio-centred ideas and methods relating to MINERVA and JUNO and supporting the growing community of BlueBio focused researcher in Europe. Inclusion of Associate Partner allows some of these to be in Spanish thereby diversifying reach with regard to language as well as knowlege access and techniques support. Training, Exchange, and Capacity Building are integral and at the forefront of JUNO activities and are met through training two postgraduate researchers, and diversifying training, and skills set through research placement. The latter will also facilitate capacity building at the level of knowledge, competencies, and ideas, as well as through training. Capacity building at the level of the BlueBio community is also supported through communication and dissemination activities.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Project Overview

3. Additional Call | 2023

Project Partners:

- **Dr Zoë Popper**
  University of Galway
- **Prof Hugo Mélida**
  Universidad de Leon

Priority Area:

Business and commercialisation preparation

PlastiSea_DISS

From seaweed to bioplastics: Challenges and opportunities across the value chain

About the Project

The PlastiSea project (2020-2023) has worked on developing bioplastic materials from cultivated brown algae, toward different markets and applications. Through the expertise and cross-disciplinarity of the consortium, the project has covered the value chain from primary production of biomass to pilot-scale manufacturing of material prototypes.

The current proposed project aims to disseminate this whole value chain to the scientific community, industry stakeholders and general public through three targeted communication and outreach activities. 1) A scientific article summarizing key results along the value chain, with a holistic environmental perspective (LCA, supply chain aspects), 2) A factsheet that will be available on the project web site and distributed to stakeholders, and 3) A project video used for public outreach. The dissemination project will be implemented by SINTEF, the coordinator of the PlastiSea project, with contributions from the PlastiSea consortium.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

3. Additional Call | 2023

Project Partners:

- **Dr Øystein Arlov**
  SINTEF Industry

Priority Area:

Dissemination of research and results

QUALISEA_DISS

Quality assessments and preservation of cultivated seaweed

About the Project

In QualiSea, factors that affect the stability and quality of fresh biomass are studied, and methods for characterisation of fresh and stored biomass are assessed with the aim to develop cost- and energy efficient preservation methods for the biomass. Since the proposal was prepared, the challenges that the project aims to solve, has become even more urgent for the seaweed farmers. As parts of the results from the QualiSea project have a high applied and practical impact for the seaweed farmers, these results should be shared and disseminated in a targeted way.

The additional funding applied for by the current proposal will thus be used to significantly expand the dissemination of the applied aspects of the project. Specifically, we will produce two handbooks that will contain recommendations and practical protocols for A) Use of sensors, instrumentation, and rapid analytical methods for assessing the biomass composition and quality; and B) Choice of preservation methods.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Project Overview

3. Additional Call | 2023

Project Partners:

- **Mrs Inga Marie Aasen** SINTEF AS

Priority Area:

Dissemination of research and results

SeaSoilDemo

Amplifying SeaSoil: Demonstrating seaweed fertilisation effects on perennial ley.

About the Project

The project "Amplifying SeaSoil: Demonstrating seaweed fertilisation effects on perennial ley" (SeaSoilDemo) will be carrried out by the Norwegian Centre for Organic Agriculture (NORSØK) in collaboration with The Norwegian University of Life Sciences (NMBU) and SeaSoil industry partners from Norway and Ireland. The industry partners have delivered seaweed materials which will be tested in field at NORSØK (Tingvoll, NW Norway) during the growing season of 2023. In a demonstration trial (one set of experimental plots, without replicates), the effect of various seaweed materials will be studied, when they are applied to a 1st year perennial grass-clover ley. With the amplification funding, this demo-trial can be expanded by a thorough and regular visual documentation (photo + video), and industry partners and SeaSoil researchers from Norway, Denmark, Estonia and Croatia can be included in a close communication about the effects, and possible explanations of the observed plant growth.
NORSØK will prepare all documents and files required for such communication. A final video will be produced (by NORSØK) where SeaSoil researchers and industry partners comment on the products and the output of their application in field. This will be a valuable dissemination product for the main project (SeaSoil), and the main project will provide a good environment for creating interest for this video among various relevant stakeholders. For this, the SeaSoil multiactor platform will be useful. In the main project (SeaSoil), funding is provided for spreading the materials in field and recording the growth of ley with two harvests, and analysing the concentrations of minerals in the plant material (at NMBU). However, there is no funding for a thorough visual documentation of the field work and the growth effects, conduct the described requested communication, and editing a final dissemination video.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

3. Additional Call | 2023

Project Partners:

- **Dr Anne-Kristin Løes**
  Norwegian Centre for Organic Agriculture (NORSØK)
- **Dr Åsgeir Almås**
  Norwegian University of Life Sciences
  Faculty of Environment Sciences and Natural
  Resource Management (MINA)
- **Dr Ariadna Szczybelski**
  Nutrimar AS
  R&D
- **Prof Ingrid Olesen**
  Nofima
  Department of Production Biology

Priority Area:

Dissemination of research and results

SIDESTREAM

SIDESTREAM_DISS

About the Project

SIDESTREAM_DISS aims at disseminating SIDESTREAM results during the most important meeting of key players in the European aquaculture business, research, and policy. The annual conference of the European Aquaculture Society is the largest gathering of professionals active in European aquaculture. The conference regularly attracts 2000-3000 attendees, which makes it a perfect outlet to disseminate results from SIDESTREAM. Many results in the project came in during the late period of the project or keep coming until the end of the project, hence we so far had no chance to disseminate the entirety of the project in a synthetized manner. The EAS 2023 is after the SIDETSREAM project lifetime, and we think the 3rd additional call is beautifully suited to disseminate the SIDETREAM project. This will be done by seven oral presentations across the different theme sessions, and as a leaflet which will be distributed at the conference, and online.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

3. Additional Call | 2023

Project Partners:

- **Dr Arne Malzahn** SINTEF OCEAN AS
- **Dr Oscar Monroig** Consejo Superior de Investigaciones
- **Prof Volker Wendisch** Bielefeld University
- **Dr Massimo Perucca** Project Hub-360
- **Prof Luisa Valente** CIIMAR-University of Porto
- **Dr Sinem Zeytin-Schüning** Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research

Priority Area:

Dissemination of research and results

Smartchain_policy

Smart solutions for advancing supply systems in blue bioeconomy value chains_ Policy

About the Project

Smartchain_policy extends the results of the Smartchain project by performing additional analyses focused on more in-depth examination of policy and management for advancing circular blue bioeconomy value chains. Smartchain_policy takes a three pronged approach starting with targeted mapping of regional, national and sectoral current and upcoming policies relevant to a circular blue bioeconomy in Iceland and Norway, followed by an examination of organizational management aims through systematic examination of fisheries and aquaculture companies' sustainability reports, and, finally, engagement with relevant stakeholder groups (policy-makers and value chain actors) for the Smartchain project's targeted policy and management recommendations.

Blue BIO COFUND

Project Overview

3. Additional Call | 2023

Project Partners:

- **Dr Nína María Saviolidis** University of Iceland
- **Dr Sigurdur Bogason** MarkMar
- **Dr Rita Bouman** SINTEF
- **Prof Allan Larsen** Technical University of Denmark (DTU)
- **Dr Sveinn Margeirsson** BRIM

Priority Area:

Mapping of relevant policy landscape

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

SmartChain_diss

Smart solutions for advancing supply systems in blue bioeconomy value chains_ Dissemination

About the Project

Smartchain_dissemination project addresses the need for a greater impact of the results of Smartchain initial project at social, economic and policy levels. Smartchain_dissemination will use effective dissemination and communication strategies to ensure that not only institutions and companies involved in the original Smartchain project benefit from its results but also a wider audience.

Smartchain_dissemination addresses the specific challenges in reaching out to stakeholders by finding the right audience (e.g. public, policymakers, researchers, industry) and tailoring communication methods and activities accordingly. The project includes complimentary dissemination actions from the initial project to maximise the impact of the produced knowledge and know-how. Among other activities, webinars and a policy paper will be developed to accelerate the development of a Blue Bio knowledge community mostly in Norway, Island and Denmark. **Smartchain_dissemination** project also caters to other audiences by promoting arenas for discussion of the Blue circular economy and by integrating its research into high education activities.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

3. Additional Call | 2023

Project Partners:

- **Dr Rita Vasconcellos Oliveira Bouman** Sintef Ocean
- **Dr Sigurdur Bogason** MarkMar
- **Dr Zouhir Marsni** Seagarden AS
- **Dr Gudrun Olafsdottir** University of Iceland
- **Dr Sveinn Margeirsson** Brim
- **Prof Allan Larsen** Technical University of Denmark
- **Dr Per Gunnar Auran** Sintef Digital

Priority Area:

Dissemination of research and results

SoundScapes

Sonification as a platform for communication of three-dimensional data sets

About the Project

The project SoundScape wishes to gather data from BlueCC on enzymatic hydrolysis and present it as sound instead of the more common use of images and oral presentations. The inspiration for this comes from the Hubble Space telescope and the use of sonification in nonspeech audio to convey information (NASA, Space Physics Data Facility).

During enzymatic hydrolysis, protein structures are broken down into smaller proteins, commonly with commercial interest. To investigate this breakdown, data are often generated in three dimensions, time, wavelength, and intensity of light absorbance. We wish to illustrate this change in protein structure using sonification instead of traditional visual presentations.

Data in three dimensions may be difficult to communicate in a two-dimensional image and the interdependency of datapoints in three dimensions is difficult to visualise. With sound, there are opportunities to transfer variation in data and present it as the change in a series of different parameters, such as pitch, volume, instrument etc. By organising all these parameters on a time dimension we aim to create an atmosphere where data is perceived only through sound

SoundScape will utilise already collected data from the BlueCC library of experiments and convert it to sound using commercial software. The different parameters will be tuned so that the level of protein degradation is expressed as the amount of harmony in the audio output; more harmony equals more protein degradation.

Communication of the results is the very foundation of this project. Sound is a communication tool that may be used to disseminate research to a broad range of target audiences. No knowledge or language barriers can hinder that.

Target audience is youth, people who are generally uninterested in research results, people who need help to understand the sometimesdifficult language used in scientific dissemination, and other scientists willing to expand the horizons of conceivable dissemination.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Project Overview

3. Additional Call | 2023

Project Partners:

- **Dr Runar Gjerp Solstad Bouman**
  Nofima AS

Priority Area:

Dissemination of research and results

SuMaFood_BCOM

Commercial production of marine ingredients from Rest Raw Material

About the Project

Nuas Technology has developed and patended a new technology to extract food grade marine ingredients from fish residuals. The technology consist of a vertical hydrolysis column with gentle stirring. The products from the process are protein, oil and bones. All three ingredients are suitable for both dietary products and food production.

A global market for ingredients have been growing with 4-5 percent each year the last decade. On top of this, the world population growth calls for an increased food demand in the future as well.

The SuMaFood project intends to reduce food waste and increase the productive use of marine biomass by devising innovative methods of processing and preservation, and developing ingredients that will serve as the basis for new food products.

As a partner in Sumafood, Nuas Technology will now through Sumafood_BCOM prepare for a commercial production of food grade ingredients from fish residuals based on the experience we have gained in the Sumafood project.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

3. Additional Call | 2023

Project Partners:

- **Mr Frode Blålid**
  Nuas Technology AS

Priority Area:

Business and commercialisation preparation

SUREMETS_BCOM

Business and Commercialisation of novel marine protein hydrolysates

About the Project

SuReMetS project consortium has generated a significant amount of scientific knowledge with respect to, protein hydrolysates produced from sustainable marine resources and their role in the management of metabolic syndromes. All the novel protein hydrolysates developed were assessed and ranked as per their potential of DPP-IV inhibitory activity, GLP-1 secretory activity, anti-inflammatory activity and antioxidant activity via in vitro studies. An animal trial is ongoing to assess and reconfirm the potential of the most promising protein hydrolysates developed under this project.

Bio-marine Ingredients Ireland Limited (BII) as an industrial partner, has successfully demonstrated industrial-scale bio-refining of the most promising biomasses studied under the SuReMetS project with the higher TRL (from TRL-2 to TRL-6). However, there was no work package assigned related to the "development of commercialization strategy of new protein ingredients" in the ongoing SuReMets project. Hence, BII intends to add more financial impact to the new protein ingredients developed under the SuReMeS project by developing a commercialization strategy and presenting their applications towards not only for metabolic syndrome but also for different segments of the global market viz., infant formula, sports nutrition, clinical nutrition and pet nutrition. The Global protein hydrolysates market is forecast to reach €3.7 Billion by 2024 growing at a CAGR of 6.1% and the global protein Ingredients market is anticipated to experience a CAGR of 9.1% from 2020 to 2027 to reach $76bn value including human & pet food ingredients. BII is the only industry partner of this consortium that has the potential to produce these marine protein hydrolysates at an industrial scale and take these new protein hydrolysates to a global market of protein ingredients using their existing base of customers and distributors based in Asia Pacific, North America, and Europe.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 817992.

Blue BIO COFUND

Project Overview

3. Additional Call | 2023

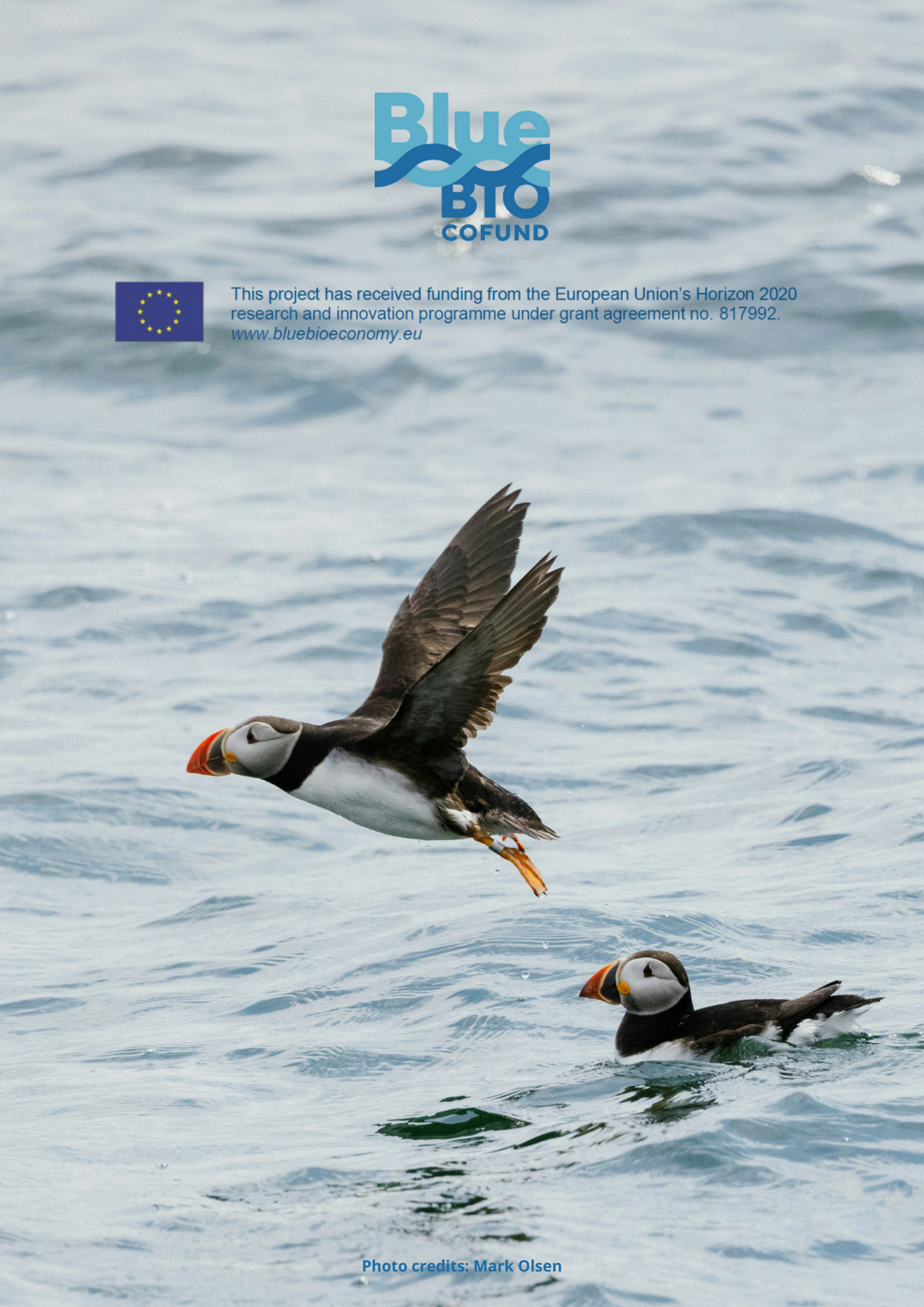
Project Partners:

- **Mr Jason Whooley**
  Bio-marine Ingredients Ireland

Priority Area:

Business and commercialisation preparation

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 817992.
www.bluebioeconomy.eu



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