

January 2015

A heavy workload is expected for 2015 regarding the closure of the first phase of IDEALG, finalizing fundamental research activities and establishing a valorization strategy...

Dear colleagues, collaborators, partners,

During our annual general assembly in October, IDEALG was nominated by our national funding agency ANR as the most productive project among the other «Bio-resources and Biotechnology» projects. In order to maintain this dynamic fundamental research on seaweed, we are soliciting other sources of funding, as well as preparing IDEALG's future strategy in terms of valorization and technology transfer. In this context, IDEALG's partnership is open to other academic institutions and private partners... an opportunity to set up a wider network of knowledge on seaweed !

(P. Potin, Scientific coordinator of IDEALG)



IDEALG 2014 General Assembly - IFREMER - BREST

More than 80 people took part in the IDEALG general assembly, organized at the IFREMER Center in Brest, on the 13- 14th of October 2014. The aim was to provide an overview of the 9 work-packages: 25 presentations and guest speakers to highlight the diversity of our coming results over 2014 as well as ongoing studies and further scientific bottlenecks to focus on. The international advisory committee and the ANR Bio-resources and Biotechnologies representative, Mrs SIMON were also present during these two days.

The first feedbacks are very positive as IDEALG has been positioned as the most productive among all the *Investment expenditure projects* (scientific papers and patents). Following this GA, a meal entirely prepared with seaweed (from appetizers to dessert) was served at the *Ruffé* restaurant in Brest... another way to support the seaweed food chain in Brittany.



The IDEALG FORUM opened to the public at the Sea Tech Week

SEA BRETAGNE-FRANCE
TECH WEEK

With 110 subscribing participants, Mr Hervé vice-president (founder president) of the **Pôle Mer Bretagne Atlantique (PMBA)**, honored the opening of the Forum with his encouraging speech about the prospective of cross-sectoral developments involving seaweed.

Philippe Potin then presented the implications and challenges of the seaweed sector before leaving the IDEALG partnership to expose 7 scientific talks outlining the progress made within the project. Two round-tables, one raising the problem of a national strategy for the sector and another on the prospective of seaweed projects at a European level, these allowing further discussions on future developments.



[Link \(in French\)](#)

PÔLE MER
BRETAGNE ATLANTIQUE

News

The first genome-scale metabolic network of brown-algae solved

The genome of a small brown algae named *Ectocarpus siliculosus* was used as a tool to build a new biologic network. It describes numerous synthesis and catabolic pathways of molecules and cell components within this organism. Thierry Tonon, research professor at the Roscoff Marine Station, with the collaboration of Anne Siegel, Research director at the IRISA of Rennes, as well as the help of other research scientists from Roscoff, Rennes and Nantes, have developed this metabolic network named [ECTOGEN](#). This biologic network, which is available to the community, emphasizes on interactivity in order to improve the understanding of brown-algae biology.



Contact: tonon@sbroscoff.fr/anne.siegel@irisa.fr

Transformation of seaweed polysaccharides : new applications in perspective

Seaweed polysaccharides are usually commercialized as colloids, such as agar, alginate and carrageenan known for their inert textural properties (thickening and gelling agent). Thierry Benvegnu, professor at the ENSC of Rennes studies the transformation of these sugars by chemical physical and enzymatic processes in order to expose new chemical properties such as innovative bio-products able to replace molecules from the petrochemical industry. Surfactant properties (tension-active) from seaweed polysaccharides are currently developed by Thierry with a production reaching pre-industrial levels (Start-up: Surfact'Green : <http://www.surfact-green.com/>).



Contact: thierry.benvegnu@enscr.fr

Seaweed aquaculture : analysis and strategic options

An IDEALG workshop on seaweed aquaculture development in France, organized by the AMURE Laboratory (UBO-IFREMER), took place in Morlaix on the 23rd of June 2014. The actors in the seaweed field (cultivation, transformation, commercialization...) expressed the need to establish a **national seaweed aquaculture strategy** in order to testify a real ambition which

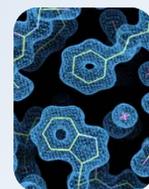
can meet issues on the development of aquaculture underlined at the European level. The debate continued on the supposed directions of the national plan on aquaculture regarding seaweed. It is a question of orientating productions towards food and non-food markets and accordingly to define research priorities. Katia Frangoudes and Sophie Girard conducted a [Strengths, Weaknesses, Opportunities and Threats](#) analysis (link in French) for the seaweed aquaculture development, which raised useful proposals for the public authorities inclined to define the national strategy.

Contacts: Katia.Frangoudes@univ-brest.fr , Sophie.Girard@ifremer.fr



Crystallography, a tool to serve seaweed bioprocessing

Crystallography is the most powerful tool to determine the 3D structure of molecules. Mirjam Czjzek, research scientist at the Roscoff Marine station studies the crystallography of marine enzymes extracted from seaweed and associated bacterial. The aim of her topic is to visualize how enzymes interact with its substrate and understand the mechanism behind each reaction.



This fundamental knowledge allows to better target the use of specific enzymes for extracting, degrading and transforming bio-molecules exposing an industrial potential... a valuable process for the seaweed bio-refinery strategy.

2014 was underlined by [the Crystallography International Year](#) with many conferences on this subject across France. Mirjam was significantly involved with the general public and students to make this transverse discipline known to several fields.

Contact: czjzek@sb-roscoff.fr



- IDEALG results (T. Tonon, SBR) presented to Gen2Bio – Saint-Malo (04/2014)
- Annual IDEALG Forum represented to the SeaTech Week – Brest (10/2014)
- IDEALG presentation of the seaweed sector in France to the European Commission - Brussels (11/2014)
- IDEALG workshop « seaweed aquaculture and algae as a food source » – AMURE seminar to the UBO – Brest (12/2014)
- BIOFUTUR press article « IDEALG quoted as a seaweed discovery accelerator... »(12/2014)
- Press article in THINK TANK N°11 « IDEALG to face the challenges of seaweed sector...» (01/2015)



...and in scientific journals

- ***A metabolic approach to study algal-bacterial interactions in changing environments.*** Molecular Ecology.
- ***Kelps feature systemic defense responses: insights into the evolution of innate immunity in multicellular eukaryotes.*** New Phytologist.
- ***Contrasting genetic diversity patterns in two sister kelp species co-distributed along the coast of Brittany, France.*** Molecular Ecology .
- ***Transcriptomic and metabolomic analysis of copper stress acclimation in Ectocarpus siliculosus highlights signaling and tolerance mechanisms in brown algae.*** BMC Plant Biology
- ***Genome and metabolic network of “Candidatus Phaeomarinobacter ectocarp” Ec32, a new candidate genus of Alphaproteobacteria frequently associated with brown algae.*** Frontiers in Genetics.
- ***Physiological plasticity of Dictyota kunthii (Phaeophyceae) to copper excess.*** Aquatic Toxicology
- ***Chondrus crispus - A present and historical Model organism for Red seaweeds.*** Chapitre de livre : "***Advances in Botanical Research - Sea Plants***" édité par N. Bougougnon. Editions AP.
 - ***Functional screening of a metagenomic library of seaweed-associated microbiota: identification and characterization of a halotolerant, cold active marine endo-β-1,4-endoglucanase.*** Applied Environmental Microbiology.
 - ***Marine habitats ecosystem service potential: A vulnerability approach in the Normand-Breton(Saint-Malo)Gulf,France.*** Ecosystem Services.
 - ***Community, trophic structure and functioning in two contrasting Laminaria hyperborea forests.*** Estuarine, Coastal and Shelf Science.
 - ***Tracing the Trans-Pacific Evolutionary History of a Domesticated Seaweed (Gracilaria chilensis) with Archaeological and Genetic Data.*** PLOS ONE.

... and more to come in 2015 !



Surfact'Alg : a project of eco-friendly surfactants development

This ANR project concerns the elaboration of non-ionic surfactants from algal origin for detergent applications and bitumen emulsions. The partnership includes 5 public institutes and companies such as : ENSCR, the INRA of Narbonne, CEVA...

Oligomar-Skin for cosmetics

This collaborative project, run by LESSONIA company (29) in partnership with the Roscoff Marine Station, aims to develop cosmetic active ingredients extracted from oligosaccharide algae fractions.

Seaweed for nutrition and ALGOLIFE health, for animals and humans

The industrial project, ALGOLIFE, supported by the SICA, groups 5 partners of which the Roscoff Marine Station. This investment will structure the valorization of macro-algae bioactive molecules for high added value products aiming nutrition and health markets for animals and humans.

Seaweed in the national press

Concerns about natural resources. A difficult harvesting season of wild seaweed has aroused serious discussions about sustainable practices...

The 2014 harvesting season in Brittany has been disastrous (Télégramme). Facing the shortage of large algae biomass, the harvesting boats reacted rapidly by harvesting *Laminaria hyperborea* instead of *Laminaria digitata* (Ouest France). For shore seaweed populations, the lack of management and knowledge on the exploitable stock was revealed during this period and underlined the emergency identify an official advisor (Le Marin).

Seaweed aquaculture still in debate. Several large scale seaweed aquaculture projects are ongoing at the moment, cultivated surfaces already engaged positions France as a European leader ...

Fifty hectares of *Saccharina latissima* cultivated offshore of Lesconil (Brittany) have been harvested this year with the aim to reach 150Ha (Ouest-France). The same seaweed farmer has applied for an exploitation license covering 225Ha off the coast of Moëlan-sur-mer has raised lively debates although the approval of the prefect (Le Télégramme).

Companies invest in Brittany! After the expansion of the alginate production site of CARGILL at Lannilis (10 million euros) and the diversification of the activity of DUPONT-DANISCO at Landerneau (10 million euros), the investment continues ...

ALGOTHERM of Bateau Group specialized in the cosmetic sector expands its unit in Landerneau. 40 jobs will be created by 2016. ALGOPACK diversifies the bioplastics granules application and expands its factory at Saint-Malo. OLMIX invests in poultry production at Guerlesquin by supporting an innovative new model of feed based on seaweed. TETE EN MER, a brand new breton company, has received an award for its new product, a seaweed based drink.



MORE INFO ...job offers, news, press articles :

www.idealg.ueb.eu

Contact

Monique Ras : mras@sb-roscoff.fr

