

Dr. Philippe Potin



After an initial research training in ecophysiology and cultivation of seaweeds (MD), Philippe Potin has developed techniques for purification of algal polysaccharide-degrading enzymes and separation of oligosaccharides. He obtained his Ph.D. from the University of Brest (Brittanny, France) in 1992 and continued his post-doctoral research at the Institute for Marine Biosciences in Halifax (NS Canada) and was hired by CNRS in Roscoff as a scientific officer. He collaborated with the Goemar company and with physico-chemists to characterise structures and biological properties of oligogalactans. This research was part of the development of algal oligosaccharides as triggers of induced

resistance for plant defense to provide a sustainable approach to crop protection. It led to the commercial development of Iodus^{RT}, a laminarin preparation, as a stimulator of wheat defenses in 2003.

He is currently leader of the team Algal Defences at the Station Biologique of Roscoff. P. Potin's scientific interests are in the bases of pathogen defense reactions and signalling in marine algae, with an emphasis on the specific traits of marine plants such as the halide metabolism. Halogenated compounds arise from the activity of vanadium-haloperoxidases (iodo- and bromoperoxidases), a family of enzymes that his team is studying using functional approaches in the kelp *Laminaria digitata*. These specific enzymes are also likely involved in the unique mechanism of iodide uptake, which lead to the accumulation of huge amounts of iodide in the cell walls of kelp thalli and provide an inorganic antioxidant system to kelps.

Philippe has also investigated the relevance of oligosaccharide signalling in marine plant-pathogen systems using biochemical and molecular approaches. Major advances were done in the context of oligoguluronate perception by kelps. Seaweeds resemble terrestrial plants and animals in their basic mechanisms for pathogen recognition and signaling, suggesting that these essential cell functions arose in the sea. Of major importance is the fact that red and brown algae, such as *Chondrus crispus* and *L. digitata*, synthesise and are responsive to hydroperoxides from both eicosanoid and octadecanoid fatty acids, which tend to suggest that the oxylipin pathway ancestrally featured these two categories of lipid signals. Major challenges remain in determining the functions of these key metabolites in the control of biotic interactions of algae and in signaling which might be relevant also at the community level. Therefore, his team is now developing genomic and genetic approaches to address key issues in the innate immunity of *Ectocarpus siliculosus*, in order to establish it as a model species for the brown algae in the field of defense metabolism and signaling.