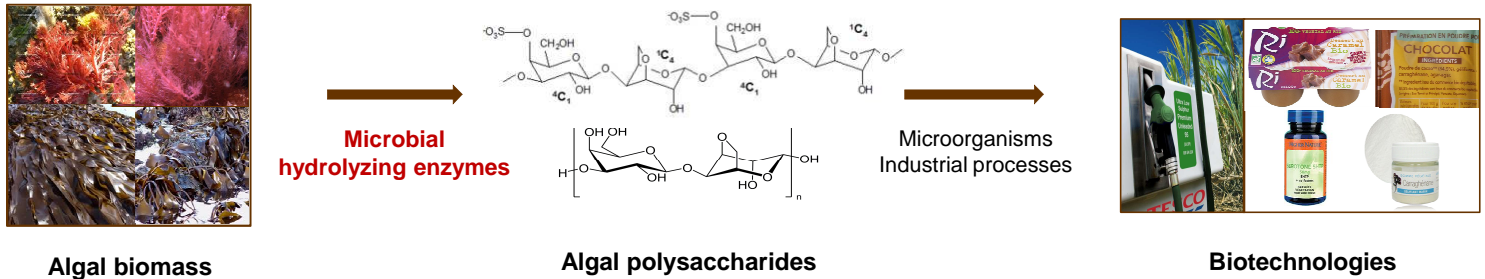


# Microorganisms living on algae : An interesting reservoir of enzymes hydrolyzing algal biomass

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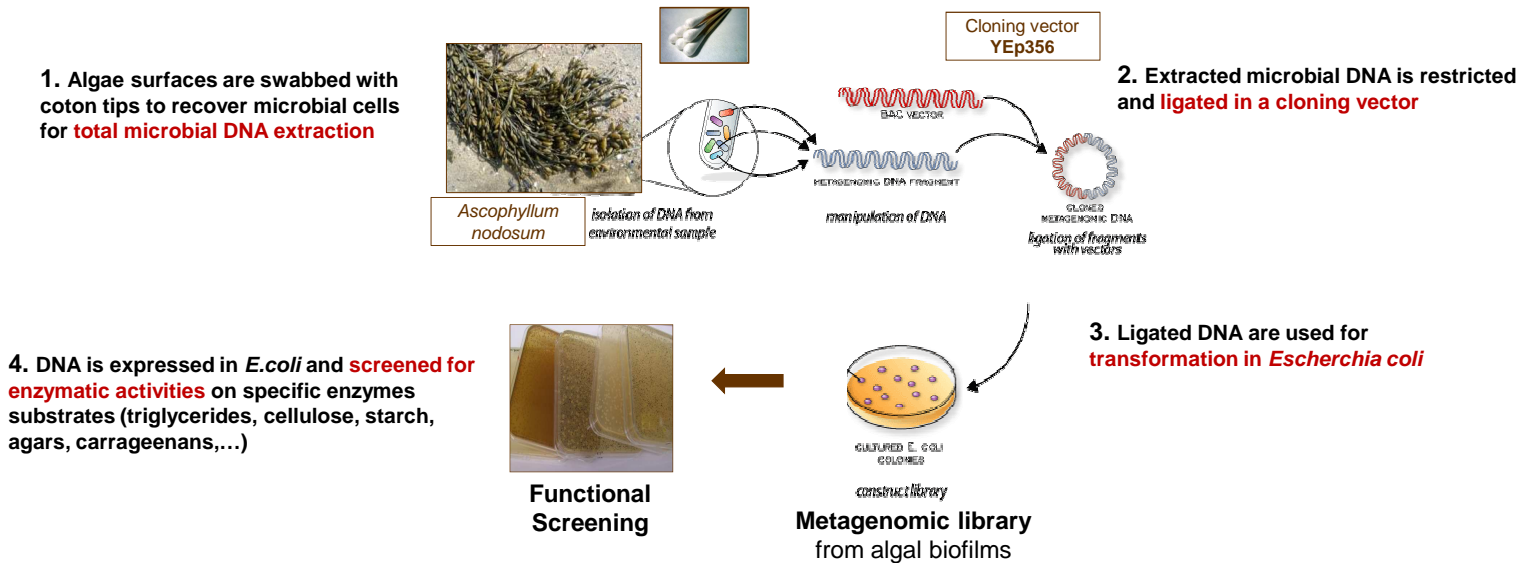
## The use of algal biomass in biotechnologies needs algal biomass hydrolyzing enzymes

Algae and their polysaccharides are commonly used for their gelling and therapeutic properties in food and pharmacology industries. Furthermore, increasingly interest is taken on the production of 3<sup>rd</sup> generation biofuels from algal biomass. To purify and hydrolyze those polysaccharides, algal biomass hydrolyzing enzymes are needed and searched for.



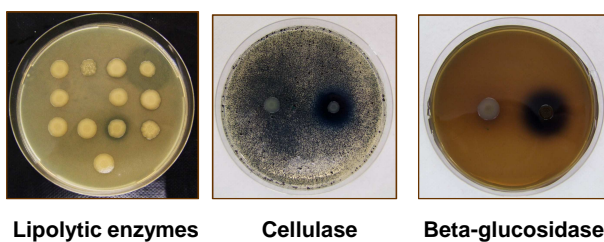
## How to identify new algal biomass hydrolyzing enzymes produced by microorganisms living on algae ?

Microorganisms living on algae are in constant interaction with algal biomass, making them an interesting reservoir of biomass hydrolyzing enzymes. To access those interesting enzymes, a metagenomic DNA library from algal biofilms was constructed and functionally screened on solid media.



## 7 new hydrolyzing enzymes identified by functional screening of a metagenomic library from algal biofilms

A first screening for biomass hydrolyzing enzymes (lipases,  $\beta$ -glucosidases,  $\alpha$ -amylases, proteases, cellulases, xylanases and arabinanases) was realized. Metagenomic libraries are currently being screened for enzymes hydrolyzing algal polyassacharides (agarases, carrageenases, alginate lyases, laminarinases,...).



The 1<sup>st</sup> screening revealed **5 new lipolytic enzymes, 1 new cellulase and 1 new  $\beta$ -glucosidase.**

➢ DNA sequences of those identified enzymes are different from known enzyme sequences

➢ First cellulase identified by marine metagenomics

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Functional screening of a metagenomic DNA library is an effective approach to identify **new hydrolyzing enzymes** and **algal biofilms are an interesting resource** of unknown and still unexploited microbial enzymes.