

## TECHNOLOGY OFFER

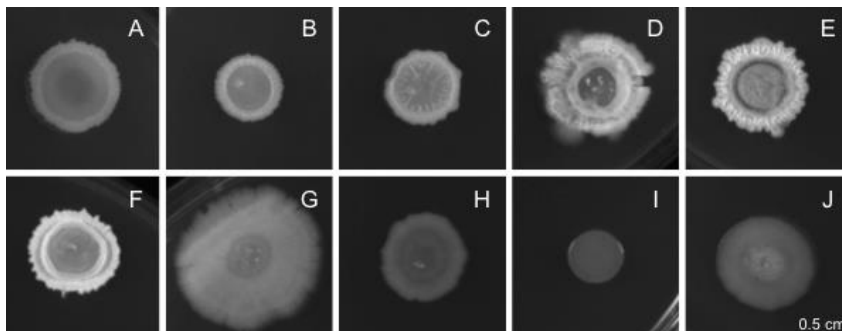
# SPOREFORMING PROBIOTIC STRAINS FOR AQUACULTURE

## Background

Aquaculture sustainability requires the replacement of fish meal (FM) with plant feedstuffs (PF) in aquafeeds to reduce diet costs and environmental impact. However, the nutritive value of PF is limited by the presence of non-starch polysaccharides (NSPs). NSPs are not digested by fish, becoming a source of organic pollutants, negatively impacting fish performance and gut health.

## Technology

The technology described involves the isolation and characterization of novel sporeforming probiotic strains with NSPs active hydrolase activity from fish gut microbiota. The bacterial strains have the potential to produce carbohydrate-active enzymes allowing the host to obtain energy from otherwise indigestible dietary constituents. The model species used was the European seabass. The technology can be used in other species.



Morphological diversity of representative sporeforming fish isolates obtained from European sea bass gut contents.

## Advantages

- Reduction of the dependence on FM in aquafeeds, by solving the incapability of fish digesting PF as an alternative protein source;
- Use of autochthonous probiotics, robust and resistant;
- Reduction of fecal matter production and reduction of NSPs harmful effects in fish gut, fed with PF;
- Decrease of economic losses related to bacterial disease outbreaks - limiting the need for antibiotic use in aquaculture.

## PATENT STATUS

International Patent Application  
via PCT WO2020084565  
Priority date: 24.10.2018  
Granted in US and Chile  
Pending in Europe

## DEVELOPMENT STAGE

**TRL4 – Technology validated in lab**

Further development for validation in large scale setups required.

## APPLICATIONS

Probiotics for PF in aquaculture feed;  
Feed additives.

## COOPERATION

Licensing agreement;  
Product development and marketability;  
Partnership for large-scale aquaculture validation;  
RD&I collaboration for validation in new aquaculture species.

## KEYWORDS

Aquaculture feeds  
Probiotics  
Non-starch polysaccharides  
Fish gut bacteria

## DEVELOPED BY

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