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# Water Institute

## Marine

Marine Inspired Design for  
Antifouling Technology



## INTRODUCTION

Biofouling, the development of nuisance or unwanted biofilms on a surface, is a major problem due to accumulation of biomass causing reduced efficiency, contamination, corrosion, and failure of engineered components.

Biofilm formation is most readily recognised in marine and freshwater environments where a cursory glance at a surface such as ship's hull immersed for even a short period reveals a multitude of organisms attached to and populating surfaces.

Economic costs associated with removal of biofouling are considerable. The cost associated without combating biofouling is associated with decreases in efficiency, performance, reliability, and increases in corrosion rates. This has resulted in many attempts at producing surfaces that prevent biofouling.

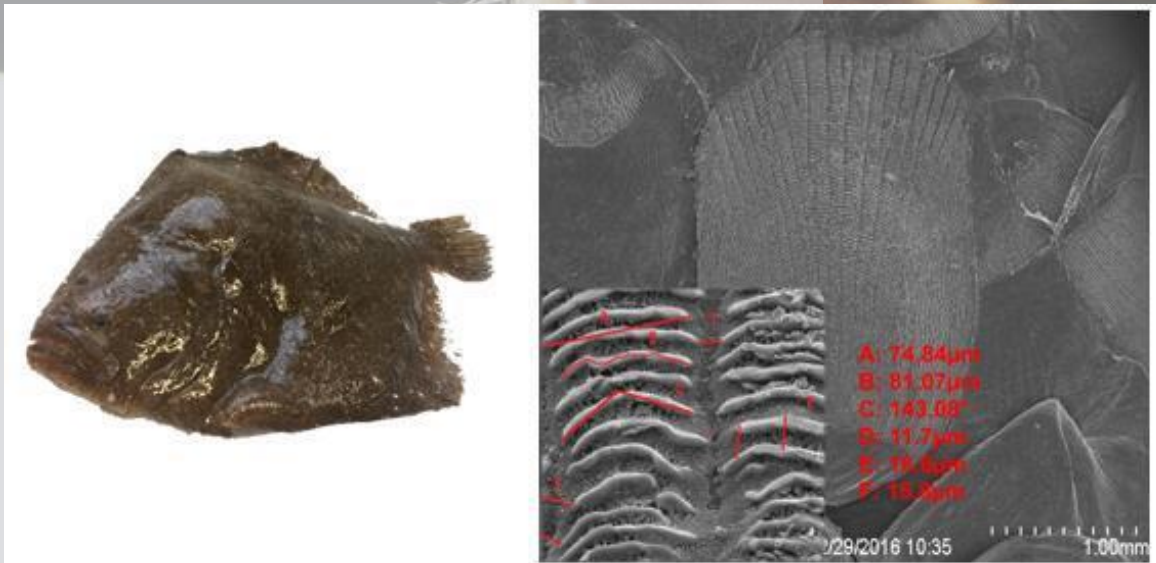


## RESEARCHERS

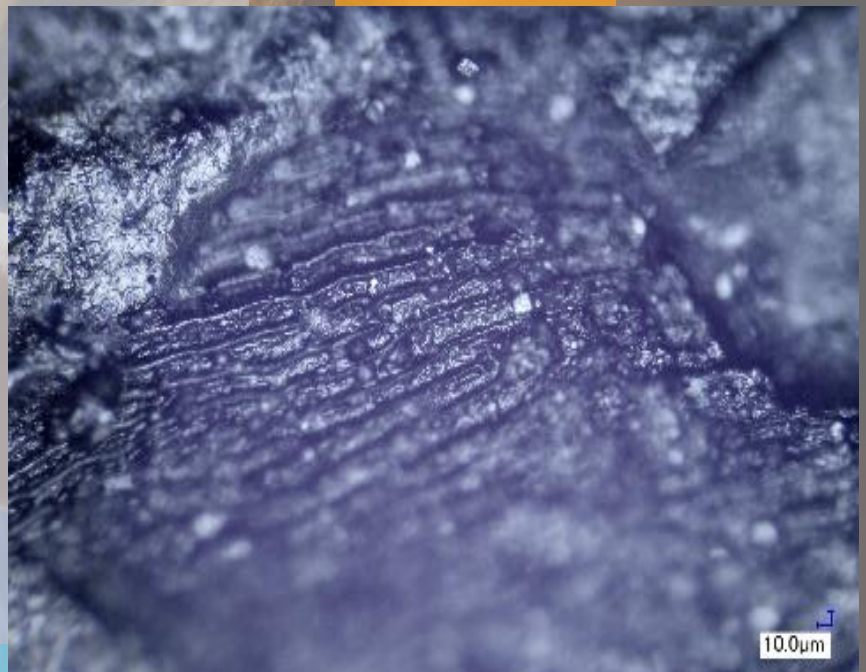
Chloe Richards, PhD Student  
(above)

Dr. Yan Delaure, PI  
Prof. Fiona Regan, PI



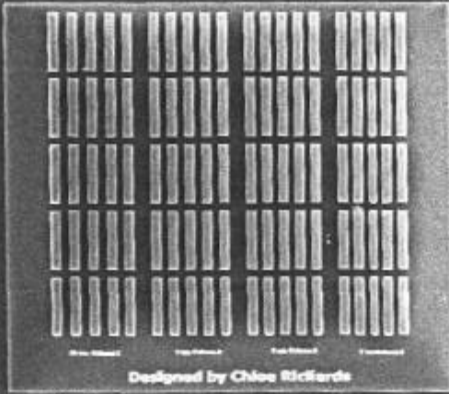
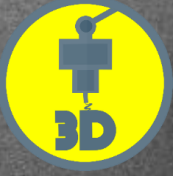


Shown are the scales of fish, *Scophthalmus rhombus* (left), shown under SEM with the measurements of surface topography using J image software.



## WHAT DOES THIS PROJECT ENCOMPASS?

Marine Inspired Design for Antifouling Technology focuses on overcoming the problems caused by biofouling in ship's hull and harbour structures from an ecological and environmental point of view using technology such as 3D printing and laser-cutting inspired by natural structures.



20.0kV x112

500um

## WHAT IS THE GOAL OF THE PROJECT?

The aim of this project is to develop and test textures inspired by nature to avoid biofouling at the microfouling level. This will address the biofouling stages such as adhesion of algae, among which we highlight diatoms.

This project will tackle the questions: what is biofouling and what are the biofouling impacts in the marine affecting ocean energy device development?



## HOW IS THE RESEARCH FUNDED?

This research is funded by the Research and Innovation Programme; *Next Evolution in Materials and Models for Ocean energy (NEMMO)*. Grant agreement No. 815278




## PUBLICATIONS

*Assessment of Antifouling Potential of Novel Transparent Sol Gel Coating for Application in the Marine Environment*

*Molecules* **2019**, 24 (16), 2983; [doi.org/10.3390/molecules24162983](https://doi.org/10.3390/molecules24162983)

# SUSTAINABLE DEVELOPMENT GOALS



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