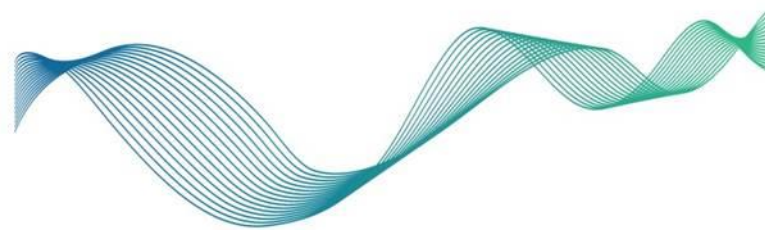


# MarineBiotech



## BLUETEETH

Marine Origin Biopolymers as Innovative Building Blocks  
from the Sea for the Development of Bioresorbable  
Multilayered Membranes for Guided Bone Regeneration

João Mano University of Aveiro (UAVER) Portugal  
Már Másson University of Iceland (UI) Iceland  
Hélène Lauzon Primex ehf (PRIMEX) Iceland  
Janne Reseland University of Oslo (UiO) Norway

ERA-MBT 2nd Transnational Joint Call: Biodiscovery

21st November 2017



Marine Biotechnology ERA-NET (ERA-MBT) is funded under the European Commission's Seventh Framework Programme. Grant Agreement Number 604814  
December 2013 - November 2017

# THE CONSORTIUM

PRINCIPAL INVESTIGATOR	INSTITUTION	COUNTRY
João Mano	University of Aveiro (UAVR) Portugal	PT
Már Másson	University of Iceland	IS
Hélène Lauzon	Primex ehf	IS
Janne Reseland	University of Oslo	NO

**Project period: 3 years (04/2017-03/2020)**

**Total costs\*: € 1.005.000**

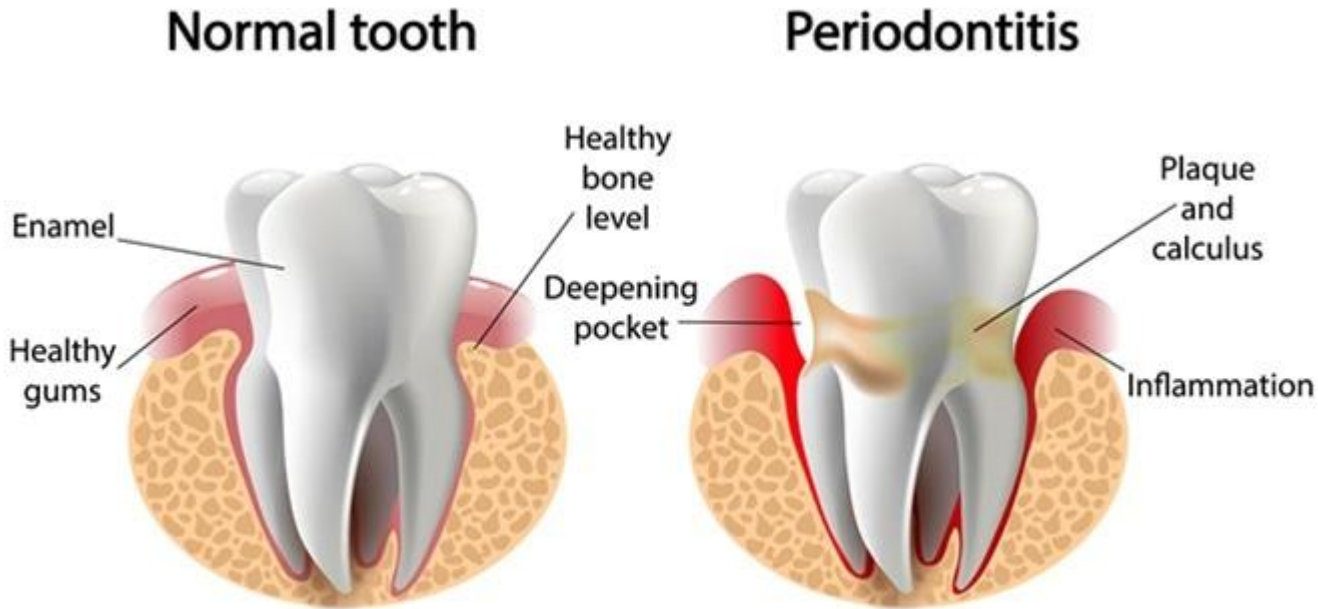
# THE CONSORTIUM



Latitude 66°

Latitude 40°

# AIMS AND OBJECTIVES



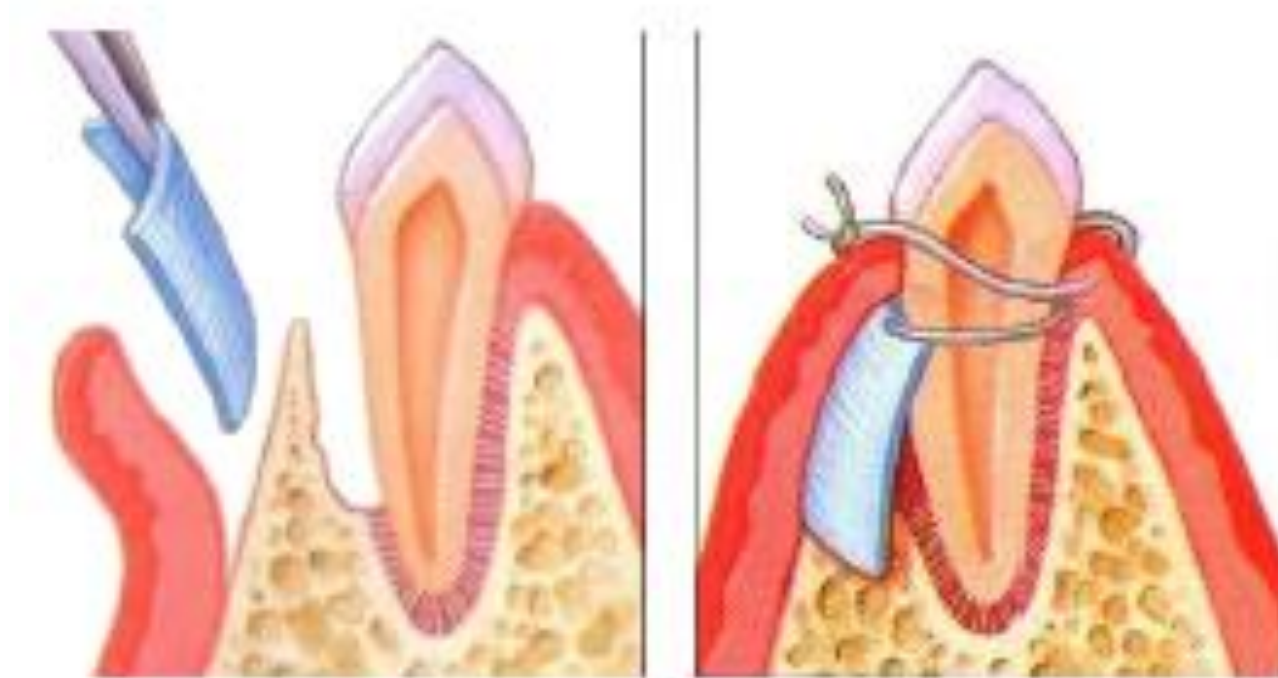
High prevalence of **periodontitis**

≥30 yrs, almost 50% affected

≥65 yrs, almost **70%** affected

*Periodontitis - Image Credit: Elen Bushe / Shutterstock*

# AIMS AND OBJECTIVES



<http://www.periodontalhealthcenter.com/>

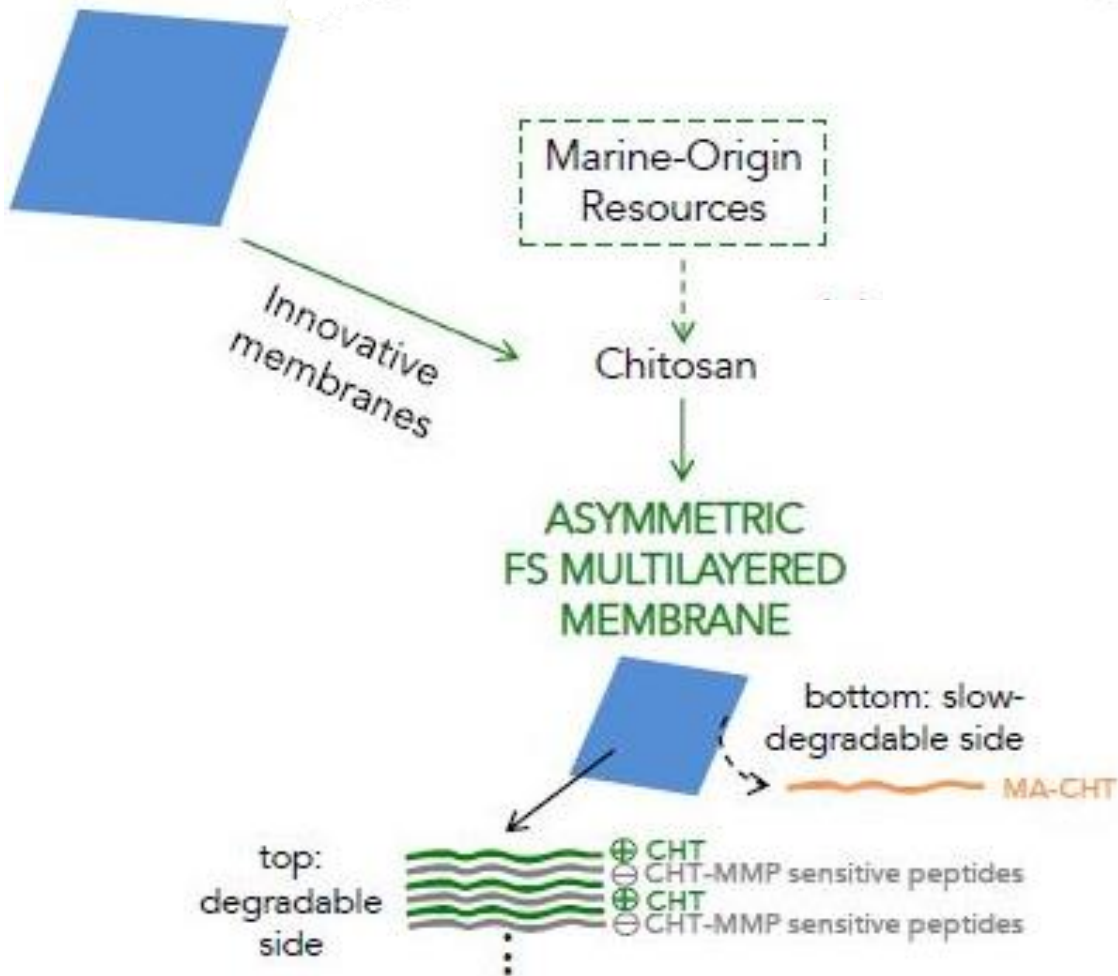
Severe periodontitis necessary surgical intervention  
**35 to 49 yrs, 5%, 50 to 64 yrs 10%**

# AIMS AND OBJECTIVES

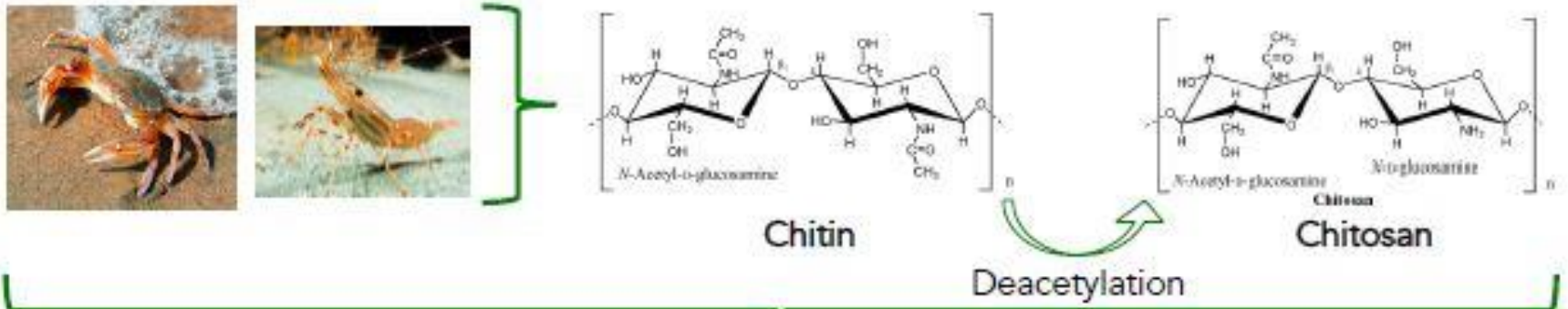
Conventional  
membranes → Collagen



# AIMS AND OBJECTIVES



# PROGRESS & ACHIEVED RESULTS



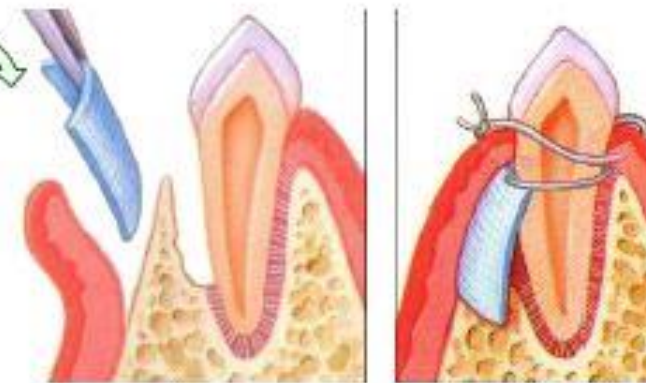
Multilayered Thin Films



Free-standing (FS) Membranes



$n$  layers



<http://www.periodontalhealthcenter.com/>

## ✓ Guided tissue/bone regeneration (GTR/GBR)

Treatment of periodontal defects (mainly caused by periodontitis, the major cause of tooth loss in human adults)

# PROGRESS & ACHIEVED RESULTS

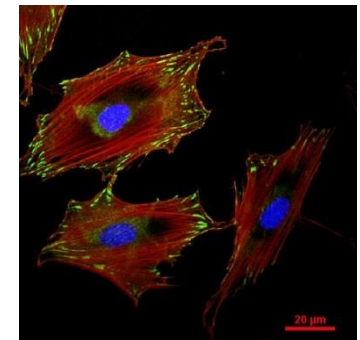
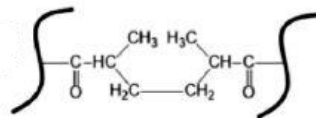
Kick-off meeting Hafjell March 15th 2017

Second project meeting Aveiro Nov 17<sup>th</sup> 2017



*Pandalus borealis*

Methacrylamide-Chitosan Hydrogel



0 EUR



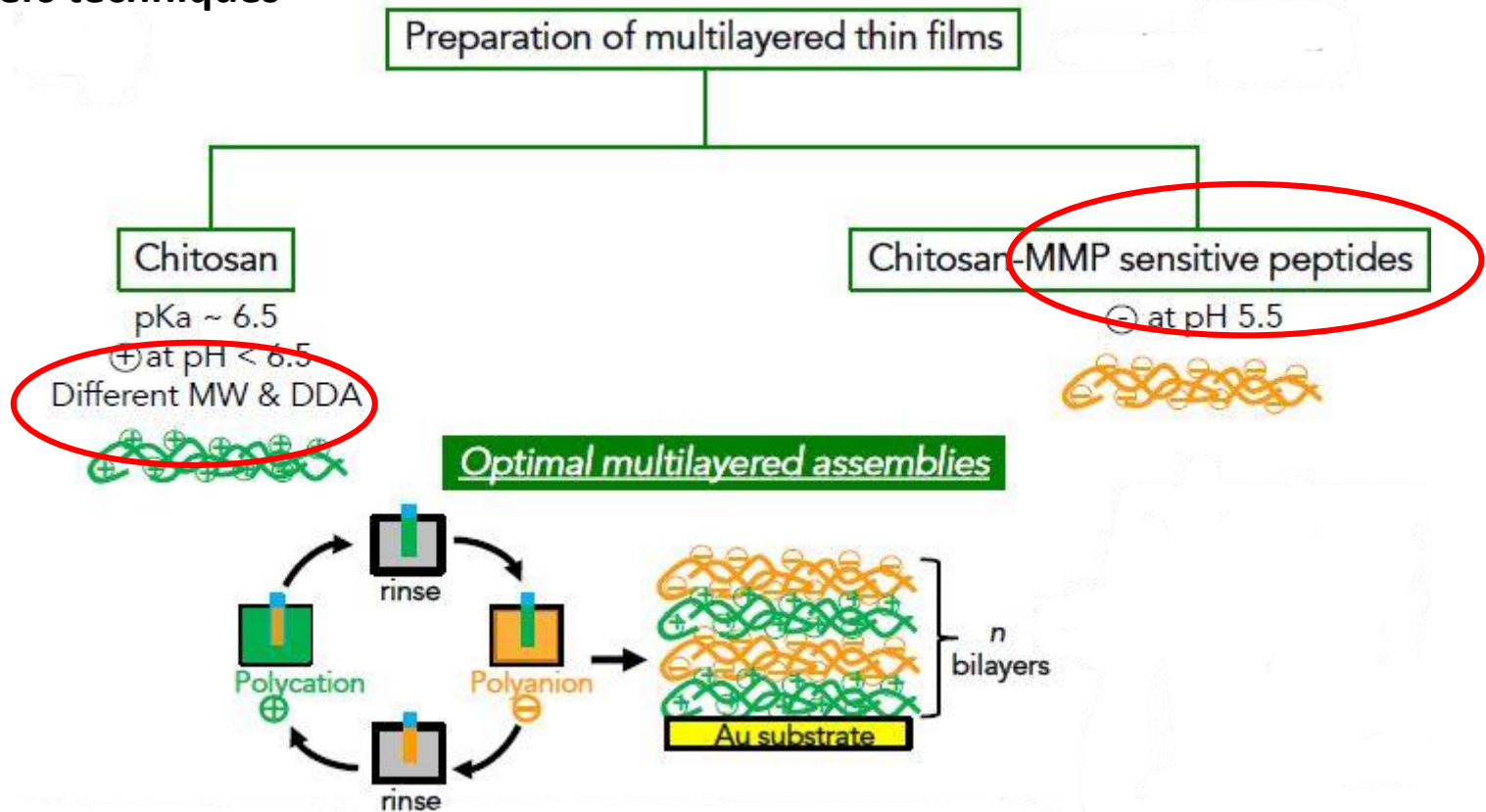
1 EUR



125 EUR

# PROGRESS & ACHIEVED RESULTS

layer by layers techniques



# POTENTIAL IMPACTS AND PERSPECTIVES

## ERA-MBT Roadmap

- “Develop a new generation of therapeutics and other biocompatible materials obtained from marine organisms” (LONG-TERM ACTIONS 2020–2030)
- “Marine bioresources found in some of the most extreme and unique ecosystems on the planet, are rich sources **of novel materials and bioactive compounds** that can help to meet the **demand for improved health and wellbeing**, and support a wide range of other **consumer and industrial applications**”. (Preface Page V)
- “In **search for new** biocompatible materials, the marine is home to a **myriad of biological materials** of interest ....”

# POTENTIAL IMPACTS AND PERSPECTIVES

**Chitosan (CHT)**, obtained mainly through the partial deacetylation of chitin (the most abundant polysaccharide found in the marine world

**2-3 million tons discarded per year** isolated from crustacean shells and shellfish wastes

Features such as **biocompatibility and biodegradability** in the human body and **immunological, antibacterial, bioadhesive and wound-healing activity**

**Can be chemical tailored to meet specific product requirements**

# CHITOSAN

## Chitosan membranes

- Tailored mechanical strength
- Anti-bacterials
- Dual sided properties
  - Bone promoting bottom
  - Soft tissue promoting top
- Drug release systems
  - Chitosan swell when wet
  - Release controlled by enzymes



# CHITOSAN

- MedTech
  - Anti-bacterial
  - Biocompatible
- Chitosan in Wound Care
  - Effective hemostat
  - Ideal product for wound care
  - Helps treating chronic wounds
  - Promotes fast healing
  - Very promising products in development
- Natural fiber
  - Soluble in stomach
  - Gel in intestine
  - Digestive health
- Cosmetics and Personal Care
  - Film-forming
  - Moisturizing
  - Antibacterial
- Dietary supplement
  - Cholesterol & blood pressure
  - Fiber supplementation
  - Weight management

# Acknowledgement



ENGINEERING LIFE GUIDED BY NATURE



UiO  
University of Oslo



HÁSKÓLI ÍSLANDS



universidade  
de aveiro