MARINE BIOACTIVES
FROM SACCHARINA LATISSIMA

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INTRODUCTION

• Inflammatory bowel disorder (IBD) is a term that is mainly used to describe two conditions; Ulcerative colitis and Crohn’s disease

• It is characterized by chronic inflammation of all or parts of the gastrointestinal tract and incidence of IBD has increased across most European countries

• IBD has also been linked with increased risk of developing colorectal cancer – one of the most common gastrointestinal cancers in Europe
During ulcerative colitis, the intestinal barrier function is negatively altered which allows the entry of inflammatory compounds. Immune cells respond to these compounds by producing cytokines which promote inflammation. Medical treatments of IBD are often associated with adverse effects, highlighting the need for alternative therapies.
• *Saccharina latissima* is a brown macroalgae which is found on the lower shore in the North Atlantic.

• Previous research has demonstrated that bioactives isolated from seaweed has potent anti-inflammatory effects.

• The purpose of this research project is to investigate the anti-inflammatory effects of *Saccharina latissima* extracts and their potential role in gastrointestinal health.
<table>
<thead>
<tr>
<th>Bioactive component</th>
<th>Location in the seaweed</th>
<th>Anti-inflammatory effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharides (alginites,</td>
<td>Present in the cell wall</td>
<td>- Supresses the expression of inflammatory genes</td>
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<td>fucoidan, laminarins)</td>
<td></td>
<td>- Reduces the production of pro-inflammatory cytokines</td>
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<tr>
<td>Phenolic compounds</td>
<td>Vesicles of the cells</td>
<td>- Prevents damage to the cells as a result of inflammation</td>
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<tr>
<td>Lipids &amp; fatty acids</td>
<td>Inner &amp; outer surface of the cell membrane</td>
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</tr>
<tr>
<td>Lectins</td>
<td>Outer surface of the cell membrane</td>
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<tr>
<td>Phlorotannins</td>
<td>Component of the cell wall</td>
<td></td>
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AIMS

• To assess anti-inflammatory effects of *crude extracts* of *Saccharina latissima* using an *in vitro* model of gastrointestinal inflammation

• To investigate anti-inflammatory effects of *individual bioactives* contained in crude extracts of *Saccharina latissima* using an *in vitro* model of gastrointestinal inflammation
**IN VITRO MODEL OF GASTROINTESTINAL INFLAMMATION**

- A co-culture system using the intestinal epithelial cell line CaCo-2 and the murine macrophage cell line J774.2 was chosen to simulate gastrointestinal inflammation.
• Co-culture system will be treated with *Saccharina latissima* extracts and stimulated with inflammatory compounds

• Measurement of pro-inflammatory cytokine production through ELISA/RT-PCR will be carried out

• Pro-inflammatory cytokines of interest include:
  • Interleukin 8 (IL-8)
  • Tumour Necrosis Factor α (TNF-α)
ACKNOWLEDGEMENTS

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LOGOS

Funds

Institutes/companies