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Extraction of high value products from seaweed for biomedical applications

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Abstract:

Brown seaweeds are evolutionarily and chemically different from terrestrial plants. They contain many potential high value feedstocks, e.g. carbohydrate polymers (alginates, fucans), aliphatics (sterols, halocarbons), aromatics (polyphenols) and pigments. In recent years, the bioactive of marine compounds are being increasingly recognised in antioxidant, anticancer, anti-inflammatory, anti-tuberculosis, anti-obesity, and anti-angiogenic therapies. For example, fucosterol was previously shown to be the dominant sterol present in *Ascophyllum nodosum* [1], and one of its breakdown products, saringosterol, has shown some tentative evidence for anti-tuberculosis activity [2]. Phlorotannins (polyphenols) have shown some radical scavenging activity [3], which is of interest in reperfusion injuries (e.g. ischemic heart disease). To unlock their full commercial potential, better separation methods are needed to isolate compounds that translate to industrial scale up. This project specifically investigates the potential extraction of high value compounds from *Ascophyllum nodosum* and their potential application in bone therapeutic. The aims of this work include: (1) to optimise suitable “green” methods for the extraction and purification of high value products, e.g. Fucoidan from *Ascophyllum nodosum*, (2) to screen their bioactivity and (3) test the extracts which show activity on cell cultures so their effects can be monitored. Results to date have shown methanol has been used to effectively extract fucoxanthin from *Ascophyllum nodosum*. Other results have indicated that oleic and linoleic acid, respectively, are the two most abundant fatty acids found in *Ascophyllum nodosum*.

References:

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