

## Determining the absorbance maximum ( $\lambda_{\max}$ ) and protein concentration of seaweed extracts

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**Year of Study:** 3, Full-time study

**Level:** Undergraduate

**Name of course:** Pharmaceutical biotechnology

**Presentation type:** Poster

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### **Background**

The emergence of antimicrobial Resistance (AMR) has highlighted the need for novel antimicrobials. Antimicrobial compounds can be isolated from various marine including seaweed which contains pigments or proteins. This study focuses on screening seaweed for potential antimicrobial compounds and, subsequently, their antimicrobial activity.

### **Methods**

Four seaweed types were collected from beaches in Cork, Ireland, and extracts of each were prepared using both methanol and H<sub>2</sub>O. The absorbance maximum ( $\lambda_{\max}$ ) of seaweed extracts was determined from 220 – 800 nm to investigate the pigment interference at 600 nm. The bicinchoninic acid (BCA) assay was preformed to determine the protein concentration of the seaweed extracts prior to testing against bacteria. To determine antimicrobial activity, a test panel including *E. coli*, *A. spot baumannii*, *K. aerogenes*, *P. aeruginosa* and clinical Staphylococci strains was established.

### **Results**

Each of the four seaweed types extracted with H<sub>2</sub>O had a greater  $\lambda_{\max}$  compared to the methanol extractions. Long string H<sub>2</sub>O had a  $\lambda_{\max}$  of 388nm whereas long string methanol had a  $\lambda_{\max}$  of 286nm.

The seaweed samples extracted with H<sub>2</sub>O had a greater protein concentration compared to the methanol samples. Black bush H<sub>2</sub>O had a protein concentration of 1815.10  $\mu\text{g/ml}$  whereas black bush methanol had a protein concentration of 197.05  $\mu\text{g/ml}$ .

### **Conclusion**

The seaweed extracted with H<sub>2</sub>O appeared darker in the 96-well plate compared to the methanol extracts, they also had greater  $\lambda_{\max}$  than the methanol extracts.

The seaweed extracted with H<sub>2</sub>O also had higher protein concentrations compared to the methanol samples. Therefore, the methanol extractions may have removed some of the seaweeds pigment and protein content.