BIV funding grows algae bioprocessing collaboration

BioProNET funding has enabled two teams of scientists with expertise in algal bioprocessing to work together for the first time. Kevin Flynn, Claudio Fuentes-Grünewald and Deya Gonzalez from Swansea University partnered with AlgaeCytes, an SME that is focused on developing and commercializing healthcare ingredients derived from algae.

Each project partner brought a selected strain of algae into the project to compare the bioactivity of certain extracts. Working together using a business interaction voucher funding enabled Swansea and AlgaeCytes to compare functionality of these bioactive properties from their respective algae. "The funding allowed us access to expertise and facilities that were otherwise unavailable to AlgaeCytes as a SME, but growing company," says John Dodd, co-founder of AlgaeCytes.

The focus of the project was algal exopolysaccharides a group of high molecular mass polymers that are secreted by microalgae and typically helps to protect themselves against stress. Exopolysaccharides are known to have antiviral, antioxidant and immunomodulatory activity, and so may have useful medical applications.

The collaborators first established protocols for growing two types of algae under stress conditions in order to maximize exopolysaccharide production. They then used novel downstream bioprocessing techniques to concentrate the exopolysaccharides from large volumes of algal growth media.

Although further studies will be needed to further optimize the production of compounds of interest, the project successfully allowed the collaborators to test the biological activity of exopolysaccharides. "We have encouraging results from preliminary tests of bioactives of algal origin that show their inhibitory activity upon several human cancer cell lines," says Deya. Moreover, the compounds had antioxidant activity on certain cell lines.

"The project has enhanced our research outputs through identification of novel microalgal compounds with potential therapeutic applications," highlights Kevin. The outcomes of this project provide vital proof-of-concept data for grant applications and it is hoped that the data will eventually form part of a patent application as well as supporting publications. "Importantly the project strengthened the relationship between AlgaeCytes and Swansea University for future projects" concludes John.

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Pictures of the two types of microalgae used in this study growing in biofences at the Centre for Sustainable Aquatic Research at Swansea University. Both types of algae produce exopolysaccharides.