



Shanmugapriya Karuppusamy

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| Technology Centre: | FHI (Food for Health Ireland) |
| Academic Mentor: | Professor Colm O'Donnell |
| Company Partner: | Nutramara Ltd |
| Company Mentor: | Stephen Fitzpatrick & Dr. Henry Lyons |

Shanmugapriya received her PhD in Biotechnology from the Bharathiar University in India. She has a proven research track-record in green extraction of natural plant products. She completed an UGC Minor Research Project as Principal Investigator. Her Master's research work programme was targeted on the isolation and screening of hydrocarbon producing *Chlorella* species and optimizing the condition for maximum yield of lipid. She completed postdoctoral research at Pukyong National University in South Korea, where she worked on marine sources based nanomaterials synthesis for wound healing and cancer applications. She investigated both in vitro and in vivo models for laser based therapy and their biomedical applications. Her research interests include analysis of marine green sources for wound healing and cancer targeted research using in vitro and in vivo model. She has published her research work in peer reviewed international journals.

Professor Colm O' Donnell

Prof. Colm O'Donnell is Head of the UCD School of Biosystems and Food Engineering. He also leads the Food Quality and Processing Pillar in UCD's Institute of Food & Health. He has substantial research experience in process analytical technology, food engineering and biorefinery applications. His food engineering research group works on a range of projects funded by EU Framework, Irish Research Council, Food Institutional Research Measure, Enterprise Ireland and industry. He has led UCD's involvement in a wide range of internationally funded research and educational projects including EU Tempus, Lifelong Learning, Comett, Marie Sklodowska-Curie and Alfa programmes. His research outputs include novel sensor characterisation technology for seaweeds and novel seaweed extraction technologies. He was designated as a Highly Cited Researcher by Thomson Reuters based on his rankings within the top 1% highly cited researchers. He is the lead UCD Principal Investigator in the EI DPTC Centre, the H2020 DiTECT project and the H2020 FreshProof project. He was appointed Editor of the International Journal of Food Properties and Associate Editor of Transactions of the American Society of Agricultural & Biological Engineers.

Mr. Stephen Fitzpatrick

Stephen Fitzpatrick is the Co-Founder and Technical Director of Nutramara. He has overall responsibility for development and manufacturing operations and ensures that products are manufactured to the highest quality standards. He also has overall responsibility for all manufacturing operations on site, and is responsible for production on current manufacturing licenses. He has senior experience in quality assurance and quality control of pharmaceutical formulations and ingredients.

Dr. Henry Lyons

Dr. Henry Lyons is a director of Nutramara. He has had a lifelong interest in natural products derived from marine and terrestrial plants and has assisted several coastal communities in setting up enterprises and environmental projects in these areas. His current R&D interests are mainly related to Marine Biotechnology and the development of natural alternatives for food industry.

Food for Health Ireland

Food for Health Ireland (FHI) unites world-class science and food industry know how in one Technology Centre aimed at developing, marketing and selling nutritional ingredients and functional ingredients to improve consumer health and wellness. FHI is a research cluster that unites researchers from multidiscipline programmes (food science, economics, and marketing) in the area of food and health into a single consortium.

Nutramara Ltd

Nutramara is a fast-growing and diversified marine-based functional food company that prioritises sustainability and is focused on developing scientifically validated high-value marine derived ingredients and seaweed formulations. Nutramara actively seeks innovative solutions to meet industry sustainability and innovation challenges, including new marine resources for functional foods/ingredients development to high-class standards.

Host Institution – University College Dublin (UCD)

University College Dublin (UCD) is one of Europe's leading research-intensive universities; an environment where undergraduate education, masters and PhD training, research, innovation and community engagement form a dynamic spectrum of activity. As Ireland's largest university, with its great strength and diversity of disciplines, UCD embraces its role to contribute to the flourishing of Ireland through the study of people, society, business, economy, culture, languages and the creative arts, as well as through research and innovation.

Shanmugapriya's project

“Sustainable Nutraceuticals from Irish Harvested Macroalgae (SunMara)”

Irish Macroalgae is the largest and structurally most complex brown algae in Ireland. In recent years, seaweeds have been used extensively in many applications including nutraceuticals, cosmetics, pharmaceuticals, food supplements, biorefinery and biofuels. This project aims to develop a novel and scalable process for marine polysaccharides, which will facilitate the development and manufacture of new functional foods in a cost-effective and consistent manner, enabling the industry partner to sustainably grow sales and profitability. The project will utilise marine cells as a biological factory that can transform the marine polysaccharides in seaweed into value-added bioactive compounds for potential nutraceutical and cosmetics applications.

The marine polysaccharide is a polymeric carbohydrate that requires a series of treatment steps. In addition, the functional and technological potential of polysaccharides depends on their physiochemical characteristics and structure. The polysaccharides will be characterised for bioactivity in each fraction and a life cycle assessment will also be conducted. The secondment partner, Nutramara will provide seaweed samples and an industry perspective to ensure the relevance of the project.

Marine sources can potentially be exploited for various applications beyond the food industry that can further improve the competitiveness and sustainability of the food industry. This academic and industry collaboration (UCD and FHI) will facilitate the translation of the research results from the lab to industry. The project has the potential to significantly advance current industry practice in the use of marine polysaccharide for health benefits and to significantly contribute to the development of a valuable bioactive compound and circular bioeconomy in Ireland.