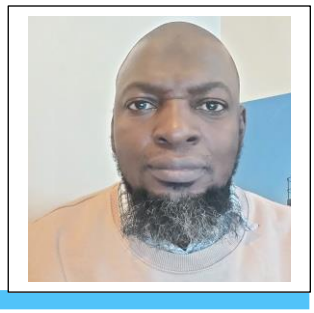
Buliyaminu Adegbemiro Alimi



Technology Centre:	CREST
Academic Mentor:	Professor Jesus Maria Frias Celayeta
Company Partner:	MBio/Monaghan Mushrooms
Company Mentor:	Dr. Kelly Dwyer

Dr. Alimi worked as a senior lecturer in the Department of Food Science and Technology, Federal University of Technology, Minna in Nigeria from 2018-2022. He was also a lecturer in the Department of Food, Agriculture and Bio-Engineering, Kwara State University, in Nigeria from 2013-2014. He had a postdoctoral research period in the School of Bioresources Engineering, University of KwaZulu-Natal, South Africa from 2014-2017. He completed his PhD in Food Processing and Storage Technology at Federal University of Agriculture Abeokuta, Nigeria in 2012, Master of Science in Food Technology at The University of Ibadan, Ibadan, Nigeria in 2003 and a Bachelor of Science at the University of Ibadan, Ibadan Nigeria in 2000.

Professor Jesus Maria Frias Celayeta

Professor Jesus Frias is the Academic Leader of the Environmental Sustainability and Health Institute (ESHI) of TU Dublin. He has over 20 years of research experience in areas which include mathematical modelling of food processes, product natural variability and shelf life of foods, postharvest technology, drying technologies and quality, metabolic profiling, modified atmospheric packaging and quality assurance in food.
ESHI is a partnership of academic (TU Dublin and Ulster University) and non academic (the Health Service Executive and Dublin City Council) organisations. At ESHI, Professor Frias is leading a community of academics that supervise over 100 researchers to create impact in the area of Environment, Sustainability and Health.

Dr. Kelly Dwyer

Dr. Dwyer is a Principal Scientist and has carried out an employment based PhD within MBio. She is an expert in the area of enzyme biotechnology. She has experienced the process of employment based projects firsthand, thus is familiar with the academic requirements for an industry related project. She is skilled in molecular biology and biochemistry techniques. As a key member of the Enzyme team of MBio, Dr. Dwyer is a de-facto mentor to several members of the team. The team participates in the Co-Op programme in University Limerick (UL), whereby undergraduates complete eight months in industry. Undergraduates are trained in all aspects of working in an industrial enzymology research setting. In their final months, students are given their own research project under her supervision.

CREST

The **CREST** Centre is the only dedicated surface coatings laboratory on the Island of Ireland. It exists to serve the SMART economy by means of translating in-house fundamental knowledge from the bench-top to the market. The CREST model relies on an expert and professional coatings consultancy service to front-face its activity. Companies with a commitment to develop an innovative technical capability, recognise the capabilities in the Centre and in time view the Centre as an extension of its own R&D capability. The Centre has over sixty years of commercial surface coating experience to provide this level of service. CREST recruits and develops industrial development scientists with a product development background operating within an ISO 9001 Quality Management System to guarantee consistent and reliable project delivery.

Monaghan Mushrooms/MBio

Monaghan Mushrooms is a vertically integrated agribusiness, meaning that the company is involved in all aspects of the mushroom-growing process. Over the last forty years, the company has grown to become one of the largest mushroom producers in the world, supplying five out of the world's top 10 grocery retailers.

MBio, formerly Monaghan Biosciences, is a subsidiary of Monaghan Mushrooms. Launched in 2012, MBio now has a team of 60 including 16 personnel with PhDs who carry out the research and development for Monaghan Mushrooms and other clients. In terms of training and development of research staff, MBio has acted as employment partner to two post-doctorate researchers, four employment based PhD students and two employment based masters' students. Two core areas of MBio's research focus include industrial enzymology and creating value added products from the waste streams of the mushroom growing process, and thus the core research focuses of the company partner are aligned with this project.

MBio is a member of several international biotechnology consortia, including Biobased Industries Consortium, FUNGUSCHAIN and BIOrescue. MBio has collaborations and receives supports from University College Dublin (UCD), BEACON Bioeconomy Research Centre and Monaghan Institute. MBio is a client of Enterprise Ireland.

Technological University Dublin - TU Dublin

TU Dublin boasts a state-of-the-art infrastructure with facilities and fully equipped laboratories relevant to the current research. High research outputs, high quality research and highly cited papers, especially in the area of food, are some of the factors that put TU Dublin as a well sought after research destination university. It provides a high quality environment and infrastructure to support research projects, including the Directorate of Research and Enterprise, Environmental Sustainability and Health Institute, Graduate Research school, research finance facilities, technology transfer office and funded research centres.

Buliyaminu's project

"Application of new food packaging materials from the bioeconomy: Bioactive films from potato and mushroom by-products"

Plastic packaging that is commonly used by the food industry is not environmentally friendly as it contains chemical ingredients that are not biodegradable. They also present economic (rising oil price, depletion oil and gas resources, high cost of recycling) and human health safety (due to toxic constituents) challenges. The food industry generates a lot of waste which is sometimes used in animal feed or simply disposed of and ends up in landfill. Economic loss from this waste is put at about US$1 trillion. However, food waste contains natural ingredients that makes them suitable for packaging to replace the more harmful chemical-based synthetic plastic.

This project aims to develop packaging using ingredients obtained from potato peels and mushroom waste, the often ignored byproducts of potato and mushroom processing, respectively. These materials have enormous potential to be used as natural, healthy, and safe ingredients in a food system. Packaging films will be developed using a technology that offers continuous operation, reduced production period and lower energy consumption. This ensures higher productivity that makes commercial large scale production of films attractive.

Potential applications of the films will be assessed by testing them on mushrooms and vegetables known for their packaging challenges under different storage conditions to mimic retail holding and exportation. The sustainable production and introduction of the developed films to the market will contribute to a decrease in waste generation, cleaner environment, and an increase in consumption of healthy foods. The novel concept will also contribute to develop a new business opportunity for the industry, local producers and farmers and will ultimately contribute to the post-BREXIT/COVID19 Irish economy.