



SAURAV Kumar Guinn

Technology Centre:	DPTC - Dairy Processing Technology Centre
Academic Mentor	Dr. Eithne DEMPSEY; National University of Ireland Maynooth
Company Partner:	Glanbia Ireland DAC
Company Mentor:	Dr. Fergal Lawless

Dr. Saurav Kumar Guin is a former scientist of Fuel Chemistry Division in the Bhabha Atomic Research Centre, Department of Atomic Energy, India and a former faculty of Chemical Sciences in the Homi Bhabha National Institute, Mumbai, India. He has published 20 peer-reviewed articles (12 first-author and 10 corresponding author) in international journals and 41 other scientific publications. His field of research is mainly focused into electrocatalysis, electroanalysis, electrodeposition/electroplating, chemical- and bio-sensors. Apart from the MSCA Career-Fit PLUS fellowship, Dr. Guin is recipient of other international awards/funding including Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) - Indian National Science Academy Bilateral Research Exchange Fellowship-2016, Institutional fellowship in National University of Singapore, Singapore 2009, several travel grants and presentation awards in the international conferences in United Kingdom, Mexico and India. Dr. Guin served as the Secretary of the Indian Society for ElectroAnalytical Chemistry for six years (2010-2016) and continuing as one of the Executive Committee Members of this national academic society. He has successfully organised 7 international electrochemistry conferences in the capacity of the Secretary (in 3 conferences) and Convener (in 4 conferences) at different locations in India. He is the co-editor of 7 proceedings of international conferences and 6 bulletins of the academic society. In addition to a regular peer-reviewer of reputed international journals, he was the leading Guest Editor of the Special Issue "EIHE-2020: Spectrum of Electroanalysis in India" published in the international peer-reviewed journal ELECTROANALYSIS (WILEY) in Volume 32, Issue 11, 2020

Dr. Eithne Dempsey

Dr. Eithne Dempsey is Associate Professor in the Department of Chemistry, Maynooth University. She is a leading researcher with more than 20 years' experience in research delivery and supervision resulting in 90+ research publications in reputed journals with H-index 29, industrial co-operation and successful management of national and international research projects. Her research focus lies in the design and fabrication of integrated (bio)sensor microsystems, which exploit the unique properties of electrocatalytic and nanomaterials for deployment in agri-food applications, biodiagnostics and environmental analysis.

Dr. Fergal Lawless

Dr Fergal Lawless is part of the R&D process development team at Glanbia Ireland. He has a strong background in biochemistry, molecular biology, biotechnology, and dairy chemistry and processing. He has significant experience in commercialisation of research and innovation from ideation to product launch.

National University of Ireland Maynooth (Maynooth University)

Maynooth University is one of the four constituent universities of the National University of Ireland and is located in Kildare, Ireland. It holds 88th rank among the global top universities under 50 years old in the Times Higher Education World University Rankings in 2021. Maynooth University is recognised among the top 200 European universities and 350 universities in the world. It is a modern institution, dynamic, research-led, engaged, and grounded in the traditions of liberal education, spanning humanities, education, social science, science and engineering.

Dairy Processing Technology Centre DPTC

DPTC is a centre of excellence for dairy processing research and innovation, providing the Irish dairy sector with world class research and innovation capabilities as well as human capital and expertise through knowledge transfer and training activities. The DPTC translates learning and know-how from other industrial sectors to the Irish dairy sector.

Glanbia Ireland DAC

Glanbia Ireland DAC is one of the largest milk processing companies in Europe, having a world class integrated agri-food and nutrition business, with a diverse portfolio of quality ingredients and leading consumer and agri brands.

Saurav's project

Saurav's project "IN-STANT: Infant Nutrition – Sialic Acid Electronic Tongue"

Free sialic acid and sialyllactose are important constituents of human milk having potential benefit in the growth of brain and central nervous system of infants. Sialyllactose is also important for gut health for infants by protection by gastro intestinal infection. Any deficit of these constituents has a profound effect on brain development, particularly in the case of premature babies. This puts immense demands on nutrient supply through infant and follow-up formula. In contrast to human milk, bovine milk contains few free sialic acids with sialyllactose as the main component. This has important implications for the effective formulation of infant milk formula particularly for preterm infants.

This project aims to simplify the current measurement approaches to sialic acid determination in dairy ingredients, infant milk formula and nutritional supplements. Sialic acids and sialyllactose will be determined in dairy streams during processing and in dairy ingredients. This will be achieved using small electronic devices designed to detect the sialic acid species following release from its biological "anchor". A smart material will be designed on a disposable strip for a screening system suitable for rapid and reliable testing of sialic acids in complex matrix.

The outputs of this projects are of relevance to women and mothers in relation to baby nutrition, while certain sialic acid species are found at high levels in the body in the case of certain cancers, thus impacting on human health and society generally.