TEAGASC PHD WALSH SCHOLARSHIP OPPORTUNITY

“Assessing the Seasonal, Genetic, Nutritional and Environmental parameters required for optimum production of Bovine Milk Oligosaccharides”

Walsh Scholarship Ref Number 2020044

Background
There has been an array of beneficial effects and functional properties associated with oligosaccharides from human breastmilk (e.g. prebiotic, anti-infective, immuno-modulatory and enhanced cognitive function), regardless if present in free form or attached to proteins or lipids. Considering this, it is important to innovate and develop the means to naturally enhance the concentrations of these valuable sugars in alternative sources such as bovine milk with the aim of improving infant formula when breastfeeding is not possible. As levels of oligosaccharides in bovine milk are low compared to breast milk, any strategy which can improve the yield and composition of cow milk oligosaccharides will ultimately facilitate the sustainable large-scale extraction of oligosaccharides from bovine milk and its whey derivatives. The OPTI-OLIGO project aims to gain a thorough understanding of the factors that modulate regulation of bovine milk oligosaccharide composition. Factors which may be expected to influence oligosaccharide expression in cows such as seasonality, genetics, feeding, age and parity, stage of lactation and disease state will be assessed. Due to the non-invasive nature of milk somatic cell sampling, this protocol can be used by Teagasc to sample cows for the expression of glycosylation-related genes in milk using RNA-Sequencing. The levels of key enzymes involved in oligosaccharide synthesis and proteins with putative glycosylation sites can also be profiled using label-free proteomics. Milk oligosaccharide levels in the various milk samples will be profiled using established HPLC methods in order to validate the expression levels indicated by transcriptomic and proteomic profiling. Such knowledge may lead to an informed breeding and management regime for the production of milk with higher diversity and concentrations of oligosaccharides. This in turn may result in further value added diversification of the ever increasing milk pool through generation of oligosaccharide ingredients that have potential to match the specific needs of target groups such as infants or immuno-compromised individuals.

The VistaMilk SFI Research Centre represents a unique collaboration between Agri-Food and ICT research institutes and leading Irish/multinational food and ICT companies. The Centre is hosted by Teagasc, the national agency with responsibility for agriculture and food research, in partnership with the Tyndall National Institute, Ireland’s national microelectronics institute, the Telecommunications Software & Systems Group (TSSG) at Waterford Institute of Technology and the Insight Centre for Data Analytics (at UCD, NUIG, DCU). VistaMilk is funded by Science Foundation Ireland (SFI), the Department of Agriculture Food and the Marine (DAFM) and the European Regional Development Fund (ERDF). Access to extensive proteomic expertise and instrumentation are facilitated through Maynooth University for this project. The successful candidate would be based mainly at Teagasc Food Research Centre, Fermoy, Co. Cork but would also spend time at Maynooth University.

Requirements
Applicants should have a good primary degree (First or Second Class Honours) or M.Sc. in Genetics, Biochemistry or related discipline. The successful candidate should be highly self-motivated, interactive and willing to learn new techniques. The Walsh Scholar will take part in wider VistaMilk Centre activities such as annual conference, relevant Masterclasses and workshops and Education and Public Engagement activities. A minimum level of competency in English is required. Please see the following link with regard to English Language requirements: https://www.maynoothuniversity.ie/study-maynooth/postgraduate-studies/courses/phd-biology

Award
The Teagasc Walsh Scholarship funding is €22,000 per annum and includes University fees of up to a maximum of €6,000 and is tenable for 4 years.

Further Information/Applications
Contact Dr Rita Hickey, Teagasc Food Research Centre, Fermoy Co. Cork. rita.hickey@teagasc.ie or Dr Rebecca Owens, Maynooth University, Maynooth, Co Kildare, Ireland. rebecca.owens@mu.ie

Application Procedure
Applicants should submit a CV and covering letter detailing their qualifications, experience and contact details for at least two referees simultaneously to Dr Rita Hickey at rita.hickey@teagasc.ie and Dr Rebecca Owens at rebecca.owens@mu.ie.

Closing date for application
5 pm on Friday June 12th 2020