



Queen's University
Belfast

Institute for Global
Food Security

NEWSLETTER JUNE 2016

WELCOME

Welcome to the current edition to the IGFS news letter. The activities illustrated within show the commitment of IGFS in helping to address the societal challenges on issues regarding foods, by both our staff, students and industry partners. Within the newsletter are detailed: our very successful Primary Food Science Event where primary school children engage with food science research; through to how our PhD students are travelling the world to learn new scientific techniques; and to the reporting of our Annual Lecture and Agricultural Technology Symposium where our BSC students impressed the local food industry on issues surrounding sustainability of the agri-food sector. The invited speaker for the Annual Lecture was Patrick Coveney, CEO Greencore plc., who gave a fascinating overview regarding building a global food company - Professor Andy Meharg

Renowned food safety expert appointed to lead the Institute for Global Food Security



A world-leading expert in animal agriculture and associated supply chains has been appointed Director of Queen's Institute for Global Food Security. Professor Nigel Scollan will take up the post on 1 September 2016.

Welcoming Professor Scollan to Queen's, Professor Chris Elliott, Pro-Vice-Chancellor of the Faculty of Medicine, Health and Life Sciences, said: "Professor Scollan has a strong track record in agricultural and food research and knowledge exchange. I look forward to

working with him as we seek to build on the Institute's international reputation for excellence in food security research and teaching.

"Food security is a global challenge that permeates human health, sustainable economic development, environment and trade. Under Nigel's leadership, the Institute's cutting-edge research will continue to play a valuable role in developing solutions to the complex problem of delivering safe, nutritious, sustainable and authentic food

supplies to the world's rapidly growing population".

Professor Scollan said: "I am delighted to be joining Queen's Institute for Global Food Security and I look forward to working with staff, students and stakeholders to help address the significant challenges and opportunities in agriculture, food and health."

Professor Scollan graduated in animal science from the University of Edinburgh and conducted his PhD, also at Edinburgh. Professor Scollan then undertook a two-year postdoctoral at University of Guelph. In 1993, he took up a research scientist position at Institute of Grassland and Environmental Research (IGER). In 2008, IGER, merged into Aberswyth University as part of the Institute of Biological Environmental and Rural Sciences (IBERS) to form one of the largest groups of academics and support staff in the UK focusing on plant, animal, environment and land based sciences. Professor Scollan held a number of senior management positions in IGER and IBERS. Most recently, Nigel was Waitrose Professor of Sustainable Agriculture and Director of Enterprise at IBERS.

IGFS Annual Lecture hosted in partnership with the Agricultural Technology Symposium at Riddel Hall

Over 170 people attended the annual IGFS lecture in association with Bank of Ireland UK which was chaired by agricultural journalist Richard Wright.

The overall theme was “sustainability of the agri-food sector” and Patrick Coveney, CEO of Greencore plc, gave the keynote speech. While emphasising the importance of product safety, quality and innovation in growing a global food company, he also gave some insights into his beliefs on the importance of education, and the use of global business as a tool for social good.

Other presenters included incoming chair of Northern Ireland Food and Drink, Declan Billington, who outlined a roadmap for building a sustainable NI agri-food sector. He stressed the importance of protecting the family farm, and of acknowledging and rewarding the positive environmental and societal impacts of farming in Northern Ireland. He also emphasised the need to consider



Pictured; Patrick Coveney, Chief Executive Officer of Greencore Group Plc

environmental emissions from farming in the context of overall levels of productivity, and to strive to maximise efficiency in production methods.

Following the theme of sustainability, Pro-Vice-Chancellor Professor Chris Elliott spoke of how the Institute for

Global Food Security at Queen's is contributing to a pioneering and innovative agri-food sector in NI through its research and teaching programmes. Professor Elliott also outlined the key research themes and challenges which the Institute are addressing and formally announced a new recruitment programme that will seek to hire world-leading academics and researchers to actively contribute to IGFS's role as a QUB Global Research Institute.

Representing his class, final year Agricultural Technology student Daniel Knowles also took to the podium to outline the positive ways in which new graduates can contribute to sustainability. These related to the enhanced knowledge of agri-food systems acquired over the course of the degree programme, but also to the broader development of skills in creativity, team-working and entrepreneurship.



Pictured; final year Agricultural Technology students at Riddel Hall

All change for the *safefood* Knowledge Networks

In 2011, **safefood** established a number of collaborative arrangements called 'Knowledge Networks' (KN) that created and augmented scientific cooperation and linkages across the island between food safety professionals throughout the whole food chain. The networks helped facilitate greater knowledge sharing by those involved in all parts of the food chain to support and enhance food safety.

From 2016 onwards, **safefood** intends to build on the compelling strengths and solid successes of the 2011-2015 programme. The KNs are a strong foundation upon which **safefood** can continue to promote its legislative mandate and ethos of promoting food safety right across the Island of Ireland food supply chain.

A new Knowledge Network concept will be delivered during 2016-18 by means of a food sector-based single Network instead of the present model of specific pathogens/chemicals. The new Knowledge Network intends to focus on the following Sectors for a three year period; Dairy, Poultry & White Meat, Red Meat, Fresh Produce, Fish & Shellfish and Animal Feed. The new framework will cover a wide variety of food safety topics which will be prioritised on the basis of their impacts on public health and the wider food chain. These will include

chemical and microbiological food safety, food production and processing issues, food fraud, new food safety innovations, as well as broader topics which may impact on food safety, including trade and economic issues, climate change and sustainability.

A new Expert Group will work collaboratively to direct the new KN at a strategic level and determine priorities for the Network. **Mr Michael Hills** has

been appointed as the Knowledge Network Manager.

The Network is expected to go live in June 2016 and all existing KN members will retain their membership. Members of the Food Allergy and Food Intolerance Network have been invited to join the new Network where a specific Food Hypersensitivity Portal has been created. Further details about the Network and confirmation of the Expert Group will be announced in due course. **Sign up here**



Prof Meharg project to reduce arsenic in Bangladeshi rice

Professor Andy Meharg travelled to the Bangladesh Agricultural University (BAU) under the auspices of a collaborative project funded by a Nestle Foundation grant. Bangladeshi's have the highest per

capita consumption of rice globally, and their rice, as for many other countries, is high in inorganic arsenic, a human carcinogen. Bangladeshi's like their rice parboiled, where un-husked rice is

pre-soaked, then briefly boiled, dried, dehusked and milled. This process alters the starch in the endosperm to give a desired textural property, kills off insect pests and helps with storage, and limits the number of grains broken through milling. As we already know that inorganic arsenic in rice was quite mobile the Nestle project set out to see if parboiled could significantly reduce arsenic at the processing stage, thus making lower arsenic rice widely available.

Andy was shown around small- and large-scale milling plants by the BAU collaborators Mahmud Sumon and Rafiq Islam, including a par-boiling plant (pictured) specially altered so that we could experiment on the processing of rice.



Primary Food Science Event hosted by IGFS

Primary Health Sciences (PHS) supported by Queen's University Belfast and the Wellcome Trust, is a programme which aims for scientists from the universities and industry to help develop primary teachers' and pupils' interest and appreciation of the biological sciences and link their application to everyday life. The scientists act as inspiring role models, and help the pupils identify potential careers in the food sciences. **Dr Lisa Connolly** (IGFS) is a key participant in the PHS programme, visiting primary schools, talking to pupils and introducing them to science. Being keen to nurture pupils' interest in the sciences, Lisa developed an associated conference whereby the primary school pupils could experience the science environment at University. The QUB event aims to give valuable insight to pupils who may hold negative misconceptions about university life or consider university out of their reach. It also allows the student to meet and converse with "real life scientists" demonstrating the importance of scientific research and its relevance to everyday life. The QUB event, held for the second time on Thursday 19 May 2016, proved to be an overwhelming success. Pupils were invited to present their PHS project within a lecture theatre environment, in front of an invited audience of scientists, industrialists, policy makers, parents and teachers. Excellent presentations were confidently given by the pupils, supported by their teachers who had also put tremendous effort into making science education an innovative and fun experience. The pupils were also given tours of the Institute laboratories by research staff and students where they experienced fun but



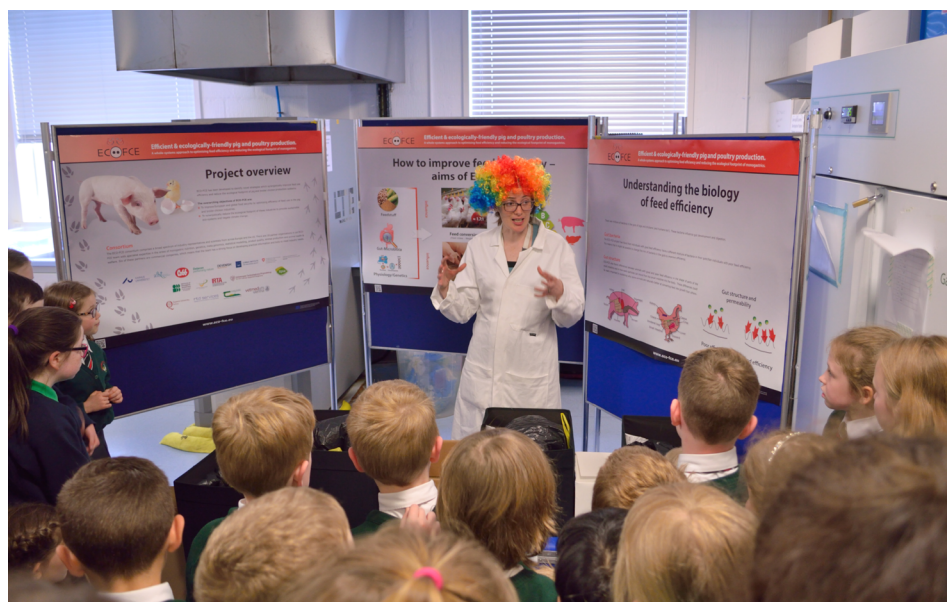
very practical demonstrations of some research behind the food we eat.

A video of the event is available to view by clicking [here](#)

Our thanks to all the staff, students, teachers, classroom assistants and parents that contributed to such a successful and informative day. Our thanks also to **safe food** and the Henderson Group for their support

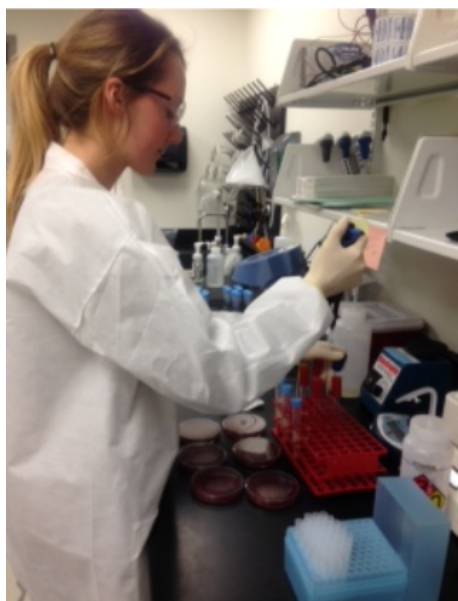
Participating schools;

Andrews Memorial Primary School
Dundonald Primary School
Fairview Primary School
St. Eunan's National School
St. Finian's Primary School
St. John's Primary School



Students from the School of Biological Sciences make their mark internationally through work experience abroad

The School of Biological Sciences at Queen's operates a diverse work placement programme and each year students gain experience with a host of employers working in a range of sectors. A number of our undergraduate students undertaking placement are currently gaining some invaluable experience abroad, in 2015 almost 30% of students gained experience outside Northern Ireland. Students undertaking international experience can greatly enhance their employability through developing increased independence and confidence. Graduates now seek employment in an increasingly globalised market place and international experience leaves our students well positioned to compete. Here a couple of students explain a bit about their experiences and motivations for undertaking experience abroad.



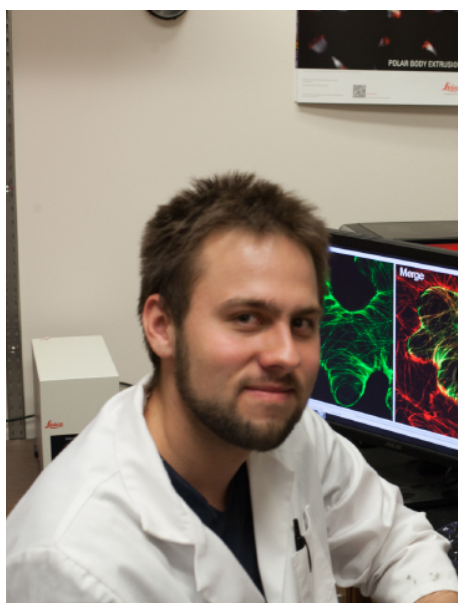
Lianna McGeary

Lianna McGeary - BSc Hons Degree in Food Quality, Safety and Nutrition with Professional Studies

Placement: US Department of Agriculture - Eastern Regional Research Centre, Philadelphia

My placement is based in the Eastern Regional Research Centre (ERRC), one of four government funded Regional Research Centres in the Agricultural Research Service (ARS). I am specifically based within the Food Safety and Intervention Technologies unit. My role as a visiting scientist, has involved contributing to a variety of projects related to validation of interventions and processes to control pathogens in foods, with an emphasis on developing chemical and physical interventions to control Shiga toxin-producing *Escherichia coli* in raw, further processed, and/or fermented beef products.

My time here at the ERRC has allowed me to expend my expertise in food safety, specifically, to compare and contrast the variations in food policies and regulations established here in the U.S and in the EU. This international experience is one which will prove to be invaluable for my future career as a food safety professional and I have loved every moment of it. The opportunities that stem from this experience are ample; having met so many people and professionals from all over the country, while also attaining the opportunity to learn various cultures and sharing my own



Rafal Kacprzyk

Rafal Kacprzyk – BSc Biochemistry with Professional studies

Host Institution – Washington State University

Washington State University is a land grant organisation committed to developing research. As part of Institute of Biological Chemistry our lab is focused on sub cellular processes in plants; mainly cytokinesis. My role for this placement is to carry out experiments in order to identify and characterize novel proteins responsible for cell division in plants. Recording movies of live cells using confocal microscope allows me to accomplish my task. Furthermore, use of chemical genetics and CRISPR/Cas9 helps me to understand the role of the protein in greater detail.

On my placement I was exposed to many techniques and different kinds of equipment, my favourite of which is the confocal microscope. Collaborating with people in different laboratories allowed me to appreciate the breadth of research carried out abroad and those collaborations allowed me to network, which will be useful in my future career. It's been an amazing experience to date and the work culture in the US has been a real eye opener for me!

If your organisation is interested in establishing a relationship with our undergraduate work placement programme please contact **Mark Gallagher** at m.gallagher@qub.ac.uk or on **LinkedIn**

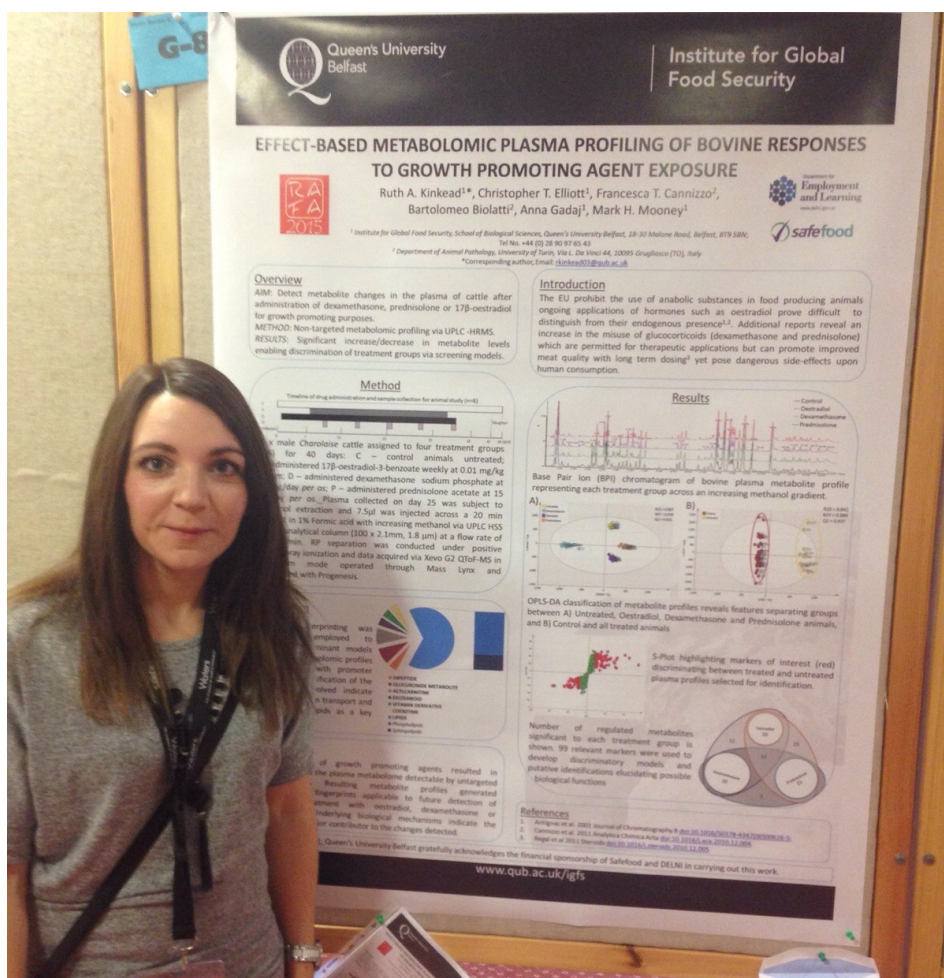
RAFA 2015 - A PhD Student's Perspective

The highly anticipated 7th International Symposium on Recent Advances in Food Analysis of 2015 was hosted in Prague, jointly by the University of Chemistry and Technology (Czech Republic) and RIKILT Wageningen UR (Netherlands) was attended by a large number of staff and students from IGFS with seminars contributed by Prof Chris Elliott, Olivier Chevallier and Rachel Clarke alongside posters presented by Simon Haughey, Ewa Wielogorska, Anna Gadaj, Ruth Kinkead, Daniel McDowell, Claire Mc Vey, Connor Black and Roberta Bajo. As always, the conference drew a wealth of attraction from experts across the EU and further with more than 800 delegates from 65 countries in attendance.

The program consisted of presentations by prominent scientists concerning the use of bioanalytical methods for food control, food quality, food allergens, food authenticity and fraud, food contaminants and residues, food analysis, toxins analysis, and omics approaches in food analysis. In addition there were a series of workshops and seminars introducing innovative instrumentation technique whilst networking opportunities were provided through social events.

The symposium series began with a plenary session dedicated to recent issues and novel technologies for food related analysis. This was led by the founder of rapid evaporation ionization mass spectrometry (REIMS) Prof. Zoltan Takats who proposed his instrumentation as a novel and rapid screening method in a range of applications. Prof. Chris Elliott proceeded to outline the complexities surrounding 'Food Fraud', demonstrating the elaborate opportunities for occurrence within the food supply chain and the need for innovative approaches to combat occurrence.

This paved the way for Paul Brereton and Petter Olsen's campaign for 'common sense' approaches to tackling today's growing food concerns. Committed to the EU funded Food Integrity Project, they demonstrated how 'Citizen Science'



is establishing a medium for simple sample collection and called for a move away from analytical chemistry investigation towards addressing the paper trail of errors with numerical reasoning and social media connections.

Leading scientists then took to the stage to reveal the advanced capabilities of ambient mass spectrometry and spectroscopic techniques as powerful tools for non-destructive sampling and offline screening procedures. Prof. Michel Nielen presented colourful work on laser-ablation electrospray ionization in the detection of fruit contaminated with pesticides. The workshops and tutorials facilitated interactions and discussions across method development and generated a large interest in novel mass spectrometry techniques for untargeted analysis

The symposium provided a unique opportunity to present results to experts within the food analysis sector and

generated interest for future research purposes. The setting within such an historic city provided ample opportunity for interactive engagement and knowledge sharing.

With the help of the **safeFood** Training and Mobility Programme Ruth Kinkead presented research entitled, "Effect-based metabolomic plasma profiling of bovine responses to growth promoting agent exposure," within the topic of 'FoodOmics' and successfully won a top poster prize contributed by Waters and RESTEK alongside Simon Haughey who was awarded for his poster, "A comprehensive strategy to detect the fraudulent adulteration of oregano" by CAMO Software Inc. within the remit of Authenticity, Traceability and Fraud.

An article by PhD Student Ruth Kinkead

An update from the IGFS endocrine disruptor research cluster

A number of ground breaking studies have recently been published by the Institute for Global Food Security's endocrine disruptor research group led by **Dr Lisa Connolly**.

Jodie Wilson recently passed her PhD viva with excellent commendations for her published studies examining whether real life exposure mixtures of persistent organic pollutants (POPs) can interact with the mammalian stress response via the glucocorticoid receptor (*Toxicology Letters* <http://dx.doi.org/10.1016/j.toxlet.2015.11.014>) and/or induce cytotoxicity in liver cells associated with the body's detoxification process (*Toxicology and Applied Pharmacology* <http://dx.doi.org/10.1016/j.taap.2016.01.001>).

This work, in collaboration with the Norwegian University of Life Sciences, aims to further progress on the risk assessment of real life exposure to POPs and their mixtures.



Pictured; PhD student Jodie Wilson

Topically timed with the introduction of the new sugar tax, final year PhD student **Maeve Shannon** has recently highlighted the necessity to be cautious in replacing sugar with "supposedly safe" natural sweeteners such as Stevia, having published its potential to act as an endocrine disruptor via steroid nuclear receptors and steroidogenesis

(*The Journal of Molecular and Cellular Endocrinology* <http://dx.doi.org/10.1016/j.mce.2016.03.005>).

This study was also supported by researchers from the University of Copenhagen, world leaders in male reproduction, to highlight that Stevia may also affect male fertility via disruption of sperm motility.

Update from the QUB Foodies Society

Following QUBFoodies successful first semester work we began the New Year with invigorated enthusiasm in light of our growing support. From our weekly blogs on various aspects of health and food science to planning our first ever formal in conjunction with QUB Biological Sciences, held in March 2016 at the Europa Hotel which was attended by over 230 people, we have certainly had a busy few months!! Additionally we also provided advice to current Queen's staff members engaged in a healthy eating/weight loss fundraiser for Cancer Focus called £ for lb., as well as linking up with the Institute of Food Science and Technology to promote the importance of Food Science for students and staff alike; additionally we are also delighted to now be working with QUB Campus Food and Drink to undertake a series of initiatives within the coming months, including a possible cooking/healthy eating guide to new incoming students. At present we have over 300 followers and have just been shortlisted for QUB Student's Union Best New Society Award to be announced at the end of April... so fingers crossed!! We would like to thank everyone for their support thus far and hope that when the next committee takes over in the forthcoming academic year QUBFoodies will continue to grow from strength to strength. If anyone would like more information then please do not hesitate to contact us at nutrition-soc@qub.ac.uk or follow us on Facebook under **QUBFoodies**.



Student and Staff News

PhD student **Elaine Cowan** recently had a paper accepted in *Metabolomics* demonstrating how metabolite profiling can be used to elucidate the function/action of a relatively uncharacterised hormone. The paper entitled: "Treatment of lean and diet-induced obesity (DIO) mice with a novel stable obestatin analogue alters plasma metabolite levels as detected by untargeted LC-MS metabolomics" will be published online shortly.

Dr Brian Green and **Dr Irene Grant** and post-doc **Dr Danielle Calderwood** had a paper accepted by *Journal of Functional Foods*. The paper, entitled "Identification of lactic acid bacteria strains modulating incretin hormone secretion and gene expression in enteroendocrine cells" has established that the gut microbiome influences the release of our gut hormones. The paper can be viewed [here](#)

Dr Claire McEvoy (Beeson-CARDI career development Research Fellow) was awarded a Wellcome Trust Seed Award in Science (18 months) in April to support her fellowship research programme 'Mediterranean diet and cognitive decline: using epidemiologic and pilot study data to inform a large-scale intervention.' This was followed in May by an ARUK Pump Priming Award to support an international research visit to Professor Kristine Yaffe's lab, University of California San Francisco (UCSF), to work on a project to investigate Mediterranean diet adherence and neuroimaging-assessed cognitive decline in The Health Aging and Body Composition Study (Health ABC).

Dr McEvoy will be taking up a 12 month visiting research fellow position at Prof Kristine Yaffe's lab, UCSF. Prof Yaffe is a world-leader in cognitive ageing and dementia research. This collaboration will bring together researchers from QUB and UCSF to advance knowledge on how diet may contribute to cognitive health.

PhD student **Anna Gillespie** published a paper in *Food Chemistry* where she characterised in detail the effects of casein proteins on enteroendocrine (intestinal) cells. The paper can be viewed [here](#)

Can you spare 15 minutes to complete a survey? Queens University Belfast in conjunction with University College Cork is conducting the study 'Food security for the food sensitive consumer on the island of Ireland' funded by **safe food**. We are looking for participants to help us to make food products safer and labelling more helpful and informative, we need your opinions and thoughts as a consumer who:

Experience adverse reaction(s) to some food themselves,

AND / OR

Following an avoidance diet either or as a life choice

AND / OR

Are a parent to a child who experiences adverse reaction(s) to some food.

To complete the survey please [click here](#)

Dr Mark Robinson has secured a BBSRC Industrial Partnership Award for his application entitled "Rumen fluke in cattle and sheep: measuring impacts and improving diagnosis".

Dr Mark Robinson (IGFS lead investigator) will work alongside Dr Aurelie Aubry, Dr Jason Barley & Dr Marijtje Speijers (AFBI-based co-investigators). The project also includes industry partners AgriSearch, AHDB Beef & Lamb and Linnodee Ltd. The grant is expected to be in region of £600,000

In April, **Désirée Schliemann**, final year PhD. researcher based at CPH and supervised by Prof Jayne Woodside and Dr Michelle McKinley, attended the Essentials European Nutrition Leadership Programme (ENLP) in Luxembourg. The programme brought 32 young European professionals from academia and industry together to equip them with essential skills in communication, leadership, strategic influencing and interpersonal skills. Désirée was also one of three winners at the newspaper writing competition set out by ENLP. She strongly recommends the programme to any PhD. or postdocs studying food science or nutrition.

Dr Lisa Connolly has secured funding as Coordinator of a 4 million Euro Marie Curie Innovative Training Network

entitled **PROTECTED, PROTECTION** against Endocrine Disruptors; Detection, mixtures, health effects, risk assessment and communication. The project involves internationally leading collaborators (research and SMEs) from the UK, Norway, France, Belgium, The Netherlands, Spain, Chile and India.

Post-doc **Dr Xiaobei Pan** and **Dr Brian Green** had a paper accepted in *Neurobiology of Aging* which describes for the first time how Alzheimer's disease pathology longitudinally affects the blood and brain metabolome. Rather unexpectedly the changes were transient (and not progressive). The paper can be viewed [here](#).

Dr Tony Benson has joined the Institute as a Research Fellow. He will work with Dr Moira Dean on a **safe food** funded project, examining the impact of nutrition and health claims on perceptions and consumption of food. Tony recently completed his PhD with Ulster University and prior to this obtained his MSc Health Psychology degree from Ulster and BSc Psychology degree from QUB. Tony's research interests span both physical and mental health and wellbeing, including attitudes to health and health behaviours, behaviour change, health services, and suicide.

If you have an article, research announcement or staff/student news you would like to see featured in the next IGFS Newsletter then please email Michael Hills at m.hills@qub.ac.uk.

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