



**Alimentary Pharmabiotic Centre**  
Mining Microbes for Mankind

# GUT REACTION

NEWSLETTER OF THE ALIMENTARY PHARMABIOTIC CENTRE

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Volume 6 No. 1 summer 2010

## WELCOME

“Consistent with the scale of our ambitions, the APC is responding to the Government-led strategy for the “Smart Economy” and the “Innovation Ireland/Island” by increasing its focus on start-up and early-stage company development. In this context we are delighted to announce the appointment of Michael Dolan as the APC’s Commercialisation Development Manager, a new position funded by Enterprise Ireland. Michael will work with APC Management, Principal Investigators and our IP Co-ordinator to define and market the commercial portfolio of the APC, developing, supporting and executing commercialisation strategies for exploitation of IP, including technology marketing, licence negotiation and spin-

out company formation. In addition he will help to establish new commercial research collaborations between the APC and Irish and multinational industry.

The APC also welcomes the UCC/Teagasc Strategic Alliance in Food Research which strengthens the existing links between UCC and Teagasc as partners in the APC. This new Alliance moves collaboration between the two organisations in food science and technology to a new level, through the sharing of resources, working to a joint research programme and the establishment of a single portal for food companies to access international quality research and innovation. The Alliance will focus on three thematic areas namely, food and health, food science and technology and food and the consumer.

*Fergus Shanahan, Director*

## Metchnikoff Award for APC Scientists

Four scientists who are Principal Investigators at the APC have been awarded the International Dairy Federation (IDF) Elie Metchnikoff Prize in Microbiology for 2010. The Prize which was presented at an Award Ceremony in Tromsø, Norway, is named in honour of the recipient of the 1908 Nobel Prize and it recognises outstanding contributions to the study of lactic acid bacteria.

The Prize winners are Catherine Stanton and Paul Ross of Teagasc, Moorepark and Colin Hill and Gerald Fitzgerald of the Microbiology Department, UCC. All four scientists are Principal Investigators in the APC and in Food for Health Ireland (FHI; [www.fhi.ie](http://www.fhi.ie)) and have been collaborating on lactic acid bacteria research for over 20 years.

Their work has focused on the fundamental biology of these important bacteria as well as on the understanding of how the bacteria can be controlled and even improved in industrial food fermentations (cheese, yoghurt etc) and in the human body (the use of probiotic bacteria to improve human health).

“One of the most exciting elements of our collaboration has been seeing our fundamental research being translated to industrial applications” stated Colin Hill.

Ger Fitzgerald expressed his pleasure at the international recognition of the group. “Collaborating with Paul, Catherine and Colin has been very stimulating and productive, and it is apposite that this announcement comes just after the launch of the UCC-Teagasc Strategic Alliance in Food Research.”

All four scientists are keen to acknowledge the enormous contributions of the many scientists and students who have participated in the research and the financial support from DAFF, EI, SFI, the food industry and others.



Colin Hill, Catherine Stanton, Gerald Fitzgerald and Paul Ross

# RESEARCH UPDATE

## Taking a fresh look at gut bacteria: Paul O'Toole



One of the central themes of the APC is improving our understanding of the role played by gut bacteria in health and disease. Much of the research done by the APC in this area focuses on known players in the interaction – host immune cells, host epithelial cells, or individual bacteria such as lactobacilli, bifidobacteria, or pathogens like listeria. However, all of these

interactions are taking place in the context of a staggering total of almost  $10^{14}$  bacteria that dwell in the normal healthy adult gut. Until recently, the community of gut bacteria – called the microbiota – was hard to study, because only a small proportion of the thousands of species present grow in the lab. Scientists at the APC have adapted so-called culture-independent methods to circumvent this problem. The technology used – high-throughput pyrosequencing – is a very specialized application that relies on high-end computer capability (bioinformatics) to handle the vast data sets generated. APC scientists have teamed up with an extended group of scientists, clinicians and statisticians to set up the ELDERMET project (<http://eldermet.ucc.ie>), which is funded by the Dept. of Agriculture, Fisheries and Food (DAFF) and the Health Research Board (HRB). The ELDERMET project, running over 5 years, is exploring the role of the gut microbiota of 500 elderly subjects recruited in the Munster area. It is already known, from research in other countries with younger adults, that the gut microbiota changes as we age, and that certain changes are associated with inflammatory changes or obesity. ELDERMET is measuring these changes in older persons, determining the connection of such changes with diet, and will work with the Irish food industry to develop novel functional food ingredients to improve gut health in the elderly. The platform technology being developed by the ELDERMET project is also being applied within the APC, in projects focusing on microbiota links with irritable bowel syndrome and obesity. The data are providing interesting insights into how changes in our gut residents impact on our general well being. Additionally, ELDERMET scientists are associate members of the International Human Microbiome Consortium, linking Irish gut microbiology to leading international developments in this exciting new field.



## Welcome to APC's new Commercialisation Development Manager

The APC's new Commercialisation Development Manager is Michael Dolan. His most recent post was as Operations Manager at Beamish and Crawford. Michael graduated from Cork Institute of Technology in Chemical Technology and is a graduate of the Institute of Brewing, the ACCA and is a past secretary of the Irish section of the Incorporated Brewers Guild. He was a member on the IBEC packaging committee for the Irish Brewers Association. He has recently been awarded a Masters in Business from UCC and is involved in Business mentoring and facilitation with the SME sector with Plato Ireland. Michael will work with APC Management, Principal Investigators and our IP Co-ordinator to define and market the commercial portfolio of the APC, developing, supporting and executing commercialisation strategies for exploitation of IP, including technology marketing, licence negotiation and spin-out company formation. In addition he will help to establish new commercial research collaborations between the APC and Irish and multinational industry.

## PROFILE - Sally Cudmore



Sally is the General Manager of the APC, where her diverse role involves overseeing all aspects of Centre, from financial management, intellectual property and tech transfer activities, to reporting to funding agencies and co-ordinating activities with industry partners and collaborators. With 23 Investigators and approximately 100 research and admin staff, this makes this position exciting!

Sally has a biochemistry degree from UCC, a PhD in cell biology from the European Molecular Biology Lab (EMBL) in Heidelberg, Germany, where she met her (now) husband, a fellow PhD student from France. Following a short postdoctoral period at EMBL, they moved to the University of California at San Francisco (UCSF), where Sally conducted research on the cytoskeleton supported by postdoctoral fellowships from European Molecular Biology Organisation (EMBO) and the Human Frontiers Science Programme (HFSP). Sally then returned to Ireland to Elan Pharmaceuticals, as Group Leader of the Cell Biology Group and as Project Leader in a gene delivery joint venture with a Seattle biotechnology company, Targeted Genetics. During this time she also completed an MSc in Technology Management at the Smurfit Business School in UCD. In 2002 she became Manager of UCC's Biosciences Institute and took up her current role with the APC in 2003.

In her spare time Sally enjoys gardening, DIY, competing in triathlons and sailing.

## APC PUBLICATIONS

Two new books and a selection of recent research publications highlight the international reputation of APC scientists:

### • Inflammatory Bowel Disease

Editor(s): Stephan R. Targan, Fergus Shanahan, Loren C. Karp  
ISBN (print): 9781405157254 (Online): 9781444318418

Fergus Shanahan and a team of international experts provide a complete review of the basic science behind inflammatory bowel disease (IBD), as well as evidence-based clinical guidance on diagnosis, treatment and long-term management of IBD.

### • Bifidobacteria- Genomics and Molecular Aspects

Editors: Baltasar Mayo and Douwe van Sinderen ISBN: 978-1-904455-68-4

Douwe van Sinderen is co-editor of this book which brings together the expertise and enthusiasm of the leading bifidobacteria experts from around the world to provide a state-of-the-art overview of the molecular biology and genomics of this exciting and important microbial genus.

### • A Gut Feeling about Pain and Childhood Stress Gastroenterology June 2010

John Cryan and Ted Dinan's group have found that stress, especially in early life and childhood, is a major predisposing factor to the development of pain symptoms associated with IBS. Co-authors: Romain-Daniel Gosselin, Richard O'Connor, Dr Monica Tramullas and Dr Marcela Julio-Pieper

### • New treatment for hospital-acquired superbug C. difficile PNAS May 18th and June 28th 2010

Colin Hill and Paul Ross's group have published two studies on a new antimicrobial, thuricin CD, which is effective against the hospital-acquired superbug C. difficile with Mary Rea as lead author in PNAS (Proceedings of the National Academy of Sciences of the United States of America). Thuricin CD is licensed to the Irish biotechnology company Alimentary Health Ltd.



John Cryan and Ted Dinan



Mary Rea and Colin Hill

## EXPANDING INDUSTRY LINKS General Electric Healthcare Increases Collaboration in Imaging with UCC & APC

General Electric (GE) Healthcare has installed a Lightspeed XTE 64-slice CT scanner at Cork University Hospital. This is only the second Lightspeed XTE 64-slice CT scanner installed in the United Kingdom and Ireland.

The installation recognizes the track record of UCC's Department of Radiology's research in the area of radiation dose optimisation and the research collaborations of Michael Maher, Professor of Radiology and an investigator at the APC with Fergus Shanahan and colleagues at the APC in the imaging of Crohn's disease.

The Lightspeed XTE 64-slice CT scanner incorporates a new technology called Iterative Reconstruction integrated into their operating system which allows quality images to be acquired at substantially lower radiation doses.

GE Healthcare is expanding its collaboration with the UCC Radiology/APC group to include the application of novel CT perfusion protocols as a non-invasive marker of disease activity in Crohn's disease. Michael Maher welcomed increased collaboration with GE Healthcare "The collaboration with GE will allow UCC radiology and the APC to use cutting edge CT technology to simultaneously reduce radiation dose associated with CT scanning, while preserving and enhancing diagnostic yield from these studies".

## Research Frontiers Awards- Beth Brint and Aileen Houston



Batt O'Keeffe pictured with Beth Brint and Aileen Houston

APC investigators, Elizabeth (Beth) Brint and Aileen Houston, received awards under Science Foundation Ireland's Research Frontiers Programme (RFP).

Beth is a lecturer in the Department of Pathology at UCC whose research focuses on regulation of the immune response and its role in the development of inflammatory bowel diseases (IBDs).

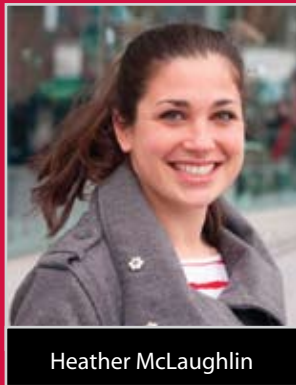
Aileen is attached to the Department of Medicine at UCC. Her award will support her investigations into the inflammatory processes that underpin the development of colon and other cancers.

# Awards

## • UCC Alumni Awards 2009

Eamonn Quigley, Professor of Medicine and Human Physiology and a Principal Investigator at the APC received a UCC Alumni Award.

• Congratulations to Heather McLaughlin, winner of UCC's BioSciences Institute Student of the Year Award and winner of UCC's Science for All Postgraduate Student Public Presentation Competition in which young scientists explain their research to a live audience "without the jargon". Heather subsequently won 2nd prize at the national Science Speak competition held at the RDS. PHOTO Heather McLaughlin



Heather McLaughlin

• Declan McKiernan was awarded a Michael C. Berndt Gold Medal for his presentation "Altered Toll-like Receptor responses in irritable bowel syndrome" at UCC's College of Medicine and Health Annual Research Day. In the poster category, Carola Murphy was awarded first prize for her poster "Development and characterisation of a novel in vivo model to track neutrophil migration in experimental colitis using bioluminescence imaging."

## • APC Awards

• APC PhD Scholar Award: Alleson Dobson

• APC Scientist of the Year Award: Marcus Claesson and Paul Cotter

• APC Person of the Year Award: Professor Liam Donnelly



Paul Ross

• Colin Hill was awarded a Research Commercialisation Award by UCC's Technology Transfer Office in recognition of the commercialisation of his research.

• Congratulations to Paul Ross on his election to the Royal Irish Academy, the highest honour available to a scholar or scientist working on the island of Ireland.

# Upcoming Events

## De Pazzi Lecture

14th September 2010

Professor Jonathan Rhodes, Professor of Medicine and Honorary Consultant Gastroenterologist, Royal Liverpool University Hospital

## UCC Food Industry Training Unit Courses 2010/2011

- Diploma in Food Science and Technology-Portarlinton
- Diploma in Speciality Food Production-Athlone
- Diploma in Manufacturing Management
- Diploma in Corporate Direction (Food Business)
- Start Your Own Food Business Short Course
- Cheese Science and Technology Training Course
- Animal Welfare Training Course

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## UREKA 2010

Twelve students, chosen from a group of 170 applicants, from universities in the US and Poland as well as from Irish third level institutions including Maynooth, DIT, CIT and UCC are taking part in this year's UREKA programme funded by Science Foundation Ireland at the APC.



Students are undertaking a 12 week challenging research project in infectious diseases and microbe-host interactions that will introduce them to all aspects of laboratory based research from the inception of the project to the design and implementation of experiments. Students will also have workshops on career development, ethics, core technologies and scientific writing as well as site visits to local pharmaceutical companies.



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## DATA PROTECTION

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