



Alimentary Pharmabiotic Centre
Interfacing Food and Medicine

GUT REACTION

NEWSLETTER OF THE ALIMENTARY PHARMABIOTIC CENTRE

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The APC as an agent of change

The recent announcement by the Tánaiste that the Alimentary Pharmabiotic Centre (APC) has been re-funded for a further 5-year term is a huge boost for our Centre and a clear statement of confidence in our role in promoting Ireland's competitiveness. The scale of the funding (approximately €17.5m in direct costs from Science Foundation Ireland with additional industry investment of over €4.5m), is an index of the vision, ambition and expectations that we all have for the Centre. The Government deserves credit for its commitment to a policy of supporting research and innovation. We have reported several success stories during our first 5 years,

but the challenges will be greater in more difficult times ahead. We will continue to develop more people with the skills and knowledge to help enhance national competitiveness. We will be expected to translate more Irish scientific ideas to the marketplace. To achieve this, we must continue to be an agent of change. In particular, we must continue to create an environment conducive to innovation and help to eliminate obstacles to achieving this objective. With hard work and the luck that usually comes with hard work, we expect to return to the Tánaiste and to her colleagues in Government with more success stories. Onward!

Fergus Shanahan, Director

APC- Continued SFI Support for another 5 years

The Alimentary Pharmabiotic Centre at UCC is one of three world-class research centres to benefit from Science Foundation Ireland funding following the announcement on December 18th 2008 by the Tánaiste and Minister for Enterprise, Trade and Employment, Mary Coughan TD.

The Tánaiste announced substantial awards totalling €45.7million over five years, through Science Foundation Ireland. This investment provides 2nd term funding to Centres for Science, Engineering and Technology (CSETs), and will be supplemented by an additional contribution from industry of €14.5million, bringing the overall investment to over €60million.

The Alimentary Pharmabiotic Centre, a partnership between University College Cork and Teagasc Moorepark Food Research Centre, focuses on research in gastrointestinal health. Its industry partners are Alimentary Health Ltd and GlaxoSmithKline.

The other centres involved include CRANN, the Centre for Research on Adaptive Nanostructures and Nanodevices which is hosted by Trinity College Dublin and is working in the area of Nanotechnology and DERI, the Digital Enterprise Research Institute, based at NUI Galway where the team are researching technologies that will underpin the next generation of the World Wide Web - the Semantic Web.

Announcing the awards, the Tánaiste said "From its inception, the SFI CSET programme has been designed to facilitate the creation of internationally-competitive, large-scale research centres that support high-quality



L->R: Dr Jimmy Devins T.D., Minister for Science, Technology and Innovation, Professor Fergus Shanahan, Director APC, Mary Coughan TD., Tánaiste and Minister for Enterprise, Trade and Employment, and Professor Frank Gannon, Director-General Science Foundation Ireland.

collaborations between higher education institutes and industry-based researchers."

Commenting on the awards, Professor Frank Gannon, Director-General of SFI stated "SFI CSETs have led our portfolio of initiatives that are steadily moving Ireland towards a truly knowledge-based economy. These CSETs have been independently verified as playing an important role in building a world-class research system in Ireland, as well as linking successfully with major multinational companies and providing an attractor for multinational investment in research in Ireland."

RESEARCH UPDATE

From Cormac Gahan Deciphering the language of gut bacteria

A human contains 10 times more bacterial cells than human cells. These bacteria are primarily resident in the gastrointestinal (GI) tract. This has given rise to the



L->R: Colin Hill, Maire Begley and Cormac Gahan

concept of the human as a 'superorganism', in which the complex communication between these two cell populations plays a very important role in human health. Most of these bacteria have never been grown in laboratories, and their very existence is only known through sophisticated DNA diagnostic techniques. The inability to grow these bacteria makes it difficult to identify the properties that allow them to adapt to the harsh conditions of the GI tract and thus to influence human health and disease.

A metagenomics approach, which allows identification of individual bacterial genes without ever having to grow the bacteria, was used to sample the DNA from a healthy human GI tract. Identification of genes which provide bacteria with the ability to break down bile salts was a particular focus. Bile is a very important compound in human physiology and plays an important role in fat digestion, as well as creating a hostile environment for bacteria. Since bile salts are uniquely found in the GI tract it was predicted that the ability to degrade them would be widespread in the gut bacterial community but should not be found in bacteria isolated from other environments. This was indeed the outcome, although the enormous diversity of bacteria carrying this property was an unexpected finding. In addition, significant insights were gained into how this property evolved in gut bacteria and to show that it is important for bacterial survival in the gastrointestinal tract and is likely to influence the stability of this community. The results will underpin novel therapeutic approaches for influencing the composition of bacteria in the gut through probiotic and other therapies, with significant benefits for human health.

This work was carried out by Maire Begley and Brian Jones in the laboratories of Cormac Gahan, Colin Hill and Julian Marchesi in the APC and has been published in Proceedings of the National Academy of Sciences vol. 105, No. 36. (9 September 2008), pp. 13580-13585.

PROFILE - John MacSharry

John MacSharry is a post-doctoral scientist in the Host Response core of the APC with Principal Investigators Sylvia Melgar, Ken Nally and Fergus Shanahan. John is currently working on the role of miRNA-mediated gene expression regulation in mucosal immunology in the APC-GlaxoSmithKline Inflammatory Bowel Disease group.



John became interested in science through the natural history works of Éamon de Buitléar and David Attenborough. He obtained a BSc (hons) in Microbiology and a PhD in Mucosal Immunology entitled "Gene expression profiling of intestinal M cells", from UCC. He subsequently collaborated in an Enterprise Ireland-funded research project with Alimentary Health Ltd and the IAMS corporation. Following the success of this project, John joined Alimentary Health Ltd as Molecular Biology Section Head. In this role, he coordinated company projects involved in probiotic strain identification, host response and quality control and collaborated on several projects with multinational companies such as P&G, IAMS and Mead Johnson.

John returned to academic research in May 2008, when he joined the APC-GSK laboratory. He recently published a paper on "Mucosal cytokine imbalance in irritable bowel syndrome (IBS)" with co-author Eamonn Quigley.

Over the past year, John has also been working with James Martin from McGill University, Montreal who visited the APC on an SFI Walton fellowship. Their work has revealed novel insights on the role of bacteria in the lung and John received a Young Researcher Award from the European Respiratory Society to present this research at their conference in Berlin. John has recently been awarded a Short-term Travel Fellowship from Science Foundation Ireland to visit James Martin's laboratory for three months to continue the research begun during the Walton fellowship.

John recently became a father to his first child Hugh. In his spare time, John plays Tag rugby with the APC team, enjoys swimming, cooking and, most importantly, supports Munster rugby!

Paul Ross wins Enterprise Ireland's Lifescience and Food Commercialisation Award 2008



Paul Ross with Joe Healy, Enterprise Ireland

Paul Ross, Principal Investigator at the APC and Head of Biotechnology at Teagasc Moorepark Food Research Centre, won Enterprise Ireland's Lifescience and Food Commercialisation Award 2008. Presenting the award, Joe Healy, Enterprise Ireland's Food Technology Manager, said "Dr. Ross's success in bringing his research to the marketplace has been phenomenal – in the last four years he has licensed seven new technologies to companies in the food sector, more than any Irish researcher to date."

EXPANDING INDUSTRY LINKS

APC in Taoiseach-led Trade Mission to Japan

An Taoiseach, Brian Cowen, T.D., recently led the biggest ever Irish trade mission to Japan. He was accompanied by Mr John McGuinness, T.D., Minister for Trade and Commerce, and Mr Brendan Smith, T.D., Minister for Agriculture, Fisheries and Food. Paul Ross, Principal Investigator APC and Head of Biotechnology at Teagasc Moorepark Food Research Centre took part in the mission and spoke at sessions on Food and Health and Functional Foods. The Enterprise Ireland mission of 70 Irish companies and organisations visited Tokyo and Osaka and the programme included high profile networking receptions in both cities, economic briefings and sectoral events.

The Taoiseach said "The size of the trade mission, the diversity of industry sectors represented and the calibre of Irish companies taking part all testify to the commitment of Irish companies to do more business with Japan. The mission includes many of the key internationally traded sectors in the Irish economy



L->R: Paul Ross, APC in Tokyo with Dr Richard Walton, Meiji Dairies, Mr Brendan Smith, T.D., Minister for Agriculture, Fisheries and Food, Dr Hideaki Kamikado, Meiji Dairies and Eddie Hughes, Enterprise Ireland.

such as information and communication technologies, pharmaceutical, biotechnology and medical technologies, aeronautical, engineering, and financial services, high-value consumer goods, and food."

Eamonn Quigley appointed President of American College of Gastroenterology



Eamonn Quigley receiving the ACG chain of office from outgoing President, Dr Amy Foxx-Orenstein from the Mayo Clinic.

Eamonn Quigley, Professor of Medicine and Human Physiology, UCC, Consultant Gastroenterologist at Cork University Hospital and Principal Investigator at the APC recently became the first non-US President of the American College of Gastroenterology (ACG). The ACG represents 10,000 physicians from 75 countries. It was founded in 1932 to advance the scientific study and medical practice of diseases of the gastrointestinal tract through annual scientific meetings, the American Journal of Gastroenterology, regional postgraduate training courses and research grants.

Eamonn is keen to encourage and foster links between the American College and other societies. As current President of the World Gastroenterology Organisation (WGO) he has already developed strong ties between the ACG and the WGO and he plans to continue this work. As President, he also presides over the Board of Trustees of the ACG and is delighted that the Board will be holding their first meeting in Ireland next June, in conjunction with the Irish society of Gastroenterology

"Patho-biotechnology" Book Launch



L-R: John Fitzgerald, Librarian, UCC being presented with a copy of "Patho-biotechnology" by Roy Sleator and Colin Hill

Using bad bugs to do good things is the subject of a new book called "Patho-biotechnology" by Roy Sleator and Colin Hill, Principal Investigators at the APC.

The term "Patho-biotechnology" was coined by Sleator and Hill to describe the exploitation of pathogens, disease-causing organisms, or pathogen derived factors, for beneficial applications in biotechnology, food and medicine. This book, which includes chapters from leading scientists worldwide, outlines the many ways in which disease causing microbes can be harnessed for beneficial effect, encapsulating the patho-biotechnology concept.

The book, "Patho-biotechnology" (ISBN: 978-1-58706-304-6), published by Landes Bioscience as part of its Intelligent Unit Series, is available through <http://www.landesbioscience.com/>

Staff Awards

Maire Begley won the BioSciences Institute Postdoctoral Researcher of the Year, sponsored by Roche, for her research on the metagenomics of bacteria in the gastrointestinal tract.

John MacSharry was awarded a short-term Travel Fellowship by SFI to visit James Martin's lab in McGill University in Canada for 3 months, to continue their collaborative research on lung microbiota.

Lindsay Hall and Gerard Moloney received travel awards from the European Mucosal Immunology Group to travel to their conference in Milan.

Niall Hyland was awarded Poster of Distinction at the Neurogastroenterology & Motility Joint International Meeting in Lucerne.

Eileen Murphy received a travel award to attend the International Association for Probiotics & Prebiotics (ISAPP) meeting in London, Ontario, Canada.

ISG Winter Meeting, Trim, Co. Meath



Pictured receiving the Abbott Innovations in Gastroenterology Bursary Award are Mr Eoin Murphy, Abbott, Professor Michael Maher, Cork University Hospital, Dr Kevin O'Regan, CUH, Dr Alan Desmond APC and CUH, Ms Brenda Egan, Abbott and Fergus Shanahan, APC.

APC staff made many contributions and took several awards at the 92nd meeting of Irish Society of Gastroenterology which took place in Trim, Co Meath.

Alan Desmond, Michael Maher, CUH and Fergus Shanahan were awarded The Abbott Innovations in Gastroenterology Bursary for their proposal to extend our work on diagnostic radiation.

Liam O'Mahony was awarded first prize for the Best Oral Presentation.

Carola Murphy was awarded first prize from the Best Poster Presentation.

Alleson Dobson was awarded third prize for the Best Poster Presentation.

Upcoming Events

Falk Forum

"New Insights into Gut Inflammation- Implications for the Clinician"

6th March 2009

Sheraton Fota Island Hotel & Spa, Cork

Details: <http://apc.ucc.ie>

Contact: Mary Earp, Dr Falk Pharma

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Irish Society of Gastroenterology

Summer Meeting

19-20 June 2009

Hotel Europe, Killarney

Details: www.isgorg.ie

World Digestive Health Day 2009

26 May 2009, UCC

Events for Medical Professionals and Public

In association with Danone

Details: <http://apc.ucc.ie>

Work-Based Learning (WBL) Symposium

hosted by UCC in collaboration with

Institute of Technology, Cork

5-6 May 2009, UCC

Contact: Ms Elaine Cahill

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CONGRATULATIONS

to Professor Liam Donnelly,
the first recipient of the Teagasc Gold Medal
awarded for contributions to Agriculture
and Food Research .



L->R: Professor Gerry Boyle, Director, Teagasc; Dr Noel Cawley, Chairman, Teagasc Authority and Professor Liam Donnelly, Director, Food Research, Teagasc.



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DATA PROTECTION

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