FOOD BIOSCIENCES DEPT

Focus is on bioactives, biocontrol, biotransformation and health

Teagasc
Agriculture and Food Development Authority

Vision:

- *To be a national and international leader in food and health research and innovation by identifying, optimising and developing Irish foods and food components for the benefit of consumer health and the competitiveness of the Irish food industry.*

Department Permanent Researchers:


Paul Cotter


Tom Beresford


Catherine Stanton


Olivia McAuliffe


Orla O'Sullivan


Kanishka Nilaweera

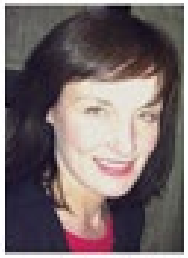

Linda Giblin


Rita Hickey


Sheila Morgan


Paul Simpson

Research Officers


Maria Hayes


Dilip Rai

Key Program Research

Bioactives

- Extraction & isolation
- Structural characterisation
- Mechanism of action & bioavailability

Gut Health

- Gut microflora & health status
- Gut health programmed by food
- Pre- & Pro-biotics

Biocontrol

- Natural antimicrobial peptides
- Bacteriophage (anti-bacterial viruses)
- Antimicrobial fermentates and hydrosylates

Fermented Foods

- New starter cultures & enzymes
- Culture protection during processing
- Health benefits of fermented foods

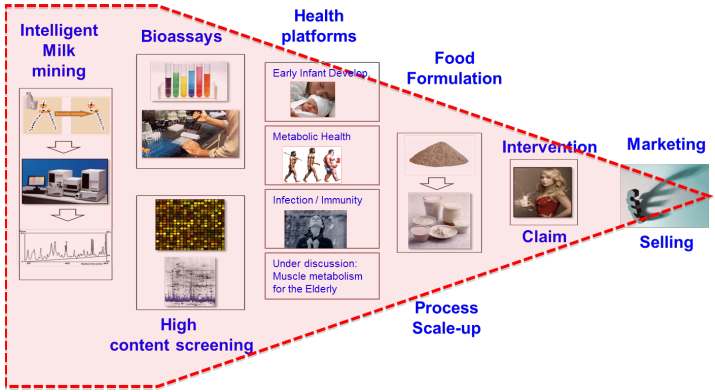
Main Objectives:

- To employ foods, food components and health promoting microorganisms as food-based solutions to address key societal diet related health concerns including gut health, obesity, and infant nutrition.
- To exploit microorganisms, microbial metabolites and bacteriophage as agents to control deleterious or pathogenic organisms in food systems or the gastrointestinal tract.
- To focus on the application of microorganisms and their enzymes to impact on the sensory, textural, techno-functional properties and health benefits of a range of foods.
- Contribute to milk quality research, a cross departmental activity in the Food Programme

Activities:

BIOACTIVES

- Multiple national and international research and industry projects relating to prebiotics, milk (cow and human) oligosaccharides, Brewer's spent grain, fruit and vegetable streams, marine industry
- Novel extraction approaches, structural investigation of bioactives
- Assessment and optimisation of health impacts through *in vitro* and *in vivo* approaches



GUT HEALTH

- 2 PIs within both the internationally recognised research centre, APC Microbiome Ireland, and the newly funded centre, VistaMilk
- Key contributors to Food Health Ireland.
- Multiple national and international research and industry projects. High spec DNA sequencing and bioinformatics platforms
- Recognised as global leaders in the probiotic and microbiome fields

APC Microbiome Ireland
Interfacing Food & Medicine

fhi
FOOD FOR HEALTH IRELAND

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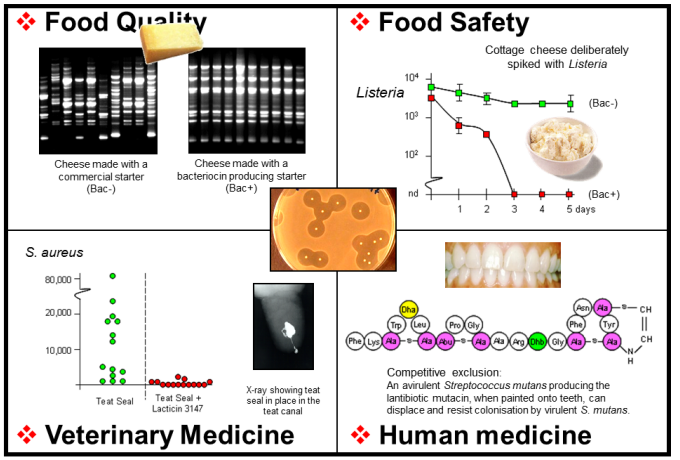
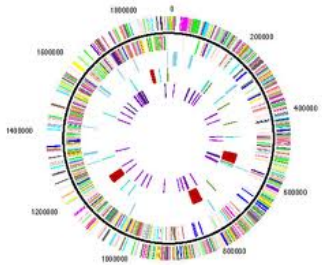
BIOCONTROL

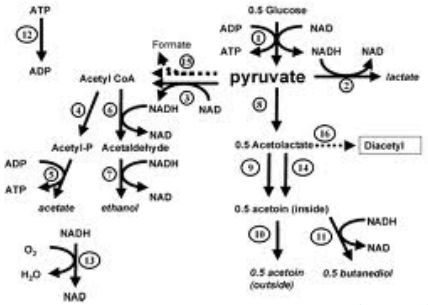
- International reputation as leaders in the bacteriocin field
- Laboratory and computer based screens for bacteriocins from different sources
- Bioengineering to enhance bacteriocins e.g. 30,000 derivatives of nisin with different functionalities
- Use of phage to detect and control pathogens
- Use of antimicrobials to preserve food and modulate the gut microbiota in a desirable way
- Sequencing to monitor the flow of microbes through the food chain



FERMENTED FOODS

- Isolation and characterisation of novel starter and adjunct strains
- DNA sequencing to identify spoilage and pathogenic microbes in fermented foods including the first application of shotgun metagenomic sequencing to dairy foods and subsequent expansion of this programme
- Identification of correlations between microbes and flavours in fermented food
- Development of new fermentates for the food industry





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Recent Highlights:

Milkybiotics

Sinead Morrin won Best Oral Presentation and the RDS medal at the recent TEAGASC Walsh Fellowships seminar, along with Best Food Research Presentation, and the Institute of Food Science and Technology Ireland medal, for her presentation on 'Milkybiotics: influencing the intestinal surface to increase colonisation of health-promoting bacteria'.

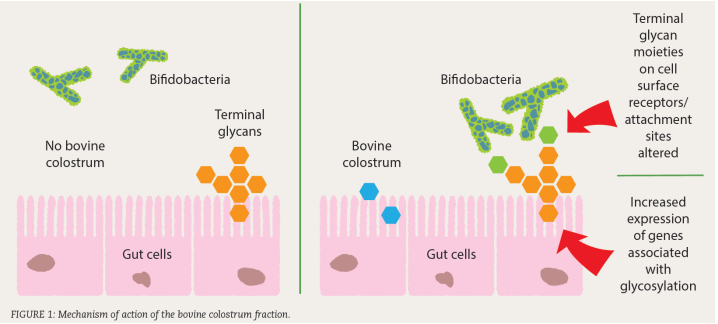

FIGURE 1: Mechanism of action of the bovine colostrum fraction.

Gut scrum - the rugby microbiome team

The microoganisms that reside in the gut, or gut microbiome, of professional athletes is distinct from that of the general public both functionally (i.e., what they do) and metabolically (i.e., what they produce).

So say scientists at the Science Foundation Ireland-funded APC Microbiome Institute and Teagasc, together with collaborators at Imperial College London, who have taken their research on the microbiome of professional rugby players to a whole new league. The study is just published in the prestigious scientific journal, *Gut*.

Guts and glory: the inside secrets of our rugby team's success

Fibre-rich foods said to reduce gut stress and 'anxiety-like behaviour'

Researchers at the APC Microbiome Ireland at University College Cork and Teagasc Food Research Centre discovered that supplementation with short-chain fatty acids (SCFAs) derived from fibre appear to alleviate episodes of psychosocial stress.

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