






USP-Instituto de Biociências and NUI Galway: Exploring potential for research collaboration & training alliances

NUI Galway
OÉ Gaillimh

School of Natural Sciences delegation, May 2015

Introducing the delegation

Dr Sara Farrona
Plant Developmental Epigenetics

Dr Peter McKeown
Plant and agriculture genetics

Dr Fiona Brennan
Soil and environmental microbiology

Galway and Ireland

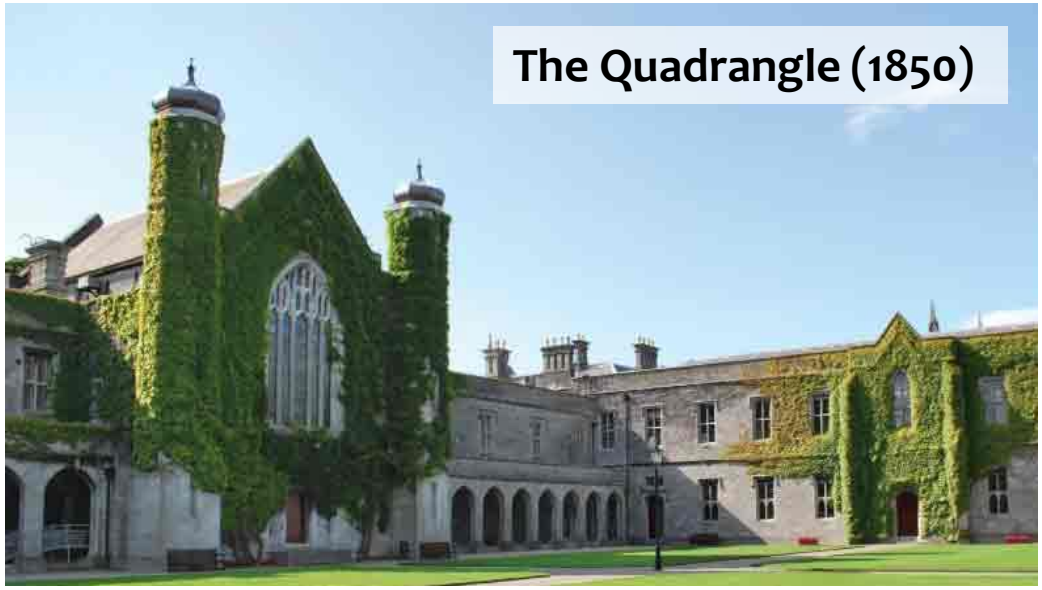
City Centre

Campus

15 min walk

National University of Ireland Galway

NUI Galway



- National University of Ireland Galway (NUI Galway) was founded in 1845:

→ one of Ireland's leading research-led universities;

→ 17,900 students (3,500 international);

→ 2,200 staff (30% international).

NUI Galway is one of the Top 100 Most International Universities in the world (*Times Higher Educational Supplement*, 2014).

The School of Natural Sciences

www.nuigalway.ie/natural_sciences/

- Zoology
- Botany & Plant Science
- Biochemistry
- Microbiology
- Earth & Ocean Sciences

150 staff members, 1500 undergraduate, 170 postgraduate students

- Plant & AgriBiosciences Research Centre
- Centre for Chromosome Biology
- Apoptosis Research Centre
- Glycosciences Research Centre
- Energy Research Centre
- Marine & Biogeosciences Research Cluster
- Ryan Institute
- Developmental Biology Cluster
- Infectious Disease & Immunity Cluster

Ryan Institute

- The NUI Galway centre for Environmental, Marine and Energy Research.
- Founded in 2010 with priority research areas covering:
  - Climate change
  - Environment & Health
  - Energy
  - Marine & Coastal Processes
  - Biodiversity & Bioresources
  - Built Environment & Smart Cities

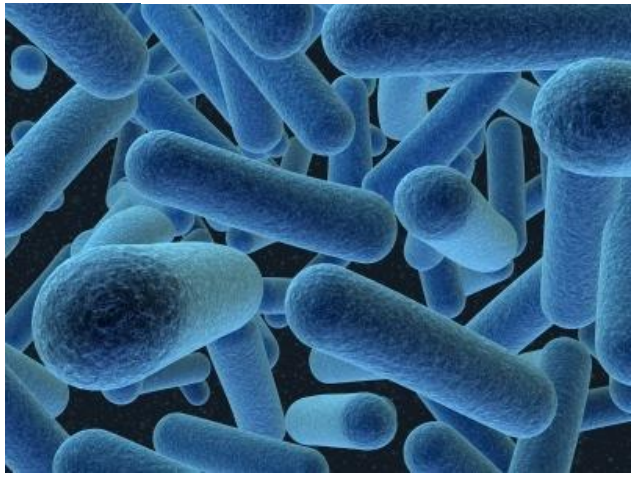
http://www.ryaninstitute.ie/

Energy Research Centre

Bioenergy	Energy efficient technologies
Renewable resources	Energy & Society

http://www.nuigalway.ie/energy/

Energy Research Centre



Energy Research Centre

- Long tradition of Anaerobic digestion (AD)
- Food, grass, sewage and industrial wastes
- Low-temperature high-rate AD in novel reactors: new technologies
- Microbial ecology: who's there and can we manage them?
- Systems Biology: cutting-edge ecosystems science
- The waste biorefinery – recovery of VFA and other platform chemicals
- Unique Phosphate attenuation and recovery process

Biorefining & Bioenergy

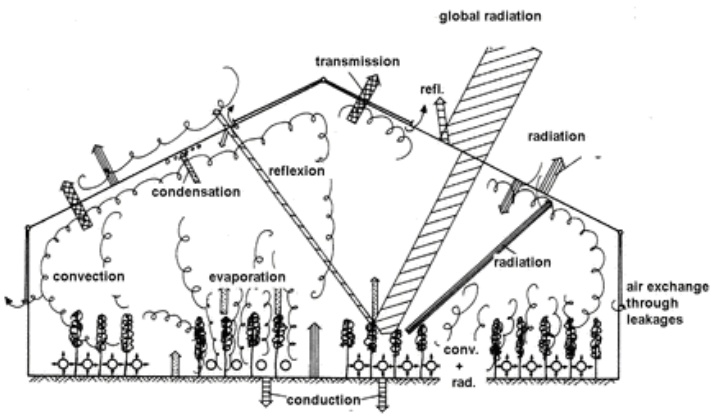
AN ENTERPRISE IRELAND
& IDA IRELAND INITIATIVE

TECHNOLOGY CENTRE

ENTERPRISE IRELAND
IDA IRELAND SUPPORTED

Agriculture, Energy, Bioenergy & Biorefining Research

- On farm biogas digestors
- Agri-waste processing
- Bioenergy crops/plants
- Biochar
- Rural Biorefinery Enterprises
- Energy management in agri, horticulture / greenhouses



The Plant & AgriBiosciences Research Centre (PABC)

- **A inter-disciplinary cluster of researchers, research groups, companies and institutions sharing a common interest in plant and agricultural biosciences innovation:**

  → founded at NUI Galway by Professor Charles Spillane in 2009;

  → 32 research groups contribute to the work of the PABC;

  → includes School of Natural Sciences faculty and members from Irish institutions and international partners e.g. as adjunct faculty.

http://www.plantagbiosciences.org/

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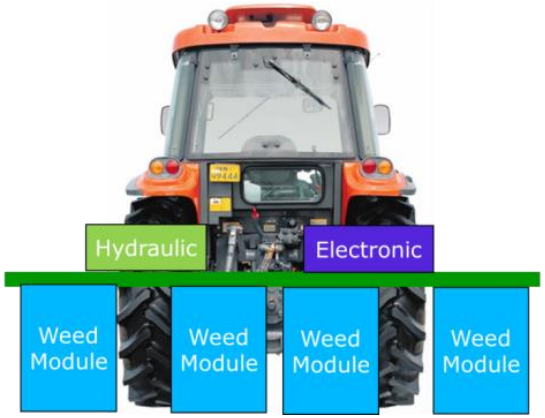
NUI Galway
OÉ Gaillimh

Plant & AgriBiosciences Research Centre

- Plant breeding and 'Future Crop'
- Climate Smart Agriculture
- Precision agriculture
- Agri-Glyco Sciences
- Food, Feed & Nutrition
- Microbiology
- Closed-Loop Agriculture
- Agriculture for development
- Soil Sciences
- Fundamental Biology
- Bioinformatics
- Algal Biosciences
- Economics & Policy
- Plant BioProducts
- Agricultural Engineering

PABC field trials and crop research capability

PABC technologies



Soil & AgriEnvironmental Research

- Soil erosion
- Soil fertility
- Nutrient run-off
- Soil microbes
- Geochemistry

- Environmental footprint (LCA) analysis
- Greenhouse gases

Brazil-Ireland Common Challenges

- **A unifying theme of the PABC is to promote plant and agricultural biosciences for *sustainable development*:**

→ aims to use research in these areas to help meet social and economic 'mega-challenges' in the EU and internationally;

→ a *strong emphasis* on collaborative international research to meet them .

Food

Population

Climate

Energy

Source: Patrick Cunningham

Examples of existing Brazil-Ireland collaborative research at NUI Galway

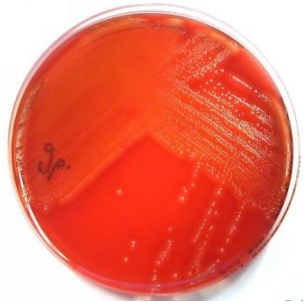
Sandwich PhD research in SNS

• **Collaboration with Gustavo Enck Sambrano (UFCSPA) and Dr. Florence Abram:**

Microbiology
Energy & Environment
Infectious Diseases
Marine

→ **based in Microbiology in the School of Natural Sciences, NUI Galway;**

→ **applying proteomics to study of *Streptococcus pyogenes*.**



Sandwich PhD links between PABC and Brazil

- **PhD student Cleiton Oliveira from Federal University of Lavras visited Prof. Spillane's lab NUI Galway (September 2013 to August 2014):**

→ **plant metabolic engineering to increase levels of health-promoting vitamin A compounds in lettuce;**

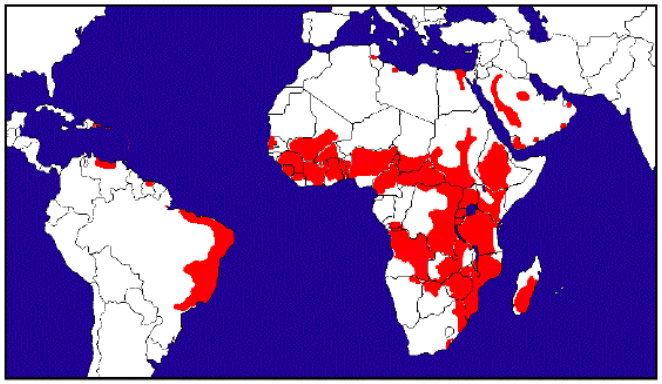
→ **funded by the Brazilian Federal Agency for Support and Evaluation of Graduate Education (Capes Foundation).**

CAPES

UFLA
UNIVERSIDADE FEDERAL DE LAVRAS

Prof. Luiz Antonio Augusto & Prof. Roberto Maluf

Sandwich PhD in Parasite Genomics



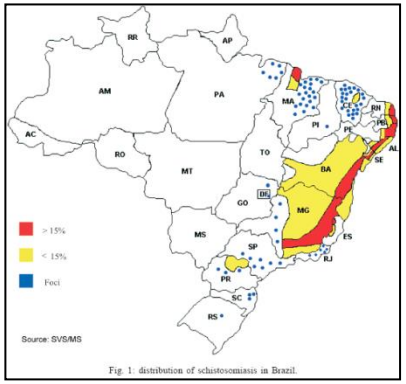


Fig. 1: distribution of schistosomiasis in Brazil.

- **Prof. Spillane collaboration with Prof. Dr. Matheus de Souza Gomes, Instituto de Genética e Bioquímica, UFLA and UF Uberlandia**

de Souza Gomes M, Donoghue MTA, Muniyappa MK, Verciano Pereira V, Guerra-Sa and Spillane C (2013) Computational identification and evolutionary relationships of the microRNA gene cluster miR-71/2 in Protostomes. *Journal of Molecular Evolution*.

Selcuklu SD, Donoghue MTA, Rehmet K, **de Souza Gomes M**, Fort A, Kovvuru P, Muniyappa MK, Kerin MJ, Enright AJ and Spillane C (2012) MicroRNA-9 inhibition of cell proliferation and identification of novel mir-9 targets by transcriptome profiling in breast cancer cells. *Journal of Biological Chemistry.*

UNIVERSIDADE FEDERAL DE LAVRAS

UFU

Full PhD in SNS

- **Alberto Abrantes Esteves Ferreira in the laboratory of Dr. Ronan Sulpice (SNS, Plant Sciences):**



→ topic of Cyanobacteria Systems Biology;

→ ongoing collaboration with Pr. Wagner Araujo, Universidade Federal de Viçosa;

→ Dr. Sulpice is also a Special Visiting Researcher at UFV and provides English-language teaching.

Universidade Federal de Viçosa

Sandwich Postdoctoral research

• **Collaboration with Dr. Cristiana Ossaille Beltrame (Universidade Federal do Rio de Janeiro) and Prof Jim O'Gara:**

→ **initiated in January 2015, in the School of Natural Sciences, NUI Galway;**

→ **methicillin-resistant *Staphylococcus aureus* (MRSA).**

UFRJ

Strategies for enhancing collaboration

1. Strengthen existing research collaborations and establish new ones.
2. Develop platforms for formal exchange of students and staff.
3. Facilitate training/research exchange visits by students and PIs.
4. Generate additional joint research funding opportunities.
5. Develop/deepen inter-institutional MoUs for research alliances.
6. Establish joint teaching and lecturing frameworks.

Establishing MoUs

Joint publications

Conferences and workshop organisation

Graduate training schemes (e.g. funded by Irish government)

Joint funding applications

Opportunities for collaboration at the School of Natural Science

Joint PhD students

Visiting Researchers

Joint Postdoctoral researchers

Teaching programmes delivered in English

Invited lectures

Common progress towards strategic scientific goals

Interested in collaborating?
List of PIs in SNS and their research interests available

Brazil-Ireland Funding opportunities

- Government of Ireland MSc funding for Brazilian students
- European H2020
- SWB
- Other national research funding
- Research visit funding
- Potential joint funding partnership programmes

THANK YOU FOR LISTENING
We are happy to take questions

www.nuigalway.ie

www.plantagbiosciences.org

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