

Research and Innovation Overview 2024

Department of Biology

The Department of Biology at Maynooth University is a thriving research hub, with a diverse team of 29 academic staff, 12 postdoctoral fellows, and 63 postgraduate research students. The department has seen significant growth in its PhD cohort, almost doubling the number of PhD students over the past four years. With a strong focus on research, collaboration, and teaching, the department is dedicated to advancing knowledge in the biological sciences.

Head of Department: Professor Paul Moynagh



Research Themes and Focus Areas

The department's research covers a broad spectrum of biological disciplines, with key focus areas including:

- **Immunology and Global Health:** Research in this area centres on molecular and cellular aspects of immunology and relevance to health and disease. The department's MSc programme focuses on immunology and its applications to global health challenges.
- **Microbial Resistance and Environmental Biology:** Faculty members conduct cutting-edge research in microbial resistance, biodiversity, and ecosystem management.
- **Plant Biology and Environmental Science:** Research in this area focuses on the molecular mechanisms of plants and their adaptation to changing environmental conditions.



Significant Research Outputs

In 2022-2023, the Department of Biology published a total of 69 research outputs, with 58 appearing in high-impact peer-reviewed journals. Notable achievements include:

Publications

- Two papers were published in *Nature Communications*, one in *EMBO Journal*, and another in *Proceedings of the National Academy of Sciences (PNAS)*, reflecting the department's commitment to high-quality research.
- A study by Dr Fiona Walsh and colleagues, which showed that there is a greater antimicrobial resistance reservoir in grass than in soil, was published in a leading journal, contributing to our understanding of resistance patterns in environmental contexts.

Awards

- The department secured €3.4 million in direct research funding, with an additional €820,000 in overheads. Major grants include two HRB investigator-led project grants, three SFI Frontiers for the Future project grants and one Horizon Europe grant with Professor Karen English as co-investigator.
- Dr Shirley O'Dea received Enterprise Ireland funding through the Commercial Case Feasibility Fund for her research on biotechnological applications.



Collaborations and Partnerships

The department actively collaborates with both national and international research institutions. Key partnerships include:

- **National Collaborations:** The department works with Irish institutions such as Trinity College Dublin, University College Dublin, Teagasc, and the National Parks and Wildlife Service and many others. Dr John Devaney's research on Continuous Cover Forest management in Ireland is an example of interdisciplinary collaboration involving Teagasc and UCD.
- **International Collaborations:** The department has forged partnerships with institutions worldwide, including Harvard Medical School, Kyoto University, and the Senegalese Institute for Agricultural Research. A key project, *Future Proofing Senegal's Great Green Wall*, led by Dr John Devaney, focuses on the resilience of tree species to climate change and engages with local communities in Senegal.



Research Impact and Societal Contributions

The department's research has significant implications for public health, environmental management, and policy development. Dr Andrew Hogan contributed to the development of Irish Clinical Practice Guidelines for Obesity, which were implemented in November 2022. The department's research on antimicrobial resistance and forest management also supports national and international efforts to address environmental and health challenges.



Future Directions

Looking ahead, the department will continue its focus on immunology, microbial resistance, and plant molecular biology. Future projects include expanding collaborations with international institutions to further explore global challenges in health and the environment. The department aims to build on its success in securing competitive research funding to support innovative projects.

The Department of Biology at Maynooth University is a leading centre for biological research, making significant contributions to both academic knowledge and societal challenges. With its growing team of researchers and strong network of collaborators, the department is well-positioned to continue producing impactful research in the years to come.