

INSTITUTE:

Limerick Institute of Technology

RESEARCH AREA:

Biotechnology - Microbial cell factories

Dr. Patrick Murray: Identifying and exploiting industry relevant bioactive compounds

**Excellent Researchers
Delivering Impact**

Biotechnology



Institutes of Technology Ireland

Dr. Patrick Murray's work focuses on screening microbial cell factories (bacteria, fungi, yeast, microalgae, cyanobacteria etc.) from varied national and international habitats for bioactive compounds with industrially relevant commercial opportunities. In his research Dr. Murray and his team identify, extract, characterise and purify bioactive compounds from microbial life-forms with potential innovative applications.

The search for novel biologically active compounds which can act as lead compounds for development is an ongoing process for multi-national biotechnological industries. One of the most important sources of these novel biologically active compounds, or secondary metabolites, are fungi which produce a multitude of low molecular weight bioactive compounds. Approximately 38% of the 22,000 known bioactive, microbial metabolites are of fungal origin. Similarly microalgae are emerging as sources of an array of commercially viable bioactives for the food and health sectors e.g. carotenoids and PUFAs. By mining the genomes of microbes, Dr. Murray aims to discover new biomolecule leads for industry and establish excellence in microbial research at Limerick Institute of Technology (LIT).

Dr. Murray is the author of 26 peer reviewed scientific research publications, as well as 2 patents and a number of invention disclosures. He conducted his PhD research in the area of second generation lignocellulosic biofuel research at NUI Galway. He continued his work

in this field at the Wallenberg Wood Biotechnology Institute in Stockholm, Sweden and the National Biotechnology Centre of Finland VTT in Helsinki.

Dr. Murray joined LIT in 2009, working at Shannon Applied Biotechnology Centre (Shannon ABC). As a senior research fellow and research leader with Shannon ABC he was responsible for the day to day running of the facilities in Limerick. The Centre has a strong history of collaboration with industry in the area of bioactive compounds, as well as with the broader Irish biotechnology sector, and was established through core funding provided by Enterprise Ireland under the Applied Research Enhancement (ARE) programme. ➔



Dr. Patrick Murray, LIT

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→ Dr. Murray is currently a member of LIT's Department of Applied Science where he supervises 3 PhD and 3 MSc students. He also serves as the Research Funding Coordinator for the Institute. Since joining LIT, Dr. Murray has been instrumental in securing 2 European Commission FP7 grants to a total project value of €4.5 million. As the scientific manager of the FP7 'BAMMBO' project, LIT coordinates a team of international scientists in developing strategies for extraction of high-value bioactive molecules from marine plants and animals, with specific interests on environmentally friendly and sustainable extraction processes (using Supercritical Carbon Dioxide).

Dr. Murray has a long track record of working closely in partnership with industry. He is the Principal Investigator of 4 large Enterprise Ireland funded innovation partnership projects with SMEs, developing biotechnological solutions which lead to new product and process developments for the companies.

Dr. Murray aims to build on the strengths across disciplines within LIT, supported by the dedicated research facilities and state of the art analytical equipment. He will continue to build collaborations and links with other Higher Education Institutions and companies both at home and abroad. This will provide a platform for increased commercialisation opportunities with partner industries. He also aims to further consolidate LIT as an international institute in his field of study and to increase PhD outputs from the Department of Applied Science in LIT.

Using his background as a microbial biotechnologist, Dr Murray will target Horizon 2020 funding in the area of 'novel biomaterials'. This new research area is a key component of the European Union's new funding programme for research and innovation and reflects the ambition to deliver ideas, growth and jobs for the future. Through Dr. Murray's work, LIT will be well placed to benefit in this regard. ■

TESTIMONIAL

Dr. Patrick Murray
Limerick Institute
of Technology

"The support provided by LIT has been invaluable in establishing my research area. LIT has provided access to a number of national and international training programmes aimed at career and personal development which has aided my progression greatly. The applied nature of research at the Institute has offered the opportunity to work directly with national and international companies ultimately leading to job and product creation. While a number of groups are involved in microbial science nationally I believe that the research infrastructure available at LIT, including the state of the art analytical laboratory and growth chamber facilities, offers a marked advantage in providing fermentation experience with microorganisms as well as sustainable environmentally friendly biomolecule extraction and analytical capabilities. My research hopes in the future to gain further funding recognition from all Irish national research funding agencies including EI, IDA, HRB and SFI as well as all of the Horizon 2020 research funding mechanisms."



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