

Overview

Programme Code	36360
Programme Title	Natural Products Discovery
Awarding Institution	Liverpool John Moores University
Programme Type	Masters
Language of Programme	All LJMU programmes are delivered and assessed in English
Programme Leader	Jose Prieto Garcia
Link Tutor(s)	

Awards

Award Type	Award Description	Award Learning Outcomes
Target Award	Master of Science - MS	See Learning Outcomes Below
Alternative Exit	Postgraduate Certificate - PC	Demonstrate personal skills in critical analysis and contextual awareness in the multidisciplinary field of natural product discovery. Engage with advanced levels of theories and practice in relation to the field of natural products discovery. Identify and follow appropriate research methods to the field of natural product discovery.
Alternative Exit	Postgraduate Diploma - PD	Demonstrate personal skills in critical analysis, reflection and contextual awareness in the multidisciplinary field of natural product discovery. Engage with advanced levels of theories and practice in relation to the field of natural products discovery. Identify and adapt appropriate research methods to the field of natural product discovery.

Alternate Award Names	
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External Benchmarks

Subject Benchmark Statement	
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Programme Offering(s)

Mode of Study, Mode of Delivery	Intake Month	Teaching Institution	Programme Length
Full-Time, Face to Face	September	LJMU Taught	1 Years

Aims and Outcomes

Educational Aims of the Programme

Natural products discovery is a highly multidisciplinary endeavour comprising the stepwise use of analytical, biological and chemical methods to extract and isolate natural products, elucidate their structure, assess their pharmacological and toxicological properties to select hits, modify their chemistry to obtain innovative preclinical drUG-candidates, excipients, nutraceutical and/or cosmeceutical ingredients and formulate them to improve their bioavailability. These steps are underpinned by the following transferable skills: the ability to find and critically assess professional and scientific literature, design, write and execute a research project, and effectively communicate about natural products facts, research and its findings to a variety of audiences using appropriate means of dissemination. Therefore, the overarching aim of the program is to equip students with an understanding of, and practical experience in, all the above methods and skills. As a Level 7 chemistry programme the aims are: - To extend students' comprehension of key phytochemical concepts and so provide them with an in-depth understanding of specialised areas of natural products chemistry - To provide students with the ability to plan and carry out experiments independently and assess the significance of outcomes - To develop in students the ability to adapt and apply the methodology to the solution of unfamiliar types of problems. - To instil a critical awareness of advances at the forefront of phytochemistry and natural products discovery. - To prepare and effectively support students for professional employment or research degrees in the areas of phytochemistry, natural products chemistry and allied analytical and biological sciences.

Learning Outcomes

Code	Description
PLO1	Independently acquire advanced chemical knowledge and apply specialised methods necessary for the extraction, purification and identification of natural products.
PLO2	Demonstrate competence in a range of computational skills pertinent to scientific research.
PLO3	Demonstrate knowledge of the traditional application of natural products to health and critically assess the evidence behind such practices as well as their limitations
PLO4	Independently acquire specialised, advanced knowledge and understanding of the application of biological approaches to investigate and predict pharmacological and toxicological properties of natural products.
PLO5	Understand and apply advanced synthetic knowledge to modify the physical-chemical properties of natural products.
PLO6	Understand and apply advanced pharmaceutical approaches to formulate natural products into valid final products for use by patients and public in general.

Code	Description
PLO7	Safely solve - alone or as part of a team - multidisciplinary challenges in the field of natural products even in the absence of complete information.
PLO8	Ethically source, systematically locate, critically evaluate, objectively assess and make appropriate use of information from scientific literature and relevant electronic resources.
PLO9	Communicate scientific information clearly, orally and in writing, at a level appropriate to different audiences.
PLO10	Demonstrate the necessary skills to plan, perform, report and interpret the results of laboratory experiments and analyses applied to natural products.
PLO11	Plan, conduct and report an independent a high-level research project, considering all relevant aspects, e.g. developing a testable hypothesis, time management, requirements for statistical analysis, health and safety, resource allocation, additional training needs, etc.

Programme Structure

Programme Structure Description

The Postgraduate Diploma (120 credits) in Natural Products Discovery programme is offered as an alternative exit award and is achieved via completion of six taught modules (7101PHASCI, 7124PHASCI, 7125PHASCI, 7126PHASCI, 7127PHASCI and 7128PHASCI). The Postgraduate Certificate in Natural Products Discovery programme is offered as an alternative exit award for those students completing three 20 credit modules.

Programme Structure - 180 credit points	
Level 7 - 180 credit points	
Level 7 Core - 180 credit points	CORE
[MODULE] 7101PHASCI Research Methods Approved 2022.03 - 20 credit points	
[MODULE] 7108PHASCI Research Project Approved 2022.01 - 60 credit points	
[MODULE] 7124PHASCI Analytical Techniques in Natural Products Approved 2022.01 - 20 credit points	
[MODULE] 7125PHASCI Natural Products Formulation Approved 2022.01 - 20 credit points	
[MODULE] 7126PHASCI Natural Products Pharmacology and Toxicology Approved 2022.01 - 20 credit points	
[MODULE] 7127PHASCI Approaches to Natural Products Discovery Approved 2022.01 - 20 credit points	
[MODULE] 7128PHASCI Natural Products Chemistry Approved 2022.01 - 20 credit points	

Module specifications may be accessed at <https://proformas.ljmu.ac.uk/Default.aspx>

Teaching, Learning and Assessment

A mix of both formative and summative assessments: The formative continuous assessment allows for incremental feedback to identify problems at all stages whilst not being as stressful as a summative continuous one. The aim is to facilitate a continuous dialogue between staff and students at both individual and group level on how to improve performance and achieve a high degree of critical thinking. It will consist of -but not restricted to- feedback of the laboratory and workshop activities. Some of these activities may be individual and anonymous (MCQs or notebooks) if so desired by the candidate/s whilst others cannot be run in this way. Group activities may consist of - but not restricted to - civic engagement activities and journal clubs and will typically require light supervision from staff as the objective is to test the creativity, resourcefulness and complementarity of the members as a single unit. Extracurricular activities will include guided visits to botanical gardens and museums exhibiting materials related to medicinal natural products. The summative assessments will test individuals and/or groups in a double-blind manner. Individual activities may consist in -but not restricted to- solving the structure of a natural products from spectra, proposing procedures to obtain such products or reviewing the evidence being their uses and alleged pharmacological activities. The latter may consist of -but not restricted to- engaging with the general public and peers by means of talks and posters, the creation of mock companies developing natural products into innovative products, creation of blogs about medicinal natural products. This will typically require light supervision from staff. Unseen exam papers will be implemented for all S1 and S2 non-shared taught modules.

Opportunities for work related learning

This MSc does not contemplate at this stage any Work-related learning. We do not discard identifying future opportunities in this area and eventually implementing them into the programme via modifications of the present proposal.

Entry Requirements

Type	Description
Alternative qualifications considered	Interest in Natural Products, Pharmacognosy, Phytochemistry.
Other international requirements	Equivalent to UK BSc Hons. (Second class or higher) in Sciences or Healthcare. English –applicants need to demonstrate competency in English equivalent to an IELTS score of 6.5 with a minimum score of 5.5 in each component.

Extra Entry Requirements