

## Liverpool John Moores University

Title: Approaches to Natural Products Discovery  
Status: Definitive  
Code: **7127PHASCI** (128060)  
Version Start Date: 01-08-2021

Owning School/Faculty: Pharmacy & Biomolecular Sciences  
Teaching School/Faculty: Pharmacy & Biomolecular Sciences

Team	Leader
Fyaz Ismail	Y
Jose Prieto Garcia	

**Academic Level:** FHEQ7      **Credit Value:** 20      **Total Delivered Hours:** 42  
**Total Learning Hours:** 200      **Private Study:** 158

### Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	18
Practical	12
Workshop	10

**Grading Basis:** 50 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam	Unseen paper on the Materials delivered during Lectures and workshops as well as theoretical aspects of the Laboratory Practicals	60	2
Report	Report	Reports on the Background, Methods, Results and Interpretations of Results obtained in the Laboratory Practical. Miniessays on the topics covered by cine forums (Biodiversity, biopiracy, Interface Pharmacology-Nutrition).	40	1

## Aims

*This module aims to cover the R&D aspects of natural products 'from field to bedside'.*

*The learning activities will:*

- (1) Integrate and apply the analytical and phytochemical knowledge acquired in modules 7224PHASCI and 7128PHASCI modules to natural products/drug discovery;*
- (2) Provide the candidates with further knowledge in preparative chromatography and other isolation methods;*
- (3) Integrate and apply the chemical knowledge acquired in module 7124PHASCI and 7128PHASCI towards mastery in synthetic and semisynthetic methods applied to natural products;*
- (4) Provide the candidates with advanced knowledge on strategies to discover new natural products with therapeutic and functional uses.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Independently acquire advanced chemical knowledge and apply specialised methods necessary for the bioprospection, field extraction, and industrial purification of natural products.
- 2 Independently acquire, critically evaluate and apply advanced synthetic knowledge to modify the physicochemical properties of natural products.
- 3 Demonstrate the necessary skills to plan, perform, report and interpret the results of laboratory experiments, and case studies on the bioprospection, field extraction, chemical modification and industrial purification of natural products

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Exam	1	2
Report	3	

## Outline Syllabus

*Isolation methods (Preparative Chromatography)*

*Bioguided Isolation Methods*

*Chemical Libraries-High Throughput Screening*

*Green Chemistry*

*Microorganisms and semisynthesis*

*Academic vs. industrial approaches*

*Endophytic fungi*

## Learning Activities

Theoretical lectures: will illustrate each topic with a series of carefully selected real-life case studies. They will interactively show the students the challenges at each step of the drug discovery process and how decisions made at early R&D stages may propagate into different challenges and/or opportunities at later stages. This will be complemented with current and future R&D tools and strategies such as chemical libraries, high-throughput screening, green chemistry, fermentation, in silico strategies, etc.

Laboratory practical lectures (Approx. 3 h each): will give hands-on experience on the associated techniques to research each of these topics. Taking Artemisinin as an example of successful natural antiprotozoal drug, students will be trained in isolation, semisynthesis, and characterisation.

Workshops: Some will take the innovative form of Cine-forums. Two movies ('Medicine Man' and 'Lorenzo's oil') will showcase different scenarios (the rain forest vs. first-world urban environments) and strategies (ethnopharmacology vs. biochemical knowledge) for natural product discovery, respectively. Student will prepare in advance for a group discussion by reading selected materials. Classic workshops will focus on the processing and interpretation of the results obtained laboratory practical's.

Dissemination activity: individual posters/stall at open days to raise awareness of the importance and impact of Natural Products in society both within the wider student community at LJMU and the general public, formative. This activity may take other forms and times if needed by the cohort/student such as participating in the CNPD blog/YouTube channel/Twitter throughout the academic year or different terms.

## Notes

This module takes the very same name of the programme because it integrates all the previous content of the course into a linear and coherent narrative.