

## Liverpool John Moores University

Title: Diagnostics and Therapeutics  
Status: Definitive  
Code: **7105BSBMOL** (126684)  
Version Start Date: 01-08-2021

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

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**Academic Level:** FHEQ7      **Credit Value:** 20      **Total Delivered Hours:** 40  
**Total Learning Hours:** 200      **Private Study:** 160

### Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	20
Practical	15
Workshop	3

**Grading Basis:** 50 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam	Examination	50	2
Report	Report	Laboratory practical report. Typical word length 2500.	50	

### Aims

*To provide an overview of the application of techniques to disease diagnosis and therapeutic modulation.*

## **Learning Outcomes**

After completing the module the student should be able to:

- 1 Demonstrate a reflective understanding of molecular and imaging techniques to aid disease diagnosis.
- 2 Interpret and evaluate practical data.
- 3 Critically evaluate the literature on 'omics' technologies and research techniques.
- 4 Develop an appreciation of improving outcomes through a personalised medicine approach via targeted and personalised interventions.

## **Learning Outcomes of Assessments**

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

Module examination	1	3	4
Laboratory report	2	3	

## **Outline Syllabus**

### *Lectures:*

*The module provides a critical appreciation of the techniques used to help identify and monitor disease and therapeutics. Topics to include:*

- *Translational mass spectrometry – using extreme deep phenotyping (proteomics, metabolomics and lipidomics) for the elucidation of disease mechanisms, novel biomarker discovery, the discovery of novel drug targets, evaluation of new therapeutics and to develop new test e.g. development of anti-diabetic medicines derived by proteomics.*
- *Molecular diagnosis and treatment stratification for clinically important diseases such as cancer and HIV.*
- *Molecular diagnostics for therapeutic drug monitoring (Warfarin, Abacavir etc.).*

### *Practicals:*

*Characterisation of novel biomarkers by protein analyses.*

*The practical sessions will involve the use of proteomics technologies (western blot analyses and mass spectrometry data) to identify and characterise novel biomarkers. These studies will explore how changes in protein expression related to disease diagnosis and progression can identify possible areas for therapeutic intervention and novel drug-targets. Students will be expected to research the literature and analyse global shotgun proteomic data to identify potential novel biomarkers, which they will further validate through gel electrophoresis.*

*Determination of drug metabolising gene expression.*

*The practical sessions will involve the use of RNA analyses (QRTPCR) to*

*characterise cytochrome P450 gene expression to determine if the student is a poor or rapid metaboliser. These studies will explore how expression of different drug metabolising enzymes impacts therapeutic drug use and how this can be used to prevent adverse drug reactions. Students will be expected to research the literature, isolate and quantify RNA and analyse gene expression data.*

#### *Workshops*

*The workshops will focus on group discussions involving data interpretation/analysis and scientific communication.*

### **Learning Activities**

Lectures, practicals, workshops and student-centred activities.

### **Notes**

This module aims to give students an appreciation of current advances in disease diagnosis and therapeutics, including a personalised medicine approach.