Module Specification

Cell Signalling

Version: 2024-25, v3.0, 22 May 2024

Contents

Part 1: Information

Module title: Cell Signalling

Module code: USSKB4-15-2

Level: Level 5

For implementation from: 2024-25

UWE credit rating: 15

ECTS credit rating: 7.5

College: College of Health, Science & Society

School: CHSS School of Applied Sciences

Partner institutions: None

Field: Applied Sciences

Module type: Module

Pre-requisites: Cells, Biochemistry and Genetics 2023-24

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module provides students with a comprehensive understanding of cell signalling networks and how those events influence outcomes for both health and disease.

Features: Not applicable

Educational aims: This module aims to provide students with the critical analytical skills pertaining to the review of published works, aligning to cell signalling. Students

will also be introduced to bioinformatics and data analysis as applied to cell signalling.

Outline syllabus: Principles underlying cell signalling events:
The production of signals, their perception and the responses they evoke will be discussed in a generic setting to impress on the commonality of signalling principles. Examples will be drawn mainly from mammalian systems, but commonalty to systems in other eukaryotes will be emphasised. Cell-cell signalling, such as endocrine, paracrine and autocrine, along with gap-junctions, will be covered, leading to discussion of hormones, cytokines and growth factors.
Each signalling pathway and type of signalling will be discussed with respect to their roles in health and in specific diseases

Specific signal transduction pathways, including those involving:
cAMP, adenylyl cycles and G proteins, with discussion of the control of glycogen metabolism, cholera, pertussis toxin and cancer and any other relevant diseases
Inositol phosphates, lipid signalling, how these elements integrate into signalling. The recycling of inositols will be discussed.
Calcium ions, calmodulin, calcium sequestration, calcium ion oscillations and waves.
Developmental signalling pathways and their relevance to disease.
Electrical excitability.
Neuronal signalling and the role of neurotransmitter signalling in mental illness.
Role and mechanisms of action of cell receptors, including those linked to cell adhesion.
How ligands are perceived, receptor changes and the transition of the signal into or through the cell. Intracellular receptors which respond to pharmaceuticals such as steroids will also be discussed.

Part 3: Teaching and learning methods

Teaching and learning methods: The module will be delivered through lectures , tutorials and a bioinformatics practical class, which provide opportunities for students to engage in data analysis relevant to the major cell signalling pathways.

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Utilise research literature to inform the analysis and discussion of the molecular and cellular principles underlying cell signalling.

MO2 Discuss specific signal transduction pathways and their implication in development, health and specific diseases.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://uwe.rl.talis.com/modules/usskb4-15-2.html

Part 4: Assessment

Assessment strategy: Assessment: Set Exercise
The module assessment is a set exercise (2000 words).
Students will collect data and review published figures and data taken from research papers relating to the role of cellular signalling in development or disease.

This assessment will allow the students to develop skills in the critical analysis of published research, which are essential for both the level 6 project module and any future research the student may undertake post-graduation.

Students will be supported to succeed in this assessment through the provision of coursework support sessions in which students are introduced to peer reviewed work and undertake systematic review of that research. There will be an opportunity, in an interactive session with a member of the teaching team to critique the published work, identify strengths and areas for expansion and/or refinement.

Assessment tasks:

Set Exercise (First Sit)
Description: Research paper critique, data analysis and interpretation (2000 words)
Weighting: 100 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2

Set Exercise (Resit)
Description: Research paper critique, data analysis and interpretation (2000 words)
Weighting: 100 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Biological Sciences [Frenchay] BSc (Hons) 2023-24

Biological Sciences [Frenchay] MSci 2023-24

Biomedical Science [Frenchay] BSc (Hons) 2023-24

Biomedical Science [Frenchay] MSci 2023-24

Biomedical Science [Sep][PT][Frenchay][6yrs] BSc (Hons) 2021-22

Biomedical Science [Sep][PT][Frenchay][8yrs] MSci 2021-22

Biological Sciences {Foundation} [Frenchay] BSc (Hons) 2022-23

Biological Sciences {Foundation} [Frenchay] MSci 2022-23

Biomedical Science [Frenchay] BSc (Hons) 2022-23

Biomedical Science {Foundation} [Frenchay] BSc (Hons) 2022-23

Biomedical Science [Frenchay] MSci 2022-23

Biomedical Science {Foundation} [Frenchay] MSci 2022-23