# Module Specification

## Developmental and Stem Cell Science

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## Part 1: Information

**Module title:** Developmental and Stem Cell Science

**Module code:** USSJXY-15-3

**Level:** Level 6

**For implementation from:** 2023-24

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**Faculty:** Faculty of Health & Applied Sciences

**Department:** HAS Dept of Applied Sciences

**Partner institutions:** None

**Field:** Applied Sciences

**Module type:** Module

**Pre-requisites:** Human Health and Disease 2023-24, Studies in the Biology of Disease 2023-24

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** Pre-requisites: Students must take one out of Studies in the Biology of Disease (USSKAT-30-2) or Human Health and Disease (USSKAN-30-2).

**Features:** Not applicable

**Educational aims:** This module is designed to give an overview of two key interconnected subject areas at the forefront of current research. This will

complement and extend other modules on the programmes – briefly:

1. Fundamental and applied developmental biology.
2. Applied stem cell science.

**Outline syllabus:**

1. Fundamental and applied developmental biology:

The mechanisms of embryological development will be introduced from the point of fertilisation and embryogenesis, through embryological and foetal development. This will include aspects of molecular mechanisms of signalling and patterning within the embryo. Organogenesis will also be examined to allow an understanding of congenital organ defects (such as those affecting the heart) and subsequent effects on health. The role of developmental signalling mechanisms in both inherited and sporadic disease, such as cancer, will be covered from a research-informed perspective.

2. Applied stem cell science:

From basic biology to clinical application. The legislation and ethics around human embryo and stem cell science will be considered. The nature, identification, pathology and clinical application of stem cells will be explored in various tissue systems, including current and potential stem cell therapy. The cancer stem cell theory will be addressed using worked examples along with the potential for the development of targeted therapies.

## Part 3: Teaching and learning methods

**Teaching and learning methods:** Scheduled Learning: The Module delivery will include 42 hours of contact time, split between lectures, tutorials and research seminars.

The majority of the taught material will be delivered as lectures. Tutorials will include

opportunities for students to debate ethical issues around human embryo and stem cells in terms of both research and clinical application. Staff will also deliver research seminar sessions based around their own developmental and/or stem cell-based research.

Independent Learning: In addition, students are expected to prepare for tutorial sessions by carrying out designated reading tasks. Furthermore, they are expected to undertake further independent reading – with guidance given during lectures. This reading is designed to support student learning both for the completion of coursework, but also in preparation for the final exam, to ensure both the breadth and depth of their knowledge.

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

**MO1** Demonstrate an understanding of the fundamental molecular biology of human embryogenesis and development, and developmental disease.

**MO2** Demonstrate an understanding of the applications of developmental, embryological and stem cell technologies.

**MO3** Demonstrate an awareness and understanding of recent advances in the field of development and stem cell technologies, and critically review literature in the field.

**MO4** Demonstrate a consideration of the ethical, social and political implications of advances in development and stem cell technologies.

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

**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/index.html

## Part 4: Assessment

**Assessment strategy:** Assessment Task 1: will consist of an online examination comprising essay type questions. A choice of 3 out 6 six questions will allow students to demonstrate both the breadth and depth of their knowledge of the subject area.

Assessment Task 2: The coursework task in the module will consist of a 2000 word essay based on a topical issue in applied embryological and stem cell research and potential clinical application. Students will consider the underlying cellular and molecular biology of the topic, recent advances in methods and technologies for studying these areas, alongside the ethical and political issues and changing legislation.

Assessment Task 1 assesses knowledge and understanding of fundamental concepts underlying embryogenesis, development, stem cells biology and application.

Assessment Task 2 tests the application of knowledge, critical evaluation and the ability to research and review relevant literature. It requires the student to consider scientific principles in the wider context of society, politics and ethics. Assessment Task 2 also tests the students' broad and up-to-date knowledge of the field, which is necessary in a rapidly advancing area such as this.

Feedback from the coursework assessment will feed forward in preparing students for the final examination.

**Assessment tasks:**

**Examination** (First Sit)
Description: Written Exam (online - 24 hour window)
Weighting: 50 %
Final assessment: Yes
Group work: No

Learning outcomes tested: MO1, MO2, MO3

**Written Assignment** (First Sit)
Description: Essay (1500 words)
Weighting: 50 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

**Examination** (Resit)
Description: Written Exam (online - 24 hour window)
Weighting: 50 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3

**Written Assignment** (Resit)
Description: Essay (1500 words)
Weighting: 50 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

## Part 5: Contributes towards

This module contributes towards the following programmes of study:

Biomedical Science [Sep][FT][Frenchay][3yrs] BSc (Hons) 2021-22

Biomedical Science [Sep][FT][Frenchay][4yrs] MSci 2021-22

Applied Biomedical Science [Sep][FT][Frenchay][3yrs] BSc (Hons) 2021-22

Biological Sciences [Sep][FT][Frenchay][3yrs] BSc (Hons) 2021-22

Biological Sciences [Sep][FT][Frenchay][4yrs] MSci 2021-22

Biomedical Science [Sep][SW][Frenchay][5yrs] MSci 2020-21

Biomedical Science {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2020-21

Biomedical Science [Sep][SW][Frenchay][4yrs] BSc (Hons) 2020-21

Biomedical Science {Foundation} [Sep][FT][Frenchay][5yrs] MSci 2020-21

Biological Sciences [Sep][SW][Frenchay][4yrs] BSc (Hons) 2020-21

Biological Sciences [Sep][SW][Frenchay][5yrs] MSci 2020-21

Biological Sciences {Foundation} [Sep][FT][Frenchay][5yrs] MSci 2020-21

Biological Sciences {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2020-21

Biological Sciences {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2019-20

Biomedical Science [Sep][PT][Frenchay][6yrs] BSc (Hons) 2019-20

Biomedical Science [Sep][PT][Frenchay][8yrs] MSci 2019-20

Biomedical Science {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2019-20

Biomedical Science {Foundation} [Sep][SW][Frenchay][6yrs] MSci 2019-20

Biological Sciences {Foundation} [Sep][SW][Frenchay][6yrs] MSci 2019-20