

MODULE CODE:	UIN XJN-10-3	MODULE VERSION: 2.1
MODULE TITLE:	CELLULAR MECHANISMS OF DEVELOPMENT	
LEVEL:	3	
UWE CREDIT RATING:	10	
ECTS CREDIT RATING:	5	
MODULE TYPE:	STANDARD	
OWNING FACULTY:	HARTPURY	
FIELD:	Animal and Land Sciences	
VALID FROM:	September 2011	
DISCONTINUED FROM:		
PRE-REQUISITES:	UIN XGV-10-1 (Animal Genetics)	
CO-REQUISITES:	None	
EXCLUDED COMBINATIONS:	None	

LEARNING OUTCOMES:

At the end of this module the student should be able to:

- A. *Knowledge and understanding*
 - 1. Discuss the process of gastrulation in detail commenting on the various stages involved (A);
 - 2. Demonstrate a sound knowledge of the processes involved in early embryonic development (A);
 - 3. Define the developmental programmes associated with individual cells in an embryo, and to discuss the topic of lineage analysis (B);
 - 4. Differentiate between the processes of gastrulation, neurulation and somite formation (A);
- B. *Intellectual skills*
 - 1. Evaluate processes of cell differentiation, relating to the production of different cell types, for different purposes (A, B)
- C. *Subject/professional and practical skills*
 - 1. Demonstrate a range of laboratory skills appropriate to this discipline
- D. *Transferable skills and other attributes*
 - 1. Produce an academic review to a professional standard (B)

SYLLABUS OUTLINE:

Morphogenic movements and the shaping of the general body plan; how the geometrical structure of the early embryo is formed and what physical forces mould it.

Egg polarity, the blastula, gastrulation, endoderm, mesoderm and ectoderm.

Cell diversification and cell memory; the genome, gene expression, blastomeres, early embryonic development.

Developmental programs of individual cells; lineage analysis, positional information, developmental control genes, differentiation programs, cell-autonomous behaviour, cell-cell interactions.

Principles of spatial patterning; pattern formation, positional information, asymmetries, positive feedback, localised signalling regions, morphogen gradients, cell memory.

Molecular genetics of pattern formation; the modulation of a fundamental pattern of repeating units, syncytial blastoderm, orthogonal systems.

Organogenesis; selective cohesion, patterns of morphogenetic movement, positional information, migrant cells, development of the nervous system.

Maintenance of the differentiated state; extracellular matrix, fibroblasts, schwann cells.

TEACHING & LEARNING METHODS:

A variety of learning strategies will be used which may include lectures, seminars, practicals, tutorials, and e-learning

READING STRATEGY:

Essential Reading

It is essential that students read one of the many texts on research methods available through the Library. Module guides will also reflect the range of reading to be carried out.

Further Reading

Students are expected to identify all other reading relevant to their chosen research topic for themselves. They will be encouraged to read widely using the library catalogue, a variety of bibliographic and full text databases, and Internet resources. Many resources can be accessed remotely.

Access and Skills

The development of literature searching skills is supported by the Library seminar within the induction period and by the Graduate Development Programme at level three. These level three skills will build upon skills gained by the student whilst studying at levels one and two. Additional support is available through iSkillZone. This includes interactive tutorials on search skills and on the use of specific electronic library resources. Sign up workshops are also offered by the Library.

Indicative Reading List

The following list is offered to provide validation panels/accrediting bodies with an indication of the type and level of information students may be expected to consult. As such, its currency may wane during the life span of the module specification. However, as indicated above, CURRENT advice on readings will be available via the module handbook.

Alberts, B., Bray, D., Lewis, J., Raff, M., Roberts, K., and Watson, J.D. (Current Edition) *Molecular biology of the cell*. New York: Garland Publishing.

Browder, L. (Current Edition) *Developmental biology*. Philadelphia: Saunders.

Gilbert, S.F. (Current Edition) *Developmental biology*. Massachusetts: Sinauer.

Slack, J.M.W. (Current Edition) *From egg to embryo: Determinative events in early development*. Cambridge: Cambridge University Press.

Spermann, H. (Current Edition) *Embryonic development and induction*. New York: Yale University Press.

Websites and databases:

The above sources give an indication of the area of study involved. Although students may be directed to some specific titles, they will also be encouraged to identify other relevant material for themselves.

