

Medical Biology (CASP)

Scientists work to find out how and why things happen. Natural curiosity sometimes provides the starting point for scientific investigations. Other investigations might set out to solve certain problems and therefore have definite aims. Even then, unexpected results may emerge and lead to unexpected discoveries. X-rays, radioactivity and penicillin are examples of unexpected scientific discoveries.

No-one can predict which research projects will lead to new developments because no-one knows what areas of science await to be discovered beyond the frontiers of knowledge. Michael Faraday, who discovered how to generate electricity, was asked, 'What use is electricity, Mr Faraday?' He is said to have retorted, 'What use is a new baby?' Faraday's response highlights the idea of the potential that might come from an initial discovery that in itself might not seem all that important. More than 160 years later progress in science without electricity would be virtually impossible; everyday living without electricity would be unthinkable for most of us.

Progress in science often depends on the development of new techniques. The course aims to provide an understanding of how new techniques and methodology have, historically, led to our current understanding of areas of biology fundamental to agriculture, medicine and the origins of life itself. The areas of biology to be studied will be chosen from:

Muscles

Early notions of how muscle works
Optical microscopy: new technology leads the way
The chemistry of muscle: a different approach
Electron microscopy: the key to progress

Photosynthesis

Early discoveries
Towards the current understanding
Photosynthesis: preview
Light harvesting, dependent reactions & independent reactions

DNA

Discovering the chemical carrier of genetic information
Structure of DNA
Genes and polypeptides
DNA and chromosomes
The genetic code
Polypeptide synthesis
Gene mutation & expression

Evolution

The growth of an idea
Evolution through natural selection – a modern statement
The current paradigm
Before Darwin
Enter Charles Darwin (1809 – 1882)
The man who walked with Henslow
HMS *Beagle*
1836 – 1838
Hesitation . . . and barnacles
Wallace intervenes

1859

Selection and speciation

The developmental origins of speciation: an afterthought for the future

Teaching will be supported by detailed print resources and discussion driven. Students will research points of interest arising from discussion and give brief accounts of their findings within the context of the topic under consideration. The aim is to improve the confidence of students in expressing their views supported by appropriate evidence. The style will be in the tradition of Oxbridge supervisions.

Recommended pre-summer reading

Applin, D G	<i>AS Biology for AQA/OCR,</i>	Oxford University Press
Applin, D G	<i>A2 Biology for AQA/OCR,</i>	Oxford University Press (OCR available online)

The books can be ordered from your local bookshop, Oxford University Press, or www.amazon.co.uk