



### About the Tutor

Guy Sutton's primary research interests are the genetics of neural development and the interactive nature of biological, behavioural and genetic factors in disease processes.

He is honorary lecturer in the Division of Psychiatry at University of Nottingham and has held previous academic appointments at Manchester, Manchester Metropolitan and Cambridge Universities. Guy has lectured in neuroscience and genetics to a range of undergraduate and postgraduate students, including medics, biologists and psychologists. He has conducted research projects and data analysis for various organisations, including the Department of Health and the Medical Research Council. In addition to presenting research at various international conferences and writing for academic publications, Guy has talked about the theoretical and clinical aspects of his research on television and radio. He sat on the advisory board for the Wellcome Trust's 2013 'Inside The Brain' publication. Recent articles include 'Methods For Exploring The Brain' and 'The Epigenetic Brain' in *Psychology Review*.

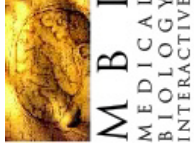
He has tutored on 'A' level reading parties for students and teachers for several years. He is an associate tutor with Villiers Park Educational Trust, Cambridge and has written and delivered courses for Young, Gifted & Talented.

### About MBI

MBI (Medical Biology interactive) delivers one-day and half-day courses, seminars and tutorials in epidemiology, occupational health and the human sciences to the health service, industry and education. All MBI seminars are written and run by academics and health specialists, each of whom has considerable experience in research and its practical applications. Seminars are delivered at the hospital, workplace or school, based on cutting-edge research and current practice benchmarks, and tailored to the needs and concerns of the client.

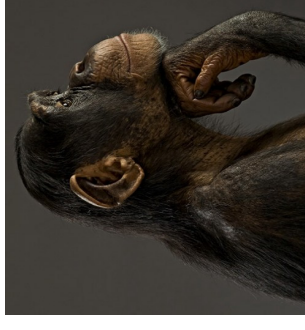
Some of the courses and tutorials that MBI currently offers are listed in this pamphlet.

For further information and full programmes, please contact Dr. Guy Sutton; tel. 07941 039670, e-mail: [gmsutton@mbi-consultancy.co.uk](mailto:gmsutton@mbi-consultancy.co.uk).



PRESENTS

# COMPARATIVE BIOLOGY & ZOOLOGY



*A Half-Day Tutorial  
On The Physiology  
of Other Animals -  
Delivered At Your School*

TUTOR:

**Dr Guy Sutton**

Director, MBI &

Honorary (Consultant) Assistant Professor,  
University of Nottingham Medical School



**Seminars & Tutorials For  
The Health Service, Industry & Education**

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## INTRODUCTION TO THE TUTORIAL

The fields of comparative biology and zoology are wide-ranging and shed light on the evolution of taxa and also that of *homo sapiens*. Comparative biology is generally concerned with the study of patterns of life across organisms and the biological mechanisms that drive phylogeny. In a simple sense, zoology refers to the study and animals and the animal kingdom, but encompasses the study of evolution, embryology and behaviour. This tutorial is intended to provide students with an exciting introduction to the basic concepts, methods and branches of these fields, with focus windows on comparative genomics, parasitology, primate ethology and marine biology. Amongst the topics considered are how we classify animals, evolution of the mammalian skull, and homosexual behaviour in the animal kingdom.

The tutorial is intended to push beyond traditional study into current research. Thus, we also examine the relationship between comparative biology, zoology and medicine. How is the study of subterranean species aiding cancer researchers and how might variation in regenerative abilities across species inform our understanding of senescence and augment human regenerative capacity? The morning offers a wonderful opportunity for the inquisitive biology student, marrying molecular biology, ethology, paleontology, genomics, evolutionary theory, physiology and philosophy.

## WHICH STUDENTS WILL BENEFIT?

This tutorial is designed primarily for very able A-level biology students but will also be useful to:

- any AS students with an interest in comparative biology and study of the animal kingdom.
- those students considering a university degree and/or career in the following subjects:

Zoology    Veterinary Science    Life Sciences  
Medicine    Biological Sciences    Ethology

## AIMS OF THE TUTORIAL

There are three main aims to this tutorial:

- to provide the student with an introduction to the central themes of comparative biology, together with a review of methods and branches of zoology.
- to study the mechanisms of evolutionary diversity in animals, exploring differences in anatomy, physiology, embryology and behaviour in different species.
- to consider how the study of different species may have implications for our understanding of the ageing process and the treatment of human disease.

## SPECIMEN PROGRAMME

A variety of topics and issues relating to comparative biology and zoology will be covered. Topics can, to some extent, be tailored to the requirements of the teacher:

- **9.00-9.10: Introduction & Aims**
- **9.10-10.00: An Introduction To Comparative Biology & Zoology**  
Issues in comparative and integrative biology. Branches of zoology. The phylogenetic scale. Linnaean taxonomy. Zoology, Darwinism and post-Darwinism. Important discoveries in zoology: tool use by chimpanzees; symbiosis in coral; migration routes; transitional species; island biogeography and marine evolution.
- **10.00-10.30: ZooWeb**  
Computer-based exercises.

- **10.50-11.20: Comparative Genomics**  
Evolutionary principles and DNA variation. Whole genome alignment. Decoding ancient genomes: Yersinia pestis. Molecular genetics and parasitology. Genome evolution: shellfish genes. Similarities and differences in human and gorilla genomes. Gene regulation and epigenetics.
- **11.20-11.50: Comparative Neuroanatomy**  
Other animals' brains: from *Drosophila melanogaster* to pan troglodyte. Evolution of the head and skull. The insect brain and nervous system. The brain and home building in different species of bird. Brain tissue under the microscope.
- **11.50-12.20: Fossils, Faeces & Flies**

What fossils tell us. Coprolites as indicators of an organism's behaviour. The explosion of flies during the Cenozoic Era. Extinction, the Dodo and the toothless dwarf dolphin.

- **12.20-12.50: Comparative Biology & Medicine**  
Why naked mole rats don't develop cancer. The comparative biology of tissue repair, regeneration and ageing and implications for understanding human senescence and disease.
- **12.50-1.00: Questions & Conclusions**

## FORMAT

The tutorial is delivered in your school and would usually run during the morning. The tutorial date can be arranged by contacting MBI. Format is varied, with interactive, multimedia lectures, microscopy, computer-based work and group discussions.

Each school receives interactive Comparative Biology software featuring activities and web links, plus a comprehensive pdf tutorial pack.

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## Praise for Brain Day

"It was amazing that the day passed so quickly and it was lovely to see our students so enthusiastic, asking stimulating questions and receiving such interesting answers. Like many teachers, I have sometimes come away from conferences feeling rather disappointed in the speakers, however Brain Day was truly excellent."  
Margaret Hight,  
Tadcaster Grammar School

"Spot on! The day took the students' knowledge to another level... it has also greatly improved my knowledge and understanding of the brain."  
Mr. A. Harper,  
Oldershaw School, Wirral.

"This was the best whole day tutorial that I have experienced in 20 years of teaching."  
Mrs N. Williams  
Worth School

"Fantastic - brings it alive. Great tutorial pack, fantastic resources."  
Mr. Peters,  
Hoistforth School, Leeds.

"A very high standard of presentation. Even the most reluctant students were engaged and fascinated."  
Mrs. V. Sweeting,  
Enfield County High School, London.

"The students are still buzzing (to use their terminology) and the AS students are already asking if we will do it again next year - to which the answer is a resounding 'yes!'"  
Mrs. K. Higgins,  
Wyke College, Hull.

"Superb, stimulating and challenging for even the most able students. I found many of the topics inspiring and really cutting edge. I would not hesitate to recommend this to other schools."  
Ms. C. Nicholls,  
The Lady Eleanor Holles School, Hampton.

"An excellent tutorial, delivered with real enthusiasm and verve. The students went away inspired and are still talking about it!"  
Mr. P. Lucas,  
Queen Elizabeth School, Kirkby Lonsdale.

"A thoroughly stimulating day for both students and staff, exceeding all our expectations."  
Ms. K. Smith,  
St Albans Girls' School, Hertfordshire.

"Students enjoyed the tutorial enormously and loved the sheep brain dissection. The day had been presented as an "Enrichment" opportunity and it certainly was."  
Mrs. J. Hardy,  
Ashtree College, Harrogate.