



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; in particular, how the brain can affect immunity increasing susceptibility to illness.

He is Honorary (Consultant) Assistant Professor in the Division of Psychiatry at University of Nottingham School of Medicine 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 medical students, and continues to be involved in teaching, assessment and examination of pre-clinical students at Nottingham. 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, most recently in the film 'Beyond The Genome' for Reelhouse Productions (2016). 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* and 'Crime and The Brain' in *Catalyst*.

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.

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

*“An excellent day,
during which students
(and staff) learnt a lot.”*

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JERSEY COLLEGE FOR GIRLS



PRESENTS

BRAINS & GENES FOR MEDICS



*A One-Day Tutorial
For Prospective Medical Students
In Neuroscience & Genetics -
Delivered At Your School*

TUTOR:

Dr Guy Sutton

Director, MBI &

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

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

Director Dr. Guy Sutton
7 Gloucester Road
Wallasey
Wirral
CH45 3JS

Tel. 07941 039670
E-mail: gmsutton@mbi-consultancy.co.uk
Web site: www.medicalbiology.co.uk

WHY A BRAIN & GENES DAY?

This tutorial is thus intended to serve as a comprehensive primer in neuroscience and modern genetic principles applied to medicine and biomedical science, developing knowledge beyond the A-Level curriculum and preparing students for degree-level study.

Over the past twenty years there have been astounding advances in our understanding of the workings of the human brain and nervous system. The multidisciplinary research attempts to understand brain function are collectively referred to as neuroscience. Undergraduate medical students usually first encounter neuroscience in their second year of study, receiving up to 50 related lectures and tutorials. Medical students must also become proficient in clinical genetics. Like neuroscience, genetics is currently one of the most rapidly developing areas of academic and clinical study. Estimates of the number of protein-coding genes in the human genome are constantly being revised (with the latest figures suggesting fewer than 21,000 genes). In years to come, the genome map and proteomics are likely to revolutionise the practice of medicine and dramatically increase our knowledge of preventing and treating many diseases.

In addition to reviewing elementary principles of brain function and medical genetics, this tutorial will introduce the student to modern scientific theories and findings, such as neuroplasticity in healthy and diseased nervous systems and neuroimaging, in neuroscience; and cancer epigenetics, DNA methyltransferase inhibition and state-of-the-art technologies for selective *in vivo* gene activation, in genetics.

WHICH STUDENTS WILL BENEFIT?

This tutorial is designed primarily for able A-Level biology and/or chemistry students intending to read medicine at University. It will also be useful to students intending to read biomedical sciences and pharmacology.

AIMS OF THE TUTORIAL

There are three main aims to this tutorial:

- to provide the student with an overview of some elementary principles in neuroscience and genetics.
- to examine what happens when the brain becomes damaged, disorganised and degenerates, with accompanying clinical examples.
- To explore modern conceptions of disease aetiology, considering how abnormal gene function translates into disease processes, with a focus on molecular cancer genetics.

SPECIMEN PROGRAMME

A variety of topics and issues relating to neuroscience and genetics will be covered. Topics can be tailored to the requirements of the syllabus studied and the teacher:

- **9.00-9.10: Introduction & Aims**
- **9.10-10.00: Mind & Brain In The 21st Century**
Debates in neurology and brain science. Brain cells and neurotransmission. Developments in neuroscience: genes and neurogenetics; neuroplasticity; brain imaging. On the horizon...
- **10.00-10.40: BrainWeb: Internet Session**
The nerve impulse, Drugs & The Brain. Voltage-gated ions channels and the action potential.
- **11.00-11.40: Genes & Genetic Disease**
What do genes do? Post-Human Genome Project Genomics & ENCODE. Genes, chromosomes and disease.
- **11.40-12.45: The Dissected Brain**
Cranial nerve, ascending and descending pathways. The brain and its major structures.
- **1.30-2.15: The Working The Damaged Brain**
Brain lobes and subcortical structures. The neurobiological and biochemical basis of memory, Alzheimer's disease and Huntington's disease. Types of brain damage and associated impairments.
- **2.15-2.45: DNAWeb: Internet Session**
Transcription, translation and gene products; chromosome mapping; DNA technologies.
- **2.45-3.35: Focus On Cancer**
The molecular biology, immunology and genetics of cancers. Epigenetics and future molecular therapies. Treatment options, from conventional chemotherapy to monoclonal antibodies and epigenetic pharmacotherapies.
- **3.35-3.45: Conclusions**

FORMAT

The tutorial is delivered in your school and runs throughout the school day. Tutorial date can be arranged by contacting MBI. Format is varied, with interactive, multimedia lectures and group discussions.

Students each receive a comprehensive pdf tutorial pack relating to and complementing material presented during the tutorial. The school also receives Brains & Genes software for further exploration of material in the tutorial.

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SEMINARS & TUTORIALS

FOR THE HEALTH SERVICES & THE LEGAL PROFESSION

MEDICAL GENETICS
(FOR GENERAL PRACTITIONERS)

METHODS IN
MOLECULAR BIOLOGY

EPIDEMIOLOGY & STATISTICS IN
CLINICAL PRACTICE

BRAIN DAY FOR THE
HEALTH & EMERGENCY SERVICES

THE BRAIN & THE LAW

FOR EDUCATION

BRAIN DAY

DNA DAY

PSYCHOPATHOLOGY

FORENSIC SCIENCE

BRAINS & GENES FOR MEDICS

THE HISTORY OF MEDICINE

THE LEARNING BRAIN
(INSET FOR TEACHERS)

STRESS & SRESS MANAGEMENT
(INSET FOR TEACHERS)