Imperial College Faculty of Medicine

BSc Endocrinology MODULE 3

Neuroendocrinology, health and disease

Wednesday 2 January - Friday 1 February 2013

Course Organiser: Prof Glenda Gillies [g.gillies@imperial.ac.uk](mailto:g.gillies@ic.ac.uk),

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***Locations:***

HM-WEC = Hammersmith Wolfson Education Centre

LT = Lecture Theatre

CXLB = Charing Cross campus, Lab Block

HM-SBS = Hammersmith campus, Sub-basement, Commonwealth Building

SR = Seminar Room

Computer Room: CWB Basement

Library: CWB First Floor

*N.B. Where no formal sessions are timetabled, please allocate your time sensibly for personal reading and preparation of in-course assessments.*

**Aims and content**

* To provide an understanding of the body's response to stressful stimuli, including analysis of the regulation of the hypothalamo-pituitary-adrenal (HPA) axis, the intercommunication between the HPA axis and the immune system and central actions of stress hormones.
* To assess the impact of early life exposure to stress and glucocorticoid hormones on physiological processes and disease susceptibility in later life.
* To explore the reproductive and non-reproductive roles of sex steroid hormones in the brain.
* To illustrate the roles of gonadal steroids in the emergence, maintenance and biological significance of age- and sex-dependent patterns of hormone secretion, as illustrated in the hypothalamo-pituitary –GH, -adrenal and -gonadal axes.
* With this understanding, to highlight the scope for new therapeutic approaches to disease.

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| **Week 1 The stress response** | | | | |
| **Date** | **Time** | **Location** | **Title** | **Lecturer** |
| Monday  31st Dec 2012 |  | | | |
| Tuesday  1st Jan 2013 | Bank Holiday | | | |
| Wednesday  2nd January | 10.00-11.00 | HM-WEC LT3 | Welcome Introduction.  Then: The neuroendocrine concept | Professor John Laycock |
| 11.00-11.30 | HM-WEC LT3 | Course overview | Professor Glenda Gillies |
| 12.00-13.30 | HM-WEC LT3 | The HPA response to stress | Professor Glenda Gillies |
| Thursday  3rd January | 09.00-10.00 | HM-WEC SR2 | Hypothalamus: co-ordinator of the stress response | Professor Glenda Gillies |
| 10.00-11.00 | HM-WEC SR2 | Behavioural & autonomic responses to stress I | Dr Chris John |
| 11.00-12.00 | HM-WEC SR2 | Behavioural & autonomic responses to stress II | Dr Chris John |
| 13.00-15.00 | HM-WEC SR2 | Tutorial 1: How can you discover a hypothalamic hormone? | Professor Glenda Gillies and Dr Chris John |
| HM-WEC SR 4 |
| Friday  4th January | 11.00-13.00 | HM-WEC SR 4 | GC feedback: loci and mechanisms | Professor Glenda Gillies |
| GC feedback: mechanisms regulating sensitivity of cells |
| 14.00-15.00 | HM-WEC SR 4 | HPA axis and depression | Dr Chris John |

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| **Week 2 Stress, glucocorticoids (GCs) and disease susceptibility** | | | | |
| **Date** | **Time** | **Location** | **Title** | **Lecturer** |
| Monday  7th January | **Private Study** | | | |
| Tuesday  8th January | 10.00-11.00 | HM-WEC SR4 | Steroid feedback: non-genomic mechanisms of action | Professor Glenda Gillies |
|  | 12.00-13.00 | HM-WEC SR4 |  |  |
|  | 13.30-15.00 | HM-WEC LT2 | **Tutorial 2:** Critical analysis and ICA | Professor Glenda Gillies & Dr Pat Cover |
| HM-CWB SBSR 1&2 |
| Wednesday  9th January | **Private Study and Sport** | | | |
| Thursday  10th January  **Charing Cross Hospital** | 11.00-13.00  (with break) | CXLB  9th floor LT | Stress hormones & reproductive competence I & II | Dr Pat Cover |
|  | 14.00-15.00 | CXLB  10th floor LT | GCs stress and hypertension | Professor John Laycock |
|  | 15.00-16.30 | CXLB  10th floor LT | Love, trust and the neurohyphysis | Professor John Laycock |
| Friday  11th January | 10.00-11.00 | HM-WEC LT3 | Stress and immunity | Dr Caroline Small |
| 11.00-12.00 | HM-WEC LT3 | The HPA response to immune challenges | Dr Caroline Small |
| 14.00-15.00 | HM-WEC LT3 | Cytokines and immunity: focus on leptin | Dr Caroline Small |

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| **Week 3 Stress and sex hormones as mediators of early life programming** | | | | |
| **Date** | **Time** | **Location** | **Title** | **Lecturer** |
| Monday  14th January | 10.00-11.00 | HM-WEC LT2 | Corticosteroids in perinatal life: physiology | Professor Glenda Gillies |
|  | 11.00-12.00 | HM-WEC LT2 | Corticosteroids in perinatal life: pathology I | Dr Chris John |
|  | 13.00-14.30 | HM-WEC LT2 | Stress & corticosteroids in perinatal life; pathology II | Professor Glenda Gillies |
| Tuesday  15th January | 10.00-11.30 | HM-WEC LT2 | Paediatrics and perinatal stress and distress | Dr Mitch Blair |
|  | 11.30-13.00 | HM-WEC LT2 | Neurodevelopmental implications of stress and endogenous glucocorticoid exposure during early human development – I & II | Professor Vivette Glover |
|  | 14.00-16.00 | HM-WEC LT2 | **Tutorial 3:** Data Analysis | Professor Glenda Gillies & Dr Pat Cover |
| HM-CWB SBSR 1&2 |
| Wednesday  16th January | **Private Study and Sport** | | | |
| Thursday  17th January | 10.00-11.00 | HM-WEC LT2 | Sex steroid hormones in perinatal life: programming of the HPG axis I | Professor Glenda Gillies |
|  | 11.00-12.00 | HM-WEC LT2 | Sex steroid hormones in perinatal life: programming of the HPG axis II | Professor Glenda Gillies |
|  | 13.00-14.30 | HM-WEC LT2 | Sex dimorphisms in hypothalamic regulation of human reproduction | Dr Channa Jayasena |
| Friday  18th January | **Private Study** | | | |

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| **Week 4 Brain sex dimorphisms and disease** | | | | |
| **Date** | **Time** | **Location** | **Title** | **Lecturer** |
| Monday  21st January | **09.00 - ICA1 submission deadline** | | | |
| 10.00-11.00 | HM-WEC LT3 | Hypothalamic regulation of sexually dimorphic GH secretory profiles and their biological significance | Professor Glenda Gillies |
| 11.00-12.00 | HM-WEC LT3 | Ontogeny of growth and GH secretory patterns I | Professor Glenda Gillies |
| 13.00-14.00 | HM-WEC LT3 | Ontogeny of growth and GH secretory patterns II | Professor Glenda Gillies |
| 14.00-16.00 | HM-SB SR3 & SR4 | **Tutorial 4**: Data interpretation | Professor Glenda Gillies & Dr Chris John |
| Tuesday  22nd January | Private Study | | | |
| Wednesday  23rdJanuary | Private study and sport | | | |
| Thursday  24th January | 10.00-11.00 | HM-WEC LT3 | The endocrine contribution to sex differences in CNS disorders | Professor Glenda Gillies |
| 11.00-12.00 | HM-WEC LT3 | The endocrine contribution to sex differences in CNS disorders | Professor Glenda Gillies |
| 13.00-15.00 | HM-SB SR 1&2 | Open discussion forum |  |
| Friday  25th January | 10.00-12.00 | HM-WEC SR2 | Translational workshop: implications of endocrine function for behavioural disorders | Dr Stavros Bekas, Dr Anju Soni and Dr Nick Larsen |
| 13.00-15.00 | HM-SB SR 1&2 | Exams & revision | Module leaders |

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| **Week 5 Oestrogens and neurodegeneration** | | | | |
| **Date** | **Time** | **Location** | **Title** | **Lecturer** |
| Monday  28th January | 10.00-11.00 | HM-WEC  SR4 | Sex hormones and Parkinson’s disease | Professor Glenda Gillies |
|  | 11.00-12.00 | HM-WEC  SR4 | Neurotrophic and neuroprotective actions and mechanisms of action of oestrogens | Professor Glenda Gillies |
|  | 13.00-14.00 | HM-WEC  SR4 | ICA1 feedback | Professor Glenda Gillies |
|  | 14.00-15.30 | HM-WEC  SR4 | Environmental oestrogens: where do they come from, what might they be doing to us and how can we test this? Video followed by Q&As | Professor Glenda Gillies |
| Tuesday  29th January |  |  | Private study/ ICA preparation |  |
| Wednesday  30th January | Private study and sport | | | |
| Thursday  31st January | Private study / ICA preparation | | | |
| Friday  1st February | Private study / ICA preparation  **16.00hrs - ICA2 Critical Analysis deadline** | | | |