**Physiology 415**

**Laboratory Techniques in Biomedical Research**

Winter 2018

|  |
| --- |
| **MODULE I/Nupur and Hui** |
| Nucleic acids in molecular biology: Principles and methods (Lecture) |
| Techniques in the study of DNA (Lab) |
| Molecular cloning /Gene editing part I (Lab) |
| Molecular cloning /Gene editing part II (Lab) |
| Techniques in the study of RNA (Lab) |
| Gene, protein and sequence resources: (Computer Lab) |
| **Exam** |

|  |
| --- |
| **MODULE II/ Dhiman and Juilee** |
| Electrophoretic and antibody-based methods in protein chemistry (Lecture) |
| Application of SDS-PAGE and western blotting to detect proteins from tissue samples (Lab) |
| -continued from last week- (Lab) |
| Chromatographic techniques for studying proteins (Lecture) |
| Preparation of oxy-hemoglobin from met-hemoglobin using desalting column and UV-Vis characterization of oxy and met-hemoglobin (Lab) |
| LCMS based study from clinical specimens of reproductive disorders (e.g. PCOS) (Lab) |
| **Exam** |

|  |
| --- |
| **MODULE III/ Sadeesh and Charlotte** |
| Animal Cell Culture Techniques (Lecture) |
| Maintenance and propagation of established cell lines (Lab) |
| Genetic manipulation of cells (Lab) |
| Isolation and maintenance of primary cells (Lab) |
| Application of cell culture techniques in research (Lab) |
| **Exam** |

|  |
| --- |
| **MODULE IV/ Kavaljit, David and Charlotte** |
| Genetic and pharmacological rodent models of metabolic and reproductive disorders (Lecture) |
| Laboratory tests to diagnose metabolic reproductive disorders (Lecture) |
| Laboratory tests (animal models of castration) to investigate negative and positive feedback mechanisms by gonadal steroids  Insulin tolerance test in mice (Lab) |
| Glucose tolerance test in mice (Lab) |
| Demonstration of obesity in Pomc-KO mice including comparison of fat mass between WT and the KO mice  Exploring the regulatory mechanisms by steroids, dissection and preservation of brain tissue (Lab) |
| Application of visualization techniques for sexual dimorphism in the brain (Lab) |
| **Exam** |