

**SEMESTER II**  
**LSM3235 EPIGENETICS IN HUMAN HEALTH AND DISEASES**

**Prerequisite:** LSM2102

**Workload:** 24 lecture hours + 12 tutorial hours + 14 SDL/CA hours

This module introduces the concept of epigenetics, the relationship between the genome and the epigenome, and the translational aspects of epigenetics in relation to human health and diseases. The topics that will be covered include epigenetic variation, genomic technologies to study epigenetics, epigenetics in development, epimedecine, epigenetics in human diseases and epigenetics in ageing.

| S/N | Topics   | Lecture hours             |
|-----|--|---------------------------|
|     | <b>Molecular basis of Epigenetics</b>                      |                           |
| 1.  | Introduction to Epigenetics                                | 2h (KM)                   |
| 2.  | DNA Methylation  | 2h (SJ)                   |
| 3.  | Writers, readers and erasers of epigenetic code            | 2h (ESC)                  |
| 4.  | Molecular machines involved in maintaining epigenetic code | 2h (SJ)                   |
| 5.  | Mitochondrial Epigenetics                                  | 2h ( KM )                 |
|     | <b>Translational Epigenetics</b>                           |                           |
| 6.  | Epigenetics in development                                 | 2h (TWW)                  |
| 7.  | Epigenetics in Heart and Related Diseases                  | 2h (TWW)                  |
| 8.  | Epigenetics in metabolic diseases                          | 2 h (TWW)                 |
| 9.  | Epigenetics in Brain and Related Diseases                  | 2h (TVA)                  |
| 10. | Epigenetics in ageing                                      | 2h (TVA)                  |
| 11. | Environmental influences on Epigenome                      | 2h (TWW)                  |
| 12. | Mitochondrial Epigenetics in disease                       | 2h (KM)                   |
|     |  | <b>Total Lectures: 24</b> |
|     |  | <b>Tutorials: 12</b>      |
|     |  | <b>SDL/CA: 14</b>         |
|     |  | <b>Total hours: 50</b>    |

**TEXT BOOK:** The readings will mainly be based on key scientific papers & review articles. The module has three major themes. At the end of each major theme, the students will be given stellar publications related to the thematic area they learned in the class.

**MODE OF ASSESSMENT:** CA 50%; Final exam: 50%

**MODULE CO-ORDINATOR:**

Dr. Karthik Mallilankaraman (Tel: 6516-4227, E-mail: phsmkb@nus.edu.sg)

**LECTURERS:**

Dr. Karthik Mallilankaraman, Physiology (KM, Physiology)

A/P Thiruma Arumugam, Physiology (TVA)

Dr Tee Wee Wei, Physiology (TWW)

Dr. Sudhakar Jha, Biochemistry (SJ)

Dr Chen Ee Sin (ESC)