BHARATHIDASAN UNIVERSITY

Tiruchirappalli- 620 024
Tamil Nadu, India

Programme: M.Sc. Biochemistry

Course Title : Chromatin and Epigenetics
Course Code : BC205DCE

Unit-4
Epigenetic Control of Chromatin

Dr. V. RAVIKUMAR
Professor
Department of Biochemistry

Unit-4 Overview

- Locus specific control
- NuRD, SIN3A, methyl transferase and kinase complexes
- Coordination among chromatin modifying complexes
- Epigenetic control of cell specific gene expression
- Mitotic cell cycle
- Gene imprinting
- Cellular differentiation
- Reversibility of epigenetic modifications
- Reprogramming epigenome by somatic cell nuclear transfer, cell fusion and by cell extracts

Genetics vs Epigenetics

Genetics changes alters which protein is made

Epigenetics changes on and off protein synthesis

Both are inheritable

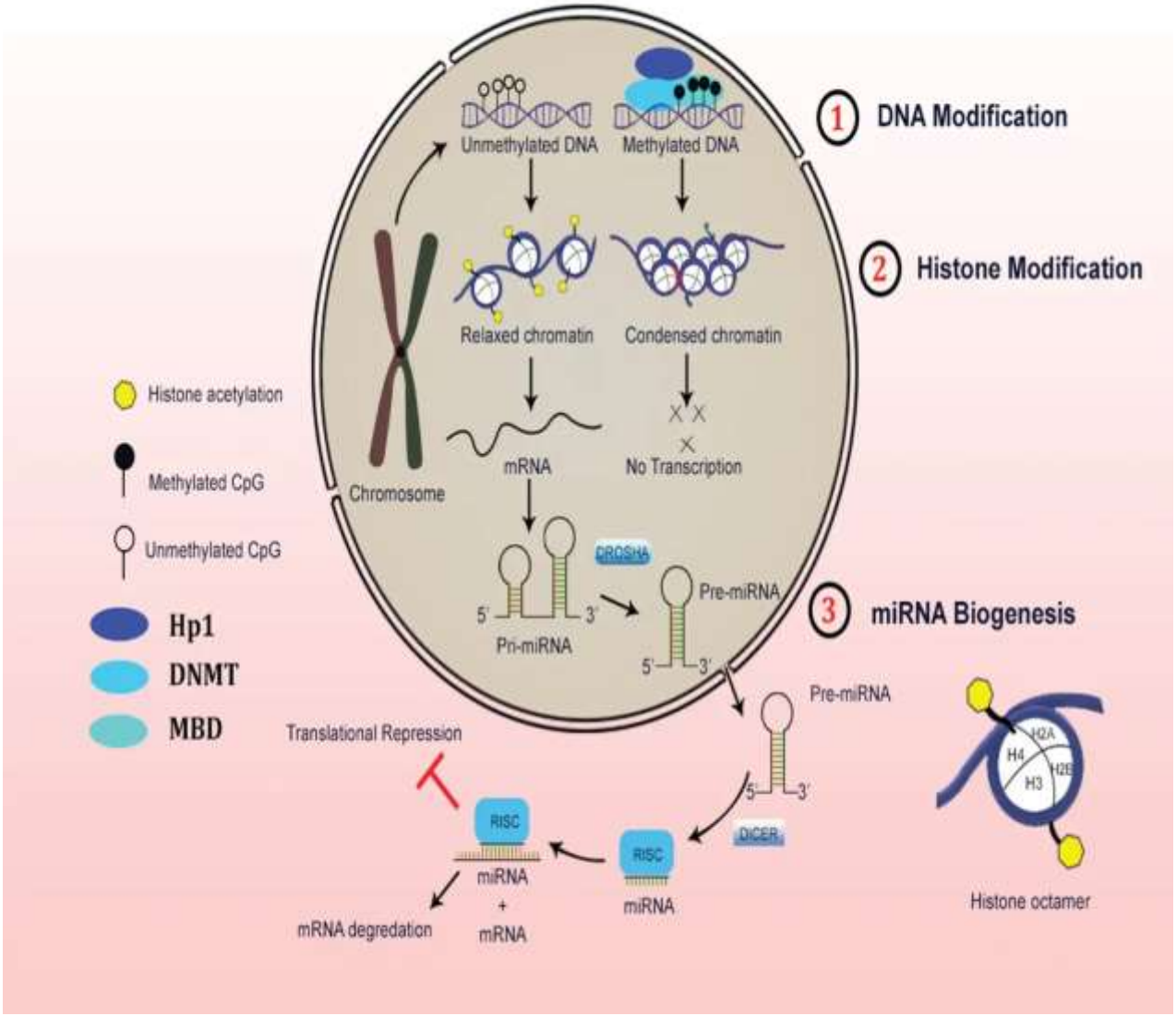
Genetic changes irreversible. Epigenetics reversible/irreversible

Genetics deals with gene and gene function

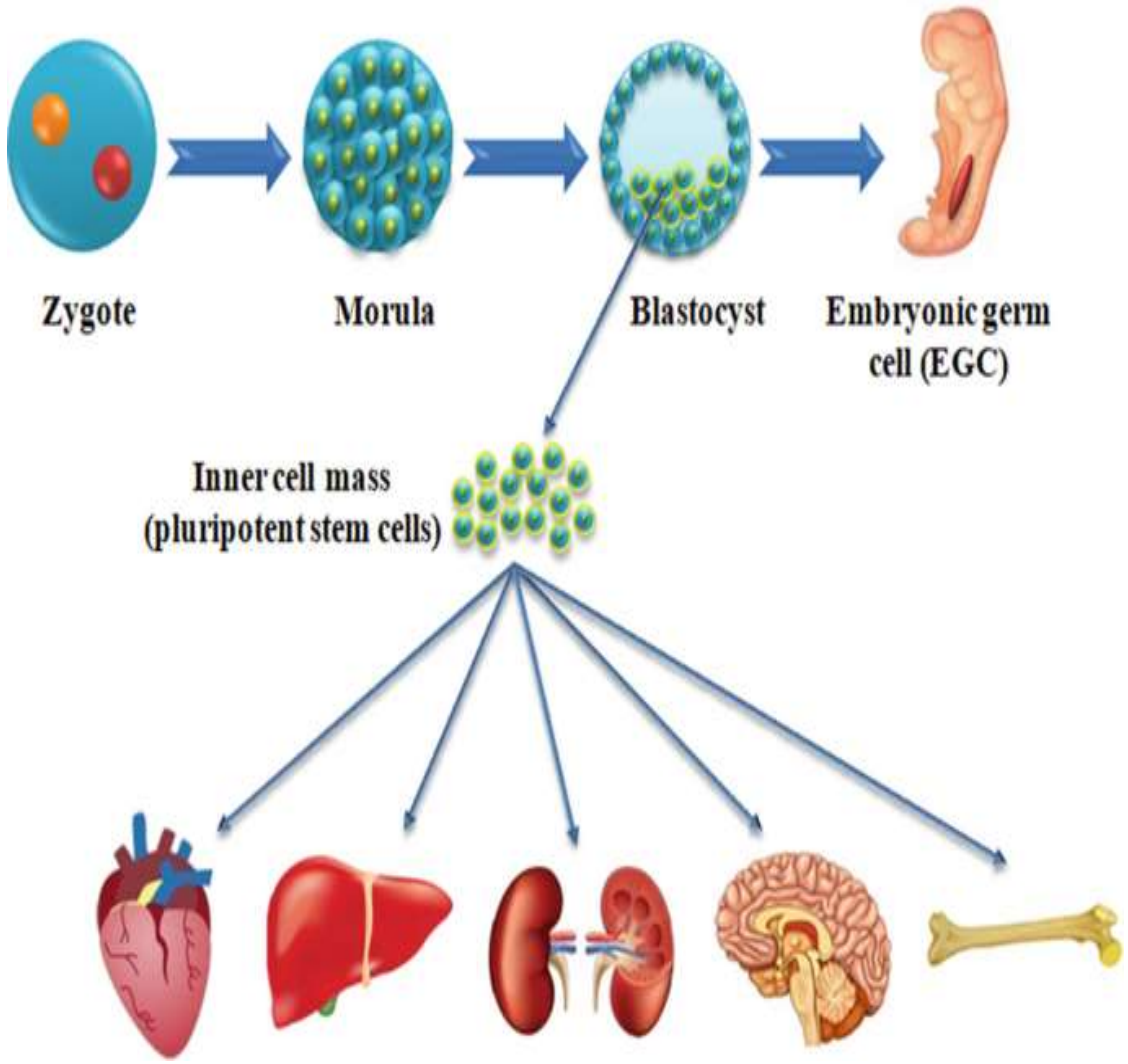
Epigenetics deals with gene regulation

Both deals with the function of the cell

Regulation and cell fate



Zygote to multipotent cells



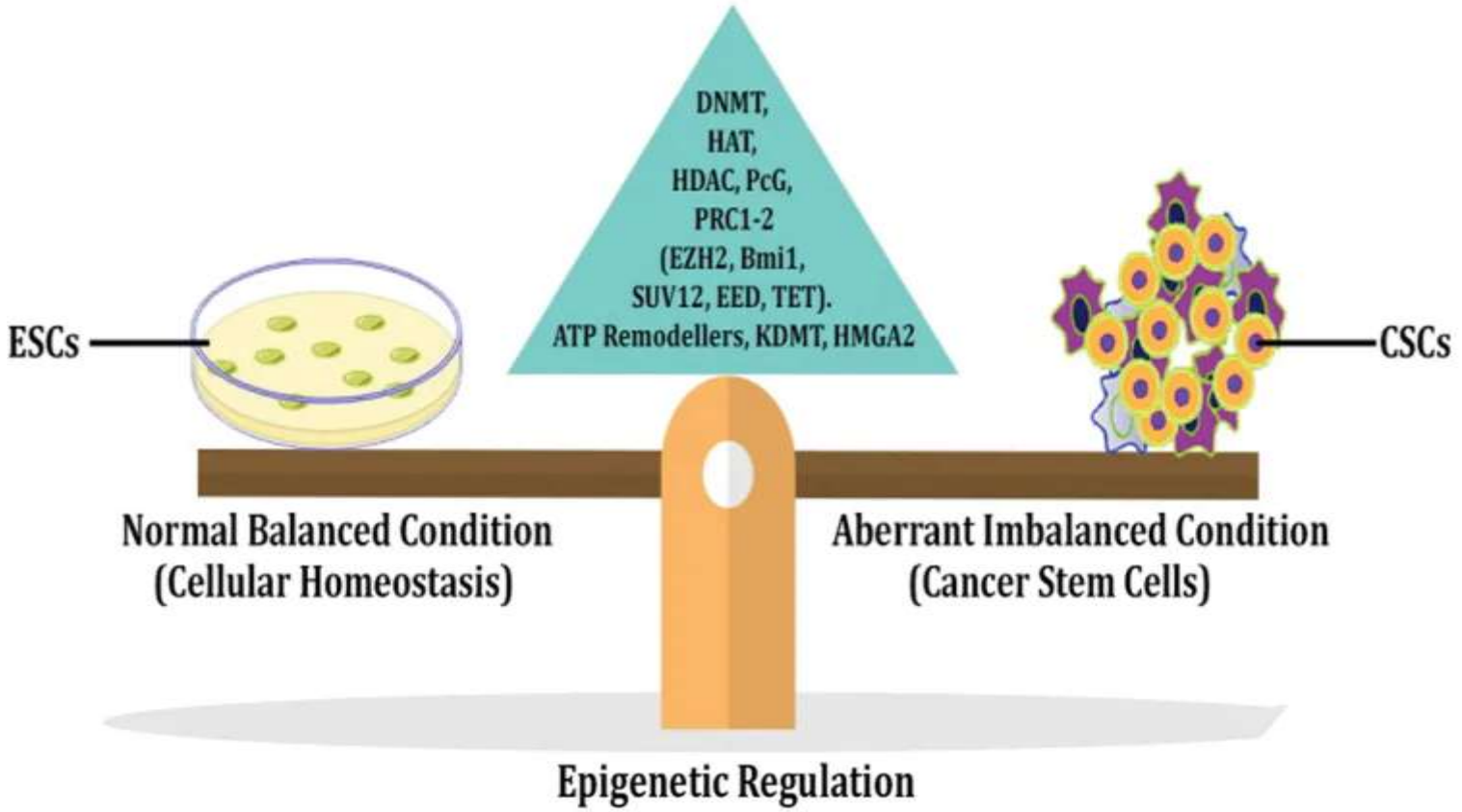
Epigenetics in tissue development

DNA methylation, histone modification and MiRNA in stem cell self-renewal and differentiation

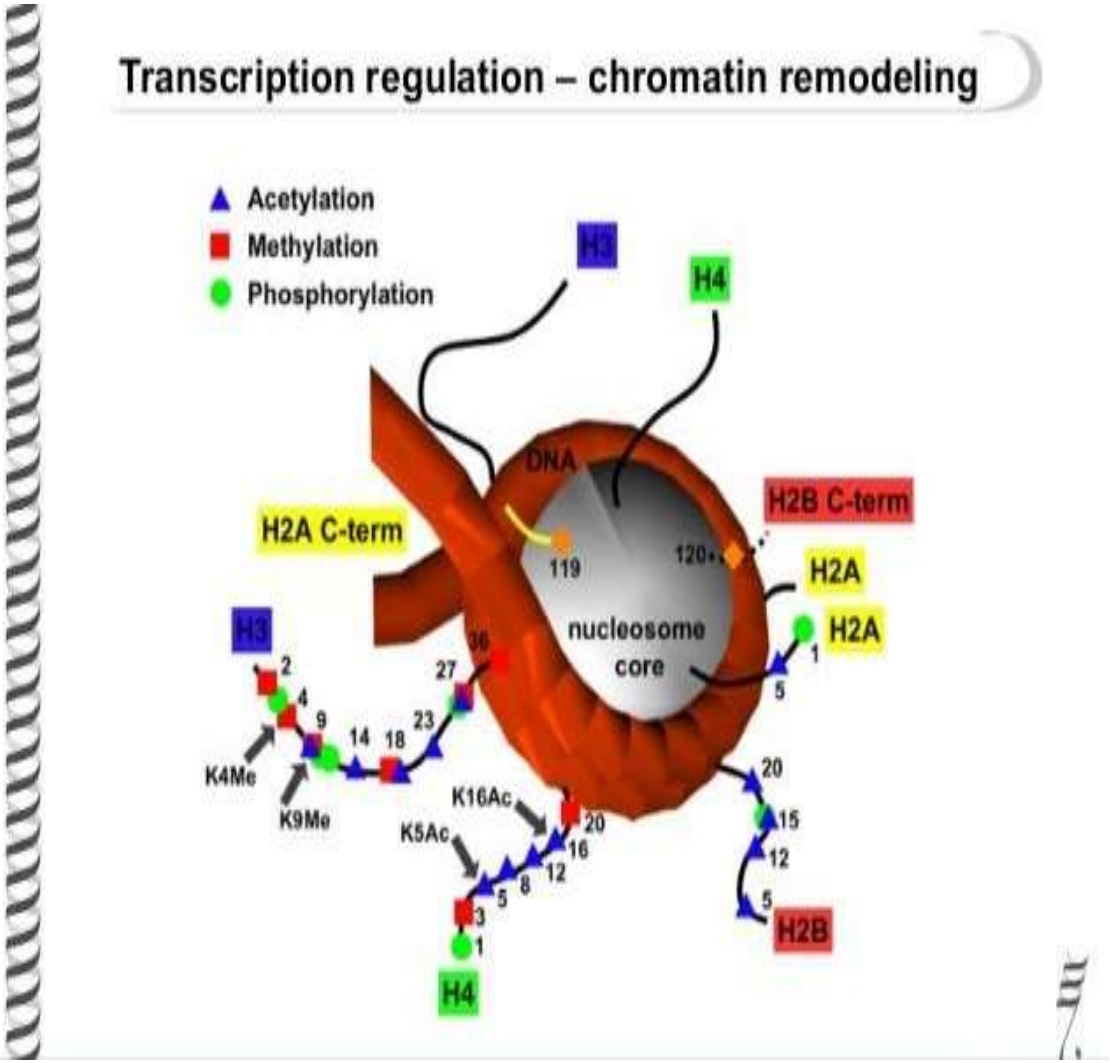
Global epigenetic reprogramming during early embryogenesis

DNA methylation and histone modifications in ESC self renewal

Epigenetic regulation–The guardian of cellular homeostasis



Chromatin remodelling and Transcription



EUCHROMATIN AND HETEROCHROMATIN