Translational Epigenetics in Precision Medicine

October 18-21, 2025

Holiday Inn

Telavi, Georgia

Preliminary program:

DAY 1

Basic Concepts of Epigenetics

09.00-09.45	Opening remarks; Course overview
09.45-10.30	Epigenetic mechanisms: DNA methylation and demethylation; histone modifications and nucleosomes
10.30-11.00	Coffee break
11.00-11.45	Epigenetic mechanisms: non coding RNAs: MicroRNAs, Piwi-interacting RNAs, Small interfering RNAs, Long ncRNAs
11.45-12.30	Mechanisms of chromatin remodeling, ATP-dependent chromatin remodeling, chromatin remodeling complexes
12.30-13.30	Lunch break
13.30-14.15	Genomic imprinting in mammals; Dosage compensation; Epigenetic regulation in stem cells and cell reprogramming
14.15-15.00	DNA methylation episignatures fundamentals: from molecular profiles to AI biomarkers
15.00-15.30	Coffee break
15.30-16.30	Epigenetic epidemiology: Epigenetics in EWAS and DOHaD
16.30-17.15	Statistical approaches in epigenetic studies
17.15	Q&A
18.00	Welcome Dinner

DAY 2

Cancer Epigenetics

09.00-09.45	Introduction to Cancer Epigenetics; Innovative epigenomic approaches in cancer diagnosis and treatment
09.45-10.30	Epigenetics drug design; Epigenetic therapy: DNA methyltransferases inhibitors
10.30-11.00	Coffee break
11.00-11.45	Epigenetics drug design; Epigenetic therapy Histone deacetylase inhibitors (HDACi)
11.45-12.30	The epigenetics of metastasis and cancer microenvironment
12.30-13.30	Lunch break
13.30-14.30	Genome-wide methylation profiling in diagnosis and prognosis of cancer
14.30	Q&A
15.00-18.00	Going to Food and Wine tour

DAY 3

Epigenetics in rare Diseases

09.00-09.45	Genetics meets epigenetics in rare diseases; Mendelian diseases with epigenetic machinery: Disease Classification/Characterization
09.45-10.30	Clinical Case Discussion: Orchestrating genetics and epigenetics from a clinical perspective: lessons from Rubinstein-Taybi and Cornelia de Lange syndromes.
10.30-11.00	Coffee break
11.00-11.45	The epigenetics of dysmorphology: Overgrowth and growth restriction syndromes
11.45-12.30	Clinical Case Discussion: Peculiarities of inheritance pattern of Angelman synrome
12.30-13.30	Lunch break
13.30-14.15	Workshop: Clinical applications of DNA methylation episignatures in rare diseases
14.15-15.00	Peculiarities of inheritance pattern of Angelman synrome
15.00-15.30	Coffee break
15.30-16.15	Clinical Case Discussion
16.15-17.00	Challenges and Future Perspectives: DNA methylation episignature for the intellectual developmental disorder
18.00	Gala Dinner

DAY 4

Environmental Epigenetics and Its Implication on common diseases

09.00-09.45	Genetics, epigenetics and environment; Environmental epigenomics and disease susceptibility; Aging and the epigenetic clock
09.45-10.30	Epigenetic mechanisms of brain plasticity in the context of peripheral trauma
10.30-11.00	Coffee break
11.00-11.45	Epigenetic regulation in metabolic diseases; Dietary bioactives: the potential to modify the aberrant Episignature
11.45-12.30	Epigenetics in complex diseases: Cardiovascular diseases
12.30-13.30	Lunch break
13.30-14.15	Nutritional Epigenetics; Toxin Exposures and Epigenetic Effects
14.15-15.00	Translational Epigenetics: Animal model adoption for translational and basic research
15.00-15.30	Coffee break
15.30-16.15	Genome-wide epigenetic differences among twins: DNA methylation and histone acetylation of a large cohort of monozygotic twins.
16.15-17.15	Written test
17.15-17.30	Closing remarks