LITHUANIAN UNIVERSITY OF HEALTH SCIENCES

International Summer School Practice

Exploring the prognostic role of hereditary single nucleotide variants in cancer

Cancer is a genetically heterogenous disease in which hereditary single nucleotide variants (SNVs) play an important role in host susceptibility, tumor development and disease prognosis. The identification and evaluation of prognostic genetic markers contribute to improved risk stratification and the development of personalized treatment approaches. This scientific internship focuses on the investigation of SNVs in cancer using molecular biology techniques.

Objective

The objective of the internship is to provide hands-on research experience in molecular cancer biology, focusing on the identification and prognostic evaluation of SNVs in cancer using quantitative PCR (qPCR)-based approaches.

Goals

The internship is designed to enable the student to:

- Gain an understanding of the role of hereditary genetic variants in cancer prognosis.
- Understand fundamental principles of molecular methods, particularly qPCR.
- Acquire practical laboratory skills, including DNA isolation and qPCR techniques.
- Perform supervised analysis of qPCR and genetic data.
- Develop skills in data interpretation and presentation of scientific results.

Program structure

- Introductory phase

- Orientation in the molecular biology laboratory and research environment.
- Overview of general cancer genetics with a focus on hereditary variants and prognostic biomarkers.
- Introduction to fundamental principles of molecular methods used in cancer genetics research, laboratory safety, good laboratory practice and ethical aspects of working with biological samples.
- Laboratory training

Observation and supervised hands-on training in DNA extraction from biological samples, DNA quantification and quality assessment, qPCR workflow.

- Data collection
- Generation of qPCR data related to selected SNVs.
- Documentation of laboratory procedures and experimental results.
- Data processing

Guided statistical analysis and correlation of genetic data with clinical or phenotypic information.

- Scientific output

Participation in drafting a scientific report, manuscript section, or conference abstract.

- Complementary methods and tools (as available)

Overview and demonstration of alternative molecular techniques depending on availability.

Expected outcomes

Upon completion of the internship, the student is expected to have:

- An understanding of the clinical significance of hereditary SNVs in cancer.
- Practical competence in basic molecular biology techniques, including DNA extraction and qPCR.
- The ability to process, analyze and