# **The Fingerland Department of Pathology**

The department was established in 1928 and provides a full range of necropsy, biopsy and cytology diagnostic services. The Institute includes laboratories for biopsy, cytology, immunohistochemistry, electron microscopy, in situ hybridization and molecular pathology. Special scientific and research focus of the department: cardiovascular pathology, haematopathology, head and neck pathology and stomatopathology, gynaecopathology, thyroid pathology, breast pathology, central nervous system and neuroendocrine system pathology. The institute is a teaching centre of the Faculty of Medicine of Charles University in Hradec Králové and teaches bachelor, master (general medicine and dentistry) and doctoral study programmes (pathology) in Czech and English.

#### Main research topics

- New predictive markers for solid malignancies and haemato-oncological diseases.
- Etiopathogenesis of precancerous and malignant tumors of the head and neck and female genital tract.
- New differential diagnostic and predictive markers in central nervous system and pituitary tumors and neuroendocrine tumors.

#### Scientific research groups

- Group for research of predictive markers in cancer (<u>prof. MUDr. Aleš Ryška, Ph.D.</u>); focus on research of new
  predictive markers in breast cancer, lung cancer and colon cancer in order to improve the possibilities of personalized
  medicine
- Head and Neck and Female Genital System Cancers Research Group (<u>prof. MUDr. Jan Laco, Ph.D.</u>);focus on research on etiopathogenesis of sinonasal, pharyngeal and salivary gland cancers, focus on molecular genetic characteristics of ovarian, uterine mucosa, cervix and vulva cancer; research on interaction between cancer and immune system
- Central nervous system and pituitary and neuroendocrine tumours research group (<u>MUDr. Jiří Soukup, Ph.D.</u>); focus on research of new differential diagnostic and prognostic immunohistochemical and molecular genetic markers in these tumours

## Equipment

- Multiparallel Sequencing System NGS technology enables detection and multiple comparisons of single point mutations (SNVs), deletions, insertions, copy number variations (CNVs) and structural variants, used for comprehensive molecular profiling of solid tumors
- Cyclers for real-time PCR highly sensitive method for qualitative mutational analysis, enables targeted detection of variants in paraffin-fixed tumour tissue or in freely circulating tumour DNA from blood plasma
- Tissue microarray- TMA-technology enables very efficient high-throughput pathology, where a tissue roll is cut out from a donor tissue block under microscopic control and then transferred to a composite block. Expression profiles of up to several hundred samples can be monitored in a single paraffin block with significant savings in reagents and time during readout

### Achievements

- 2022-2023 prof. MUDr. Aleš Ryška, Ph.D., President of the European Society of Pathologists
- 2022 prof. MUDr. Jan Laco, Ph.D., became one of the co-authors of the 5th edition of the WHO classification of head and neck cancer

The institute operates a biological material bank, which is involved in the Czech part of a large distributed research infrastructure of pan-European importance - BBMRI (Biobanking and Biomolecular Resources Research Infrastructure), which aims to create and operate a network of biological material banks for biomedical research. The biobank primarily holds native tumour tissue for future genomic or proteomic analysis for diagnostic, prognostic, predictive and research purposes.