
4th Department of Internal Medicine – Haematology

IV. internal hematology clinic (IV. IHK) is one of the largest hematology departments in the Czech Republic. It is a progressive and modernly equipped department providing the whole spectrum of care for blood diseases, including allogeneic hematopoietic cell transplantation and treatment with chimeric antigen receptor T-lymphocytes (CART-cells). In addition to inpatient stations (including a haematology intensive care unit and a transplant unit), outpatient clinics including specialised consulting rooms and a centre for haemostatic disorders dealing with bleeding and thrombotic conditions, the clinic is equipped with a modern separator centre offering highly specialised methods including LDL apheresis and repheresis. Last but not least, a highly important part of the clinic is the endocrinology unit providing comprehensive care including the possibility of radioiodine treatment. The IV. IHK there are a number of professional groups focused not only on medical care, but also on scientific research tasks. The clinic regularly ranks at the top in the field of publication activities within the Hradec Králové University Hospital and the Hradec Králové University Hospital.

The department has been and is involved in a number of research projects as principal investigator or co-principal investigator, in particular AZV, for example "Efficacy and safety of tyrosine kinase inhibitors after two-step dose reduction in patients with chronic myeloid leukemia", "Cardiovascular effects of flavonoid metabolites and the influence of metabolic risk factors", "Prognostic significance of circulating tumor DNA in Hodgkin's lymphoma", "Mapping the molecular-pathological mechanisms of hematological cancers and thyroid cancer", "Internekin-alpha in aggressive/rapid and slow growing clinically affunctional pituitary adenomas" and others.

Main research topics

- Proteomics in multiple myeloma, new methods for paraprotein determination and minimal residual disease
- Investigation of cellular transporters and their inhibitors in relation to new drug resistances in leukemias
- Evaluation of immunosuppression and modern prognostic and predictive markers in chronic lymphocytic leukemia

Scientific research groups

Scientific and research activities are carried out within the individual professional groups IV. IHK (e.g. lymphoma / CLL group, myeloma group, acute leukaemia and transplantation group, separator centre, myelodysplastic and myeloproliferative diseases group, haemostasis disorders centre, endocrinology group). Members of the groups cooperate with laboratory staff from other departments of the Faculty of Medicine and the Faculty of Medicine of Charles University (Institute of Clinical Immunology and Allergy, Fingerland Institute of Pathology, Institute of Clinical Biochemistry and Diagnostics, Institute of Clinical Microbiology, etc.).

Equipment

- **The Sysmex XN-3000** haematology analyser with integrated smear and stain automation and digital morphology system. The system also enables the measurement of advanced new parameters such as ICIS score or COVID-19.
- STAGO STA R Max3 and STA Compact Max3 **coagulometers**. Instruments measuring on both coagulation and optical principles. They enable a comprehensive assessment of haemostasis.
- Instruments for **assessing platelet function** (aggregometers, PFA-100)
- Miltenyi Biotec autoMACS Pro **cell separator** - device for magnetic separation of selected groups of cells using specific antibodies, e.g. multiple myeloma or acute leukaemia cells from peripheral blood/bone marrow.

Achievements

- Based on the collaboration within the Czech Myeloma Group, the department has published a new simplified prognostic score for elderly patients with multiple myeloma (Radocha J et al., Am J Hematol 2019)
- A prognostic score for patients with chronic lymphocytic leukaemia diagnosed at an early stage has been developed under the leadership of our department through collaboration across the Czech Republic (Smolej et al., Br J Haematol 2021)
- Laboratory IV. IHK in collaboration with other departments of the Faculty of Medicine and the Faculty of Medicine of the Medical University of HK showed that the Intensive Care Infection Score (ICIS), which uses parameters obtained from blood cell analyzers during blood counts, is elevated in patients with moderate and severe forms of COVID-19 in the early stages of the disease (Vrbacki F et al., J Infect Public Health 2022)

- Clinic staff have been awarded a number of prizes, such as the Přerov Prize of the Czech Society of Angiology for the best publication in 2021 and the Cancer League Award for Publication in 2022.