

## **Toxicogenomics Unit**

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## **Basic information about Toxicogenomics Unit**

Unit is involved in the following studies:

(1) Role of biotransformation enzymes in chemical carcinogenesis and genotoxicity

Major aim of this program is to define the role of individual susceptibility in toxicity of chemicals and foresee applicability of assessment of genetic polymorphisms in biotransformation enzymes as risk factors in genotoxicity and subsequent onset of cancer. Cohorts of patients with breast, colorectal, ovarian and pancreatic carcinomas are currently under study.

(2) Expression of biotransformation and transporting genes and enzymes as promising markers of prognosis and prediction of therapy outcome in cancer patients

Preparations of tumors and adjacent tissue without morphological signs of tumor cells from cancer patients are analyzed for expression of drug metabolizing and transport genes (e.g. cytochromes P450s and ABC transporters) in order to identify prognostic and predictive biomarkers with clinical relevance.

(3) Mechanisms of action of anticancer drugs and ways to enhance their efficacy

This program is devoted to the study of taxane drugs frequently used for treatment of breast and ovarian cancer. Enzymes inactivating these drugs by direct metabolism and ABC transporters which actively transport them outside of cancer cells are studied. New promising derivatives of taxanes are under characterization at present. Models including sensitive and resistant stable cell lines derived from human breast tumors are employed as well as in vivo animal models.

## **Staff activities constitute of:**

- Lecturing at Faculty of Natural History, Charles University in Prague
- Supervision of pre-graduate and postgraduate students
- Reviewing of grant applications for Czech Health Research Council (member of Grant Panel 09 since 2018), Czech Science Foundation, Grant Agency of Charles University, and foreign grant agencies
- Reviewing manuscripts for Scientific Reports, Cancer Letters, International Journal of Cancer, Chemical Research in Toxicology, Cancer Genetics and Cytogenetics, Human Molecular Genetics, Leukemia and Lymphoma, Pharmacogenetics and Genomics, European Journal of Pharmacology,



Haematologica and others

- Reviewing proposals for usage of genetically modified organisms from the view of labor safety
- Memberships in ISSX, UICC, Czech Society of Biochemistry and Molecular Biology, Czech Medical Society, Czech Society of Medical Genetics, Czech Society of Xenobiochemistry, Czech Society of Clinical and Experimental Pharmacology and Toxicology
- Membership in Habilitation Board of Faculty of Science, Charles University, Prague, CR; membership in Commission for doctoral exams and defense of doctoral theses at Faculty of Science, Charles University; membership in Coordination Committee of Doctoral Studies in Biomedicine

Staff
Pendings grant projects

List of scientific publications International collaborations