Study of Toxic and Protective Effects of Drugs on Cardiovascular System

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Cardiovascular toxicity of drugs is among the important complications of today's pharmacotherapy. Numerous drugs have off target potential to damage the heart and vessels; however, the most important problem has been associated with anticancer chemotherapy.

The main objectives of the research are:

(i) research of molecular mechanisms of cardiovascular toxicity of traditional as well as novel anticancer drugs.

(ii) study of possibilities to protect the heart using established and newly synthesized drugs, including the structure activity and pharmacodynamic/pharmacokinetic relationships, effects on anticancer effectiveness and advanced drug delivery methods.

(iii) study of vascular protection and development of novel drugs with vascular targeted photodynamic therapy.

This research is characterized by multidisciplinary approach – from rational design and synthesis of potential drug, through assessment of their therapeutic effects using in vitro and in vivo experiments, safety/toxicity determinations to analysis their pharmacokinetics. This project aims to bring together complementary skills, knowledge, and resources in new ways, in order to jointly address the research problems. The research team is composed of 20 researchers students from 7 departments of the Charles University Faculties of Pharmacy and Medicine in Hradec Králové.

Selected outputs

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