

CEIPEX MU TOPIC 10 B

Položka / Field	Obsah / Content
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NAME OF THE RESEARCH GROUP	Structure of Biosystems and Molecular Materials
CEIPEX RESEARCH TOPIC LEVEL2	Molecular Medicine: Molecular Oncology of Solid Tumors
TOPIC	Next-Generation Anticancer Therapies Based on Metallodrugs
ABSTRACT	Cancer represents one of the most common causes of mortality worldwide. Consequently, considerable attention is devoted to the development of new cancer therapies and strategies for preventing the formation of metastases. Despite significant advances in biological therapies, including gene therapy, chemotherapy, and the modulation of biological processes using small therapeutic molecules, these approaches remain among the important tools for the treatment of these serious diseases. Metallodrugs, historically represented by cisplatin, constitute an established class of anticancer agents with considerable potential for further development. A detailed understanding of the molecular processes underlying their activity, transport, and release may enable the development of new metal-based therapeutic systems and molecular drug carriers. Our current research focuses on platinum-based systems involving platinum in oxidation states +II and +IV and their association with molecular carriers, including supramolecular host-guest complexes. A parallel research direction focuses on the development of migrastatic agents based on ruthenium complexes, which target processes associated with cancer cell migration and metastasis. Molecular carriers based on macrocyclic compounds and metallocages will be further developed by incorporating biovectors (targeting moieties) to improve the targeting of the therapeutic agents. Drug release at the target site is achieved either through spontaneous release mechanisms or by external stimuli, such as an external magnetic field. The development of these drug-carrier systems is carried out in collaboration with the Masaryk Memorial Cancer Institute.
WEBPAGE OF THE RESEARCH GROUP	https://www.ceitec.eu/structure-of-biosystems-and-molecular-materials/rg108