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4-O2. Supramolecular bioinorganic chemistry: an interdisciplinary challenge for the Faculty of Chemistry and Pharmacy at Sofia University

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Metallosupramolecules gain increasing popularity as both molecular containers with various analytical and catalytic applications, and anticancer agents. Here we aim to present the implementation of state-of-the-art spectroscopic and microscopic techniques, such as TEM and fluorescence microscopic imaging of tumour cells that have been achieved at the Faculty of Chemistry and Pharmacy in collaboration with specialists from the Bulgarian Academy of Sciences, Faculty of Biology at Sofia University, and Sofia Medical University. Significant cytotoxicity of Pt(II)- and Pd(II)-linked M_2L_4 coordination capsules against human cancer cells was observed. Mechanistic insights into the anticancer activity were obtained by fluorescence microscopy of tumour cells treated with the capsules, and complemented by TEM images, electrophoretic, enzymological, immunochemical tests.

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4-O3. A comparative study of the effects of salinomycin, monensin, and DMSA on the biodistribution of cadmium, calcium, copper, iron, and zinc in Cd-intoxicated mice

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To treat acute and chronic metal intoxications, a therapy with chelating agents was applied. The FDA-approved chelating agents ($CaNa_2EDTA$, DMSA) for the treatment of toxic metal intoxications are not effective antidotes to Cd poisoning. $CaNa_2EDTA$ has poor absorption by gastrointestinal tract and can be administered only by i.v. injections, which is one of the disadvantages of this chelating agent for the treatment of toxic metal intoxications. DMSA and its metal complexes are hydrophilic and might cause renal dysfunction.

Our studies have shown that monensin, administered p.os. as tetraethylammonium salt, decreased the Cd concentration in all of the organs of Cd-treated mice. The observed effect was in the range 90% for heart and 50% for liver compared to the untreated control animals. Furthermore, the antibiotic inhibited the Cd-induced toxicity and did not affect the homeostasis of Cu and Zn. These results provoked us to examine in detail the potential application of other natural polyether ionophorous antibiotics as chelating agents for the treatment of Cd intoxications. Among the polyether ionophorous antibiotics salinomycin exhibits the lowest *in vivo* toxicity. In 2012, the antibiotic was approved for clinical trials in patients diagnosed with invasive triple negative breast cancer. Herein we present novel information about the potential application of salinomycin as chelating agent for the treatment of Cd intoxications. The effect of the antibiotic on Cd, Ca, Cu, Fe, and Zn biodistributions in Cd-treated mice was compared with the effects of monensin and DMSA.

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