COPPER(II) COMPLEXES OF THIOSEMICARBAZONES WITH EXCELLENT WATER SOLUBILITY: SOLUTION EQUILIBRIUM STUDIES AND NANOFORMULATION

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Thiosemicarbazones (TSCs) and their metal complexes are an important group of compounds due to their anticancer, antibacterial, and antiviral effects [1]. However their aqueous solubility is often limited, which may restrict their *in vivo* applicability. Therefore, one goal of their further development is to increase their hydrophilicity. However, their cytotoxic mechanism of action is based on passive transport across the cell membrane requiring proper lipophilicity, so the use of various carrier systems may be necessary to optimize the hydro-lipophilic character. One group of carrier systems consists of gold nanoclusters (Au NCs) stabilized with various proteins is very common [2].

In this work, the characterization of thiosemicarbazones containing four methylene trimethylammonium groups and their metal complexes is presented, in three cases with the group in a neighboring position and in one case in a distant position. We investigated the solution equilibrium and redox properties of the ligands and their metal complexes. Subsequently, we selected the two most active copper(II) complexes based on their biological activity and investigated their interaction with Au NCs stabilized with human serum albumin (HSA). The results showed that the stability of copper(II) complexes significantly affects the feasibility of drug delivery with Au NCs.

Acknowledgements
This work was supported by the EKÖP-25-3-EKÖP-449 University Research Scholarship Program of the Ministry for Innovation and Technology.

References
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