

Accepted Manuscript

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PII: S0141-8130(13)00247-X
DOI: <http://dx.doi.org/doi:10.1016/j.ijbiomac.2013.04.064>
Reference: BIOMAC 3713

To appear in: *International Journal of Biological Macromolecules*

Received date: 25-1-2013
Revised date: 17-4-2013
Accepted date: 19-4-2013

Please cite this article as: M. Šimšíková, M. Antalík, M. Kaňuchová, J. Škvarla, vCytochrome *c* conjugated to ZnO-MAA nanoparticles: the study of interaction and influence on protein structure, *International Journal of Biological Macromolecules* (2013), <http://dx.doi.org/10.1016/j.ijbiomac.2013.04.064>

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Cytochrome *c* conjugated to ZnO-MAA nanoparticles: the study of interaction and influence on protein structure

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Abstract

Nanoparticle-protein conjugates have potential for numerous applications in due to the combination of the properties of both components. In this paper we studied the conjugation of horse heart cytochrome *c* with ZnO nanoparticles modified by mercaptoacetic acid (MAA) which may be a material with great potential in anticancer therapy as a consequence of synergic effect of both components. Cyt *c* adsorption to the ZnO-MAA NPs surface was studied by UV-vis spectroscopy and by a small angle scattering in various pH. The results indicate that the optimal pH for the association of protein with modified nanoparticles is in range 5.8-8.5 where 90-96% of cytochrome *c* was assembled on ZnO-MAA nanoparticles.

The interaction of proteins with nanoparticles often results in denaturation or loss of protein function. Our observations from UV-vis spectroscopy and circular dichroism performed preserved protein structure after the interaction with modified nanoparticles.

Keywords: ZnO nanoparticles; mercaptoacetic acid; cytochrome *c*; protein interaction

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