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Atti del Convegno

OC-100

Polyoxometalates-peptides conjugates for cancer cell targeting: a structural investigation

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Polyoxometalates (POMs) have a rich topology and tunable physical and chemical properties, which contribute to their widespread and attractive applications in different fields, for instance, catalysis, material science and medicine. As reported in the literature, some POMs exhibit anticancer activity: they are able to interfere with cellular redox processes, compete with ATP synthesis and inhibit different enzymes.[1] However, despite their interest, mostly related to the low cost of the drug candidates, POMs show low selectivity for cancer cells and turn to be too toxic for healthy ones.

In this communication, the potential antitumor activity and the selectivity of hybrid Mn-Anderson hexa molybdates and of Lindqvist hexavanadates (Figure 1) will be discussed.

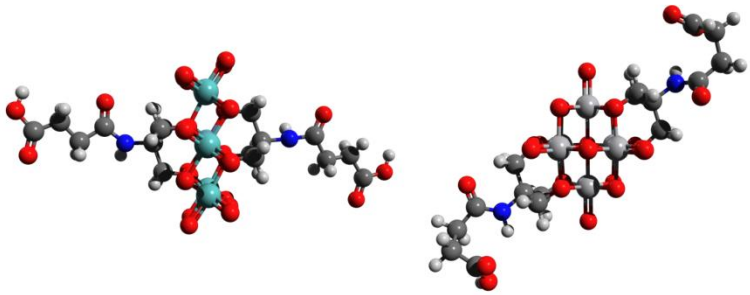

Figure 1: The hybrid organic-inorganic Anderson-Evans polyoxomolybdate $\{MnMo_6O_{18}[(OCH_2)_3CNHCOCH_2CH_2COOH]_2\}^{3-}$ (left) and Lindqvist Hexavanadate $\{V_6O_{13}[(OCH_2)_3CNHCOCH_2CH_2COOH]_2\}^{2-}$ (right) precursors used for peptide grafting.

The aim of the work is to exploit the POMs' cytotoxicity combined with the targeting ability given by suitable peptides (bombesin or RGD), covalently attached to the POM. Different derivatives were prepared, and spacers (PEG and/or tetraglutamic acid) were also introduced to tune the interactions between the peptide and the POM, so to avoid the latter to scavenge and deactivate the peptide.[2] The synthesis and a combined 2D NMR, Circular Dichroism (CD) and Transmission Electron Microscopy (TEM) investigation will be presented to highlight the structural features of the most promising drug candidates, for which the biological activity was finally assessed.

References

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