Lanthanide complexes – synthesis, characterization and biological evaluation

Irena Kostova
Medical University - Sofia, Bulgaria

There is an increasing requirement for the discovery of new metal-based compounds having better activities than their precursors. Recently a number of lanthanide(III) complexes were reported. These studies highlighted the potential of developing novel lanthanide complexes with improved biological potency. As a part of our continuing work on the synthesis, characterization and applications of lanthanide(III) complexes, it was observed that changes in ligands and reaction conditions had profound effects on selectivity and activity of the products obtained. The present work deals with the synthesis, theoretical, analytical, NMR, FT-IR and FT-Raman spectral investigations, supported by DFT calculations, to understand the structural and bonding features, the intramolecular interactions of biologically active ligands and their lanthanide(III) complexes. Detailed spectral analysis based on both calculated and experimental data confirmed the suggested metal–ligand binding mode. The recorded spectra and the marker bands of characteristic functional groups were identified, in order to use them as data bank for further application in trace analysis of rare-earth complexes. The overall results confirmed that the DFT approximation is a reliable method for calculations of geometries and vibrational frequencies of the tested ligands and their lanthanide(III) complexes. The cytotoxic effects on different tumor cells and antioxidant activity of the complexes were studied in order to set up a sequence of experimental assays *in vitro* which allow predicting their activity *in vivo*. Our investigations have shown that the complexes reveal promising pharmacological properties more pronounced than for the respective ligands and should be subset to further detailed pharmacological and toxicological evaluation.

Biography

Irena Kostova has graduated from Mendeleev University - Moscow with the highest grade. She has been appointed as a Research Scientist at Ministry of Environmental. Her PhD and DSc thesis has been awarded by MU-Sofia which is established and maintains relationships with many European Universities. She has published hundreds of publications with more than 3300 citations (IF>150; h-index: 27), scientific book chapters and books for students. Her research interests include the developmental work of coordination chemistry, vibrational spectroscopy, pharmacological investigations etc.

irenakostova@yahoo.com

Notes: