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## **Metal-Based nanoclusters: Pharmacological and toxicity targets**

### **Abstract:**

Metal-based nanoparticles have been reported to possess promising properties as contrast-enhancing staining agents (CESAs) for computed tomography (CT) due to their high X-ray attenuation and density. Recent studies revealed tungsten-containing polyoxoanions of Wells-Dawson and Keggin type as non-destructive CESAs to visualize murine long bones, kidneys, and placenta using microCT. However, the development of novel candidates for a medical application requires an assessment of their toxicological safety, which could be a key barrier to their potential clinical use. Accordingly, the results of neurotoxicity evaluation and oxidative stress responses in vitro of selected Wells-Dawson polyoxotungstate nanoclusters, which were found as promising CESA candidates to visualize kidney tissues and bone marrow vascularization and adiposity, will be the topic of this presentation. For neurotoxicity assessment, acetylcholinesterase, the key enzyme for nerve impulse transmission and commonly used as neurotoxicity marker, was in vitro exposed to increasing concentrations of the studied Wells-Dawson nanoclusters. The induced inhibition of the enzyme activity was monitored and served as a marker of neurotoxic potential of the potential contrast agents. In order to elucidate the enzyme-inhibitor interaction at molecular level, the effect of Wells-Dawson nanoclusters on the secondary structure of acetylcholinesterase, which might induce the decrease of the enzyme activity, was monitored by using circular dichroism and fluorescence spectroscopy. The results of neurotoxicity assessment will be correlated with oxidative stress responses and cyto/genotoxicity parameters determined after human blood treatment in vitro.

### **Biography**

**Mirjana B. Colovic**, a senior research associate-chemical sciences, has been employed at University of Belgrade, Republic of Serbia, from 2005. She published over 150 scientific contributions including 50 papers in impacted international journals and 5 chapters in books. She served as a reviewer in over 40 international journals and 9 foreign projects, and as an editorial board member in 2 international journals. Her papers are cited over 2600 times. In 2021 and 2023 she was at USA Stanford University list of top 2% scientists in the world, based on a standardized citation metrics.