

POSTER

ANALYSIS OF THE EFFECTS INDUCED BY VANADIUM-BASED METALLODRUGS IN SEA URCHIN EMBRYOS

I. Termine, G. Sangiorgi, A. Terenzi, G. Barone, R. Bonsignore, F. Geraci, R. Chiarelli

Department of Biological, Chemical and Pharmaceutical Sciences and Technologies (STEBICEF), University of Palermo, Italy

The use of metal compounds as therapeutic agents has attracted growing interest, as they tend to interact with biological macromolecules. Several studies have highlighted the therapeutic potential of various metals in the treatment of various pathologies, and currently, metallodrugs based on platinum, copper, gold, ruthenium, yttrium, silver, and lithium exist. Furthermore, some metallodrugs are used in clinical diagnosis: iodine, barium, and gadolinium. Vanadium (V) complexes have also attracted considerable interest in the biomedical field. From the middle of the last century to the present, the study of V compounds as potential therapeutic agents has experienced exponential growth. Cytotoxicological approaches carried out on whole marine embryos represent a valid research tool since they grow directly in contact with the pollutants and are equipped with highly responsive

cells to stressors. Here, we discuss the impact on *Paracentrotus lividus* sea urchin embryos resulting from two V-based coordination compound UP3 and UP4, metal complexes of Schiff base ligands. The results demonstrate the remodeling of embryonic architecture at the morphometric level, revealing developmental delays and anomalies. Furthermore, both a modulation in total tissue remodeling enzymatic activities and a variation in the amount of two MMP-like gelatinases (MMP-2, and -14) were observed. Embryos activated a cytoprotective mechanism mediated by HSPs (-60, -70 and -90) and they eliminated cells with fragmented DNA, in order to safeguard the developmental program. This research demonstrates that V-based metallodrugs activates different biological pathway (stress, cytoprotection and cell death) emphasizing the necessity for comprehensive toxicity assessments in *in vivo* evaluations.