

3<sup>rd</sup> International Conference on

# Systems and Synthetic Biology

July 20-21, 2017 Munich, Germany

## Metallothionein family in sea urchin: Genes and their expression during embryo development and following exposure to stressors

**Maria A Ragusa**

University of Palermo, Italy

Echinoderms represent a very fascinating phylum belonging to deuterostome superphylum, including also hemichordates, tunicates and vertebrates. Among echinoderms, sea urchin species are studied worldwide as excellent model organisms for the study of developmental biology, and are suitable as bioindicators. During a study on the defense strategies activated by *Paracentrotus lividus* sea urchin embryos in response to CdCl<sub>2</sub>, we isolated five metallothionein (MT) cDNAs. Two of the five MT genes were constitutively expressed, whereas the other three genes appear to be specifically switched-on in response to cadmium treatment. With the aim of better understanding the evolutionary relationships, functional variety, and the utilization of MTs during development, the gene organization of *P. lividus* MTs was analyzed and their mRNA expression patterns were unveiled. Particularly, we determined the expression profiles and the spatial patterns of MT transcripts during development and after metal and antimicrobial drug treatments. MTs show a high polymorphism both in sequence/structure and expression pattern. In the light of our findings it seems reasonable to consider MT7 and MT8 as the major variants associated with physiological functions, playing their major roles in metal homeostasis and redox activity in ecto-, meso- and endo-dermal tissues. On the other hand, a metal detoxification role can be attributed to MT4, 5, and 6, particularly important in mesenchyme cells for the skeletogenic pathway. Since differences not only between the two classes occur, each isoform would correspond to a more definite physiological function. For these interesting results we started to study the mechanisms that control MT gene expression in sea urchin embryogenesis.

### Biography

Maria A Ragusa has completed her PhD in Cellular and Developmental Biology and Post-doctoral studies from Palermo University. She is an Assistant Professor of Molecular Biology at the University of Palermo (Italy). She has published more than 15 peer reviewed papers in reputed international journals and has been serving as peer reviewer for many international journals. Her research work comprises gene transcription regulation during embryo development and early molecular defense strategies activated by embryos in response to exposition to stress agents. Recently, she also studied the effects of HPV infection on semen.

maria.ragusa@unipa.it

### Notes: