ALESSANDRA ALEOTTI[1], IAIN C. WILKIE[2], LUIS A. YANEZ GUERRA[3], MICHELA SUGNI[1], FRANCESCO BONASORO[1], M. DANIELA CANDIA CARNEVALI[1], MAURICE R. ELPHICK[3]

[1]Dipartimento di Scienze e politiche ambientali, Università di Milano
[2]Institute of Biodiversity, Animal Health and Comparative Medicine, University of Glasgow, Glasgow, Scotland, UK
[3]School of Biological and Chemical Sciences, Queen Mary University, London, UK

## FUNCTIONAL CHARACTERISATION OF A VASOPRESSIN-OXYTOCIN-TYPE NEUROPEPTIDE IN THE CRINOID *ANTEDON MEDITERRANEA*

A wide range of physiological and behavioural processes in animals are regulated by neuropeptides. The ever-growing availability of genomic and transcriptomic data has led to the identification of neuropeptide signalling systems in a vast number of animal species. This has unlocked the opportunity to reconstruct the evolutionary history of these molecules and understand their broad array of functions in different animals. Echinoderms are interesting invertebrate models due to their phylogenetic position close to vertebrates. Furthermore, echinoderms exhibit a variety of peculiar features, including remarkable regenerative abilities, which are of interest for physiological studies. While several studies in recent years have characterized numerous neuropeptide signalling systems in starfish, sea urchins, sea cucumbers and brittle stars, research on crinoids, the most basal class of the phylum, has been lagging behind. Here we have exploited recently obtained transcriptomic sequence data from *Antedon mediterranea* to investigate neuropeptide systems in this crinoid species endemic to the Mediterranean Sea. Transcripts encoding the precursor of a vasopressin/oxytocin (VP/OT)-type peptide (crinotocin) and its corresponding receptor have been identified. The expression of crinotocin in *A. mediterranea* was investigated using antibodies to the starfish VP/OT-type neuropeptide asterotocin, with immunostaining observed in the epithelium of the ambulacral groove, a structure that extends along the whole length of the oral surface of the arms and that is involved in capturing and directing food particles towards the mouth. Immunostaining was also observed in the epithelium of the mouth and of the oesophagus. *In vitro* pharmacological experiments aiming to explore the physiological roles of crinotocin, revealed that crinotocin induces dose-dependent destiffening of dissected arm preparations. Due to the complex anatomy of the arm, the exact mechanism of action of crinotocin is still not clear. However, our hypothesis is that this destiffening is due at least in part to effects on collagenous ligaments. Our work represents the first effort to characterize a neuropeptide signalling system in a crinoid, advancing our understanding of this signalling system within echinoderms and providing a basis for further investigation of neuropeptide function in crinoids.