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P12. MAPPING NOCICEPTORS IN OCTOPUS VULGARIS ARM: DISTRIBUTION AND COMPLEXITY

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Limited morphological and behavioral evidence, supporting the view that cephalopods are able to experience pain, was used as the basis for the recommendation by EFSA Panel to the European Commission for the inclusion of these invertebrate animals in the Directive 2010/63. It is only recently that the presence of nociceptors has been postulated in the squid Doryteuthis (Loligo) paeleii, and in the octopus Abdopus aculeatus. These putative nociceptors are high threshold mechanoreceptors that undergo sensitization after the application of a potentially noxious stimulus. The central projections of these nociceptors are still not known. In the common octopus, Octopus vulgaris, the existence of a “pain circuit” has been postulated on the basis of behavioral responses to putative negative stimuli. Here we present our recent data based on the search of pain related genes and nociceptor-markers in O. vulgaris. Transcriptomes and genome sequencing allowed to estimate for the first time the relative expression of pain-related-molecules in octopus nervous systems and in the arms. Relative expression of transcripts coding for transient receptor potential channels (e.g., TRPA1, TRPV1), peptides (e.g., Substance P, CGRP), G-protein coupled receptors (e.g. ADORA2a, CALCRL) and other proteins involved in nociceptive pathways will be presented. We also provided a mapping of putative nociceptors in the octopus arm and suckers by localizing fibers and cellular structures expressing proteins involved in nociceptive pathways, e.g., Substance, P IB4 and CGRP. Our data contribute in providing evidence of the existence of a nociceptive system in Octopus vulgaris, for the first time.