ABSTRACT Comunication Session 7 Hazards – Environment

Accumulation and embryotoxicity of Polystyrene Nanoparticles in sea urchin embryos *Paracentrotus lividus*

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Nanoplastic debris represent an emerging concern for marine ecosystems. The aim of the present study was to investigate accumulation and toxicity of polystyrene nanoparticles (PS NPs) in early development of sea urchin embryos *(Paracentrotus lividus*). NPs with two different surface charges where chosen, 40nm anionic carboxylated (PS-COOH) and 50nm cationic amine (PS-NH_2). NPs stability in natural seawater (NSW) was measured while accumulation and embryotoxicity were monitored within 48h post-fertilization (hpf). Modulation of potential target genes (*cas8, 14-3-3ε, p-38MAPK, Abcb1, Abcc5*) was investigated. PS-COOH form micro-aggregates in NSW, while PS-NH_2 result better dispersed. No embryotoxicity was observed for PS-COOH up to 50 µg/mL while PS-NH_2 caused severe developmental defects (EC_{50} 2.61µg/mL 48hpf). PS-COOH accumulated inside embryo's digestive trait while PS-NH_2 were more dispersed. *Abcb1* gene resulted up-regulated at 48hpf by PS-COOH while PS-NH_2 induced *cas8* gene at 24hpf, suggesting an apoptotic pathway. The observed differences in accumulation and toxicity of PS-COOH and PS-NH_2 might be related to surface charge and aggregation in NSW. Our findings clearly indicate that sea urchin embryos are vulnerable to PS NPs.