P06 – Molecular basis of development

P06.1
Different profile of hepatic biotransformation system detected in the Petromyzon marinus, an ancestral vertebrate, in Portuguese river basins

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Biotransformation enzymes catalyze oxidation of a diversity of xenobiotics, doing a key role in its detoxication. CYP1A and GST expression, induced by pollutants, seems to be highly conserved across vertebrate taxa. Since this system acts as a defense mechanism, the intra or interspecies differences have been attributed to adaptations to different habitats and trophic strategies. Thus, the main goal of this study was to evaluate the presence and inducibility of biotransformation enzymes in *Petromyzon marinus* (agnathan), because a clear causal link between toxicological effects on individuals and population responses have demonstrated reduced abundance in wild populations. Sampling occurred at the beginning of the sea lamprey downstream migration in three Portuguese river basins: Lima, Vouga, and Mondego. The collected ammocoetes of each basin were transported live to the laboratory in appropriate life support conditions. Liver homogenates were used to prepare microsomes and cytosol by differential centrifugation and post centrifugation 105000 ***g*** pellet were stored at -80°C for subsequent determination of heme and protein contents, MFO and conjugation activities. The results show that levels of NADPH reductase (CPR) activity, determined immediately after capture, presents a significantly correlation ($p < 0.01$) with mGST, and ECOD activities and heme contents of *P. marinus*. These results taken together with those obtained in ammocoetes stayed in the aquaria for 30 days in freshwater or subjected to salt gradient up to 35 psu show also highly significant correlation ($p < 0.001$) between liver mGST levels and CPR, EROD, ECOD activities and heme content. The results reveal that agnathan, in the early phase of trophic migration, presents different functional expression of biotransformation enzymes regulated by AHR–ARNT system. This fact contributes to reveal the importance of this response and its ancestral role.