

EVALUATION OF THE ENDOCRINE DISRUPTING ACTIVITY OF CHEMICALS CONTAMINATING NORTH SEA PORPOISE USING IN VITRO ASSAYS

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During the last decades, the production of endocrine disrupting chemicals reached such elevated levels that they are now spread all over the environment. Endocrine disrupting chemicals are known to be very slowly degraded, decreasing the environmental quality and causing ecological risks. Marine mammals inhabiting polluted environments accumulate high quantities of these chemicals, and are good indicators of marine pollution. Thirteen major organochloride pollutants (known from literature to contaminate north sea porpoise) were chosen in this study – o,p'-DDD; p,p'-DDD; p,p'-DDE; o,p'-DDT; p,p'-DDT; HCB; α -HCH; β -HCH; γ -HCH; δ -HCH; PCB 138; PCB 153 and PCB 180. The thirteen chemicals were tested individually and in mixtures by the use of report gene expression assays. The MCF7-ERE cells used in the assays were originated from MCF7 human mammary tumor cells transfected with the ERE-luciferase reporter system. Preliminary results suggest that o,p'-DDD; p,p'-DDD; o,p'-DDT; HCB; β -HCH; δ -HCH; PCB 138 and PCB 180 are able to stimulate the luciferase expression of MCF7-ERE cells when they are present individually or in mixtures. No synergism was observed within mixtures. When MCF7-ERE cells were exposed to the chemicals and 17 β -oestradiol simultaneously, p,p'-DDE; α -HCH; PCB 138 and PCB 180 could raise the luciferase expression in comparison to the exposition of 17 β -oestradiol alone; on the other hand, o,p'-DDD; p,p'-DDT; HCB; β -HCH; γ -HCH and δ -HCH seem to inhibit the luciferase expression at low doses. In the next step, the pollutants will be searched and quantified in the blubber tissue of porpoises by use of gas chromatography-mass spectrometry. The blubber tissue samples will also have their endocrine disrupting effects characterized.

This work is ongoing and It is expected a relevant level of these compounds to be found in the samples. Conversely, their endocrine disrupting effects and how they act in agonist, antagonist ways are subject that still needs to be studied.