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Serum xenohormone activity of Europeans and Inuits

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Background: Human exposure to persistent organic pollutants (POPs) is ubiquitous and found in all individuals. We compared the level of xenoestrogenic and xenoandrogenic activity in serum of groups with varying POP exposure, and evaluated correlations to the POP biomarkers, 2,2',4,4',5,5'-hexachlorobiphenyl (CB-153) and 1,1-dichloro-2,2-bis (p-chlorophenyl)-ethylene (p,p'-DDE). **Methods:** The xenohormone activity was determined in adult male serum (n=358) from Greenland, Sweden, Warsaw and Kharkiv was analyzed. The xenohormone activity was determined in estrogen- and androgen- receptor reporter gene assays as the effect of serum POP extracts, free of endogenous hormones, alone and on ligand induced xenohormone activity as a mimic of in vivo physiological hormone processes.

Results: The xenohormone activity differed significantly between the Inuits and the European study groups. Xeno-estrogenic activity of the Inuit study group was negatively correlated to CB-153 and p,p'-DDE levels. For the Warsaw group a positive and negative correlation between XER and p,p'-DDE and estradiol equivalence level and CB-153 levels was found. In Kharkiv the highest level of the AR antagonist p,p'-DDE was determined, and accordingly this study group showed the highest percent of serum samples with antagonized xeno-androgenic activities. No correlations between serum xeno-androgenic activities and the two POP markers were revealed.

Conclusions: No strong consistent correlations between xeno-hormone activity and the two POP markers were found. Our data indicate that the selected POP markers alone can not predict the integrated xeno-hormone serum activity. We suggest that the variation in xeno-hormone serum activity reflects differences in POP exposure mixture, genetic factors and/or life style factors.