Effects of Endocrine Disrupting Chemicals on Female Reproductive Health

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We are currently living in a world where exposure to endocrine disrupting chemicals (EDCs) occurs in everyday life. This is of global health concern as studies of humans, wildlife populations, multiple experimental animals studies, and epidemiological cohorts show associations between EDC exposure and adverse health effects. While the detrimental effects of EDCs are extensively studied for male fertility, their effects on female germ cells have been poorly studied.

The purpose of this project is to identify EDCs with adverse effects on infertility in women in Sweden through analysis of follicular fluid and blood of women undergoing in vitro fertilization (IVF) treatment and through analysis of the Swedish Environmental Longitudinal, Mother and child, Asthma and Allergy (SELMA) cohort (Parts I and II) and to investigate the effects and mechanism of action of the identified chemicals on ovarian folliculogenesis and steroidogenesis in vitro through ovarian cortical slice culture developed by Prof. Hovatta in addition to a novel culture model using isolated follicles (Parts III and IV).

Infertility is a substantial medical issue and a significant burden on the healthcare system, as well as a life crisis for the affected couple. In Sweden, 19,000 IVF cycles are performed annually and from these, only approximately 25% result in the birth of a child. The negative impact of EDCs on human health is becoming increasingly well-documented, and it is essential that their effects on female fertility are delineated. This study will provide a better understanding of the effects of EDCs on ovarian functions as well as elucidating its mechanisms. Ultimately, this work will help to protect vulnerable groups through lifestyle advice to reduce exposure, and will provide long-term benefit to society as a whole via more efficient legislation on chemicals.