

Endocrine Disruptors and Infertility

Endocrine Disruptors, Endometriosis and Infertility

FONDAZIONE ITALIANA ENDOMETRIOSI

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Endocrine Disruptors and Infertility

Female

Maternal &/Uterine

Male

Prevention

Endocrine Disruptors and Infertility

Female

Ovarian

Oocytes

Endocrine Disruptors and Infertility

Four major aspects of female reproductive health:
fertility and fecundability, endometriosis, precocious
puberty and breast and endometrial cancer

Caserta et al Human Reproduction Update 2008 14:59-72

Endocrine Disruptors and Infertility

To evaluate the possible role of endocrine-disrupting compounds (EDCs) on female reproductive disorders emphasizing developmental plasticity and the complexity of endocrine-dependent ontogeny of reproductive organs. Declining conception rates and the high incidence of female reproductive disruptions warrant evaluation of the impact of EDCs on female reproductive health.

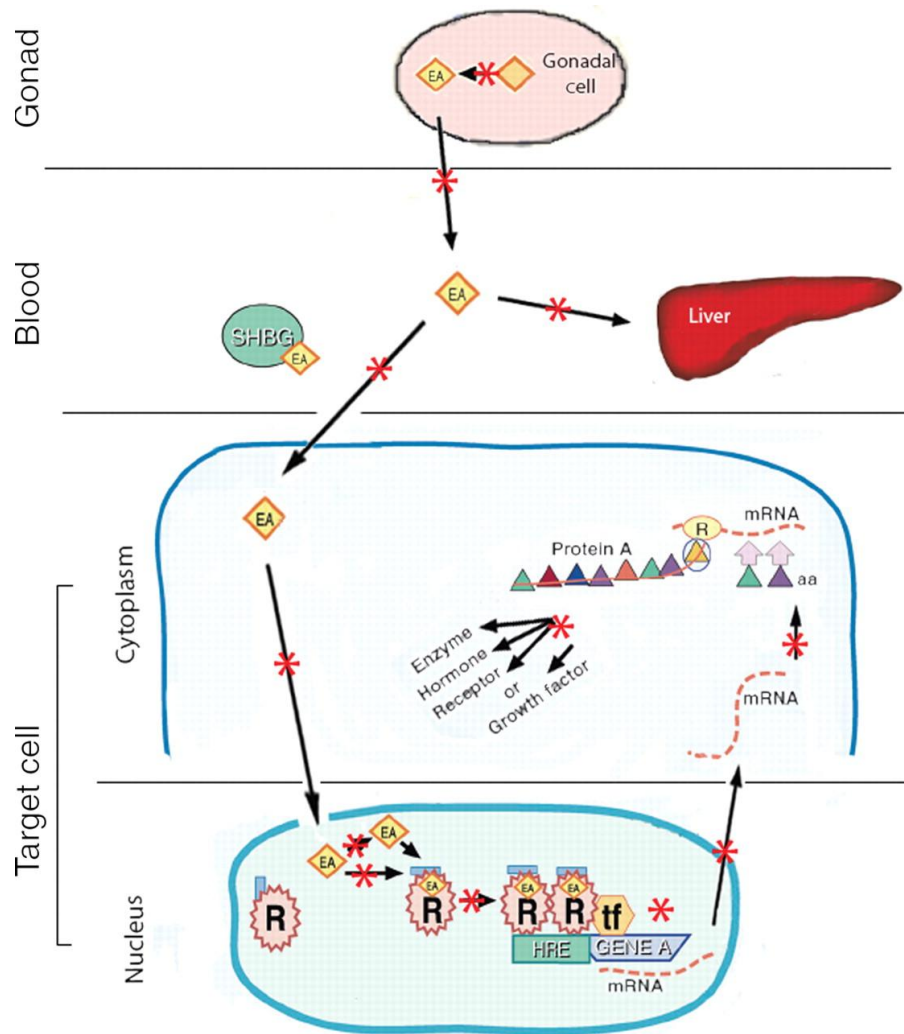
Crain et al Fertility & Sterility 2008 90: 911-940

Endocrine Disruptors and Infertility

Data reviewed illustrate that EDCs contribute to numerous human female reproductive disorders and emphasize the sensitivity of early life-stage exposures. Many research gaps are identified that limit full understanding of the contribution of EDCs to female reproductive problems. Moreover, there is an urgent need to reduce the incidence of these reproductive disorders, which can be addressed by correlative studies on early life exposure and adult reproductive dysfunction together with tools to assess the specific exposures and methods to block their effects. This review of the EDC literature as it relates to female health provides an important platform on which women's health can be improved.

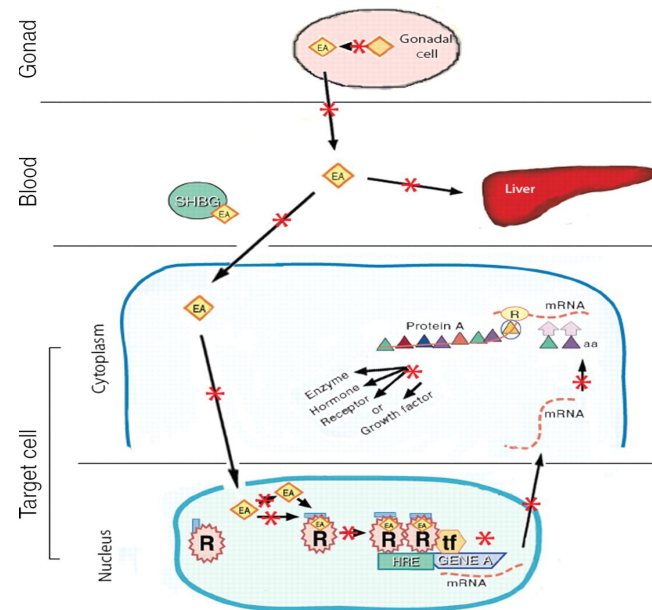
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Schematic diagram depicting several key steps in steroid hormone action that may be sensitive to disruption by environmental chemicals: synthesis and secretion of steroids hormones [EA] from the gonadal cells; binding affinity of the EA for the SHBG protein; diffusion into the cell; diffusion into the perinuclear region; binding the receptor; conformational change of the receptor (R) which forms homodimers; formation of a transcriptional complex from homodimers; which binds to specific sequences on the DNA of hormone-dependent genes, known as HRE; transportation of mRNA into the cytoplasm; synthesis of proteins; alteration of liver function, either increasing or decreasing metabolism of the hormone



Caserta, D. et al. Hum Reprod Update 2008 14:59-72; doi:10.1093/humupd/dmm025

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Four major aspects of female reproductive health: fertility and fecundability, endometriosis, precocious puberty and breast and endometrial cancer.

Currently available human data are inadequate to support a conclusion about whether the female reproductive system is adversely affected by exposure to EDCs; however, the weight of the evidence is adequate to address further studies as well as to prompt precautionary actions against excess exposure to xenobiotics specifically active on hormonal homeostasis.

Crain et al Fertility & Sterility 2008 90: 911-940

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Endocrine Disruptors and Infertility

Male

general

spermatogenesis

Endocrine Disruptors and Infertility

Male

general

Our results support an association between congenital cryptorchidism and fetal exposure to PCBs and possibly DDE. Higher concentrations in milk could be a marker of higher exposure or for an impaired detoxification pattern in genetically predisposed individuals.

Brucker-Davis et al Human Reproduction 2008 23:1708-1718

Endocrine Disruptors and Infertility

Male :spermatogenesis

The finding of a significantly decreased sperm count in relation to an elevated PCB metabolite level within the subgroup of men with normal semen quality is important. This is the first time that a correlation between exposure to environmental pollutants with **endocrine**-disrupting capacity and human sperm quality has been observed.

Dallinga et al Human Reproduction, 2002 17:1973-1979

Endocrine Disruptors and Infertility

Maternal

Uterine

Endocrine Disruptors and Infertility

Maternal

These data suggest that anti-estrogenic PCBs may be associated with the development of endometriosis.

Buck-Louis et al Human Reproduction 2005 20:279-285

Endocrine Disruptors and Infertility

Uterine

It is unlikely that exposure to PCB and DDE is a main cause of menstrual disturbances. Genetic differences or dietary factors may be involved in the non-homogenous associations of organochlorine exposure and menstrual cycle between countries.

Toft et al Human Reproduction 2008 23:193-200

Endocrine Disruptors and Infertility

Prevention

Pollution: industrial, agricultural

Oral contraception: metabolites ???

Diet

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Conclusion