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EDITORIAL

Estrogen receptors in human disease

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Many physiological processes are controlled by estrogen receptors, and their loss and overexpression may contribute to disease. Numerous xenobiotics mimic or antagonize estrogenic effects (Höfer et al. 2010; Romano et al. 2010, Bolt and Stewart 2011; Hengstler et al. 2011). In breast cancer, besides proliferation (Schmidt et al. 2008, 2009, 2011), immune cell infiltration (Schmidt et al. 2012), ERBB2 expression (Brase et al. 2010; Kammers et al. 2011; Petry et al. 2010), and antioxidative capacity (Cadenas et al. 2010), the estrogen receptor status also plays a critical role in prognosis and chemoresistance. Because of the central role of estrogen receptors in toxicology and human disease, the editors are pleased that Katherine A. Burns and Kenneth S. Korach from the National Institute of Environmental Health Sciences in North Carolina have contributed a comprehensive review on this cutting-edge topic (Burns and Korach 2012; this issue). Key messages are as follows:

- Positive estrogen receptor status is associated with better prognosis, because patients respond to antiestrogenic therapy. However, an exception is expression of a 36-kDa variant of ERα, which is associated with worse survival and poor response to tamoxifen.
- Estrogen receptor levels are strongly controlled by miRNA. A well-documented example is the negative correlation between $ER\beta_1$ and miR-92.
- Endometriosis affects more than 10 % of all women and leads to dysmenorrhea and infertility. Increased ERβ levels and decreased ERα levels have been shown, and ERβ has been suggested as a therapeutic target.
- After menopause, prevalence of cardiovascular diseases increases in women to levels similar to those in men. While ERβ seems to mediate myocardial protection, ERα is responsible for protection against vascular diseases.

The comprehensive state-of-the-art review of Burns and Korach is highly recommended to anyone interested in the role of estrogen receptors in human disease.

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