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Expression Pattern of Phospholipid Hydroperoxide Glutathione Peroxidase Gene in the Male Reproductive System of Sprague-Dawley Rats Exposed to 17β-estradiol

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This study investigated expression pattern of PHGPx gene in male rat reproductive organs exposed to 17β-estradiol. First, in view of quantitative change, the exposure to 17β-estradiol for 1 week increased PHGPx mRNA level in testis and prostate. PHGPx mRNA level in epididymis decreased weakly as compared to control group. However, there was negligible difference in degree of reduction between 17β-estradiol treatment and control groups. The PHGPx mRNA level in tamoxifen the treatment group decreased as compared with the control group for all organs. Among them, the PHGPx mRNA level of epididymis in tamoxifen treatment group decreased weakly less than in other organs. Under microscopic examination, spermatogonial proliferation in seminiferous tubules was observed in the 17β-estradiol treatment group.
However, in testes in rats exposed to Tamoxifen, there was an observable disappearance of spermatocytes and cell debris on the seminiferous tubular epithelium and in the lumen of tubules. The degeneration of germ cells, and the vacuolation and partial depletion of the seminiferous epithelium in the seminiferous tubules, resulted in severe depletion of spermatogonia and spermatocytes. Additionally, there were observed proliferative changes in interstitial tissues. To determine the expression pattern of PHGPx mRNA during spermatogenesis, *in situ* hybridization using DIG-labeled riboprobes for PHGPx was perfomed in testis, epididymis, prostate in 12 week old rats after 17β-estradiol and vehicle treatment. The signals of the 17β-estradiol treatment group appeared stronger than in the control group in all organs. The PHGPx mRNA level increased due to by 17β-estradiol treatment, while it decreased during tamoxifen treatment, as compared to control groups.

These fingings indicate that PHGPx is regulated by testosterone, but may be regulated by estrogen in the male reproductive system. Also, this represents that estrogen may be an important hormone capable of regulating spermatogensis.