

**TIME AND DOSE-RELATED EFFECT OF CORTISOL ON
TESTICULAR AND FOLLICULAR APOPTOSIS IN
GOLDFISH (*Carrassius auratus*)**

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EXTENDED ABSTRACT ONLY- DO NOT CITE

Apoptotic cell death plays a critical role during development of organism tissues including testis and ovary during spermatogenesis and oogenesis. Apoptosis is also involved in modulating pathogenesis of a variety of diseases via regulated genetically and biochemically suicide program. Its disregulation has been shown to be associated with infertility. In the present study we investigated the effect of cortisol which is the main stress hormone in fishes on the goldfish testicular and follicular apoptosis. Although apoptosis occurs in the normal conditions in testis and ovary, but stress is known to cause problems with fertility in fish. However no information is available on the effect of cortisol on gonadal apoptosis in fish. The results demonstrate that cortisol treatment was found to stimulate caspase 3 activity which was used as an indicator of apoptosis in the immature goldfish testis (GSI less than 2.4). No significant change in caspase 3 activity was observed in mature testis (GSI > 2.4) following treatment with cortisol in goldfish. Cortisol was also found to stimulate caspase 3 activity in the goldfish ovary in a stage-dependent manner. Follicles in early vitellogenesis (less than 0.6 mm in diameter) did not respond to cortisol treatment. However, treatment of 0.8-0.9 mm goldfish follicles with cortisol significantly stimulated caspase 3 activity in a dose-related manner. Cortisol treatment in fully mature goldfish follicles (> 1.0 mm) was without effect.

The results provides evidence that cortisol effects caspase 3 activity in goldfish ovary and testis in a stage-dependent manner. The findings supports the hypothesis that stress may cause lower level of fertility in fish due to the production of cortisol leading to onset of apoptosis in the ovary and testis.

Keywords: Apoptosis; Cortisol; Caspase 3; Testis; Follicles; Goldfish; in-vitro; Dose and time-response; Mature; Immature