

## **Gonadal development in the Japanese Medaka (*Oryzias latipes*) as a model for estrogenic potency determination.**

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Increasing concern regarding potential estrogenic environmental contaminants highlights a need for the development of laboratory screening assays to measure estrogenic response. An *in vivo* screening method for natural and environmental estrogens using the Japanese medaka (*Oryzias latipes*) is being developed. Medaka fish exposed to 17 $\beta$ -estradiol (17 $\beta$ -E) during early life stages exhibit disruption of normal gonadal development. Some fish display an inter-sex appearance when fully mature and the proportion of females to males is higher than expected. In this study, newly hatched medaka fry with undifferentiated gonads (60/group) were exposed to sublethal concentrations of 17 $\beta$ -E (1.25, 2.5, and 5 $\mu$ g/L), spring water and acetone carrier control for 48 hours in a water bath at 25°C. After two weeks, 50% of the surviving fry were killed and processed for histopathological analysis. The remaining 50% of fry were grown-out for four months, killed, photographed, and processed for histopathological analysis. The mortality rates ranged from 26-38% and there were no statistically significant differences among groups. After two weeks, testis-ova (hermaphroditism) were observed in all groups including the spring water control (8%). A statistically significant dose-response trend for hermaphroditism was observed ( $p < 0.05$ ). In the four month grow-out groups, the majority of fish developed into females, some were sexually immature, and hermaphroditism was not observed. Secondary sexual characteristics such as fin shape usually clearly identify the gender of the fish, but in our study we found that the gender of fish smaller than 2 cm in size was not easily identified. The estrogenic potency of xenoestrogens can be determined by comparing their dose response curve with 17 $\beta$ -E dose response.