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JOURNAL ARTICLE

Hormonal regulation of inhibin B secretion by immature rat sertoli cells in vitro: possible use as a bioassay for estrogen detection

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The influences of follicle-stimulating hormone (FSH), gonadal steroids, and culture time were studied in relation to inhibin B production by Sertoli cells of immature rats cultured in vitro. Sertoli cell-enriched cultures were established from 18-day-old rats and were maintained in medium supplemented with insulin, transferrin, and epidermal growth factor at 34 degrees C. A recently developed ELISA for the measurement of inhibin B was used to assess the effects of recombinant human FSH (rh FSH), testosterone (T), and estradiol (E2) on inhibin B production and accumulation in the culture media of Sertoli cell-enriched cultures and to optimize the cell culture system to serve as a bioassay for the detection and quantification of estrogens and estrogenlike substances. Prolonging the incubation time (24, 48, or 72 hours) of Sertoli cells with control medium without rh FSH, T, or E2 resulted in a time-dependent increase of inhibin B production. Incubation with rh FSH (1, 2.5, 5, or 10 U/L) caused a dose- and time-dependent increase of inhibin B production by Sertoli cells (but not by cultured Leydig cells), reaching a plateau at 5 U/L rh FSH. Addition of T in concentrations of 2.88, 5, or 50 ng/ml to medium without rh FSH and E2 significantly lowered the daily production rate of inhibin B ($P < 0.05$). In contrast, addition of E2 (0.01 and 0.1 ng/ml) caused a dose-responsive increase in inhibin B production after 24 and 48 hours. The relative increment of inhibin B production induced by E2 was maximal after 24 hours in the presence of 2.5 U/L rh FSH (acting synergistically) and in the absence of T. When these conditions are implemented, the Sertoli cell culture system may serve as a bioassay for estrogenic substances, and it may reflect the possibly harmful effect they may have on spermatogenesis.

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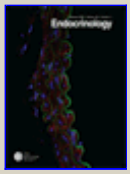

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