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## JOURNAL ARTICLE

# GnRH agonists and antagonists stimulate recovery of fertility in irradiated LBNF1 rats

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The goal of this study was to determine whether both gonadotropin-releasing hormone (GnRH) agonists and antagonists could enhance fertility in rats given sterilizing doses of irradiation, to quantify the levels of fertility, and to measure their relative effectiveness in stimulating recovery of spermatogenesis. Irradiated rats were treated with either the GnRH agonist Lupron or the GnRH antagonist Cetrorelix, which have different mechanisms of action. The antagonist suppressed luteinizing hormone (LH), reducing intratesticular testosterone from 75 ng/g-testis to about 5 ng/g-testis, whereas the agonist reduced intratesticular testosterone only moderately to about 20 ng/g-testis, presumably by direct action on the Leydig cell since LH was elevated. These differences were reflected in Leydig cell morphology. When hormone treatment was started immediately after 3.7-Gy irradiation, fertility was normal at week 20 in the agonist-treated rats and was near normal in antagonist-treated rats, whereas irradiated-only rats were sterile. At week 22 in the GnRH antagonist-treated rats, testicular weights and sperm counts were maintained at greater than 80% of control values; in GnRH agonist-treated rats, they were slightly but significantly lower than in GnRH antagonist-treated rats, and in irradiated-only rats, they were very low. When the treatment was initiated 10 weeks after 5-Gy irradiation, after spermatogenesis had ceased, fertility was restored at week 30 to subnormal levels in 83% of GnRH agonist- and 50% of GnRH antagonist-treated rats. Testis weights and sperm counts were restored to about 50% and 20% of control levels, respectively. The percentages of tubules with differentiated germ cells were higher in all groups of antagonist-treated rats than in those of agonist-treated rats. Thus, both GnRH agonists and antagonists produced dramatic recovery of spermatogenesis and fertility in irradiated rats, although there were differences in mechanism and perhaps also in effectiveness.

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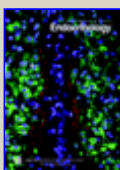
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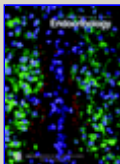
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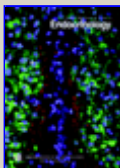
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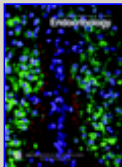


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