Journal of Andrology, Vol 3, Issue 1 45-51, Copyright © 1982 by The American Society of Andrology



# Validation of a Direct Radioimmunoassay for Testosterone in Unextracted Serum from Five Species: Application to Study of the Hypothalamic-Pituitary-Gonadal Axis in Males

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A method for the radioimmunoassay of serum testosterone that does not require extraction or chromatography is described. Utilization of a highly specific antiserum, tritiumlabeled ligand, and double antibody precipitation makes the direct radioimmunoassay feasible. The direct radioimmunoassay is valid based on the criteria of sensitivity, specificity, accuracy, and precision. Because extraction, chromatography, and transfer are eliminated in this procedure, recovery of serum testosterone is always 100%. Interference by serum binding components is lacking, and values obtained for ram, bull, dog, rat, and man by direct radioimmunoassay are in agreement with those obtained by a conventional extraction assay. Direct testosterone radioimmunoassay has been applied to the study of hypothalamic control of testosterone secretion in bull, ram, and rat. The intravenous injection of synthetic luteinizing hormone releasing hormone (LHRH) increases blood testosterone and can be administered to mimic the pulsatile nature of testosterone secretion characteristic of intact males. On the other hand, immunoneutralization of LHRH by active or passive immunization results in substantially reduced serum testosterone and failure of testosterone secretion in response to exogenous LHRH. These investigations lead us to conclude that testosterone secretion by the mammalian testis is regulated largely by inputs from the hypothalamus and that synthetic LHRH and LHRH antisera provide useful tools for studying the hypothalamopituitary-gonadal axis. The direct radioimmunoassay provides a convenient and inexpensive method to study testosterone secretion by the testis.

Key words: direct radioimmunoassay, serum testosterone, luteinizing hormone releasing hormone, immunoneutralization

Submitted on May 15, 1981
Revised on June 17, 1981
Accepted on June 23, 1981