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JOURNAL ARTICLE

Metabolism of 5 alpha reduced androgens by various tissues of the male rat

V. Pasupuleti and R. Horton
Section of Endocrinology, University of Southern California, School of Medicine, Los Angeles 90033.

Since an animal model for the study of peripheral androgen metabolism is needed, we studied the metabolism of 5 alpha-reduced androgens in various tissues of the rat. Labeled DHT and 3 alpha androstanediol (3 alpha diol) were added to tissue minces of male rat scrotal skin, muscle, prostate, or liver. Conversion ratios of the interconverting pair DHT in equilibrium with 3 alpha diol or the formation of the respective glucuronides (G) were determined over a 3 h period. Major differences in the activity and the oxidation/reduction relationship were observed between tissues. Scrotal skin was very active and balanced in the DHT in equilibrium with 3 alpha diol interconversion (31 and 33%/100 mg/3 h, respectively, whereas liver was minimally active (3.1/2.7%). 3 alpha reduction was prominent in muscle (37.0/2.7%), although 3 alpha oxidation was more active in prostate (6.0/31.5%). Steroid glucuronidation also differed in the various tissues. Sexual skin formed about 2% 3 alpha diol G, but much smaller amounts of DHTG. Liver, muscle, and prostate formed minimal (less than 0.2%) 3 alpha diol G, although liver synthesized 1.2% of DHTG. Addition of DHT or 3 alpha diol increased formation of the respective glucuronides by liver, whereas DHT blocked the synthesis of 3 alpha diol G, and 3 alpha diol markedly increased formation of 3 alpha diol G in skin. These studies indicate a similarity in DHT metabolism between rat and human sexual skin and a high rate of glucuronidation compared with other tissues. The pathway of 3 alpha diol G formation in skin is DHT----3 alpha diol----3 alpha diol G. Steroid 3 alpha oxidase is more active than 3 alpha reductase in muscle whereas 3 alpha oxidase predominates in prostate. This may be a mechanism whereby DHT levels and action as a nuclear androgen is favored in prostate, whereas testosterone is the major androgen in muscle.(ABSTRACT TRUNCATED AT 250 WORDS)

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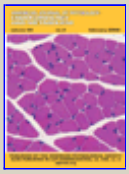

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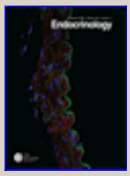

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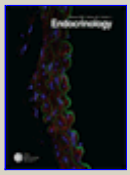

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