conversion to T(2×) by granulosa cells. A to T in theca was not increased by LH or FSH. DHT accumulation from added A was detectable in both granulosa (1.1 ng) and theca (1.7 ng), with no further LH or FSH effect. DHT accumulation from exogenous T was approximately the same in both granulosa cell and theca (1.5 ng), with no LH or FSH effect. The results indicate the source of follicular A is the theca and that of T the granulosa cells. Both tissues have a small and comparable amount of 5α-reductase activity. LH appears to increase 17α-hydroxylase activity while FSH increases granulosa cell 17β-dehydrogenase.

**30. Steroidogenesis in the accessory genital organs of adult male rats**

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Synthesis and metabolism of testosterone in the caput and cauda regions of the epididymis and ductus deferens of adult male rats was investigated. In *in vitro* incubation studies with $^{14}C$-labelled pregnenolone and acetate, caput epididymis synthesized more of testosterone than other tissues. Addition of LH to these tissues had no effect on steroidogenesis. Labelled testosterone was mainly converted to 5α-dihydrotestosterone(DHT) in caput epididymis and 4-androstene-3,17-dione in ductus deferens. The caput also had higher levels of progesterone, testosterone, DHT, 4-androstene-3,17-dione and dehydroepiandrosterone than other regions of the epididymis and ductus deferens. Unilateral ligation for 24 h decreased the levels of DHT in cauda epididymis and ductus deferens. Thus, both the epididymis and ductus deferens have all the enzymes necessary for the synthesis of testosterone. The biological actions of testosterone, however, may be manifested through different metabolites in different segments of the epididymis and ductus deferens and the caput may need testicular secretions for converting testosterone to DHT.

**31. Serum testosterone, Leydig cell population and activities of marker enzymes during sexual maturation in the rat**

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To define hormonal and morphological changes related to testicular function during sexual maturation, serum testosterone and LH were estimated by specific radioimmunoassays in male rats aged between 5 and 90 days. Simultaneously, the Leydig cell population in H & E stained testis sections and 5ene-3β hydroxy steroid dehydrogenase (5ene-3β-HSD) and alcohol dehydrogenase (ADH) were quantitated histochemically. Serum testosterone was 0.95 ± 0.04 (SE) ng/ml at day 5, decreased to a minimum (0.21 ± 0.05) by day 25 and thereafter increased progressively to the maximum level (2.94 ± 0.19) by day 90. No significant differences in serum LH were noted at any age. The relative proportion of Leydig cells per testis increased progressively throughout maturation. Concurrent to decrease in serum testosterone in early postnatal life, both 5ene-3β-HSD and ADH activities decreased. By day 30, the 5ene-3β-HSD activity was comparable to that in adults. The ADH activity progressively increased till day 50. Thus, in the absence of a parallel increase in serum LH the increasing testosterone levels during pubertal development could be due to increase in Leydig cell sensitivity.

**32. Origin of oestrogen in pre-implantation rabbit blastocysts**

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It has been hypothesized that pre-implantation embryos of rabbits, certain other rodents and pigs can synthesize oestrogen which plays an important role in implantation. The present study, carried out to investigate the oestrogen synthesizing potential of day-6 rabbit blastocysts, consisted of incubation of blastocysts in medium 199 containing $^{3}H$-labelled steroid substrates (pregnenolone, progesterone, dehydroepiandrosterone, androstenedione or testosterone) followed by separation of radiometabolites by thin layer and paper chromatography and their identification by coincidence of peaks of radioactivity with authentic steroids and recrystallization. Under these conditions blastocysts were unable to convert any of these substrates into oestrogen. There was a significant metabolism of all the substrates into other less potent neutral steroids suggesting detoxifying action of blastocysts. Using radioimmunoassay (RIA) we have also demonstrated the presence of oestrone and oestradiol in blastocysts and uterine fluid. [$^{3}H$]-Oestradiol administered (i.v.) to rabbits was localized in the blastocysts and uterine fluid. These studies reveal that rabbit blastocysts do not contain the enzymes necessary for oestrogen synthesis: the steroid present in them is of maternal origin.

**33. On inhibition of testosterone synthesis by the rat Leydig cells following incubation with gonadotropin inhibiting material from human urine**

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Gonadotropin inhibiting material (GIM) has been subjected to extensive studies in our laboratory to describe its presence in various patho-physiological states, and define its physico-chemical characterization. The present communication elucidates the mechanism of action of this anti-LH material at the cellular level. For this, Leydig cells were incubated with HCG both in the absence and presence of GIM and a graded decrease depending on the dose of GIM was observed in the HCG induced testosterone production. Our results also reveal that GIM inhibits, *in vitro*, the HCG induced conversion of [$^{3}H$]-ATP to cAMP. Further, when Leydig cells were preincubated with GIM, the binding of [$^{125}I$]-HCG to membrane receptors was prevented. This was further substantiated, using [$^{125}I$]-GIM as well as FITC-tagged GIM. GIM did not prevent the binding of prolactin to its Leydig cell receptors.

**34. Estradiol receptors and steroid aromatization in the etiology of gynecomastia**

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Pathogenic mechanisms for the development of gynecomastia in a large majority of young subjects remain obscure. Estradiol receptors (ER) were demonstrated in all the 17 gynecomastic tissues from males ranging from 17–48 years. Further, incubation of 12 breast tissues with [$^{3}H$]-androstenedione revealed formation of significant quantities of estrone ($E_1$) and estradiol ($E_2$) in addition to small amounts of testosterone (T) and 5α-dihydrotestosterone (DHT) in all the subjects irrespective of their genotypes. Furthermore, preoperative high urinary estrogen levels in these cases, dropped significantly following mas-