A progesterone analog has been covalently linked via an amide bond to poly (Ethylene Oxide) 20,000 MW. This macromolecular steroid molecule displays the biological activity of progesterone in inducing meiotic maturation when incubated with *Xenopus Laevis* oocytes (stage VI) *in vitro*. Its efficiency (ED_{50}: 30 μM) is approximately 10 times lower than that of its low-molecular weight homolog (ED_{50}: 3 μM). Control experiments with poly (ethylene oxide) and an estradiol derivative (up to 1 mM) assessed the specificity of the progesterone macromolecular analog. Uptake experiments using radioactive derivatives revealed a very small (if not negligible) intake of the macromolecular progesterone analog by the oocytes compared to that of free steroids, and no parallelism was found between radioactivity incorporation and effect. The possibility of cleavage of the macromolecular derivative during the incubation was ruled out. Furthermore, injection of the polymer-linked progesterone into the oocytes did not induce maturation.

These observations suggest that the macromolecular progesterone analog is itself responsible for the biological effect and therefore, that the presence of this compound inside the cell is neither necessary nor sufficient in triggering meiosis reinitiation. These conclusions are in agreement with the proposal that interaction with the plasma membrane of the oocyte is decisive for progesterone action in this particular system, in contrast to the case of somatic cells which display intracellular steroid receptors.

27A. Relationship between prostaglandins in seminal fluid and plasma testosterone in man, A. ISIDORI, D. CONTE, G. LAGUZZI, L. BONIFORTI and F. DONDERO, Istituto di Patologia Medica II, Università di Roma, Istituto Superiore di Sanità, Rome, Italy

In 6 normal subjects (medical student volunteers) and in 20 patients with impaired exogenous testicular function, the levels of prostaglandins in the seminal fluid have been recorded. The prostaglandins (PG) taken into account were the PGE and the 19-OH-PGE, which seem to be the most important as far as the male gonadal function is concerned. The assay procedure was a gas-chromatographic method, slightly modified by us. The normal ranges obtained were: 39,496 $\pm$ 23,278 for PGE, and 49,905 $\pm$ 25,029 mcg/ml for 19-OH-PGE. In the same subjects plasma testosterone and dihydrotestosterone were assayed in order to detect a definite relationship—if any—between circulating androgens and seminal prostaglandins. This in view of the suggested androgen-dependence of these PG. Our results seem to confirm a close relationship between androgenic activity of the testis and PG production by the male genital tract in normal and pathological conditions.

54. Differentiation of immature chick oviduct by progesterone and diethylstilbestrol, J. RATIA, H. ELO and P. TUOHIMAA, Department of Biomedical Sciences, University of Tampere, SF-33520, Finland

Estrogens stimulate a synthesis of the majority of avian oviductal proteins (e.g. lysozyme and ovalbumin) in immature chicks, whereas progesterone induces a synthesis of a specific secretory protein, avidin. A daily pretreatment for a week with estrogen or progesterone is necessary for a significant synthesis of these proteins in immature chicks. However, it is not known whether or not this differentiation of protein synthesis is due to a glandular formation and generation of new cell populations through mitosis during this period.

Immature chicks were injected daily either with 0.5 mg of diethylstilbestrol (DES)/chick or 20 mg of progesterone/kg B.W. for 3, 7, 14, 21 or 28 days. Chicks were injected i.v. with 50 μCi of tritiated thymidine/100 g B.W. 24 h after last hormone injection. They were killed 1 h later and the oviducts were processed for radioautography. Epithelial and glandular labelling index was counted. Tissue composition of the oviducts was analyzed as follows. The projected epithelium, glandular tissue and connective-smooth muscle tissues were traced onto a paper. The traced areas were cut out separately and weighed.

An exponential growth of the oviduct appeared during the first week of DES stimulation and during the second and third week of stimulation by progesterone. The most essential change in tissue composition was the development of mucosal glands during the second half of the first week of DES treatment and no significant changes in relative tissue composition occurred after 14 days of DES. Progesterone did not significantly affect epithelial mitotic activity, since the mitotic indexes were less than 5% both in progesterone and control chicks. In contrast, DES caused a clear stimulation of epithelial and glandular cell renewal.

In conclusion, mitotic activity appears not to be necessary for avidin synthesis after progesterone, whereas a cell renewal precedes glandular formation and estrogen-dependent protein synthesis after DES.

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