A radioimmunoassay (RIA) for rabbit uterine blastokinin has been developed using [^{125}I]-iodoblastokinin and antisera raised in male guinea pigs against homogenous uterine protein. Using the RIA technique, immunoreactive blastokinin was detectable in many tissues of female and male rabbits, the highest levels being found in uterine fluid and cytosols from endometrium, myometrium, and lungs of both sexes. Immunoreactive blastokinin was also present in kidney, ovary and epididymis as well as in serum of both female and male animals. Administration of hCG for 5 days brought about a 400-fold increase in the blastokinin level in uterine flushings, a 10-fold increase in the endometrium and a 35-fold increase in the myometrium. Single intravenous doses of progesterone and some synthetic progestins (D-norgestrel, norethisterone and medroxyprogesterone acetate) induced blastokinin synthesis very rapidly with a peak uterine fluid secretion within 12–16 h postinjection. Similarly, the same steroids were equally effective in eliciting uterine blastokinin synthesis after a longer treatment period. In contrast to the uterine tissue, levels of immunoreactive blastokinin-like antigens were not influenced by the above hormonal treatments in extra-uterine tissues. Although lung is reported to be a corticosteroid-responsive tissue, dexamethasone was unable to induce blastokinin synthesis in the lungs of adult rabbits. A blastokinin-like protein was purified close to homogeneity (over 80% pure) from rabbit lungs with successive chromatographies on hydroxylapatite, DEAE-cellulose and Sephadex G-75. On the basis of several electrophoretic and immunological criteria, uterine and lung blastokinins are very similar, if not identical proteins, although their synthesis is not under the same control mechanisms.

In conclusion, blastokinin, thought to be a progesterone-specific protein of rabbit uterus, is also present in extra-uterine tissues, but progestins only regulate the synthesis of blastokinin in the uterus.

5. Quantitative aspect of specific protein synthesis (IP) response (IP synthesizing potentiality) in the uterus of ovariectomized rat, subjected to continuous infusion with [^{3}H]-estradiol-17β ($E_2{}^3H$), E. EKKA, I. VANDERHEYDEN and R. DE HERTOGH, Endocrinology and Nutrition Unit, University of Louvain School of Medicine, U.C.L. 54.29, Av. Hippocrate 54, 1200 Brussels, Belgium

Earlier, we have shown that the time sequence of I.P. synthesis, maximal at 90 min after estradiol stimulation and decreasing thereafter, was not modified even by sustaining a steady level of estradiol in the uterus, notwithstanding the presence of a residual I.P. synthesizing potentiality. This observation stressed the importance of the first "impact" of the hormone and of a graded response of I.P. synthesis. The present study was aimed at correlating the tissue level attained after a given "impact" and the maximal I.P. response observed after 90 min infusion with $E_2{}^3H$, and to tentatively quantitate this observation. The rate of I.P. synthesis was measured by *in vitro* incorporation of ^3H or ^{14}C labelled leucine into stimulated and control uteri respectively and by electrophoretic fractionation of cytosol proteins on cellogel strips. I.P. response was stimulated sequentially by repeating at given intervals, a high rate-short term (8 min) infusion in course of a low-rate long-term infusion. When the first stimulus was maximal (300% of the I.P. response), a second stimulus was unable to elicit any additional response. When the first stimulus was submaximal, a second and even a third stimulus could induce I.P. response, until the overall effects of all stimuli totalled the maximal response of 300%. In conclusion, these data lend support to a quantitative relationship between a limited capacity of response of the uterus and the amount of specific binding of estradiol in the tissue. The total I.P. synthesizing potentiality is spent up when the tissue binding capacity attains saturation. Whether the secondary fractional or total refractoriness of the tissue is secondary to a lack of nuclear translocation of cytosol receptors or to a nuclear "blockade" remains to be elucidated.

HUMAN UTERINE RECEPTORS

6. The comparative study of the human uterus and Fallopian tubes cytosol estradiol–receptor systems, N. D. FANCHENKO, The All-Union Research Institute of Obstetrics and Gynaecology, Moscow, U.S.S.R.

While the human uterine estradiol–receptor (E_2–R) system has been extensively studied, the investigations of similar E_2–R-system of Fallopian tubes are limited. There are only a few data on dissociation kinetics of the E_2–R complex and on the number of receptor sites in various segments of Fallopian tubes. The aim of this study is to compare physico-chemical parameters of E_2–R interaction and specificity of that interaction in both tissues, the same methodology was used. Morphologically unchanged uteri extracted from postmenopausal women because of prolapse, and specimens of Fallopian tubes taken from patients who underwent the operation because of myoma were used in this study. The cytosol was prepared by 105,000 *g* centrifugation for 1 h. A solid-phase adsorbtion by charcoal was used to separate free and bound hormones. Incubation temperature in all experiments was 30°C.

The values of K_{ass} measured by Scatchard plot, were $0.234 \times 10^{10}\,M^{-1}$ and $0.563 \times 10^{9}\,M^{-1}$, for uterine and tubal receptor systems, respectively. Dissociation rate constants determined by Mešter and Robertson's method were $0.902 \times 10^{-4}\,s^{-1}$ and $0.123 \times 10^{-3}\,s^{-1}$. Calculated values of association rate constants were $0.211 \times 10^{6}\,s^{-1}\,M^{-1}$ and $0.692 \times 10^{5}\,s^{-1}\,M^{-1}$. Half-life time of E_2–R complexes was 128 min for uterine tissue and 97 min for tubes.

For comparative assessment of the specificity of the receptor systems under study we have used 12 most active compounds, selected for their affinity to the E_2–R-system of the human uterus. The affinity was measured using E_2-displacement curves and two doses of the compound under investigation.

The most important condition for the active interaction of steroid molecule with both E_2–R systems is the presence of unchanged 3-phenolic and 17β-hydroxy-groups. While the role of these groups for the uterine E–R system is not equal (affinity of 17-desoxyestradiol is 3 times less than that of 3-desoxyestradiol), it is equal for the Fallopian tube receptor system.

Various modifications of steroid molecule influence the degree of estrogen–receptor interaction in both tissues in different ways.

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7. Sex steroid receptors in human myometrium and fibromyoma, M. CHAMBON*, F. CAPONY†, J. F. TEISSEDRE‡ and H. ROCHEFORT†, *Laboratoire de Génétique et Biologie Cellulaire, Complexe Scientifique des Cézeaux, B.P. 45, 63170 Aubiere, †Unité d'Endocrinologie Cellulaire et Moléculaire (INSERM, U 148), Avenue des Moulins, 34100 Montpellier, and ‡Maternité du Centre Hospitalier Régional, 34000 Montpellier, France

The concentrations of binding sites of RE and RP were 3–4 fold higher in fibromyoma than in myometrium of the same woman, when represented per g of tissue or mg of protein. This increase was also observed for RP when reported per μg of DNA. Progestin treatment decreased