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JOURNAL ARTICLE

Identification and characterization of a beta-adrenergic receptor in hamster Sertoli cells

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Sertoli cells cultured from immature hamsters contain a beta-adrenergic receptor which is coupled to the cAMP second messenger system. Thus, isoproterenol, epinephrine, and norepinephrine, which act via beta-adrenergic receptors, all stimulate cAMP accumulation in Sertoli cells cultured for 4-5 days. This cAMP response to isoproterenol is inhibited stereospecifically by the beta-receptor blocker, propranolol. It is also sensitive to inhibition by beta-adrenergic antagonists in this order of potency: nonspecific beta receptor antagonists, propranolol, timolol, hydroxypindolol greater than beta 1 selective antagonists, oxyprenolol, metoprolol much much greater than beta 2 selective antagonist, butoxamine. Butoxamine was at least 1000-fold less sensitive than either the nonspecific or the beta 1 selective antagonists at inhibiting the response of either isoproterenol (nonspecific), dobutamine (beta 1 selective) or zinterol (beta 2 selective). The hamster Sertoli cell beta receptor is, therefore, predominantly of the B1 subtype. This beta receptor mediated increase in cAMP is sensitive to homologous desensitization and is stimulated synergistically by forskolin. In addition, Seroli cells freshly isolated from immature hamsters contain an active beta receptor. However, this beta receptor mediated increase in cAMP is dependent on the type of trypsin used in the cell preparation. In agreement with Kierszenbaum et al (1985), freshly isolated Sertoli cells from immature rats never responded to the catecholamines regardless of the type of trypsin used; indicating an important physiologic difference between rat and hamster Sertoli cells.

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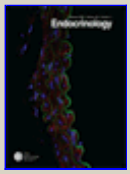

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M. O. R. Borges, M. L. C. Abreu, C. S. Porto, and M. C. W. Avellar
Characterization of Muscarinic Acetylcholine Receptor in Rat Sertoli Cells
Endocrinology, November 1, 2001; 142(11): 4701 - 4710.
[Abstract] [Full Text] [PDF]