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FSH-mediated signaling pathways in proliferating and differentiating sertoli cells

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Spermatogenesis and male fertility are dependent upon a complex interplay of hormonal inputs. In the testis, Sertoli cells are required to support germ cell development and survival after puberty, because Sertoli cells can support only a finite population of germ cells, the extent of Sertoli cell proliferation and its number defines the upper limit of sperm output and fertility. Follicle Stimulating Hormone (FSH) is a known regulator of Sertoli cell proliferation that ends with the establishment of the blood testis barrier. After that, FSH assumes a role on Sertoli cells differentiation. For this reason, it is expected that FSH-receptor downstream signaling differ during the two development stages (pre and post pubertal). FSH stimulates some mechanisms only on the pre pubertal stage such as Ca2+ uptake, MAPK/Erk phosphorylation and PI3k/Akt activation. On the other hand, cAMP can acts either way on proliferation and differentiation by different pathways mediating FSH signal. This fine tune on the timing regulation by the same molecules, show us the diversity and complexity of this hormonal signaling. We want to discuss the importance of pathways for the Sertoli cell development, demonstrate the expression of key molecules that change related to the pre and post-pubertal phases and have a broad view at the FSH role on proliferation and differentiation of Sertoli cells. Altogether, these data may contribute for the understanding of the signaling dynamics, especially for the development of the favorable seminiferous milieu for sperm production and for identifying better control points providing strategies for male contraception.

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In vitro assessment of ROS on motility of epididymal sperm of male rat exposed to intraperitoneal administration of nonylphenol

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The mechanism by which nonylphenol (NP) interferes with male infertility is not yet fully elucidated. NP was evaluated for its effects on epididymal sperm of adult male rats. Twenty four Sprague-Dawley (SD) rats were used as epididymal sperm donors. Previously rats were administrated with NP (0, 2, 10 and 50 mg/kg) body weight respectively in corn oil every forty-eight hours by intraperitoneal injection for 30 days. Computer assisted sperm analysis (CASA) was used to determine parameters of sperm. The sperm morphology examination was conducted with a high resolution microscope. Results indicated that exposure to NP no effect on body weight, while testes weights were significantly decreased. Computer assisted sperm analysis (CASA) showed significant decline in the percentage of motile spermatozoa ($P < 0.001$), STR and LIN ($P < 0.01$), significant increase in ALH ($P < 0.001$), while significant decline in BCF ($P < 0.001$) respectively. Plasma LDH was significantly increased while; plasma γ-GT activity was significantly decreased. H2O2 production and malondialdehyde (MDA) were significantly increased. The Plasma CAT, GSH-Px and SOD activities were significantly decreased. This concludes that NP leads oxidative stress in the epididymal sperm of rats. Moreover, NP can disrupt sperm motility and alterations in the sperm morphology.

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