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### Interactive roles of epidermal growth factor and stem cell factor in mediating proliferation and differentiation of adult human testicular germ cells

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Development of an ideal culture system in which human testicular germ cells can proliferate and differentiate will be a remarkable achievement in the field of reproductive biology as such a system will not only facilitate better understanding of control and regulation of human spermatogenesis but also provide a source of germ cells for therapeutic use (transplantation/ART) in patients with gonadal insufficiency. In the present study, we successfully developed & characterized an organotypic culture system to study local paracrine/ autocrine action of growth factors on spermatogenesis. We were able to demonstrate that human testicular tissue is responsive to EGF & SCF which act as specific autocrine-paracrine mediators in the regulation of proliferation and differentiation of germ cells. EGF/EGFR and SCF/c-KIT systems were found to be expressed in a cross complimentary fashion within the human testis. *In vitro* treatment with EGF and SCF elicited cell specific responses, with EGF displaying a stimulatory effect on the expression of meiotic and post meiotic transcripts (*boule*, *scp3*, *th2b*, *tp1*) and SCF on pre and post meiotic transcripts ( *$\beta$  integrin*, *c-kit*, *th2b*, *tp1*). EGF also mediated upregulation of SCF expression. The study indicates that EGF via interactions with EGFR on the Sertoli cells regulates germ cell differentiation by altering local paracrine networks and production of factors such as SCF which further stimulates spermatogonial proliferation and differentiation in the basal compartment. This study demonstrates the tight coordination existing between Sertoli and germ cells in regulating the cycle of the seminiferous epithelium via action of paracrine factors such as EGF and SCF within the human testis and may provide insights for designing *in vitro* systems for germ cell maturation. The study provides a snapshot of the myriad interactions that take place within the testicular compartments for progression of spermatogenesis and serves as a valuable tool for understanding basic human spermatogenesis.

#### Biography

Sreepoorna Unni completed her PhD in Reproductive Biology from National Institute of Research in Reproductive Health, Mumbai, India. Her research focus was on development of strategies for fertility preservation of men with gonadal insufficiency due to chemotherapy. She was able to successfully develop and characterize a culture system for growth and proliferation of human testicular cells. Presently, she is working as Asst. Professor at University College, Zayed University where her current research focus is on understanding the knowledge and awareness levels of Poly Cystic Ovarian Syndrome (PCOS) amongst female Emirati students.

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