Promising targets for non-hormonal male contraception

There is an obvious need to provide men with choices for their fertility regulation but advocacy for this research needs to expand and convince the industry that there is a demand with unmet needs that deserve attention and investments.

Simplicity, reversibility and effectiveness are desired features of a male contraceptive, but only two methods, condom and vasectomy, are available and not always well accepted. In contrast to hormonal methods, the non-hormonal approach aim at inducing reversible infertility without interfering with hormones secreted by the hypothalamus, pituitary gland, and testis. Research targeting spermiogenesis and differentiation, maturation of sperm or factors inhibiting sperm motility, identified promising non-hormonal targets for men.

Among these approaches, antagonists to the testis-specific Bromo Domain Protein, or to the retinoic acid receptors which are involved in meiosis proved effective in inhibiting spermatogenesis. Adjudin or H2-gamendazole, two modified lonidamine derivatives exert a contraceptive effect by causing premature spermiation and infertility. Eppin (epididymal protease inhibitor) secreted by Sertoli cells and epididymal epithelial cells is also a potential target. Anti-eppin antibodies which block the semenogelin binding to eppin inhibit the motility of the human spermatozoa. Blocking CatSper (cationic channel of sperm), a novel and complex ion channel that mediates Ca2+ entry in sperm flagellum, or the sperm-specific glyceraldehyde-3-phosphate dehydrogenase (GAPDS) result in reduced sperm motility.

Although current research on non-hormonal contraception remains confined to preclinical studies with the identification of new promising targets specific to the reproductive system, there is yet scope for further advancement in this area, and a few methods may enter into clinical testing during the current decade.