Methods for ablating niche cells in testis

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Value Proposition

Infertility affects 10-15% of couples and up to 50% of these cases are due to the male partner. While the largest proportion (30%) of these cases are idiopathic with no known causes and for which there are currently no effective treatments, a small percentage of these cases (<10%) are caused by a defect in Sertoli cells (cells in the testis that are essential for testis formation and sperm production.). A method to ablate and replace these malfunctioning cells would be extremely valuable to treat this portion of the population.

Technology

The inventors have developed a technique that treats infertility patients with Sertoli cell defects by replacing Sertoli cells after they are depleted in the patient. The inventors ablate the defective tissue using benzalkonium chloride, a non-toxic drug in common use in the clinic. In a mouse model, when injected in vivo, the drug eliminates Sertoli cells without affecting other cell types in the testis, leaving a scaffold into which healthy cells can be engrafted. Donor Sertoli cells are then engrafted onto the ablated site, where within two weeks they function correctly producing sperm, and infertility is treated.

The above data has exciting implications for Sertoli cell transplantation to treat idiopathic cases of male infertility, where there is no known cause or cure. This technology has potential further applications in treating infertility for pediatric cancer patients, where infertility is often an adverse side effect of chemotherapy.

Advantages

- There are currently no treatments for Sertoli-cell related infertility, in addition to idiopathic forms of male infertility.
- The drug involved is non-toxic and commonly used.

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Inventor(s)

- Capel, Blanche
- McKey, Jennifer
- Yokonishi, Tetsuhiro

College

School of Medicine (SOM)

For more information please contact

Krishnan, Shweta
919-681-7541
shweta.krishnan@duke.edu