

Researchers clone key sperm-binding proteins

March 17 2009



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contraception.

"We have previously isolated and characterized BSPs from many species, such as bulls and boars," says Dr. Puttaswamy Manjunath, senior author and a professor in the departments of medicine and of biochemistry at the Université de Montréal and a member of the Maisonneuve-Rosemont Hospital Research Centre.

"We know from these studies that if this protein is missing or defective in these species, fertility is compromised. We believe that BSP is equally important in humans."

An elusive protein

Dr. Manjunath and colleagues have tried to isolate human BSPs for more than 10 years. In most mammals, these proteins are typically produced by the seminal vesicles and added to [sperm](#) at ejaculation. Yet this is not the case for humans, primates and rodents. According to Dr. Manjunath and his team, these species produce small amounts of BSPs only in the epididymis, a duct that connects the testes to the urethra.

"For a few years, we were looking in the wrong place," says Dr. Manjunath. "In addition, the minute quantities of BSP produced in humans has made it impossible to isolate and characterize."

Cloning leads to purification

Dr. Manjunath and his team went back to the basics. Using molecular biology technique they cloned the gene (DNA) that encodes human BSP. Through cloning, they were able to produce and purify this protein.

"After considerable troubleshooting, we were able to produce functional

human BSP. Our next steps are to confirm its biological role in human fertility," says Dr. Manjunath.

Role of BSPs in other animals

Following ejaculation, sperm undergo a complex series of modifications inside the female reproductive tract. The changes sperm undergo during this process include redistribution of surface proteins, loss of sperm membrane lipids and increased sperm movement. A family of sperm-binding proteins (BSPs) secreted by the seminal vesicles has been shown to be essential for sperm maturation in female reproductive tracts of cows, sheep, pigs and other hoofed animals.

More information: The article, "Recombinant expression and affinity purification of a novel epididymal human sperm-binding proteins, BSPH1," was authored by Université of Montreal and Maisonneuve-Rosemont Hospital Research Center researchers Jasmine Lefebvre, Guy Boileau and Puttaswamy Manjunath.

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Citation: Researchers clone key sperm-binding proteins (2009, March 17) retrieved 1 May 2024 from <https://medicalxpress.com/news/2009-03-clone-key-sperm-binding-proteins.html>

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