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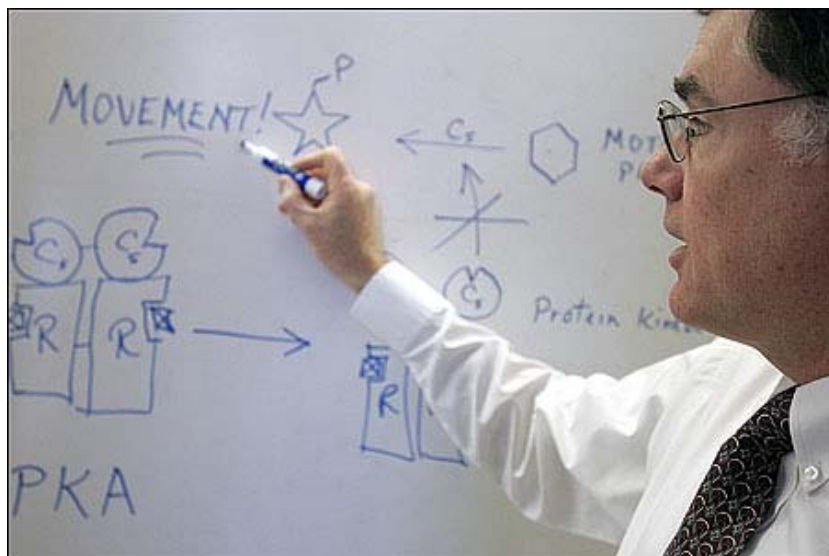
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Way seen to male birth-control pill

UMass, Norwegian researchers in pact

The Boston Globe

By Stephen Smith, Globe Staff | January 31, 2005

WORCESTER -- University of Massachusetts researchers will announce today that they have discovered a strategy for immobilizing sperm and have reached an agreement with a Norwegian company to develop a male contraceptive pill.

The finding is occurring five decades after scientists, also in Central Massachusetts, devised a formula for a women's birth control pill, one with worldwide social and sexual repercussions so great that it came to be known simply as the Pill.

The approach by the UMass Medical School scientists involves turning off the tiny tails that allow sperm to swim to the female egg for fertilization. If their theory is right -- and animal studies suggest it is -- the method could result in a male contraceptive that is easy to take, free of side effects, and reversible.

UMass has forged a licensing deal with a Norwegian biotech company called SpermaTech to use this pioneering approach to develop a male pill, a process that could require a decade of lab work and human testing.

If the partnership between US and European scientists is successful, specialists in reproductive health said, it would herald a new era in sexual relations, with issues of trust, responsibility, and power unfolding in ways not easily predicted. And the economic consequences could be significant, too: Last year alone, US doctors wrote 82.5 million prescriptions for oral contraceptives, responsible for \$2.8 billion in sales, according to IMS Health, which tracks the pharmaceutical market. UMass did not disclose the details of the agreement, but it stands to profit handsomely should a male pill be developed.

"This would be revolutionary," said Dr. Karen Loeb Lifford, medical director of Planned Parenthood League of Massachusetts. "The existence of alternative methods of birth control is exceedingly important, particularly methods men can use and where the responsibility for contraception becomes more of a shared responsibility."

The female pill is viewed by medical and social historians as contributing to the sexual revolution of the 1960s and to the women's liberation movement, which led to large numbers of women entering the workforce.

Loeb Lifford and other specialists in reproductive health said a male pill could also have important and unintended social consequences, including a potential increase in sexually transmitted diseases if men in less-stable relationships stop using condoms.

The hunt for a male version of the Pill has been underway for years, with some of the most significant explorations starting decades ago at the Worcester Foundation for Biomedical Research. It was scientists there who developed the Pill for women in the 1950s, hitting upon the right mix of hormones taken by mouth to prevent pregnancy.

When researchers at the foundation, its scientific operations merged with UMass in 1997, wanted to better understand how they might be able to prevent men from reproducing, they decided to look at pond scum.

Algae are propelled through water by flagella, microscopic engines of locomotion. And, it turns out, sperm use similar structures for movement, said George B. Witman III, a UMass cell biologist.

"For many years, people probably wondered why we were interested in studying pond scum," Witman said. "Pretty much anybody studying male sperm would acknowledge the debt we owe green algae. When you get down to the cellular level, the building blocks are essentially the same."

In a lab down the hallway from Witman's office, rows of flasks demonstrate what happens if the flagella are shut down. On one side of the lab, flasks glow green from top to bottom. These contain algae that still have quavering flagella.

In other flasks, the algae hug the bottom -- their flagella are silenced.

So, Witman and his colleagues wondered, what if you could do the same thing to sperm? They chose to study the sperm of rams because the movement of ram sperm closely mimics that of humans.

Witman discovered that ram sperm harbor a protein integral to the operation of the flagella, and the same protein has been found in human sperm. And his tests demonstrated that the protein exists nowhere else in the body, a finding that suggests that a pill might be developed that would have no side effects.

"This is an important discovery because we have something that is unique to sperm and also we know it's essential to the sperm," said Dr. Jerome F. Strauss III, director of the Center for Research on Reproduction and Women's Health at the University of Pennsylvania. Strauss is not involved with Witman's research but is familiar with it.

The protein, called Cs, exists from the time sperm originate in the testes. But it is activated only in the epididymis, a tightly coiled duct through which sperm travel. It takes about a week for sperm to pass through the human epididymis -- which would be about 20 feet long if stretched out end to end. A biochemical messenger activates the Cs protein, working something like a key turning on the ignition switch of the sperm.

A separate team of researchers at the University of Washington engineered a mouse without Cs protein and found that while the male mouse was incapable of impregnating females, it remained otherwise healthy and virile.

Other pharmaceutical approaches to developing a male contraceptive involve hormones or changes in the immune system, both of which raise concerns because of potential side effects. Safety is paramount in developing any contraceptive, both because some men would take it for years, and because unlike drugs used to treat life-threatening illnesses, birth control pills are preventive, meaning their benefits must greatly outweigh any risks.

"Our hope now," Witman said, "is to go forward and identify a small molecule that can gum up the Cs, the ignition switch."

Finding the right compound could prove daunting, Penn's Strauss said.

It means performing sophisticated chemical screening, and that takes considerable patience and money.

The initial work on finding the right compound will be done by scientists at SpermaTech in Oslo.

In a telephone interview, one of the founders of the biotech company, Bjorn Steen Skalhegg, said that shortly after Witman patented his discovery of the Cs protein in the United States, the Norwegian researchers disclosed that they had made a similar finding and filed a patent in Europe.

Now, the scientists from two continents have formed a partnership.

"The need is great," Skalhegg said. "We are 6 billion people now in the world, and it is already very, very crowded."

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