



# Microbicides

Written by David Mariner, special thanks to Jim Pickett and Anna Forbes

## What is a Microbicide?

A microbicide is a product designed to prevent or greatly reduce the risk of acquiring HIV and other sexually transmitted diseases (STDs) during sexual activity. Many potential microbicides are now being tested, but none have been proven to be effective.

Virtually all of these products are 'topical' microbicides. A topical microbicide can take many forms, such as a foam, cream, or gel, which is applied directly to the vagina or rectum. It could also be a suppository (medication that is inserted into a body cavity like the vagina or rectum).

You may also hear people use the term 'oral' microbicide. This refers to a pill that could be taken (swallowed) to prevent the transmission of HIV and other STD's. Tenofovir, a drug that is now widely used in treatment of HIV and AIDS, is currently being tested for possible use as such a product that HIV-negative people could take regularly to reduce their risk of HIV infection.

## A New Tool in the Prevention Toolbox

If a microbicide is discovered, it would be a welcome addition to current HIV prevention tools. It would not, however, replace other prevention tools like male condoms, female condoms, dental dams, or latex gloves. The proper and consistent use of a condom during intercourse is still your best bet for preventing HIV transmission, and that is unlikely to change even if a microbicide is found.

In fact, it's likely that the first microbicide (or HIV Vaccine) to be developed will only be partially effective. A partially effective microbicide doesn't sound very promising, but it could actually have a huge impact on the global HIV/AIDS epidemic. Experts suggest that over a three year period, a partially effective microbicide could prevent well over two million HIV infections worldwide.<sup>1</sup>

For those who consistently use condoms, a microbicide could be used as an added preventive measure. For those who, for whatever reason, do not always use condoms, a microbicide could be used alone to reduce risk of HIV transmission.

## Women & Vaginal Microbicides

Male-to-female transmission of HIV and female-to-male transmission of HIV are not the same. Women are twice as likely as men to contract HIV from a single act of unprotected sex because of their biological differences.<sup>2</sup> This is one reason women are disproportionately impacted by HIV/AIDS.

In the United States women comprise a growing share of new AIDS cases each year. The proportion of AIDS cases among women has more than tripled since 1986 from 7% to 23%.<sup>3</sup> In sub-Saharan Africa, women make up 57% of those living with HIV, and 75% of young people infected are women and girls.<sup>4</sup>

New HIV prevention strategies for women are clearly needed. A microbicide is one such strategy. For millions of women around the world, negotiating condom use with a partner can be extremely difficult, if not impossible. A microbicide would help to address this by empowering women to take action and reduce their risk of HIV infection on their own.

Microbicides would not just benefit women, though. In theory, such a microbicide could also prevent HIV transmission from a woman to her male partner.

## Rectal Microbicides

Less research has been done on rectal microbicides, than vaginal microbicides. Unfortunately, just because a microbicide works vaginally, does not mean it will also work rectally. There are many differences between the rectum and vagina which include:

- The vagina is an enclosed space, while the anus, rectum, and colon are continuous and open-ended.
- The vaginal epithelium (membrane tissue) is 40 cell layers thick, while the epithelium of the rectum is only 1 cell layer thick, and therefore more fragile.
- The human vagina is a moderately acidic environment, the rectum is not; Both have different ecologies<sup>5</sup>

What works as an effective vaginal microbicide, could actually be harmful if used rectally. We cannot make any assumptions. Clearly it will be important to test microbicides for safety in both environments and to educate consumers about the differences that may exist.

Rectal microbicide research will be crucial for gay, bisexual, and transgender men, but many others will benefit from this research as well. One study showed that among a group of women at high risk for becoming HIV positive, 32% had engaged in anal intercourse.<sup>6</sup>

## The State of Microbicide Research

There are approximately 60 candidates, or potential microbicides, in development. Of these, approximately 20 are in clinical trials.<sup>7</sup> Most of this research is funded by the public sector (like our federal government and other countries) and philanthropic organizations (like non-profit organizations). Pharmaceutical companies have traditionally shied away from microbicide out of concerns including the scientific feasibility, the demand for a microbicide, and the profit margins.<sup>8</sup> This, however, is starting to change.

Investment in Microbicide research and development has grown significantly in the past few years. In 2000, public and philanthropic investment in vaccine research totaled \$66 million. In 2004, that number rose to \$140 million. In 2004, the United States accounted for about 75% of total investments in microbicides.<sup>9,10</sup>

70% of all United States funding for Microbicide research and development is through the National Institutes of Health (NIH). The NIH supports microbicide research in part, through the HIV Prevention Trials Network ([www.hptn.org](http://www.hptn.org)).

## For more information on Microbicides

### **Alliance for Microbicide Development**

8484 Georgia Ave, Suite 940, Silver Spring, MD 20910 (301) 587-9690  
<http://www.microbicide.org>

The Alliance for Microbicide Development is a global, non-profit organization whose sole mission is to speed the development of safe, effective, and affordable microbicides to prevent sexually transmitted infections, most critically HIV/AIDS.

### **Global Campaign for Microbicides**

c/o PATH, 1800 K Street NW, Suite 800, Washington, DC 20006 (202) 822-0033  
<http://www.global-campaign.org>

The Global Campaign for Microbicides is a broad-based, international effort to build support among policymakers, opinion leaders, and the general public for increased investment into microbicides and other user-controlled prevention methods.

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<sup>1</sup> Topical Microbicides, National Institute of Allergy and Infectious Diseases, June, 2003 note: the Global Campaign for Microbicides, apparently looking at the same study (AIDS Volume 17:1227-1237, May 23, 2002) puts this number at 2.5 million.

<sup>2</sup> The Global Coalition on Women and AIDS. Media Briefing Report. (Available on-line at [http://womenandaids.unaids.org/themes/theme\\_7.html](http://womenandaids.unaids.org/themes/theme_7.html)).

<sup>3</sup> Centers for Disease Control and Prevention, HIV/AIDS Surveillance Report, Year-End Editions, 1986, 1999

<sup>4</sup> UNFPA, UNAIDS, UNIFEM. Women and HIV/AIDS: Confronting the Crisis, 2004.

<sup>5</sup> These three bullet points are adapted from the presentation: Shake That Booty, No One Left Behind: Rectal Microbicides, LifeLube, and the Fight for the Next Generation HIV Prevention, Jim Picket, AIDS Foundation of Chicago, May 24<sup>th</sup>, 2005

<sup>6</sup> Gross M, Holte SE, Marmor M, et al. Anal sex among HIV-seronegative women at high risk of HIV exposure. The HIVNET Vaccine Preparedness Study 2 Protocol Team, Journal of AIDS, 24(4): 393-8,2000.

<sup>7</sup> Shake That Booty, No One Left Behind: Rectal Microbicides, LifeLube, and the Fight for the Next Generation HIV Prevention, Jim Picket, AIDS Foundation of Chicago, May 24<sup>th</sup>, 2005

<sup>8</sup> Preparing for Microbicide Access and Use, A Report by the Access Working Group of the Microbicide Initiative funded by the Rockefeller Foundation, 2000

<sup>9</sup> Public and Philanthropic Investments, The Microbicide Quarterly, Alliance for Microbicide Development. January, February, March, 2005 v.3 no.1 page 18.

<sup>10</sup> Public and Philanthropic Investments, The Microbicide Quarterly, Alliance for Microbicide Development. January, February, March, 2005 v.3 no.1 page 18.