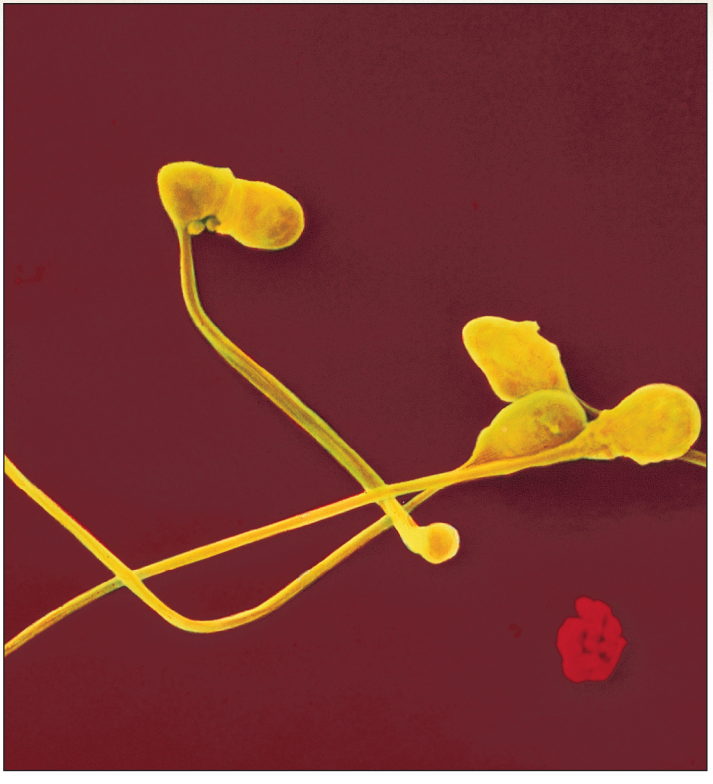
Erectile dysfunction (impotence), in which the penis cannot become erect or sustain an erection, was once rarely talked about. Then, in the spring of 1998, Viagra® (sildenafil) became available. This drug enables about half of all men who take it to produce and maintain erections. The drug was originally developed to treat chest pain. Its effects on the penis were noted when participants in the clinical trials reported improved sex lives and refused to return extra pills! Other, similar drugs have since come on the market.

Erectile dysfunction has many causes, including underlying diseases such as diabetes mellitus; paralysis; treatments such as prostate surgery and many types of drugs, such as certain antidepressants; and lifestyle factors such as excess smoking or drinking alcohol. Side effects of erectile dysfunction drugs include headache, facial flushing, gastrointestinal upset, and sudden loss of vision due to blockage of circulation to the optic nerve. Men taking nitrate drugs to treat angina should not take these drugs, because the combination can cause life-threatening drops in blood pressure.

The process of erection depends upon a very small molecule, nitric oxide (NO), that was once most widely known as a constituent of smog, cigarette smoke, and acid rain (NO should not be confused with the anesthetic nitrous oxide). The penis consists of two chambers of spongy tissue that surround blood vessels. When the vessels fill with blood, as they do following sexual stimulation, the organ engorges and stiffens. The stimulation causes neurons as well as the endothelial cells that line the interiors of the blood vessels to release NO. The NO then enters muscle cells that form the middle layers of the blood vessels, relaxing them by activating a series of other chemicals. The vessels dilate and fill with blood, and the penis becomes erect. One such chemical, cGMP, must stay around for awhile for an erection to persist. Viagra blocks the enzyme that normally breaks down cGMP, thereby sustaining the erection.

Viagra and related drugs are just one approach to treating erectile dysfunction. Evaluating therapies is challenging, because of a powerful placebo effect. Other therapies are being developed and tested in rats by measuring pressure in the penis. In more people-oriented investigations, participants keep diaries that record "daily erectile activity" while testing a new treatment versus taking a placebo, or they are asked to answer detailed questions about their sex lives. Some studies use more invasive techniques. In "penile plethysmography," for example, a volunteer watches an erotic film after taking a drug or placebo, while a device measures engorgement at the base of the penis. In an "audiovisual stimulation penogram," the penis is attached to a mercury-based strain gauge, which assesses engorgement as the man watches a movie. ■



Even with normal penile function, having too many abnormally shaped sperm cells can impair a man's fertility (3,900×).