



**DMS's Yinong Young-Xu, Sc.D., coauthored a paper showing that the cost of end-of-life care is much higher for minorities than for whites, due mostly to geographic, demographic, and other differences.**

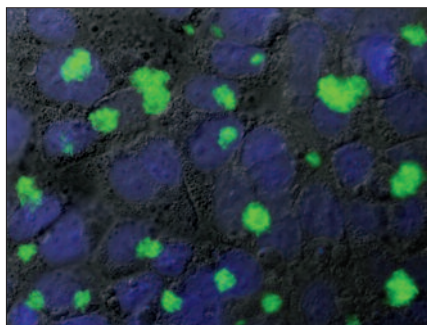
## Ironing out a problem for CF patients

Using chemicals that decrease the availability of iron, a DMS research team has developed a promising new method of attacking the bacteria that infect the lungs of people with cystic fibrosis.

**Infection:** Cystic fibrosis (CF) is a genetic disease that affects about 30,000 people in the United States. It causes a thick layer of mucus to form in the lungs, providing a welcoming environment for bacteria. The bacterium *Pseudomonas aeruginosa* is particularly problematic, infecting the lungs of about 80% of adults with CF. As the bacterial colonies grow, they cause pulmonary problems and, eventually, premature death. The average life expectancy for people with CF is just 37 years.

Treatment options are limited. "Once they become infected, there's just no way to get rid of *Pseudomonas*," explains Bruce Stanton, Ph.D., a professor of physiology. "You can suppress it with antibiotics, but you can't get rid of it."

**Resistant:** One reason for the bacterium's persistence is that it tends to congregate in biofilms—communities made up of vast numbers of bacteria—which make the organism more resistant to antibiotics. Iron also plays an important role in facilitating the formation of biofilms. "It's food for the bacteria," Stanton says.



The green spots are biofilms on the surface of airway cells, and the blue spots are the cells' nuclei.

In previous research, Stanton and a postdoctoral researcher in his lab, Sophie Moreau-Marquis, Ph.D., found that cells in the airways of CF patients release more iron than those in people without CF, exacerbating the problem. "We know iron is important for bacteria to grow, so we wanted to know what happens if we remove iron," says Moreau-Marquis.

To do that, she and Stanton tried two different iron chelators—chemicals that bind to iron, preventing it from being used. They tested the chelators on human airway cells colonized with *Pseudomonas*. On their own, the chelators inhibited the formation of biofilms but did not protect the cells from being damaged by the bacteria.

Stanton and Moreau-Marquis also treated the cells with a standard antibiotic called tobramycin. It mitigated the cell damage to some extent but did not prevent the growth of the bacteria. In fact, the bacterial biomass was even greater after the tobramycin was added.

**Dramatic:** Then they tried a tobramycin-chelator combination, which helped dramatically. It not only prevented the formation of biofilms, but, when used to treat established biofilms, it resulted in a 90% reduction in the bacterial biomass. "You really have to hit them with the combination of drugs to get the most effect," Moreau-Marquis says.

Stanton points out that the chelators that were tested in the study have already been approved by the FDA for use in humans. "It's relatively easy to take those two in combination and treat patients," he says. To find out just how well this combination therapy will work in humans, Stanton and Moreau-Marquis are now teaming up with physicians in DHMC's CF clinic to put the therapy to the test in a Phase I clinical trial. AMOS ESTY

**The drug combination resulted in a 90% reduction in biomass.**

### Which breast option is best?

Most physicians consider breast-conserving surgery the better treatment for women with early-stage breast cancer, but many such women opt for a mastectomy. A DMS team led by E. Dale Collins, M.D., surveyed 125 patients before they learned about their options, after they watched an informational video, and after they talked to a surgeon. The researchers concluded that the women understood the options' risks and benefits, but 44 of them still chose mastectomy. Collins wrote in the *Journal of Clinical Oncology* that even "when women fully comprehend the key facts, many will [prefer] mastectomy, the more invasive procedure."



### Assessing steroid effects

High-profile male athletes make headlines when they're caught taking steroids, but it's not just men who use performance-enhancing drugs. "Young women constitute the demographic with the most rapidly increasing AAS [anabolic androgenic steroid] use," reported a DMS team in *Neuroscience*.

To learn more about the side effects of steroids in women, the researchers administered three types of AASs to female mice and found that the steroids altered signaling in a region of the brain that's involved in aggression and anxiety, possibly hinting at behavioral effects of steroid abuse in women.

