



# Disease detective

## Researcher tackles antibiotic-resistant bacteria

by Mary-Love Bigony

**R**odney Rohde answered the phone at his home one evening in late December and heard the voice of a worried woman. She was concerned about her husband, she said. The retired couple from Utah had traveled over the holidays and the husband, a cancer patient, developed sores on his torso. They went to the emergency room, where a doctor diagnosed a staph infection and prescribed antibiotics. No lab tests were done. The man's condition worsened, so when the couple returned home, he went to his family doctor. After an examination and some lab tests, the doctor determined that the man had MRSA — methicillin-resistant *Staphylococcus aureus* — an infection that cannot be treated with most typical antibiotics. ➤

MRSA is one of Rohde's several areas of expertise. An assistant professor in the Department of Clinical Laboratory Science in the College of Health Professions, he conducted a study in partnership with the Texas Department of State Health Services that received the 2007 Scientific Research Award from the American Society of Clinical Laboratory Science. Each year, the ASCLS recognizes only one project in the United States that represents outstanding research in clinical laboratory science. And now, people in search of information about MRSA have found Rohde both at his office on campus and at his home, during working hours and in the evening. He receives e-mails and calls from around the country.

"The wife had some basic knowledge about MRSA from newspapers and other media coverage," Rohde says. "She was very concerned about what had happened to her husband at the emergency room given his immunocompromised state because of the cancer. She wanted to know why this had happened and whether she or anyone else they had been in contact with should be concerned about transmission."

Rohde explained to her the difference between "regular staph" and MRSA. "I told her that it is very important to have a culture done so that a proper diagnosis and identification of MRSA can be made," he says. "I also let her know that if MRSA spreads and conditions worsen, the patient might have to be admitted to a hospital and given strong antibiotics intravenously. I emphasized that it is always important to ask for a culture and antibiotic susceptibility test if her husband gets an infection again."

The man improved after being correctly diagnosed by his family physician. He received a combination of two powerful drugs and eventually recovered from the infection.

### 'Regular staph' or MRSA?

When penicillin became widely available during World War II — virtually ending soldiers' deaths from infected wounds — no one would have believed that this miracle drug would ever become too much of a good thing. But more than 60 years later, chilling stories about antibiotic-resistant infections such as MRSA show up regularly

in the news. And experts say that one of the causes is overuse and misuse of antibiotics.

Rohde compares MRSA to the more common *Staphylococcus aureus*, with which many people are familiar. "About one in three people 'carry' or are colonized with 'regular' staph," he says. "When you are colonized, you don't actually have an illness, but you may be more likely to acquire a staph infection or transmit it to someone. The good news is that 'regular staph' is still treatable with most first-line antibiotics."

When people are colonized with MRSA, however, it's a different story. MRSA is resistant to those first-line antibiotics. "If not treated properly," Rohde says, "MRSA can lead to serious illness, complications and even death."

Rohde's award-winning research was conducted in a Texas jail. "MRSA used to be found only in hospitals and long-term care facilities," he says. "But in recent years, we've found it in places with no identifiable connection to health care, such as schools, colleges, day care centers. This was the first



study undertaken on MRSA prevalence in a Texas jail.” Rohde’s students assisted with the research.

The study found that, of 403 recently booked inmates, 115 carried the more common *Staphylococcus aureus* and 18 were positive for MRSA. Testing also identified 10 different strains of MRSA in the infected group.

### **Rabies and hantavirus**

Before joining Texas State’s faculty, Rohde worked on another high-profile health threat: rabies. He was a microbiologist fresh out of graduate school and working for the state health department’s public health division in 1994 when Gov. Ann Richards declared a statewide health emergency because of the rapid spread of rabies in domestic dogs and coyotes. “Rabies was moving from South Texas toward San Antonio at the rate of 50 miles a year,” Rohde says.

He said they started studying the Canadian model of vaccinating wildlife populations, in which bait containing a vaccine is dropped from an airplane. Coyotes eat the bait and become vaccinated against rabies. The Oral Rabies Vaccine Program drops hundreds of thousands of pieces of bait every year over target areas in the southern and southwestern parts of Texas. Rohde continues to be active in rabies research.

He has also been involved in hantavirus research. Hantavirus, which has a mortality rate of 30 percent, is found in many parts of the world, including West Texas. “We were trying to find the source of infection in a West Texas town where a person had died,” he says. “Hantavirus is shed primarily in the urine and fecal content from the deer mouse and other rodents. People often acquire the infection when they stir up dust and mouse waste in enclosed areas like sheds, barns and attics. The disease can resemble the flu and lead to progressive pulmonary involvement.”

Rohde and other scientists spent a week setting out hundreds of specialized mouse-traps around town. “We had to be totally suited up with our own air supply to protect us from exposure to the virus if we came upon it,” he says. “All this happened in July. We got some really strange looks from the people in that town. We looked like aliens walking around in our space suits at all

hours of the day and night. We did end up isolating hantavirus near the person’s home, which helped the family understand what may have happened to their loved one.”

### **Looking toward the future**

Rohde continues to field phone calls and e-mails about MRSA. “I always make sure to tell people that I am not a physician and that I can’t deliver specific medical protocol,” he says. “But I can educate them and answer many of the questions they have because my specialties are in microbiology. Just hearing an explanation of what antibiotic resistance is and how to proceed is powerful information.”

Don’t take any chances with an infection, Rohde cautions. “Go to your doctor. The doctor will determine whether you have MRSA or something else based on symptoms and lab tests. And doctors depend on the clinical lab staff, the people we train and graduate here.”

Rohde believes CLS (clinical laboratory science) will play an increasingly important role in the future. “We live in interesting times,” he says. “With bioterrorism and emerging diseases around the world, CLS and public health are going to be critical components for the well-being of our country and world. We are creeping up on a vast drop-off of experienced laboratory workers, and it has been reported that 70 percent of a patient’s medical care is based on clinical laboratory work. We need students to take a working role and a leadership role in filling this critical need.” ★

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