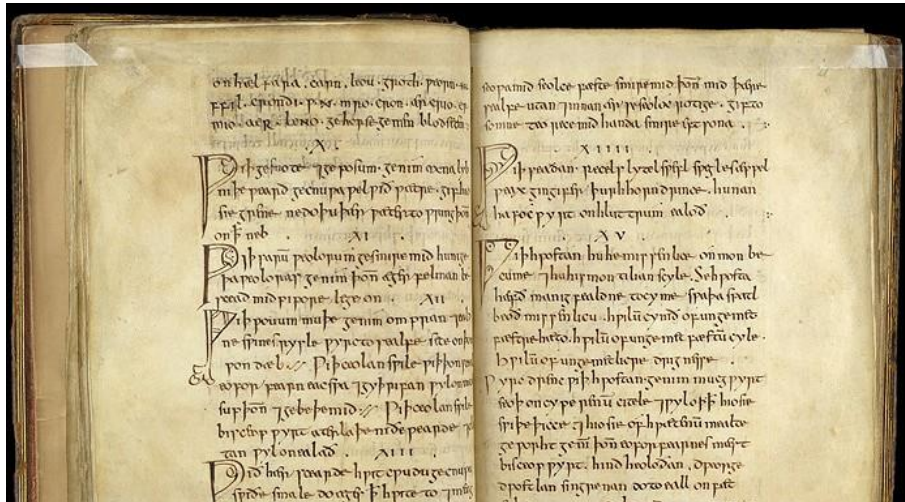


Medieval potion-making melds with modern medicine to fight MRSA

By Los Angeles Times, adapted by Newsela staff on 04.09.15

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A collection of medical recipes in "Bald's Leechbook" provided an antibiotic formula that works on a deadly bacteria called Methicillin-resistant Staphylococcus aureus, better known as MRSA (pronounced mersa). Photo: The British Library

Researchers in England have rediscovered an ancient medicinal potion that appears to fight a very modern problem.

The elixir works against a deadly drug-resistant bacterial infection called Methicillin-resistant Staphylococcus aureus.

Better known as MRSA (pronounced mersa), it is very difficult to treat.

Let's imagine that during a nighttime escape through Sherwood Forest, the legendary English outlaw Robin Hood scratched his eye on a branch and developed an infection. In nearby Nottingham, he might well have asked an herbalist about it. The early pharmacist would fetch a brass vessel, brew a remedy of bile from a cow's stomach and Allium — a plant from the garlic family — and create an ointment to treat the patient's inflamed eye.

Until recently, the recipe for that medieval remedy lay unnoticed in the brittle pages of a thousand-year-old text. Titled "Bald's Leechbook," the early book is shelved in the library of the University of Nottingham's Institute for Medieval Research.

An Ancient Recipe

Leafing through the book, Viking studies professor Christina Lee wondered what its ancient recipes revealed about medieval medical knowledge. She pondered how, a thousand years ago, healers and herbalists chose their treatments and if they had guessed right.

Lee translated the recipe for the eye ointment from the original Old English recipe in "Bald's Leechbook." She then asked chemists at her university's Center for Biomolecular Sciences to make up the treatment and test to see if it worked.

Lee's request came at an important time for Nottingham's Freya Harrison, a biologist who studies microscopic life

forms, who was looking for inspiration. Lee's idea allowed Harrison and her team to reach deep into the past in search of undiscovered or underappreciated antibiotics.

Scientists in Harrison's lab followed the recipe precisely, cooking four separate batches of the ointment. They also devised a control experiment using the same quantity of distilled water and brass to mimic the brewing container, but without the vegetable ingredients.

In a lab, the scientists made the MRSA bacteria grow out of control. They applied the ancient ointment and discovered the thousand-year-old recipe had a powerful killing effect. Only about 1 in 1,000 bacterial cells survived.

Later, in infected wounds in mice, the remedy killed 90 percent of MRSA bacteria.

A Powerful Concoction

Harrison says she was "absolutely blown away" with the antique recipe's effects. She had assumed it might show "a small amount of antibiotic activity," but not to this extent. Researchers have found some of its elements — copper and bile salts in particular — to have some effect on bacteria in the lab. And plants in the garlic family are known to make chemicals that interfere with bacteria's ability to damage infected tissues.

But compared with the control substance, the combination of these elements in this ancient formulation was powerful, Harrison said. The eye salve had the power even to get through the sticky coating and kill the dense clusters of MRSA, which are resistant to most antibiotics.

It was only when Harrison's lab diluted the ointment to see whether it would continue to kill bacteria that they figured out how it worked. The diluted salve wasn't strong enough to kill the MRSA, but it interfered with communication among its cells. This is a key finding because those signals switch on genes that allow bacteria to damage infected tissues. Blocking this signaling is a promising way to treat infection.

"We know that MRSA-infected wounds are exceptionally difficult to treat in people and in mouse models," said Kendra Rumbaugh. She carried out the testing of Bald's remedy on MRSA-infected skin wounds in mice. "We have not tested a single antibiotic or experimental therapeutic that is completely effective," added Rumbaugh, a professor of surgery at Texas Tech University's School of Medicine. But she said the ancient remedy was at least as effective — "if not better than the conventional antibiotics we used."

The collaboration between Old English remedies and microbiology has given rise to a new program at Nottingham. Called Ancient Biotics, researchers will study remedies that combine the ancient arts and modern sciences.