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# MIZZOU

## Once Bitten — or Not?

**Rapid spider bite tests can speed doctors in correctly diagnosing unusual skin lesions.**

*Story by Erik Potter*

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**T**here's a strange sore on your arm. It hurts, and you don't feel so great. What's wrong?

For many patients and doctors, the likely diagnosis for a hard-to-identify skin lesion is a brown recluse spider bite. But it could be skin cancer, a Staphylococcus infection or a rare and deadly Streptococcus “flesh-eating bacteria” infection. Determining quickly if the lesion is the result of a spider bite can speed the proper treatment and keep a bad health situation from getting worse.

However, because spiders leave so little venom to be detected, tests for spider bites have proven challenging to develop, and reliable ones must



Brown recluse spiders have a painful bite but generally avoid humans. Public domain photo.

incubate overnight. But William V. “Van” Stoecker, MD ’77, co-director of The Dermatology Center in Rolla, Mo., and Jon Green, associate professor of animal sciences, have developed a test that can detect spider venom in quantities as small as 10 picograms (10 trillionths of a gram) in as little as two hours.

Stoecker’s specialty is dermatology, and his special interest is spider bites, but his team failed to develop a working test until he found Green, who had developed and patented a test to detect early pregnancy in cattle. “We just [applied] the same skills we’d learned in the pregnancy tests to spider venom,” Green says.

Green can’t detect the proteins in spider venom directly, so instead he uses specific antibodies — blood proteins that are part of the immune system — to bind to the venom proteins and pull them out of a solution. Called an ELISA test, the process is akin to using a strong magnet to search for a needle in a haystack.

The pair have been improving the test for a decade and are now ready to seek FDA approval.

The next challenge will be achieving wide distribution. Specialized equipment is needed to run the test, which means some clinics and hospitals will have to send out their samples for testing. Van Stoecker hopes to follow the model of the strep throat test, which initially required specialized equipment, but is now done everywhere.

## Spider Bite Test (MU CAFNR)



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