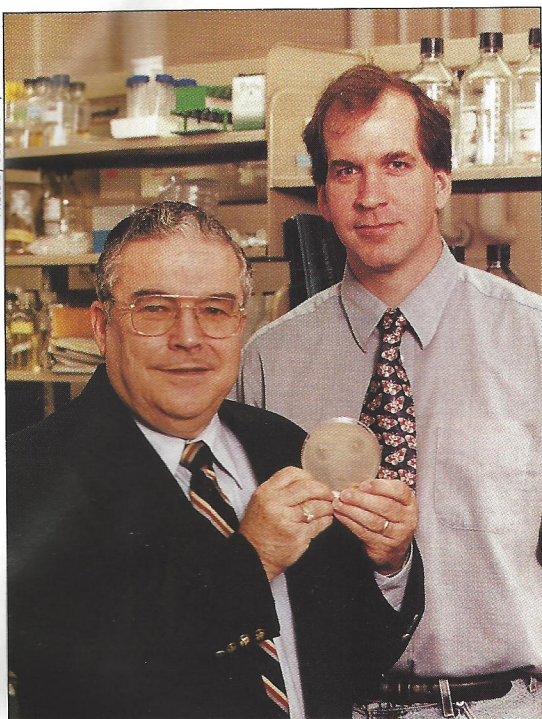


Sticks and stones won't mend broken bones, but perhaps glass will

Written by Rebecca Clayton of Rolla, a senior in psychology at UMR, and Heather Grimes of Poplar Bluff, Mo., a sophomore in psychology at UMR.

Photo by Bob Pheasant/Photomasters



UMR researchers Delbert Day, CerE'58, and David Westenberg have discovered that glass pins and sutures could help stave off infection better than metal pins.

A mending bone grows inefficiently around a metal pin, and existing sutures or staples must be removed through an invasive procedure.

Westenberg believes that glass is a superior alternative because as it dissolves, the bone meshes with the glass, and they work together as one unit.

UMR researchers **Delbert Day**, CerE'58, and **David Westenberg** may have found an unlikely substance to treat severely broken bones. They say doctors could speed up recovery times and strengthen bone mass by using infection-fighting glass pins and surgical sutures to treat breaks in place of metal pins and medical screws.

Day, a Curators' Professor emeritus of ceramic engineering, and Westenberg, an assistant professor of biological sciences, have discovered that, in addition to promoting bone strength, the glass pins and sutures could help stave off infection better than metal pins. Glass is a good alternative to metal because it can be incorporated with silver, which is known to fight bacteria, Day says.

Metal pins and screws have significant drawbacks, according to Westenberg. A mending bone grows inefficiently around a metal pin, he says, and existing sutures or staples must be removed through an invasive procedure. Glass is a superior alternative, Westenberg says, because "as it dissolves, the bone meshes with the glass, and they work together as one unit."

The research is ongoing. Day and Westenberg have established that glass alone works as an agent against bacteria, but they say a combination of glass and silver is the best defense against infection. Currently, Day is testing a variety of glass components to determine which is best suited to incorporate with silver. Meanwhile, Westenberg is testing how much bacteria is destroyed by a given glass component.

Westenberg begins by covering a Petri dish with bacteria commonly found lurking in hospitals, such as *Staphylococcus aureus*, *Pseudomonas aeruginosa* or *E. coli*. A glass-silver composition is sprinkled in the middle, and as the glass dissolves, the silver spreads and kills the bacteria. The better the glass-silver mix, the faster and farther the silver spreads.

Although Day and Westenberg are confident that glass-based pins will be more effective than metal ones, it may be awhile before doctors can use glass-based pins in medical procedures. The UMR researchers must make sure that glass compositions won't have any negative effects on human cells. It could take five years or more before the research is complete, but Day and Westenberg say the results will be worth the wait.

"The science behind this is solid," Westenberg says. "This research has the potential to make a big impact on the way the medical community thinks about treating broken bones."