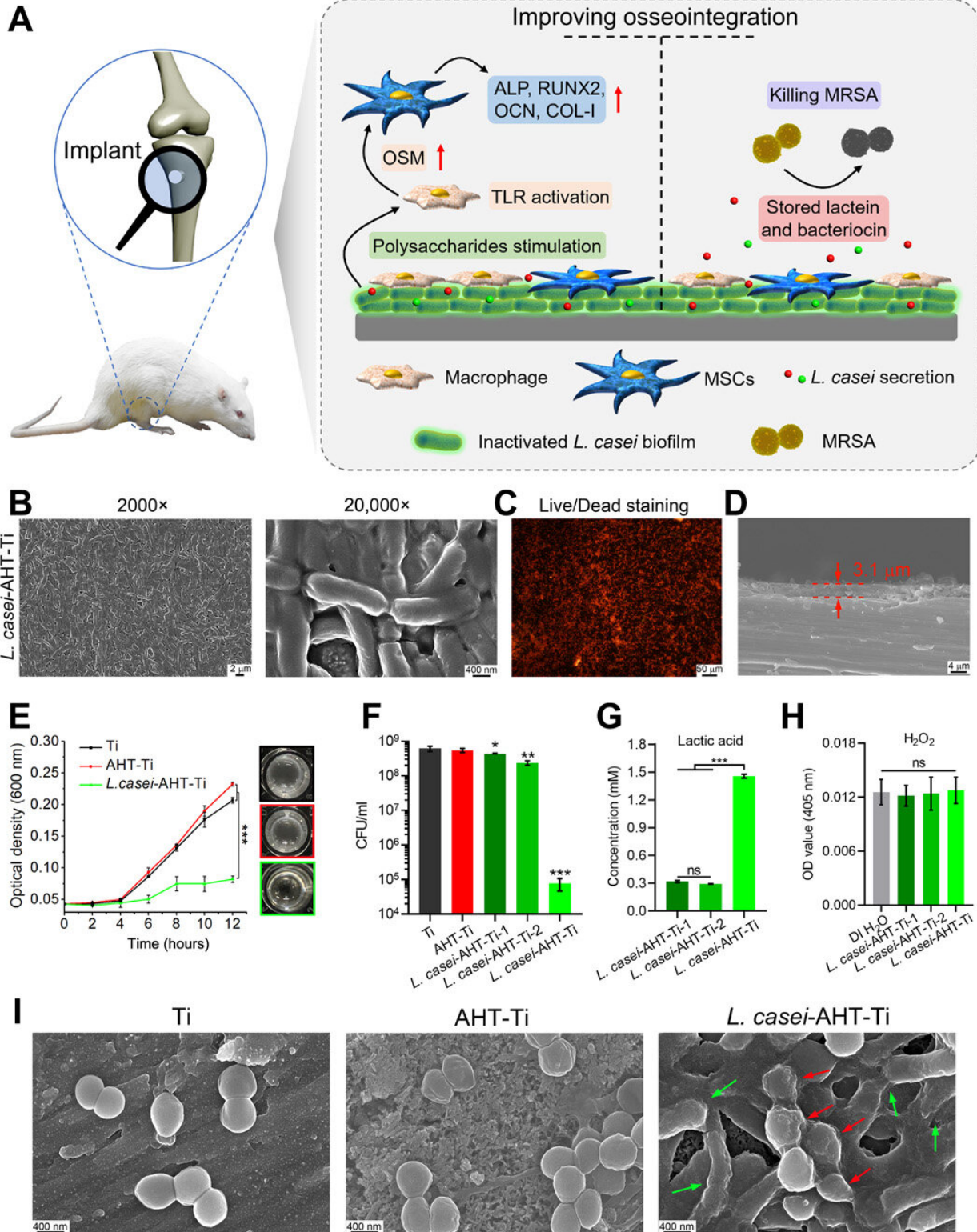


# **Coating metal bone implants with bacteria found to promote healing while reducing infections**

November 17 2020, by Bob Yirka

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Characterization and antibacterial performance of *L. casei* biofilm. Credit: *Science Advances* (2020). doi: 10.1126/sciadv.aba5723

A team of researchers affiliated with several institutions in China has found that coating titanium bone implants with a thin film of *Lactobacillus casei* before implantation promoted healing and reduced infection risk in rats. In their paper published in the journal *Science Advances*, the group describes experiments they conducted on the effects of using *L. casei* on rats with broken tibias.

Prior research efforts have shown that the [bacteria](#) *L. casei* (commonly found in many cheeses and yogurts) can kill bacteria in living organisms, but it had never been used in the treatment of bone fractures. In this new effort, the researchers have found that the application of an *L. casei* biofilm to a titanium bone [implant](#) not only helped to prevent infections, but also promoted new bone growth.

In some instances, when a person breaks a bone, an implant must be inserted into the two broken pieces to hold them together during healing. In most cases, the implants are made of titanium. And despite precautions, sometimes the implant provides conditions for bacteria (most often methicillin-resistant *Staphylococcus aureus*) to proliferate, setting off an [infection](#) that can be deadly. In this new effort, the researchers wondered if coating the implant with a known antibacterial agent might reduce the chances of infection after bone surgery. To find out, they broke the tibias of test [rats](#) and then repaired them using standard bone implant techniques; in the experiment, half of the implants were first coated with a *L. casei* biofilm.

The team then waited four weeks to see how the rats fared. They found that the rats that had received the coated implants had higher rates of bone growth than did those that had received uncoated implants (27% versus 16%). They then repeated the experiment but added a second coating of MRSA bacteria to the implants. They found that the *L. casei*

biofilm prevented 99.9 percent of infections.

The researchers suggest that use of *L. casei* biofilms for bone implants might be feasible as a way to improve results in [bone](#) fracture repair surgeries.

**More information:** Tan et al., Engineered probiotics biofilm enhances osseointegration via immunoregulation and anti-infection. *Science Advances* (2020). [advances.sciencemag.org/lookup...  
.1126/sciadv.aba5723](https://advances.sciencemag.org/lookup?...1126/sciadv.aba5723)

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