

An ultra-thin, layered patch carrying a concentrated dose of silver nanoparticles has proven highly effective in healing wounds while not damaging important cells.

Silver is commonly used to prevent bacterial contamination in traditional wound dressings, but it can damage fibroblasts—cells needed for healing.

Now Ankit Agawal, a researcher in the Department of Chemical and Biological Engineering at UW-Madison, has developed a way to deliver low doses of silver in a small concentrated area, avoiding fibroblast damage.

Wound healing is a particular problem in diabetes, where poor blood supply that inhibits healing can require amputations, and also on burn wards. Agarwal says some burn surgeons avoid silver dressings despite their constant concern with infection.

In lab tests, patches soaked with 100 times less silver than conventional silver dressings killed nearly 100 percent of the bacteria but did not damage the fibroblasts needed to repair it.

Agarwal can precisely control the thickness, porosity and silver content of the patch, a “sandwich” of microscopically thin polymer films that stick together through electrical attraction.