Polypropylene mesh is commonly utilized as a patch for hernia repairs and for pelvic slings. Unfortunately, even with modern healthcare infections still occur and the mesh has to be removed from the patient's body. Gold nanoparticles have been used for many applications in the biomedical field including antimicrobial uses. In this study gold nanoparticles were attached to polypropylene hernia mesh in an attempt to increase the biocompatibility of the mesh.

The polypropylene mesh was chemically modified and cross-linked with gold particles. The mesh was then analyzed to determine if the modifications were successful. Cells were incubated with pristine mesh and modified mesh to determine if cells were more viable on one than the other. The last test done was a bacterial study to see if gold nanoparticles could inhibit bacterial adhesion to the mesh. The results from the study showed that the modified mesh was successfully functionalized and its physical properties were not significantly different from the pristine mesh. The cellularity studies showed that the modified mesh was just as good as the pristine mesh and in some cases better. The bacterial studies showed that bacteria adhered less to the modified mesh than to the pristine mesh.

These results mean that gold nanoparticles attached to polypropylene hernia mesh may be able to reduce the rate of infection in mesh implantation surgeries. It also means that gold nanoparticles may have wider uses for antimicrobial applications in the area of biomedical materials.