

# Effectiveness of antibacterial copper additives in silicone implants.

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## Source

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## Abstract

*Staphylococcus epidermidis* plays a major role in capsular contractures of silicone breast implants. This in vitro study evaluates the antibacterial effect of copper on *S. epidermidis* in silicone implants. Specimens of a silicone material used for breast augmentation (Cu0) and specimens coated with different copper concentrations (Cu1, Cu2) were artificially aged. Surface roughness and surface free energy were assessed. The specimens were incubated in an *S. epidermidis* suspension. We assessed the quantification and the viability of adhering bacteria by live/dead cell labeling with fluorescence microscopy. Additionally, inhibition of bacterial growth was evaluated by agar diffusion, broth culture, and quantitative culture of surface bacteria. No significant differences in surface roughness and surface free energy were found between Cu0, Cu1 and Cu2. Aging did not change surface characteristics and the extent of bacterial adhesion. Fluorescence microscopy showed that the quantity of bacteria on Cu0 was significantly higher than that on Cu1 and Cu2. The ratio of dead to total adhering bacteria was significantly lower on Cu0 than on Cu1 and Cu2, and tended to be higher for Cu2 than for Cu1. Quantitative culture showed equal trends. Copper additives seem to have anti-adherence and bactericidal effects on *S. epidermidis* in vitro.