



## Surface Modification of Copper-Based Alloys in Antimicrobial Application

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### ABSTRACT

Copper and its alloys have exhibited very beneficial properties as regard to the contact killing of bacteria [1],[2]. In course of this research, surfaces of various copper-based alloys will be modified with ultrashort pulsed (USP) laser systems to understand its influence on the antimicrobial properties. Direct laser interference patterning (DLIP) is the method used in this study to produce periodic line structures on the sample surface. The periodicity chosen here is according to the dimension of the bacteria, that will be tested later (see Fig.1). The influence of alloying on topography of the sample will be investigated and analyzed. The effect of surface modification on the antibacterial and wetting properties of the samples will be tested. A series of wettability and contact killing tests is performed to determine the correlation between the structures produced via USP-DLIP and the antibacterial as well as the wetting properties. The obtained results will also be beneficial for understanding the effect of alloying on the antibacterial efficiency.

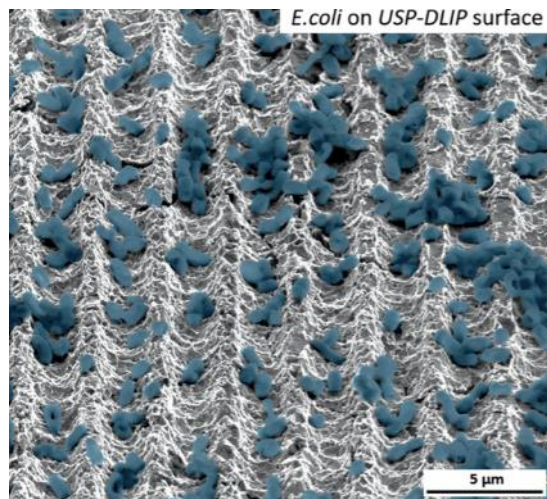


Figure 1: E.Coli on USP-DLIP copper surface [1]

[1] D.W. Müller, S. Löblein, E. Terriac, K. Brix, K. Siems, R. Moeller, R. Kautenburger, F. Mücklich... - Advanced Materials , 2021

[2] S Mehtar; I Wiid; SD Todorov , The antimicrobial activity of copper and copper alloys against nosocomial pathogens and Mycobacterium tuberculosis isolated from healthcare facilities in the Western Cape: an in-vitro study- Journal of Hospital Infection, 2008-136