

Announcement: Bachelor/Master Thesis

„Formation of Bacterial Resistance against Copper, when exposed to Copper Alloys Surfaces“

Aside of silver, copper and its alloys possess the inherent capability of killing bacteria, whenever they get in contact to the metallic surface. When exposed to copper surfaces, the bacteria get fully killed after a certain amount of time. The killing capacity of copper alloys and hence the amount of time needed for full killing is influenced by their copper content as well as surface topography. In case the exposition stops before all bacteria are killed, single bacteria, which are able to bear the copper stress better than their fellows, survive and pass their copper resistance to the next generation. Over time of serial copper exposition, this might lead to a significant enhancement of copper resistance in this particular strand of bacteria.

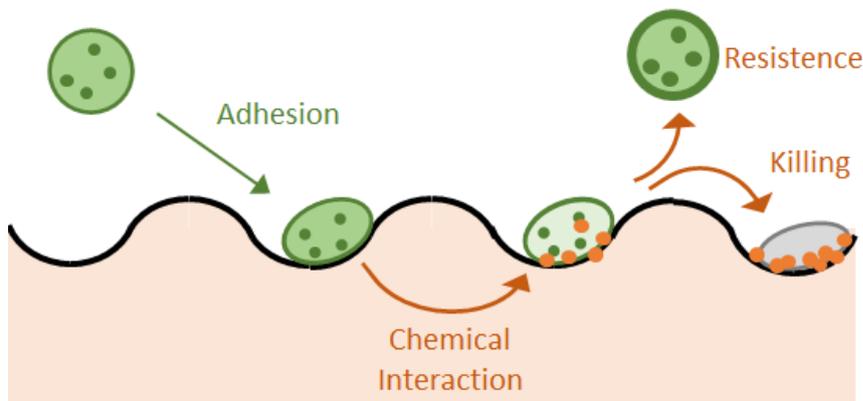


Fig.1: schematic drawing of possible bacteria interactions on a copper surface leading to either death or enhanced copper resistance.

In this work, the influence of specific topographies and the composition of copper alloys on the formation of copper resistance after short-time exposition in a non-pathogenic bacteria strand will be investigated. The work involves:

- Modification of a given laser setup to produce defined surface pattern, as well as preparation of samples by USP-DLIP.
- Characterisation of surface topography and chemistry including e.g. LSM, SEM/FIB, XRD.
- Serial short-time antibacterial testing using a defined strand of non-pathogenic bacteria.
- Analysis of the bacterial vitality and copper resistance using e.g. MIC-Screenings

Prof. Dr.-Ing. Frank Mücklich
Leiter Institut für Funktionswerkstoffe
Materialwissenschaft und Werkstofftechnik

Direktor MECS
Material Engineering Center Saarland
Steinbeis-Forschungszentrum
www.mec-s.de

Chairman EUSMAT
European School of Materials
www.eusmat.eu

Betreuer/Ansprechpartner:
Daniel Müller
Universität des Saarlandes
Campus, Geb. D3 3, Raum 2.08
66123 Saarbrücken

Tel.: +49 681 302-70545
Fax: +49 681 302-70502
Mail: daniel.mueller@uni-saarland.de

Start: as soon as possible

Duration: 4-6 months

Contact:

daniel.mueller@uni-saarland.de
or +49 681 302-70545