



Università degli Studi di Firenze



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Phenotype MicroArray Analysis of  
Microorganisms  
The Environment, Agriculture, and Human Health

**Biocide resistance associated phenotypes: a hot topic in the view of the claimed interconnection of biocide and antibiotic co- and cross-resistance**

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Biocides have been in use for hundreds of years for antiseptis, disinfection and preservation. Despite this widespread and ever increasing use most bacterial and fungal species remain susceptible to biocides. The dramatic increase and spread of resistance to antibiotics linked to reports of co- and cross-resistance between antibiotics and biocides raised speculations on potential hazard of biocide use. The overarching question which BIOHYPO is aimed to address is: has the use of biocides contributed to the development and spread of clinically significant antibiotic resistance in human pathogens? A screening of over thousand clinical *Staphylococcus aureus* isolates has been conducted for susceptibility to chlorhexidine, benzalkonium chloride, trichlosan and hypochloride. In parallel in vitro isolation of mutants with decreased susceptibility to these compounds was performed. Preliminary data of isogenic strain pairs, analyzed by standard antimicrobial susceptibility testing and phenotype microarray indicate no evidence for cross-resistance between biocides and antibiotics in *S. aureus*. Identification and tracking of defined phenotypes and molecular markers will provide a statistically significant dataset to evaluate if the hazard of co- and cross-resistance can be considered a risk for increase of clinical relevant antibiotic resistance.

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