

PS-007. Antibiotic resistance by biocide exposure

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Antibiotic resistance is one of the great global challenges in modern medicine. Antibiotic resistance can occur as a result of resistance mutations or via horizontal gene transfer. Biocides are crucial to successful infection control and widely used in hospitals, on farms, in industry and in the home for the control of microorganisms. Exposure of bacteria to biocides can select for mutants with decreased biocide susceptibility and these mutants often display a decrease in susceptibility to various antibiotics, indicating that biocides can act as drivers of antibiotic resistance under laboratory conditions. Many common biocides are not detectable in the environment and some, such as triclosan, have been found in human urine, serum and breast milk. The accumulation of biocides in the environment also represents a potentially prolonged and low-level stress that causes decreased biocide susceptibility, which could be cross-resistant to antibiotics. Mark A. Webber et al found *Salmonella enterica* serovar typhimurium mutants highly resistant to both quinolone antibiotics and the biocide triclosan. Rebecca Wesgate et al showed that exposure to triclosan (0.0004%) was associated with a high risk of developing resistance and cross-resistance in *Staphylococcus aureus* and *Escherichia coli*. Lu Lv et al The emerging halogenated nitrogenous disinfection products could raise antibiotic resistance, even multidrug resistance, in *P. aeruginosa* PAO1 via mutagenesis, which was demonstrated by mutation detection. C. soumet et al investigated adaptive responses of bacterial strains by exposing the strains daily to increasing sub-inhibitory concentrations of DDAC (didecyl dimethyl ammonium chloride) for 7 days. Following adaptation to DDAC, reduced susceptibility was found in *Escherichia coli*, *Listeria monocytogenes* and *Salmonella* strains to BC (benzalkonium chloride) and a commercial biocide formulation (Galox Horizon) containing DDAC and glutaraldehyde.

Keywords: antibiotic resistance, biocide, cross-resistance