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**Amide Side Chain Amphiphilic Polymers Disrupt Surface Established Bacterial Bio-films and Protect Mice from Chronic *Acinetobacter baumannii* Infection**

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Running Title: Biofilm Disrupting Amphiphilic Antibacterial Polymers

## Abstract

Bacterial biofilms represent the root-cause of chronic or persistent infections in humans. Gram-negative bacterial infections due to nosocomial and opportunistic pathogens such as *Acinetobacter baumannii* are more difficult to treat because of their inherent and rapidly acquiring resistance to antibiotics. Due to biofilm formation, *A. baumannii* has been noted for its apparent ability to survive on artificial surfaces for an extended period of time, therefore allowing it to persist in the hospital environment. Here we report, maleic anhydride based novel cationic polymers appended with amide side chains that disrupt surface established multi-drug resistant *A. baumannii* biofilms. More importantly, these polymers significantly ($p < 0.0001$) decrease the bacterial burden in mice with chronic *A. baumannii* burn wound infection. The polymers also show potent antibacterial efficacy against methicillin resistant *Staphylococcus aureus* (MRSA), vancomycin resistant *Enterococci* (VRE) and multi-drug resistant clinical isolates of *A. baumannii* with minimal toxicity to mammalian cells. We observe that optimal