## **Accepted Manuscript**

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

Divakara S.S.M. Uppu, Sandip Samaddar, Chandradhish Ghosh, Krishnamoorthy Paramanandam, Bibek R. Shome, Jayanta Haldar

PII: S0142-9612(15)00793-0

DOI: 10.1016/j.biomaterials.2015.09.042

Reference: JBMT 17092

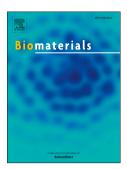
To appear in: Biomaterials

Received Date: 14 August 2015

Revised Date: 24 September 2015 Accepted Date: 26 September 2015

Please cite this article as: Uppu DSSM, Samaddar S, Ghosh C, Paramanandam K, Shome BR, Haldar J, Amide Side Chain Amphiphilic Polymers Disrupt Surface Established Bacterial Bio-films and Protect Mice from Chronic *Acinetobacter baumannii* Infection, *Biomaterials* (2015), doi: 10.1016/j.biomaterials.2015.09.042.

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#### ACCEPTED MANUSCRIPT

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

Divakara S S M Uppu<sup>a</sup>, Sandip Samaddar<sup>a</sup>, Chandradhish Ghosh<sup>a</sup>, Krishnamoorthy Paramanandam<sup>b</sup>, Bibek R. Shome<sup>b</sup> and Jayanta Haldar<sup>a</sup>,\*

<sup>a</sup>Chemical Biology & Medicinal Chemistry Laboratory, New Chemistry Unit, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Jakkur, Bangalore 560064.

<sup>b</sup>ICAR-National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI), Ramagondanahalli, Yelahanka, Bengaluru 560064, India.

\*Corresponding author. E-mail: <u>jayanta@jncasr.ac.in</u>; Fax: +91-80-2208-2627; Telephone: +91-80-2208-2565.

Keywords: Anti-infective biomaterials, biofilm disruption, membrane-active amphiphilic polymer, In-vivo burn wound infection, Acinetobacter baumannii, bacterial resistance

Running Title: Biofilm Disrupting Amphiphilic Antibacterial Polymers

#### **Abstract**

Bacterial biofilms represent the root-cause of chronic or persistent infections in humans. Gramnegative 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

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