

Scientists develop new agents to battle MRSA

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Experts from Queen's University Belfast have developed new agents to fight MRSA and other hospital-acquired infections that are resistant to antibiotics. The fluids are a class of ionic liquids that not only kill colonies of these dangerous microbes, they also prevent their growth.

The development of these new antimicrobial agents was carried out by a team of eight researchers from the Queen's University Ionic Liquid Laboratories (QUILL) Research Centre. The team was led by Brendan Gilmore, Lecturer in Pharmaceutics at the School of Pharmacy, and Martyn Earle, Assistant Director of QUILL. The discovery is published in the scientific journal [Green Chemistry](#).

Many types of bacteria, such as MRSA, exist in colonies that adhere to the surfaces of materials. The colonies often form coatings, known as biofilms, which protect them from antiseptics, disinfectants, and antibiotics.

Earle said: "We have shown that when pitted against the [ionic liquids](#) we developed and tested, biofilms offer little or no protection to MRSA, or to seven other [infectious microorganisms](#)."

[Ionic liquids](#), just like the table salt sprinkled on food, are salts. They consist entirely of ions - electrically-charged atoms or groups of atoms. Unlike table salt, however, which has to be heated to over 800o C to become a liquid, the ionic liquid antibiofilm agents remain liquid at the ambient temperatures found in hospitals.

One of the attractions of ionic liquids is the opportunity to tailor their physical, chemical, and biological properties by building specific features into the chemical structures of the positively-charged ions (the cations), and/or the negatively-charged ions (the anions).

Earle said: "Our goal is to design ionic liquids with the lowest possible toxicity to humans while wiping out [colonies of bacteria](#) that cause hospital acquired infections."

Microbial biofilms are not only problematic in hospitals, but can also grow inside water pipes and cause pipe blockages in industrial processes.

Gilmore said: "Ionic liquid based antibiofilm agents could potentially be used for a multitude of medical and industrial applications. For example, they could be used to improve infection control and reduce patient morbidity in hospitals and therefore lighten the financial burden to healthcare providers. They could also be harnessed to improve industrial productivity by reducing biofouling and microbial-induced corrosion of processing systems."

Source: Queen's University Belfast

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