

## Disinfectants may promote growth of superbugs

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Using disinfectants could cause bacteria to become resistant to antibiotics as well as the disinfectant itself, according to research published in the January issue of *Microbiology*. The findings could have important implications for how the spread of infection is managed in hospital settings.

Researchers from the National University of Ireland in Galway found that by adding increasing amounts of <u>disinfectant</u> to laboratory cultures of Pseudomonas aeruginosa, the <u>bacteria</u> could adapt to survive not only the <u>disinfectant</u> but also ciprofloxacin - a commonly-prescribed antibiotic - even without being exposed to it. The researchers showed that the bacteria had adapted to more efficiently pump out <u>antimicrobial</u> <u>agents</u> (disinfectant and antibiotic) from the bacterial cell. The adapted bacteria also had a mutation in their DNA that allowed them to resist ciprofloxacin-type antibiotics specifically.

P. aeruginosa is an opportunistic bacterium that can cause a wide range of infections in people with weak immune systems and those with diseases such as cystic fibrosis (CF) and diabetes. P. aeruginosa is an important cause of hospital-acquired infections. Disinfectants are used to kill bacteria on surfaces to prevent their spread. If the bacteria manage to survive and go on to infect patients, antibiotics are used to treat them. Bacteria that can resist both these control points may be a serious threat to hospital patients.

Importantly, the study showed that when very small non-lethal amounts



of disinfectant were added to the bacteria in culture, the adapted bacteria were more likely to survive compared to the non-adapted bacteria. Dr. Gerard Fleming, who led the study, said, "In principle this means that residue from incorrectly diluted disinfectants left on hospital surfaces could promote the growth of antibiotic-resistant bacteria. What is more worrying is that bacteria seem to be able to adapt to resist <u>antibiotics</u> without even being exposed to them."

Dr. Fleming also stressed the importance of studying the environmental factors that might promote antibiotic resistance. "We need to investigate the effects of using more than one type of disinfectant on promoting antibiotic-resistant strains. This will increase the effectiveness of both our first and second lines of defence against hospital-acquired infections," he said.

Provided by Society for General Microbiology

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