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Superbug discovery renews hope for antibiotic treatment

Bacteria that were thought to be resistant to a powerful antibiotic may be susceptible to treatment after all, research has found.

The food-poisoning bug *Listeria* was shown to respond to an antibiotic even though the bacteria carry genes that should make it highly resistant.

Scientists say the antibiotic – called fosfomycin – should be reconsidered as a treatment for life-threatening *Listeria* infections.

Early lab tests had indicated that fosfomycin fails to kill *Listeria* because the bacteria carry a gene that enables it to break down the drug.

Further studies, however, found that the drug was effective at killing *Listeria* in infected cells in the lab and in mice.

Genes that are only activated when the bacteria infect the body cancel out the effects of the drug-destroying gene, researchers at the University of Edinburgh found.

The findings suggest fosfomycin could prove to be a useful treatment for life-threatening *Listeria* cases despite these bacteria testing resistant based on laboratory tests, the researchers say.

Listeria infection – also known as listeriosis – is the most lethal food-borne disease known and is often fatal. It is caused by eating contaminated foods such as soft cheeses, smoked salmon, pates, meats and salads.

The infection is particularly deadly for those with weak immune systems, such as older people and newborns. It can also cause miscarriage.

These bacteria reproduce within the cells of the body and frequently affect the brain, which only certain medicines are able to treat. This limits the treatment options for serious infections, and so fosfomycin may prove highly beneficial.

The study, published in the journal *PLOS Genetics*, was funded by Wellcome.

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Professor Jose Vazquez-Boland, who led the research at the University of Edinburgh's Division of Infection Medicine, said: "Our study focused on *Listeria*, but this important discovery may be relevant for other species of bacteria too. It is encouraging that we may be able to repurpose existing drugs in the race against antibiotic resistance."

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Reference:

M.Scortti et al. Epistatic control of intrinsic resistance by virulence genes in *Listeria*. Plos Genetics 2018.

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