THE UNIVERSITY of EDINBURGH

News Release

Issued: Monday 10 March 2014

FOR IMMEDIATE RELEASE

Interpreting bacteria's complex language could aid infection fight

Efforts to combat bacteria's growing resistance to antibiotics could be helped by a key discovery about the complex processes that enable bugs to thrive.

A new study reveals that bacteria talk to one another using a form of communication that shows striking similarities with human language, but uses chemical signals instead of words.

New insights into the intricacies of bacterial communication could inform efforts to design new drugs that fight infections without increasing the bugs' resistance to treatments.

The number of dangerous bacteria becoming resistant to antibiotics is growing, and scientists say this poses a serious threat to human health and wellbeing. Without effective drugs, infections that are currently manageable could become life-threatening.

A study led by scientists at the University of Edinburgh helps to explain how bacteria cooperate with each other by sending multiple chemical signals.

Researchers say that bacteria recognise their physical and social environment by producing and responding to chemical compounds which act as messages. The team found that bacteria responded differently to a combination of two messages than they did to either by itself.

Until recently, only humans and other primates were known to engage in this form of dialogue – known as combinatorial communication – in which signals can have different meanings depending on their context.

Researchers say that most remedies for infections simply block all talk between bacteria, but these can drastically alter bugs' gene expression, which aid the survival of resistant strains.

This study suggests that more subtle interventions, which only block specific signals that can harm people, may be equally effective at treating infections without leading to resistance.

The study, published in the journal *Proceedings of the National Academy of Sciences*, involved collaboration with the University of Nottingham and Durham University. Funding for the work was provided by the Wellcome Trust, the Engineering and Physical Sciences Research Council, the Natural Environmental Research Council and the Royal Society.

Dr Sam Brown, of the University of Edinburgh's School of Biological Sciences, who led the study, said: "We're only beginning to scratch the surface of the complexity of bacterial social life, and its consequences for disease. Decoding their language is an important step towards placing our own communication in a broader biological context, as well as opening a new front in the search for mechanisms to control infections. "

For further information, please contact:
Dr Sam Brown, School of Biological Sciences, tel 07846 615208; Sam.Brown@ed.ac.uk
Corin Campbell, Press & PR Office, tel 0131 650 2246; Corin.Campbell@ed.ac.uk