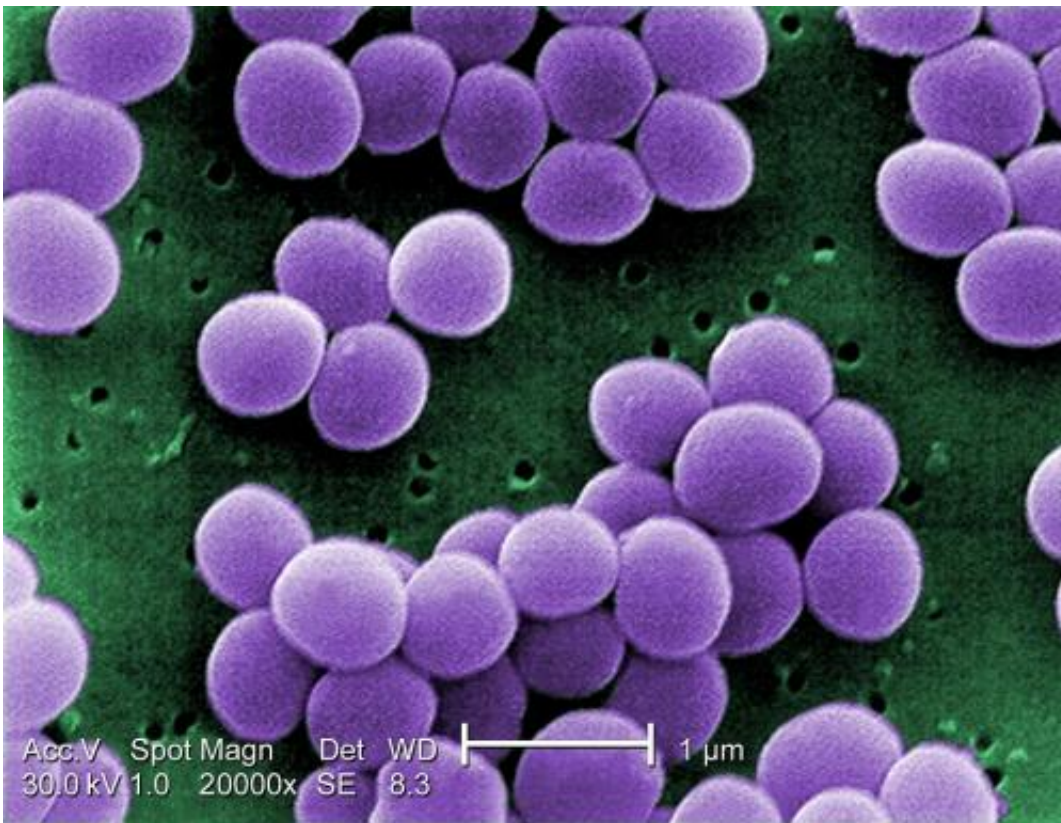


Bacteria jump between species more easily than previously thought

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Scanning electron micrograph of *S. aureus*; false color added. Credit: CDC

A new study suggests that bacteria may be able to jump between host species far easier than was previously thought. Researchers discovered that a single genetic mutation in a strain of bacteria infectious to humans enables it jump species to also become infectious to rabbits.

The discovery has major implications for how we assess the risk of [bacterial diseases](#) that can pass between humans and animals.

It is well known that relatively few mutations are required to support the transmission of viruses – such as influenza – from one species to another. Until now it was thought that the process was likely to be far more complicated for [bacteria](#).

Scientists at the universities of Glasgow and Edinburgh studied a [strain of bacteria](#) called *Staphylococcus aureus* ST121, which is responsible for widespread epidemics of disease in the global [rabbit](#) farming industry.

The team looked at the genetic make-up of ST121 to work out where the strain originated and the changes that occurred that enabled it to infect rabbits. They found that ST121 most likely evolved through a host jump from humans to rabbits around 40 years ago with a genetic mutation at a single site in the bacterial DNA code the cause for this.

The discovery transforms our understanding of the minimal genetic changes that are required for bacteria to infect different species.

ST121 is found in the respiratory tract and on the skin of some people. While it is usually harmless, the bacteria can cause a variety of conditions from minor skin infections to meningitis and sepsis. In rabbits, the bacteria can cause serious skin infections.

Professor Jose Penades, of the Institute of Infection, Immunity and Inflammation at the University of Glasgow, who co-led the study, said: "The ability for pathogens to switch [host-species](#) and lead to an epidemic in a new host population is of major concern to veterinary and public health professionals. Our results represent a paradigm shift in understanding of the minimal adaptations required for a bacterium to overcome species barriers and establish in new host populations."

Professor Ross Fitzgerald, from the University of Edinburgh's Roslin Institute, who co-led the study, said: "Domestication of animals, industrialisation of agriculture and globalisation have provided new opportunities for the transmission of bacteria between humans and animals. This latest research has important public and veterinary health implications which will require a re-examination of the future threat posed by bacterial host switching events."

Provided by University of Glasgow

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