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Study shows family bonds relatively strong between bacteria

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Family ties appear to be strong even the among the most primitive life forms.

Research by University of Edinburgh biologists shows that when the going gets tough, bacteria are just as likely as insects, birds and mammals to help near relatives. The study shows surprisingly high levels of cooperation between closely-related parasites as they scramble to find limited food supplies in host organisms. The findings, published in Nature journal this week, could help scientists to tackle some strains of bacterial infection more effectively in future.

Cooperation within certain animal species has been well documented. If individuals share a high proportion of genes with their relatives, they can maximise their genetic contribution to the next generation by helping their kin. But the new study is a clear indication that micro-organisms interact 'socially' too. It shows how pseudomonas - the disease-producing bacteria that infect cystic fibrosis patients - work together to ensure the survival of their closest kin.

The research shows how pseudomonas cooperate by scavenging for vital iron supplies - resources that are limited because the human body actively withholds iron to limit the growth of bacterial infection. The study suggests that cooperation between these related parasites (a process also known as kin selection) has evolved so that host defences can be overcome. It states that this ability to scavenge iron is a key determinant of growth and virulence (damage) in bacterial infections of humans and other animals. The researchers also suggest that if cooperation between pathogens could be reduced, infection would be less likely to spread.

Dr Stuart West, of the University of Edinburgh's School of Biological Sciences, said: "Explaining cooperation is one of the most controversial areas in evolutionary biology. We have shown that the reasons for cooperation in pathogenic bacteria can be remarkably similar to those in more complex social societies such as ants, bees, birds or mammals. Specifically, that cooperation is favoured when you can direct it towards relatives."

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