

Some cheaters can keep it in their genes

March 13 2008

A new study examining social behaviour suggests certain individuals are genetically programmed to cheat and often will do... providing they can get away with it.

The researchers looked at slime moulds – microscopic single-cell organisms or amoebae that are forced to cooperate with one another when food is in short supply. Studying slime moulds at the cellular level provides the scientists with a unique insight into the genes that may also influence human behaviour.

The international team, including biologists from The University of Manchester, found that some amoebae have the ability to use cheating tactics to give them a better chance of survival. The research – published in the journal *Nature* – not only demonstrates that cheating is a natural phenomenon governed by our genes but that it may be widespread among social creatures.

“Slime mould amoebae feed off bacteria in the soil but when food becomes scarce they aggregate to form a fruiting body of some 100,000 cells,” explained Dr Chris Thompson, in Manchester’s Faculty of Life Sciences.

“Some cells become the spore, while about one-quarter form a stalk. The stalk cells die – they appear to sacrifice themselves to allow the spore cells to be dispersed on the wind to new feeding grounds.”

The team’s earlier work had focused on this remarkable level of

cooperation in the hope of gaining an insight into why some cells demonstrated such altruistic behaviour. They concluded that the selfless acts were due to the unacceptable cost of non-cooperation – without a stalk, no amoebae would escape to new feeding grounds and all would perish.

But this latest research has uncovered a dark and complex subplot where some cells cheat the system to give themselves a better chance of survival. And this deadly game must constantly evolve as cells find new and better ways of cheating in what is effectively an evolutionary arms race.

“Social behaviour is an unresolved problem in biology – why would anyone be altruistic and give up something for someone else?” said Dr Thompson. “Our findings suggest that there is no single answer able to explain our observations but that a number of factors are at play.

“An analogy can be drawn from people in a sinking boat. If some people cheat by refusing to bail out water they benefit by conserving energy and will last longer as a result. But if not enough people bail water, or those that do become too exhausted, then everyone, including the cheaters, will drown.

“Interestingly, we noted that cheats only cheated in the presence of non-cheaters – when they could get away with not ‘bailing water’. When surrounded by other cheaters, they contribute to the group effort again, ‘aware’ that if no one does, all of them will die.”

Source: University of Manchester

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