

Cheating slime mold gets the upper hand

January 8 2013



A [?cheater?? mutation (chtB) in *Dictyostelium discoideum*, a free living slime mould able to co-operate as social organism when food is scarce, allows the cheater strain to exploit its social partner, finds a new study published today in BioMed Central?s open access journal *BMC Evolutionary Biology*. Credit: Lorenzo A Santorelli, Adam Kuspa, Gad Shaulsky, David C Queller and Joan E Strassmann

A 'cheater' mutation (chtB) in *Dictyostelium discoideum*, a free living slime mould able to co-operate as social organism when food is scarce, allows the cheater strain to exploit its social partner, finds a new study published in BioMed Central's open access journal *BMC Evolutionary Biology*. The mutation ensures that when mixed with 'normal' *Dictyostelium* more than the fair share of cheaters become spores, dispersing to a new environment, and avoiding dying as stalk cells.

Dictyostelium have an unusual life style. They generally live as individual



amoeboid cells, eating bacteria in <u>leaf litter</u> and soil. However when they run out of food they form a multi-cellular 'slug' capable of travelling to a new environment. However if conditions are right they behave more like a fungus, producing a stalk and a fruiting body which releases spores. During this co-operative behaviour approximately 20% become stalk cells which are doomed to starvation but, after dispersal, the spores germinate into new <u>amoeba</u>.

The chtB strain is able to reduce the ability of normal *Dictyostelium* to form spores so that when mixed in equal numbers with wild type *Dictyostelium* 60% of the spores will be chtB. The chtB mutation appeared to be normal in all other respects and the mutation had no 'fitness cost' which might impede its behaviour or lifespan. In fact the mutation allowed chtB to divide faster in liquid medium.



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Dr Lorenzo Santorelli from the University of Oxford who led this study, conducted at Baylor College of Medicine in the Shaulsky lab explained, "chtB cells inhibit the pre-spore gene cotB in their wild type partner. This appears to force the wild type *Dictyostelium* to become cells at the base of the stalk rather than stalk cells or <u>spores</u>. Cheaters are essentially parasites, but we could not find the expected fitness cost which usually prevents such cheaters from taking over."

More information: A new social gene in Dictyostelium discoideum, chtB Lorenzo A Santorelli, Adam Kuspa, Gad Shaulsky, David C Queller and Joan E Strassmann, *BMC Evolutionary Biology* (in press)

Provided by BioMed Central

Citation: Cheating slime mold gets the upper hand (2013, January 8) retrieved 27 April 2024 from <u>https://phys.org/news/2013-01-slime-mold-upper.html</u>

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