

What gives us sunburn protects crayfish against bacteria

September 24 2007

The production of melanin gives us sunburns, but it also helps invertebrate animals to encapsulate attacking fungi and parasites. Uppsala University researchers, in collaboration with Korean and Thai colleagues, can now show that melanin also protects against bacterial infections, at least in crayfish. The study is published in the latest Net edition of *Journal of Biological Chemistry*.

The production of melanin is an important protective reaction that gives us a sunburn, for instance. In invertebrate animals it has long been observed that parasites, fungi, and other invaders become encapsulated in melanin. In many animals this can be seen as black-brown spots on the shell that show that the animal has had an infection.

"In mosquitoes that can harbor the malaria parasite it has also been observed that the mosquito's ability to form such melanin capsules often determines whether it will be able to spread the disease to humans," says Haipeng Liu.

On the other hand, the possible effect of melanin production on bacterial infections has been intensively debated. In the current study the scientists show, by manipulating the genetic expression of the melanin-producing enzyme, that effective melanin production is crucial to the ability of freshwater crayfish to survive an infection of an extremely dangerous bacteria for them, *Aeromonas hydrophila*.

"The findings indicate that we should upgrade the significance of the

melanin reaction and that it may be worthwhile to search for further cases where it prevents bacterial growth," says Haipeng Liu.

Source: Uppsala University

Citation: What gives us sunburn protects crayfish against bacteria (2007, September 24) retrieved 19 April 2024 from <https://phys.org/news/2007-09-sunburn-crayfish-bacteria.html>

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