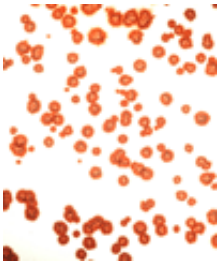


Scientists turn the tables on infectious bacteria

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A Newcastle University research team has made a significant advance in the ongoing fight against bacterial infections - by turning the infectious microbe's own weapon against itself.

When under threat, bacteria armour themselves in a slimy protective barrier. This slimy layer - known as biofilm - protects the bacteria from all the known anti-bacterials such as bleach, boiling water or [antibiotics](#).

Now Newcastle University's Prof Grant Burgess, Dr Reindert Nijland and Dr Michael Hall have shown for the first time that not only do these tiny microbes cover themselves in a slimy biofilm "armour" but they can also remove their biofilm once it is no longer needed.

Using DNA as a “kind of reversible glue”, the bacteria protect themselves from danger by producing a web of DNA which holds their

biofilm together, shielding the microbes from harm.

Once the coast is clear, they release an "anti-glue" – an enzyme – which chops up the DNA net, removes the biofilm and releases the bacteria.

Publishing their findings today in the academic journal PlosONE, the team said understanding how bacteria use enzymes to break down the biofilms is key to removing slime in the home, in industrial settings, and fighting bacterial infections.

Professor Grant Burgess, who led the study, explained: “When this glue is released, the long strands of DNA bind the cells together a bit like a spider’s web, creating a slimy biofilm layer which protects the bacteria against attack. But when the cells want to escape from that protection they release an “anti- glue” which chops up the DNA.

"It’s an amazing phenomenon. This is the first time we have seen the biofilm process in reverse and if we can harness this enzyme and use it to our advantage then it could prove a vital tool in our fight against infection.”

As part of this latest research the Newcastle team studied the marine bacterium *Bacillus licheniformis* and found that it releases nuclease enzymes to break down the biofilm. When the enzyme was purified and added to other biofilms it quickly dissolved the slime, exposing the bacterial cells and leaving them vulnerable.

Professor Burgess added: “If we can extract or develop this enzyme then we can turn the bacteria back on themselves for our own benefit.

“Scientists used this approach with penicillin when they took a microbial antibiotic and purified it for our own use to kill [bacteria](#) when and where we want to. These latest findings could be the first step towards

breaking down that previously impenetrable biofilm shield and getting rid of unwanted [microbes](#).”

Provided by Newcastle University

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