

How we can save more lives in the war against bacteria

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Ever since it was discovered that bacteria could be resistant to antibiotics we have looked at alternative methods for eradicating bacteria and treating infections. Recently we began to look at bacteriophages as a possible solution to this problem. Bacteriophages can be combined with traditional antibiotic treatments for treating infections and in the long term decreasing bacteria's resistance to antibiotics.

The war on bacteria (continues)

Antibiotics have been used for several decades, since their discovery they have been used to treat infections by killing off bacteria. Unfortunately, bacteria have become resistant to many types of antibiotics, leading researchers to look for alternatives. One of these alternatives are bacteriophages. Bacteriophages are viruses composed of proteins that infect bacteria and multiply by hijacking bacteria's own system to reproduce. The viruses continue multiplying within the bacterial host until the cell dies. Bacteriophages are specific to one or more species of bacteria and adapt in a similar way as bacteria to their environment, allowing the phages to become better at infecting bacteria. For many years' bacteriophages, have been considered as a possible future alternative to antibiotics.

Bacteria's two sworn enemies come together

There has been some success at showing that a combination of therapies including bacteriophages and antibiotics can be more successful at killing bacteria and slowing infections than just antibiotics alone. By using combination therapies to kill bacteria doctors increase the chances of treating patients and saving lives. Using traditional treatments with antibiotics in combination with bacteriophages can also influence antibiotic resistance. There is evidence indicating that it takes longer for bacteria to develop a resistance to antibiotics in situations where bacteriophages are combined with antibiotics to treat infections. The development of resistance is dependent on a variety of factors; for example, the type of antibiotics/bacteriophages used and the specific method used, not to mention which species of bacteria it is. An important factor seems to be when the antibiotics are added in respect to the bacteriophages. Adding them at the same time is not as effective as adding them individually and at different times. Bacteria can be resistant to both antibiotics and bacteriophages and because antibiotics and bacteriophages work differently, bacteria are required to alter their function to survive an attack on both fronts.

Because resistance develops in bacteria against antibiotics and bacteriophages, other alternatives to treating infections is needed in the long-term. Using combination therapy, we can in many cases slow the development of resistance and give researchers time to search for alternative forms of treatment. Both individuals and society stand to benefit from more research in this area as it should create more effective treatment and save money in the long term. We might not have to stop using antibiotics altogether; by combining and improving on the therapies we have we can prolong the life of antibiotics use for treating infections. By using bacteriophages today, we can save more lives tomorrow.

More information

Sörenby F. 2016. Hur kommer bakteriofager att påverka antibiotikaresistens. Självständigt arbete i biologi, Uppsala Universitet.

Fun Facts!

Bacteriophages: Viruses that infect and kill bacteria. Bacteriophages have been around for a very long time.

Bacteria: They have existed for billions of years. More of them than there is of us. Very small. Some are dangerous and can make us sick. Others are useful and in some cases necessary.