

## Launching vaccines

### *Future benefits of space exploration*

One of the most exciting areas of space research is vaccines. Bacteria often become more potent in microgravity – they spread more quickly and grow stronger, developing thicker membranes – and the stresses and strains of space travel take their toll on astronauts' immune systems. Space is a particularly good place to research how we combat these microbes.

Take *Salmonella* as an example. One of the most common causes of food poisoning, it is known to become more virulent in space. This is particularly concerning for future long-duration trips to Mars and beyond. But studies have already mapped out the entire gene expression response of the bacterium to the conditions of spaceflight. It is hoped that understanding this in more detail will help both astronauts and us on the ground. If a vaccine can be developed to combat this more virulent strain, it could be used to combat *Salmonella* on Earth too.

Similar studies are being conducted into an effective response to so-called superbug MRSA. Space can be an excellent place to study pathogens because they often behave in ways that they simply don't on Earth. These insights could be the key to unlocking the medicines of tomorrow.

### REFERENCES

[CNN: Super bacteria growing in space](#)

[NASA: Vaccine development](#)

### ABOUT THIS RESOURCE

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