Crystal clear

Making space for proteins

To understand how a particular protein functions, biologists look at it in its crystalline form and use X-ray crystallography to map out its molecular structure.

Creating these crystals for certain proteins can prove incredibly tricky on Earth – some, for example, are far too fragile. Under the conditions of microgravity in space, however, they can often form far more easily and then can be returned to Earth for X-ray analysis. It is hoped that by making protein crystals in space we can learn about a range of diseases back on Earth.

A good example is Huntington's disease, a hereditary condition that damages nerve cells in the brain. We all have a Huntington's gene, but there is a dominant variant allele that leads to disease. There is currently no cure, and researchers on Earth have been unable to synthesise the crystalline form of the huntingtin protein that causes the condition. In 2014, an experiment was taken to the International Space Station with the aim of producing those crystals. Bringing them back to the ground and studying them in the laboratory should lead to greater insights into the condition.

Crystalline structures are also a key part of drug design. By building larger and more perfect crystals in the less restricted environment of space, new combinations of crystals might lead to a wider range of medicines on the ground.

REFERENCES

Space.com: Huntington's disease and protein crystals

ABOUT THIS RESOURCE

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