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Scientists discover how wild mushroom cancer drug works

The drug was first isolated from a parasitic mushroom

Scientists have discovered how a promising cancer drug, first discovered in a wild mushroom, works.

The University of Nottingham team believe their work could help make the drug more effective, and useful for treating a wider range of cancers.

Cordycepin, commonly used in Chinese medicine, was originally extracted from a rare kind of parasitic mushroom that grows on caterpillars.

The study will appear in the Journal of Biological Chemistry.

The cordyceps mushroom has been studied by medical researchers for some time - the first scientific publication on cordycepin was in 1950.

However, although the drug showed great promise, it was quickly degraded in the body.

It can be given with another drug to combat this - but the second drug can produce side effects that limit its potential use.

As a result, researchers turned their interest to other potential candidate drugs, and exactly how cordycepin worked on the body's cells remained unclear.

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>
> Dr Cornelia de Moor

University of Nottingham

Researcher Dr Cornelia de Moor said: "Our discovery will open up the possibility of investigating the range of different cancers that could be treated with cordycepin.

"It will be possible to predict what types of cancers might be sensitive and what other cancer drugs it may effectively combine with.

"It could also lay the groundwork for the design of new cancer drugs that work on the same principle."

The researchers have also developed a method to test how effective the drug is in new preparations, and combinations with other drugs, which might solve the problem of degradation more satisfactorily.

Dr De Moor said: "This is a great advantage as it will allow us to rule out any non-runners before anyone considers testing them in animals."

The Nottingham team observed two effects on the cells - at a low dose cordycepin inhibits the uncontrolled growth and division of the cells, and at high doses it stops cells from sticking together, which also inhibits growth.

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> Professor Janet Allen
> Biotechnology and Biological Sciences
> Research Council

Both of these effects probably have the same underlying mechanism - that cordycepin interferes with how cells make proteins.

At low doses cordycepin interferes with the production of mRNA, the molecule that gives instructions on how to assemble a protein.

And at higher doses it has a direct impact on the making of proteins.

Professor Janet Allen is director of research at the Biotechnology and Biological Sciences Research Council, which funded the study.

She said: "This project shows that we can always return to asking questions about the fundamental biology of something in order to refine the solution or resolve unanswered questions.

"The knowledge generated by this research demonstrates the mechanisms of drug action and could have an impact on one of the most important challenges to health."