Cell discovery strengthens quest for cancer treatments

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Fresh insights into how our cells multiply could help scientists develop drugs to treat cancer.

Researchers have gained better understanding of the workings of two key proteins that control cell division. This process must be carried out accurately to keep cells healthy, and when it goes out of control, it can lead to cancer.

The study, led by the University of Edinburgh, could contribute to the development of new drugs that stop cancerous cells multiplying and so prevent the spread of the disease.

Such treatments – known as anti-mitotic drugs – would have the potential to limit the side-effects associated with some chemotherapy drugs, such as damage to healthy nerve cells. The development could also help optimise personalised chemotherapy treatments for individual cancer patients.

Scientists carried out a series of experiments to study how various proteins involved in the control of cell division interact with each other in cells. They used high-resolution microscopy to view the cells in 3D and determine the position of each of the proteins. Crucially, they were able to pinpoint how one key protein binds and triggers the activation of a further two key enzymes, each of which is involved with ensuring that cell division takes place correctly.

Both enzymes studied had previously been identified as targets for development of anti-cancer drugs. The latest discovery adds to scientists' understanding of how better drugs might be designed that stop the activity of both enzymes. The study, published in the *Public Library of Science Biology*, was supported by the Wellcome Trust.

Dr Mar Carmena of the University of Edinburgh's School of Biological Sciences, who took part in the study, said: "Cell division is a complex and tightly regulated process, and when it goes out of control this can lead to cancer. The greater our understanding of the proteins that control cell division, the better equipped scientists will be to design more effective treatments against cancer."

Provided by University of Edinburgh