'Detox protein' is collaborator in pancreatic and lung cancer development

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(Medical Xpress) -- UK scientists have revealed that a 'detox' protein which mops up harmful 'reactive oxygen' in cells could also trigger pancreatic and lung cancer development, according to a study published in *Nature*, today.

The team at Cancer Research UK's Cambridge Research Institute investigated how pancreatic and lung cancer cells detoxify damaging Reactive Oxygen Species (ROS) in mice. ROS are chemically-reactive molecules containing oxygen which can generate cancer-causing mistakes in DNA.

In healthy cells, the 'detox' protein Nrf2 steers a signalling pathway which disposes of this harmful reactive oxygen.

But the team discovered that in pancreatic and lung cancer cells, a faulty version of a gene called K-Ras sparked an unexpected upsurge in production of the antioxidant Nrf2. The findings unveil a new and surprising role for the Nrf2 protein as a 'companion protein' recruited by K-Ras to trigger cancer development.

And to confirm these results, the team discovered that blocking the Nrf2 signalling pathway, decreased the development of both pancreatic and lung tumours.

These results suggest Nrf2 may be an important target for new drugs to prevent the development of cancer.

Lead author, Dr Gina DeNicola, at Cancer Research UK's Cambridge Research Institute, said: "It seems counterintuitive that a key protein in the cell's detox program which mops up harmful oxygen, seems to also be a trigger for pancreatic and lung cancer development.

"But cancer is a complicated disease and this important knowledge will help us get to grips with the role of the double agent in question - a protein called Nrf2. By understanding exactly how it operates, we'll learn how we can block its role in causing cancer."

Dr Lesley Walker, director of cancer information at Cancer Research UK, said: "The more that we understand about fundamental cancer biology, such as the findings from this important research, the better equipped we are to beat the disease.

"Research like this has already created the foundations for the development of many current cancer drugs - helping to save many thousands of lives.

"And by discovering that a cell's detox system appears to be a double agent - also triggering cancer development in cells carrying a particular gene fault - we're one step closer to identifying new targets for potential drugs."

More information: Oncogene-induced Nrf2 transcription promotes ROS detoxification and tumorigenesis. DeNicola et al. *Nature*. doi:10.1038/nature10189

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