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The Univ Of She	versity ffield.	a Cent	tre				
Study at Sheffield	For Current Students	For Staff	Our Research	Departments & Services	Useful Links	News & Events	

You are here: Home / Departments / SRAM / Media Centre / News Releases 2009

Media Centre home	19 October 2009				
News Releases	New discovery aids development of cancer treatments				
Find an Expert	Scientists at the University of Sheffield have discovered an imaging agent which could be used to develop new treatments for cancer.				
Fast Facts	The research, published online on 18 October 2009 in the journal <u>Nature Chemistry</u>				
The University in the Media	has identified an imaging agent, which will enable scientists to understand the processes that occur within living cells and help develop new treatments for a range of diseases, including cancer				
Contact Us	The imaging agent has helped to easily identify four-stranded DNA structures within the nucleus of cells, known as quadruplexes. Researchers had suggested the existence of quadruplexes for some time, but until this breakthrough there had not been an easy way to detect them in living cells.				

Researchers are interested in quadruplex DNA for several reasons. Previous studies have suggested that certain cancer-causing genes may be switched on by a shift from a four-stranded structure to the more familiar two-strand double helix. Some researchers have even suggested that this may be a common mechanism for controlling many genes. Until now, scientists have hotly debated how often these quadruplexes occur in living cells.

This new imaging agent will allow researchers to see these structures in cells and investigate their frequency and their roles.

At present, luminescent stains can mark DNA and enable it to be viewed by fluorescent microscopy, but many of these imaging agents are highly toxic and subject to background interferences. This new agent is safer for the cells and acts as a structure-sensitive DNA probe which emits light at a different frequency when bound to four-stranded DNA structures, making them easily identifiable. It also acts as a unique imaging agent for electron microscopy allowing the researchers to study details of the cell nucleus with this technique too.

Dr Jim Thomas, from the University of Sheffield's <u>Department of Chemistry</u>, who led the study said: "For the first time the luminescent stain provides an easy method to follow DNA structural changes of this kind occurring within living cells. We hope our discovery can help further research into the development of pioneering treatments for a range of diseases."

Notes for Editors: The article was published online in the journal Nature Chemistry, on 18 October 2009.

Full Title: A Ruthenium(II) Polypyridyl Complex for Direct Imaging of DNA Structure in Living Cells

Authors: Martin R. Gill, Jorge Garcia-Lara, Simon J. Foster, Carl Smythe, GiuseppeBattaglia and Jim A. Thomas.

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