Scientists discover crucial trigger for tumour protein

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**Scientists have discovered an essential protein that controls inflammation induced by "tumour necrosis factor" (TNF) – an important part of the body’s defences against infection and a driver of cancer-associated inflammation, according to research published in**[**Nature**](http://www.nature.com/nature/journal/v471/n7340/full/nature09816.html)**today.**

The study – led by [Cancer Research UK](http://www.cancerresearchuk.org/)-funded scientists based at Imperial College London in close collaboration with scientists at[La Trobe University](http://www.latrobe.edu.au/) in Melbourne – may also shed light on the causes of certain autoimmune diseases, such as rheumatoid arthritis and psoriasis.

TNF plays a pivotal role in protecting the body against infection by bacteria, viruses and other pathogens.

It does this by directing the immune system to spot rogue pathogens and then destroy them.

As the name suggests, when TNF was first discovered scientists thought its main role in the body was to help kill cancer cells.

But later research showed that in many types of cancer TNF instead serves to promote cancer growth.

So rather than destroying cancer cells, it encourages them to grow and spread by triggering inflammation in the surrounding tissues.

Short-term inflammation is used by the body to increase blood flow to an injury or infection, helping it heal faster.

But scientists believe prolonged inflammation may be exploited by some cancers to help fuel the growth and spread of the disease.

The researchers discovered how a protein called ‘Sharpin’ prevents TNF from inducing inflammation, providing potential new insights into the link between inflammation and cancer.

Study leader [Professor Henning Walczak](http://www1.imperial.ac.uk/medicine/people/h.walczak/), from the [Department of Medicine](http://www1.imperial.ac.uk/departmentofmedicine/) at Imperial College London, said: “Together with our collaborators at La Trobe University in Melbourne, we discovered that the inflammatory skin problems triggered in mice lacking Sharpin could be completely resolved by switching off TNF.

This was a striking result, not least because TNF-controlled inflammation is central to a wide variety of different diseases from autoimmune diseases – like rheumatoid arthritis and psoriasis - to cancer.

“Understanding how inflammation is controlled in the body on a molecular level could one day open the door to completely new approaches for treating both cancer and autoimmune disease.”

Dr Lesley Walker, director of cancer information at Cancer Research UK, said: “This important discovery is the culmination of six years work and demonstrates how basic research into the fundamental mechanisms of inflammation may lead to exciting new insights into its links with cancer.

Although still at an early stage, we hope this will open up new avenues of research for developing treatments that target cancer-related inflammation in the future.”

**Notes to editors:**

1. Journal reference: Gerlach B. et al, Linear ubiquitination prevents inflammation and regulates immune signalling (2011), [Nature](http://www.nature.com/nature/journal/v471/n7340/full/nature09816.html).

2. Additional collaborators were from the University of Melbourne, German Cancer Research Centre (DKFZ) in Heidelberg and the Mediterranean Institute of Oncology in Viagrande, Italy. Research in the Walczak lab is supported by grants from Cancer Research UK, AICR, BBSRC, Ovarian Cancer Action and the EU Marie Cure Research Training Network ApopTRAIN.

3. About Imperial College London

Consistently rated amongst the world's best universities, Imperial College London is a science-based institution with a reputation for excellence in teaching and research that attracts 14,000 students and 6,000 staff of the highest international quality. Innovative research at the College explores the interface between science, medicine, engineering and business, delivering practical solutions that improve quality of life and the environment - underpinned by a dynamic enterprise culture.

Since its foundation in 1907, Imperial's contributions to society have included the discovery of penicillin, the development of holography and the foundations of fibre optics. This commitment to the application of research for the benefit of all continues today, with current focuses including interdisciplinary collaborations to improve global health, tackle climate change, develop sustainable sources of energy and address security challenges.

In 2007, Imperial College London and Imperial College Healthcare NHS Trust formed the UK's first Academic Health Science Centre. This unique partnership aims to improve the quality of life of patients and populations by taking new discoveries and translating them into new therapies as quickly as possible.

Website: [www.imperial.ac.uk](http://www.imperial.ac.uk/)

4. About Cancer Research UK

Cancer Research UK is the world’s leading cancer charity dedicated to saving lives through research.

* The charity’s groundbreaking work into the prevention, diagnosis and treatment of cancer has helped save millions of lives. This work is funded entirely by the public.
* Cancer Research UK has been at the heart of the progress that has already seen survival rates double in the last forty years.
* Cancer Research UK supports research into all aspects of cancer through the work of over 4,000 scientists, doctors and nurses.
* Together with its partners and supporters, Cancer Research UK's vision is to beat cancer.

For further information about Cancer Research UK's work or to find out how to support the charity, please call 020 7121 6699 or visit [www.cancerresearchuk.org](http://http/www.cancerresearchuk.org/)