Cells use allergic response to protect against cancer-causing damage

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(Medical Xpress) -- CANCER RESEARCH UK scientists have found that the body's surveillance for cancer causing damage and its response to allergies share a common pathway, according to research published in *Science*.

The cells that line the body's surfaces, known as epithelial cells, are exposed to potentially cancer causing damage every day, such as the effects of UV light and tobacco smoke.

Looking at the effect this can have on mouse skin cells, the researchers at King's College London and Cancer Research UK's London Research Institute found damaged cells display a stress molecule that activates neighbouring immune cells to destroy them.

But, unexpectedly, the scientists also found that this activates another response that involves the body's whole immune system, similar to the allergic response the body uses to mop up allergens such as pollen.

The stress molecules also trigger a separate part of the body's defence system to produce large amounts of antibodies typically linked to an allergic response. The researchers think they are used by the body to recognise and flag the toxins that have caused the damage, clearing them before they affect the rest of the body.

This combination allows the immune system to 'see' and respond to developing tumours on the body's surface and initiate allergic-type

reactions to protect the rest of the body.

Professor Adrian Hayday, based both at Cancer Research UK's London Research Institute and King's College London, said: "There has been a great amount of interest in immunotherapy – using the body's own defences to treat cancer - recently, but our understanding of how the immune response works to recognise and halt cancer growth has been limited. Our study suggests new and simple ways for monitoring a patient's anti-tumour responses during treatment allowing us to see if chemotherapy, for example, is helping or hindering the body's own response to tumours."

Study author Dr Jessica Strid, at King's College London, said: "The body uses many different pathways to deal with threats and damage and we only understand how they work individually. Our study offers a fresh perspective on how the body regulates its response to carcinogens, using the allergic response to remove them before they spread to the rest of the body."

Dr Julie Sharp, senior science information manager at Cancer Research UK, said: "Our body's surfaces are constantly exposed to potentially cancer causing damage. This research shows how the body can quickly react to eradicate potentially cancerous cells and clear damaging toxins from the rest of the body. Understanding how this works could pave the way to more effective treatments that use the body's immune system to track down and destroy cancer cells."

More information: Strid, J., et al The intraepithelial T cell response to NKG2D-ligands links lymphoid stress surveillance to atopy Science (2011) DOI: 10.1126/science.1211250

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