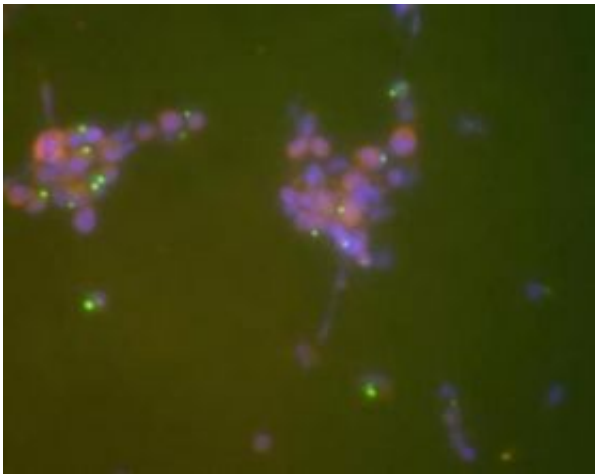


New research helps explain how tumors go undetected by the body

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Macrophages treated with nonregulatory T cells. Red indicates inflammatory cells. Green indicates anti-inflammatory cells. Credit: Dr. Leonie Taams, King's College London

Scientists studying how immune cells are regulated in healthy individuals, have made a key discovery in understanding why tumours may go undetected by the immune system and remain untreated by the body's own natural defences. The findings, published online this week (between 19 - 23 November) by the *Proceedings of the National Academy of Sciences*, could lead to new treatments for tumours.

Under normal circumstances, the immune system creates sustained inflammation around a dangerous pathogen or injury which tells the

body that there is a problem. However, in the case of tumours, certain cellular mechanisms counteract inflammation which can cause the tumour to go undetected, making it even harder for the body to expel.

The researchers at King's College London, funded by the Biotechnology and Biological Sciences Research Council (BBSRC), discovered that regulatory T cells can reverse the role of a key immune cell called a macrophage which is normally involved in causing inflammation. Regulatory T cells are cells that regulate the immune system to stop it over-responding to every external stimulus and only deal with genuinely harmful pathogens or injuries. The research shows that they can achieve this by encouraging macrophages to instead dampen down the inflammatory response that is automatically induced by all possible threats to the body, even those that turn out to be harmless.

Dr Leonie Taams, research leader explains: “A relatively harmless stimulus, such as a small cut, will automatically be treated by the body as something dangerous and will cause macrophages to promote inflammation. We discovered that it is then the regulatory T cells’ responsibility to make the macrophages promote anti-inflammation to counteract the initial response, as it is not a real danger. This helps keep the immune system stable and prevents the body over-reacting to everything in its environment.

“However problems can occur with tumours, where many regulatory T cells promoting a strong anti-inflammatory response are present. Neutralising an inflammatory response in this scenario can cause the tumour to fall under the radar of the body's immune system and ‘trick’ it into believing that there is no problem.

“We hope to be able to use this new knowledge about the relationship between regulatory T cells and macrophages to find more effective treatments for tumours. Interestingly, we also hope to use the same

knowledge to achieve the opposite result and block chronic inflammation such as that which occurs in rheumatoid arthritis.”

Source: Biotechnology and Biological Sciences Research Council

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