# Body's early immune response aids cancer growth

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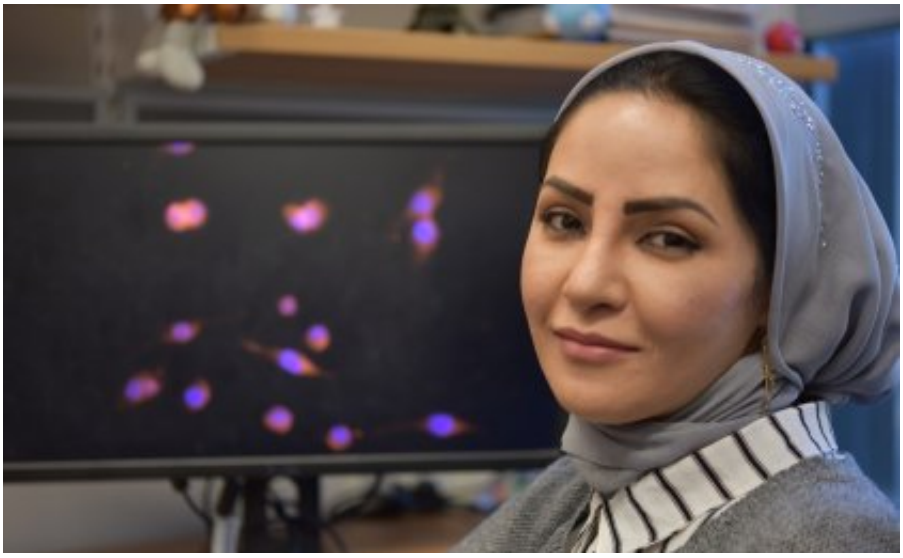

AIBN PhD graduate Dr Jamileh Nabizadeh. Credit: University of Queensland

Queensland researchers have discovered that the first-stage response of the immune system can contribute to melanoma, colon and breast cancer growth, rather than helping the body to fight it.

University of Queensland scientists Dr Barbara Rolfe from the Australian Institute for Bioengineering and Nanotechnology (AIBN) and Associate Professor Trent Woodruff from the School of Biomedical Sciences led research that found blocking a key component of the immune system in a mouse model resulted in slowed cancerous growth.

Dr Rolfe said the study, published in the June issue of the *Journal of Immunology*, showed that a peptide called C3a that usually aided the body's early immune response could instead result in reduced tumour-fighting effectiveness against cancer.

"This is the first time anyone has specifically looked at complement component C3a in cancer, and we found it has a role in adversely controlling and limiting the immune response to cancer," Dr Rolfe said.

"C3a is an ancient part of the innate immune system, and it is really the first responder when the body detects any sort of pathogen or tissue damage.

"This system is a precursor to more advanced and specific immune responses, involving cells called lymphocytes."

Dr Rolfe said the innate immune system was designed to operate against more simple pathogens, such as bacteria and viruses.

The study found that by blocking C3a binding to its receptor, tumour growth could be reduced approximately four-fold in mice.

The human immune system is similar to that of mice, and the researchers hope the results will translate to humans.

AIBN PhD graduate Dr Jamileh Nabizadeh said inhibition of another protein, C5a, also slowed tumour growth, but to a lesser extent than C3a.

"Simply blocking these proteins is not enough to eliminate the cancer, and research has recently shown how insidious cancers are, with the ability to mask their presence from the immune system," Dr Nabizadeh said.

"They can also rapidly develop resistance to anti-cancer drugs, highlighting the need to develop multi-pronged approaches to treat patients."

The researchers are working to develop safe therapeutic drugs that can used with other drugs to ensure cancer cannot hide itself before reappearing.

"We will be examining potential combinations to see if there are immunotherapeutic synergies between the two," she said.

**More information:** J. A. Nabizadeh et al. The Complement C3a Receptor Contributes to Melanoma Tumorigenesis by Inhibiting Neutrophil and CD4+ T Cell Responses, *The Journal of Immunology* (2016). DOI: 10.4049/jimmunol.1600210

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