

Researchers seek to understand brain's immune response to metastasized cancer

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Brain metastases are common secondary complications of other types of cancer, particularly lung, breast and skin cancer. The body's own immune response in the brain is rendered powerless in the fight against these metastases by inflammatory reactions. Researchers at the MedUni Vienna have now, for the first time, precisely characterised the brain's immune response to infiltrating metastases. This could pave the way to the development of new, less aggressive treatment options.

"The active phagocytes are quite literally overwhelmed by the tumour and even the white blood cells are too weak to fight off these metastases on their own; they have to be stimulated before they can have any

effect," explains oncologist Matthias Preusser from the University Department of Internal Medicine I and the Comprehensive Cancer Center (CCC), a joint institution operated by the MedUni Vienna and the Vienna General Hospital.

[Brain tissue](#) was obtained for investigation from autopsies carried out on people who had metastatic disease secondary to breast, lung or skin cancer. These are also the most common types of primary tumour. [Brain metastases](#) develop because they spread from the tumours into other parts of the body right up to the brain.

The scientists at the Clinical Institute of Neurology, the Centre for Brain Research, the CCC and the University Department of Internal Medicine I have discovered that metastases in the brain do encounter a wall of [phagocytes](#), but it is too weak to successfully arrest the tumour's development. To do this, white blood cells (lymphocytes) need to be mobilised in greater numbers as the second instance of the [immune defence](#) system.

These findings could lead to new therapeutic strategies being developed that will aim to increase the activation of [white blood cells](#) or other parts of the immune system – perhaps through medication such as antibody treatments or vaccines.

300 to 400 patients with brain metastases are treated each year at the MedUni Vienna. The standard treatment in most cases is radiotherapy to the head or generalised irradiation of the brain – which is associated with certain risks and possible side effects. Only in very few cases are drug-based treatment methods available for certain [types of cancer](#). Says Preusser: "Our findings could represent an important step towards the development of less aggressive forms of treatment."

The study has been drawn up across various disciplines at the Clinical

Institute of Neurology, the Department of Neuroimmunology at the Centre for [Brain Research](#) and at the Comprehensive Cancer Center (CNS Tumours Unit). Author Anna Sophie Berghoff from the CCC presented the findings of the study at a lecture given at the Congress of the European Association of Neuro-Oncologists (EANO) in Marseilles.

More information: Anna Sophie Berghoff, Hans Lassmann, Matthias Preusser, Romana Höftberger. [Characterization of the inflammatory response to solid cancer metastases in the human brain](#) *Clin. Exp. Metastasis*, 2012, [DOI:10.1007/s10585-012-9510-4](https://doi.org/10.1007/s10585-012-9510-4)

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