

'Silencer molecules' switch off cancer's ability to spread around body

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Scientists have revealed that a key molecule in breast and lung cancer cells can help switch off the cancers' ability to spread around the body.

The findings by researchers at Imperial College London, published in the journal *EMBO Reports*, may help scientists develop treatments that

prevent cancer travelling around the [body](#)—or produce some kind of test that allows doctors to gauge how likely a cancer is to spread.

During [tumour growth](#), cancer cells can break off and travel in the bloodstream or lymph system to other parts of the body, in a process called metastasis.

Patients whose cancers spread tend to have a worse prognosis, explains Professor Justin Stebbing, senior author of the study from the Department of Surgery and Cancer at Imperial: "The ability of a cancer to spread around the body has a large impact on a patient's survival. However, at the moment we are still in the dark about why some cancers spread around the body—while others stay in one place. This study has given important insights into this process."

The researchers were looking at [breast](#) and [lung cancer cells](#) and they found that a protein called MARK4 enables the cells to break free and move around to other parts of the body, such as the brain and liver. Although scientist are still unsure how it does this, one theory is it affects the cell's internal scaffolding, enabling it to move more easily around the body.

The team found that a molecule called miR-515-5p helps to silence, or switch off, the gene that produces MARK4.

In the study, the team used human breast cancer and [lung cancer](#) cells to show that the miR-515-5p molecule silences the gene MARK4. They then confirmed this in mouse models, which showed that increasing the amount of miR-515-5p prevents the spread of cancer cells. The findings also revealed that the silencer molecule was found in lower levels in human tumours that had spread around the body.

The team then also established that patients with breast and lung cancers

whose tumours had low amounts of these silencer molecules—or high amounts of MARK4—had lower survival rates.

Researchers are now investigating whether either the MARK4 gene or the silencer molecule could be targeted with drugs. They are also investigating whether these molecules could be used to develop a test to indicate whether a patient's cancer is likely to spread.

Professor Stebbing said: "In our work we have shown that this silencer molecule is important in the spread of cancer. This is very early stage research, so we now need more studies to find out more about this molecule, and if it is present in other types of cancer."

Dr Olivier Pardo, lead author of the paper, also from the Department of Surgery and Cancer at Imperial, added: "Our work also identified that MARK4 enables breast and lung [cancer cells](#) to both divide and invade other parts of the body. These findings could have profound implications for treating breast and lung cancers, two of the biggest cancer killers worldwide."

More information: O. E. Pardo et al. miR-515-5p controls cancer cell migration through MARK4 regulation, *EMBO reports* (2016). [DOI: 10.15252/embr.201540970](https://doi.org/10.15252/embr.201540970)

Provided by Imperial College London

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