

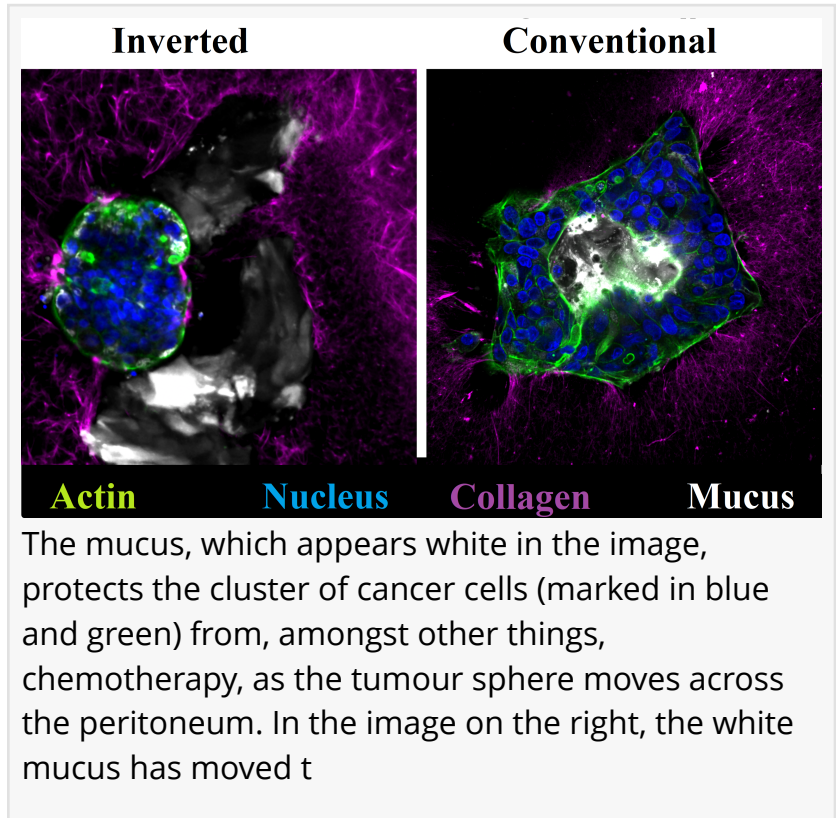
Researchers Discover Molecular Mechanism That Helps Aggressive Colorectal Cancer to Spread

TURKU, FINLAND, August 25, 2026 /EINPresswire.com/ -- Researchers from the [University of Turku](#) in Finland and Gustave Roussy Institute in France have discovered a molecular mechanism that regulates whether the cells of an aggressive colorectal cancer are conventional or inverted when they spread in the body. The discovery can help identify patients who have an elevated risk that the cancer metastasises to the abdominal cavity. The study was published in the journal [Nature Communications](#).

The researchers studied mucinous colorectal adenocarcinoma, an aggressive form of cancer that constitutes for around 10–15 percent of all colorectal cancers. It is more common in young adults and women. Unlike most colorectal cancers, mucinous colorectal adenocarcinoma spreads in the form of small, compact clusters of cells. These clusters, which are known as tumour spheres, migrate to the abdominal cavity and metastasise on the peritoneum. This dissemination pattern is associated with a poor prognosis and limited treatment options.

The tumour spheres that spread to the peritoneum are typically inverted. This is a phenomenon where the cell clusters secrete a layer of mucus onto their surface. Normally, the mucus is inside the cell cluster, in which case the cluster is considered to be conventional.

“The mucus forms a protective layer around the tumour, which reduces the effectiveness of cytostatic drugs and facilitates the spread of the cells into the abdominal cavity. This inverted structure not only helps tumour cells to migrate, but also enables them to invade tissue more effectively and makes them more resistant to chemotherapy,” says Academy Professor and InFLAMES research flagship group leader Johanna Ivaska from [Turku Bioscience Centre](#) at the





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Doctoral Researcher Meri Pelkonen

University of Turku, Finland.

However, when the cell clusters reach the peritoneum, some of them revert to their normal state, with the mucus inside the tumour sphere. The cell cluster then attaches firmly to the surrounding tissue. This is a step that is thought to promote peritoneal metastasis. Until now, it has been unclear what triggers this reversal.

Chain Reaction on a Molecular Level

The researchers studied tumour samples taken from patients and traced the molecular chain reaction that is triggered when tumour spheres come into contact with collagen, the structural protein of the connective tissue surrounding the tumour.

A multi-step sequence of events leads to an increase in the levels of three proteins—SorLa, Her2 and HER3—in cancer cells. The activity of these three proteins reverts the tumour cells into the conventional state and strengthens the attachment of their adhesion receptors, integrins, to the surrounding tissue.

Analysis of patient samples confirmed the pattern observed in the laboratory tests: SorLA, HER2 and HER3 levels were highest in tumour spheres in the conventional state, while in the inverted tumour spheres the levels were lower.

Possible Treatment: Inverting the Tumour Spheres

Therapeutic antibodies targeting the HER2 and HER3 receptors already exist and are used in the treatment of other cancers. The researchers therefore investigated whether these drugs might affect the inversion and adhesion of tumour cells.

“When tumour spheres grown in the laboratory were treated with antibodies, the cancer cells began to die, were inverted, and their ability to attach to the peritoneum was impaired. The results suggest a potential way of slowing the spread of cancer, but further research and clinical trials are still needed,” says Doctoral Researcher Meri Pelkonen from the University of Turku.

Colorectal cancer remains one of the world’s leading causes of cancer-related deaths, and in recent years there has been growing concern about its increasing prevalence amongst young adults. The reasons for this phenomenon are not yet fully understood. Mucinous colorectal adenocarcinoma is more prevalent in younger patients than other types of colorectal cancer, and therefore understanding its biology is particularly timely.

According to the researchers, the discovered mechanism may also explain the inversion seen in

other aggressive cancers and could provide a means of identifying—and, in the future, potentially treating—patients whose tumours are most likely to spread to the abdominal cavity.

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