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Stop 'amoeba-like feet' formation to prevent cancer

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Singapore: Scientists at Weill Cornell Medical College have discovered the molecular switch that allows aggressive triple negative breast cancer cells to grow amoeba-like protrusions that are needed to crawl away from a primary tumor and metastasize throughout the body. Their findings, published in *Cancer Cell*, suggest that a novel approach for developing agents to treat cancer once it has spread.

"Metastasis can be lethal, and our findings point to potential targeted treatments to stop the spread of this aggressive breast cancer," says the study's senior investigator, Dr Vivek Mittal, associate professor, cell and developmental biology, and director, Neuberger Berman Foundation Lung Cancer Research Laboratory at Weill Cornell Medical College.

According to researchers, if such agents were developed, they would perhaps be the first to specifically treat cancer metastasis, importantly in patients whose tumors have already spread. They would also be among the first designed to restore the function of microRNA (miRNA), a small, non-coding RNA that regulates gene expression, which is crucial to cancer spread. While distinct miRNA "signatures" have been found for many tumor types, including different breast cancers, their specific roles in later steps of cancer metastasis has been unclear, Dr. Mittal says.

In the study, researchers set out to identify a miRNA that impacts metastasis without affecting primary tumor growth, as well as address its underlying molecular mechanisms and therapeutic potential against metastatic breast cancer. They discovered that a miRNA known as miR-708 is inhibited in metastatic triple negative breast cancer. They found that miR-708 acts as a metastatic tumor inhibitor, and when its function is restored, the tumors do not spread or form lethal macrometastases.

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Co-authors of the study include Dr Seongho Ryu, Kevin McDonnell, Dr Hyejin Choi, Mr Dingcheng Gao, Ms Mary Hahn, Ms Natasha Joshi, Dr Sun Mi Park, Dr Raul Catena, Ms Jacqueline Brazin and Dr Randi B Silver from Weill Cornell Medical College, and Dr Yoonkyung Do from Ulsan National Institute of Science and Technology (UNIST), School of Nano-Bioscience and Chemical Engineering in Ulsan, Korea.