

Shape-shifting stops migrating cancer cells

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Like a car with a front and back end, a steering mechanism and an engine to push it forward, cancer cells propel themselves through normal tissues and organs to spread cancer throughout the body. Researchers at Mayo Clinic in Florida, however, have managed to turn these cells into shapes like a round fried egg and an exaggerated starfish that sticks out in many directions—both of which cannot now move.

In research published in the December issue of *Molecular and Cellular Biology*, investigators reveal how interplay of molecules keeps cancer cells moving forward, and how disturbing the balance of these proteins pushes their shape to change, stopping them in their tracks.

Investigators say they have already identified a number of agents—some already used in the clinic for different disorders—that may force shape-shifting in [tumor cells](#).

"We are starting to understand mechanistically how cancer cells move and migrate, which gives us opportunities to manipulate these cells, alter their shape, and stop their spread," says the study's lead investigator, Panos Z. Anastasiadis, Ph.D., chair of the Department of Cancer Biology at Mayo Clinic in Florida.

"It is the spread—the metastasis—of cancer that is largely responsible for the death of [cancer patients](#), so stopping these cells from migrating could potentially provide a treatment that saves lives," he says.

The study was conducted using tumor material from breast and brain

(glioblastoma) cancer. Both of these tumors are generally lethal when they spread—breast to other organs, and [brain cancer](#) as it crawls throughout the brain.

The researchers found that a protein called Syx is key to determining how tumor cells migrate. When researchers removed Syx from the [cancer cells](#), they lost their polarity—their leading and trailing edges—and morphed into the fried egg shape. "They are now unable to sense direction, so they are not going anywhere," Dr. Anastasiadis says.

More information: The Rho Guanine Nucleotide Exchange Factor Syx Regulates the Balance of Dia and ROCK Activities To Promote Polarized-Cancer-Cell Migration. *Molecular and Cellular Biology*, 2013, DOI: [10.1128/MCB.00565-13](https://doi.org/10.1128/MCB.00565-13)

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