Study in mice shows tumor cell reactivation by stress hormones can be slowed using beta-blockers

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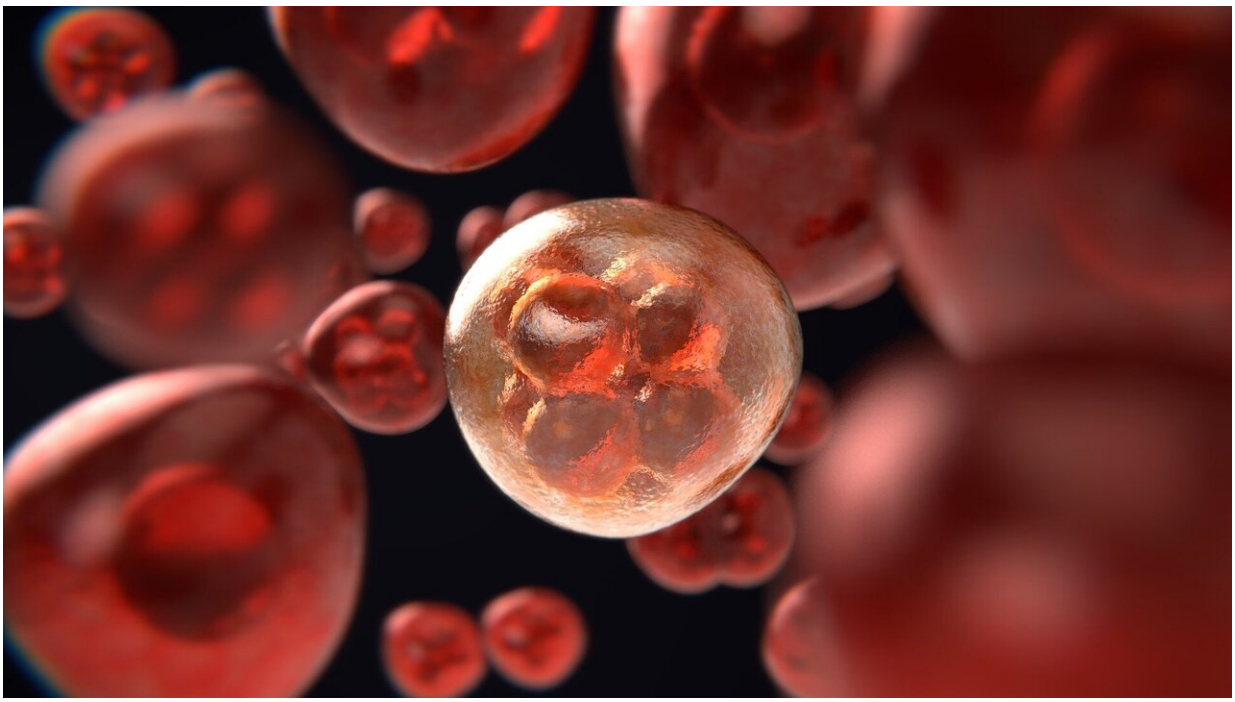

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A team of researchers from a host of institutions in the U.S. and one in Germany, working with AstraZeneca, has found that natural stress hormones can reactivate dormant cancer cells in mice. They've published their results in the journal *Science Translational Medicine*.

Medical scientists have been working for many years to try to understand why cancerous tumors can sometimes recur many years after initial successful treatment. In this new effort, the researchers have found evidence that a recurrence can happen when dormant cancer cells are awakened by stress hormones.

Prior research has shown that when a cancerous tumor begins to grow, some of its cells move to other nearby locations and enter a dormant state. Because they are distant and dormant, they are not killed or removed by surgery or chemotherapy. Prior research has also shown that such dormant cells can suddenly awaken and start growing into a new tumor—sometimes years later. The researchers with this new effort have discovered what they believe to be the mechanism responsible for reawaking the dormant cancer cells—stress hormones, such as norepinephrine.

They came to this conclusion by administering the hormone to mice with dormant cancer cells and watching as the cells awakened and began to multiply. The researchers also found that if they administered a beta blocker (known to dampen proteins expressed by hormones), the test mice were much less likely to develop new tumors from awakened cancer cells.

The researchers also collected serum samples from 80 lung cancer patients after surgical tumor removal. They found that those patients with higher levels of S100A8/A9 (proteins released by norepinephrine) had a greater chance of developing a new tumor.

The researchers suggest that giving cancer patients beta blockers might be an effective way to prevent recurrence of some kinds of cancers. They also note that drugs developed specifically to block the production of S100A8/A9 might be an even better approach.

More information: Michela Perego et al. Reactivation of dormant tumor cells by modified lipids derived from stress-activated neutrophils, *Science Translational Medicine* (2020). DOI: 10.1126/scitranslmed.abb5817