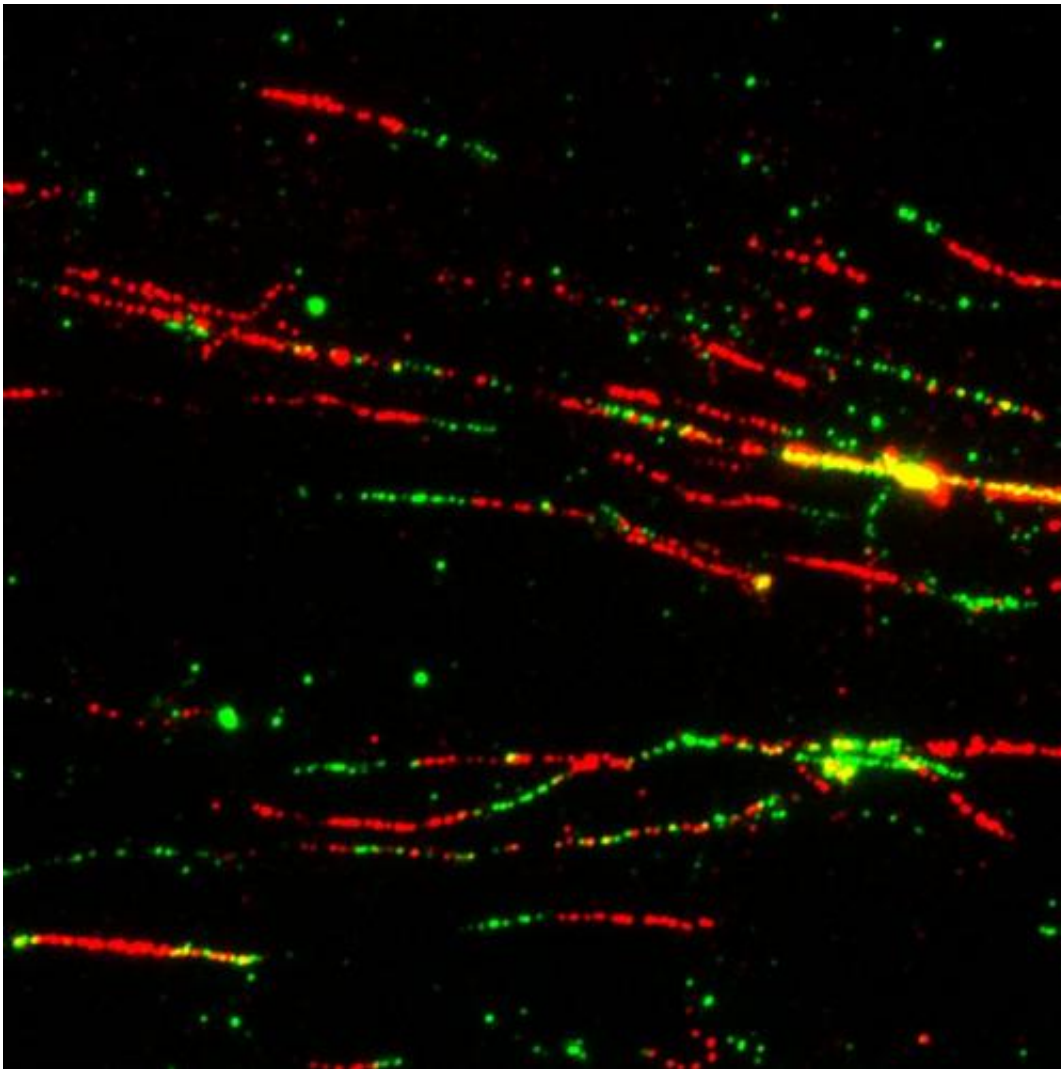


Scientists find way to boost healthy cells during chemo

December 11 2014



Scientists have discovered that adding thymine, a natural building block found in DNA, to normal cells, stimulates gene production and causes them to multiply. Pictured are normal cells producing DNA. Credit: Massachusetts Institute of Technology.

It's well known that chemotherapy helps fight cancer. It's also known that it wreaks havoc on normal, healthy cells.

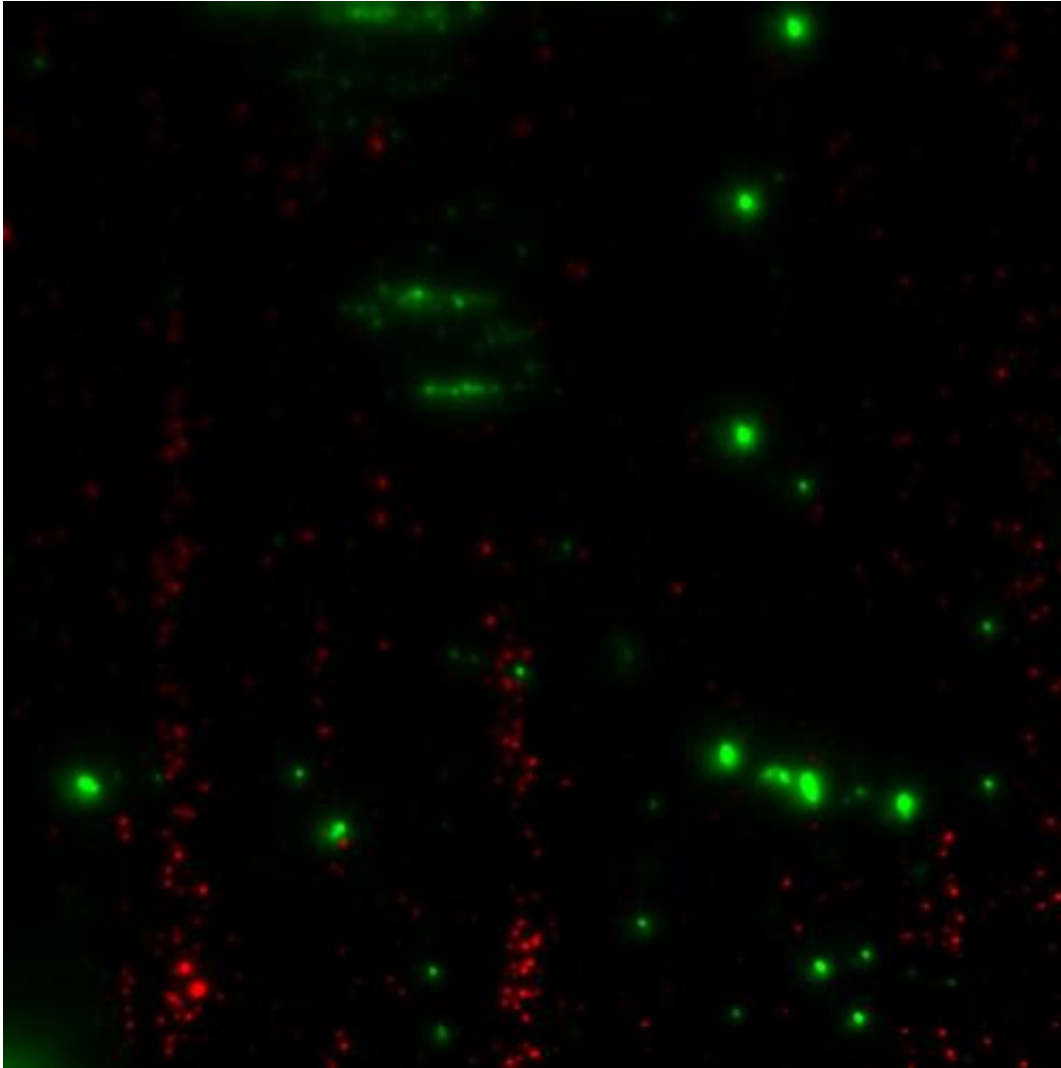
Michigan State University scientists are closer to discovering a possible way to boost healthy cell production in cancer patients as they receive chemotherapy. By adding [thymine](#) - a natural building block found in DNA - into normal cells, they found it stimulated gene production and caused them to multiply.

The study can be found online in the journal [Molecular Cell](#).

"In most cases, [cancer patients](#) who receive chemotherapy lose their fast-growing normal cells, including hair, nails and lining of the gut," said Sophia Lunt, a postdoctoral research associate who led the study along with Eran Andrechek, a physiology professor at MSU. "Therefore, it's necessary to understand the differences between normal versus [cancer cells](#) if we want to improve cancer therapy while minimizing the harsh side effects."

Thymine is made from sugar in the body and is necessary to make DNA. The research team wanted to understand how fast-growing normal cells metabolize sugar and other nutrients to stimulate growth compared to fast-growing cancer cells.

They were surprised to discover that when a shared protein, found in both normal and cancer cells, was removed from the healthy ones, it stopped growth. Previous studies have shown that deleting this protein, known as PKM2, from the cancer cells has no effect on cancer growth.



MSU researchers Sophia Lunt and Eran Andrechek have discovered that deleting a protein called PKM2 in normal cells causes them to stop making DNA. But by adding thymine, it jump starts their production again. This photo shows lack of DNA production in normal cells after PKM2 is deleted. Credit: Massachusetts Institute of Technology.

"When we deleted the protein, we found it caused [healthy cells](#) to stop making DNA," Andrechek said. "But when we added thymine, they began multiplying and producing DNA again."

Both researchers view this as a positive step in finding ways to boost healthy cell production, but indicate that more needs to be known on the effect thymine might have on cancer cells.

"Before we can look at using thymine as a possible treatment supplement during chemotherapy, we have to know if it has the same effect on cancer cells," Andrechek said. "We want to stop them from growing, not stimulate them."

Both Lunt and Andrechek in the College of Human Medicine hope the next phase of their research will help answer this question and also reveal more on what to target in order to stop cancer cell production.

"To selectively stop cancer growth while avoiding side effects including hair loss and vomiting, we need to identify a second target in [cancer](#) cells, in addition to PKM2, while providing [normal cells](#) with a supplement like thymine," Lunt said.

Provided by Michigan State University

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