Drug shows promise as immune therapy for cancer

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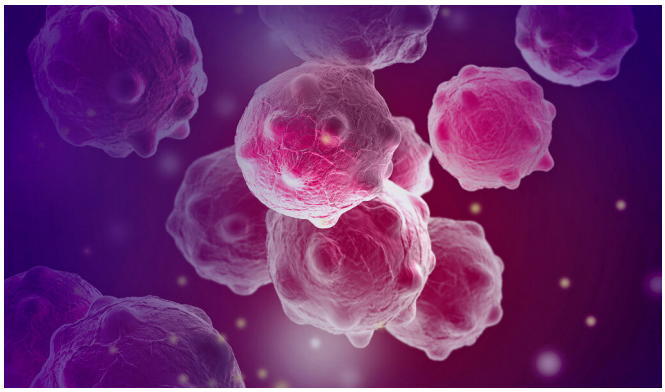

New Yale-led research may offer novel immunotherapies for skin, colon, breast, pancreatic and other cancers. Credit: stock.adobe.com

A therapy developed by Yale researchers stimulates immune cells to shrink or kill tumors in mice, according to a new study published in the *Journal of Experimental Medicine*. The therapy is effective alone or in combination with existing cancer immunotherapies, and it appears to have lasting effects, the researchers said.

The research team, led by Yale investigators Akiko Iwasaki and Anna Pyle, examined whether a synthetic RNA molecule developed to fight viruses could also trigger an immune response against tumors. The molecule, called Stem Loop RNA 14 (SLR14), was specifically designed to activate a gene that detects viruses and other threats in cells.

"Our idea is to mimic a viral infection inside the tumor, tricking the immune system into thinking there is an infection and getting rid of it," Iwasaki said.

To test this theory, the researchers experimented with several different approaches. They injected SLR14 directly into tumors in mice and observed destruction of the cancer by the immune system's powerful T cells. When they delivered the therapy to one site on a tumor, it also stimulated T cells to respond at a different site, suggesting a broad effect.

In another experiment, they mimicked cancer metastasis by spreading the tumor cells throughout the body by injecting them through the left ventricle of the heart. The results demonstrated that the SLR therapy in solid tumors could block further growth of metastatic cancer.

Further investigation showed that SLR14 is comparable to existing cancer immunotherapy drugs, and could enhance their anti-tumor response. "It has a significant effect as a single therapy agent, and when combined with current immune therapies, we see a synergistic effect," Iwasaki noted.

The researchers also found that the immune system's "memory" was induced by the therapy, protecting the animals from recurrence. "We need to employ the immune system, which has a long memory, to find tumors and kill them before they become cancerous. We show this long-term immunity after injection of SLR," she said.

The next step in research is to test the therapy alone, and in combination with other therapies, in human trials.

More information: Xiaodong Jiang et al. Intratumoral delivery of RIG-I agonist SLR14 induces robust antitumor responses, *The Journal of Experimental Medicine* (2019). DOI: 10.1084/jem.20190801

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