

Systemic tumor disappearance following local radiation treatment reported in metastatic melanoma patient

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A rarely seen phenomenon in cancer patients — in which focused radiation to the site of one tumor is associated with the disappearance of metastatic tumors all over the body — has been reported in a patient with melanoma treated with the immunotherapeutic agent ipilimumab (Yervoy). Researchers at Memorial Sloan Kettering Cancer Center shared their findings in a unique single-patient study, which could help shed light on the immune system's role in fighting cancer. Their observations suggest that the combination of ipilimumab and radiation may be a promising approach for the treatment of melanoma. The findings are published as a brief report in the March 8 issue of the *New England Journal of Medicine*. The work was done at Memorial Sloan Kettering's Ludwig Center for Cancer Immunotherapy.

The [phenomenon](#) reported by the researchers, known as the abscopal effect, occurs when localized radiation therapy delivered to a single tumor in a patient with advanced disease results in tumor disappearance outside of the irradiated area. Though the abscopal effect is extremely rare, it has been described in several cancers including melanoma, lymphoma, and kidney [cancer](#).

"We are excited about these results, and what we have seen in this one patient proves the principle that adding radiation therapy to immunotherapy may be a promising combination approach to treatment for advanced cancer," explained senior author Jedd Wolchok, MD, PHD,

a medical oncologist at Memorial Sloan Kettering Cancer Center with a joint appointment in the Sloan Kettering Institute's Immunology Program. "What we think is happening here is that the immune system's cancer-fighting response is turned up a notch with the addition of focused radiation," added Dr. Wolchok.

In the case study Dr. Wolchok and colleagues reported treating a patient with advanced melanoma using an immunotherapy called ipilimumab, recently approved by the US Food and Drug Administration. Over time the patient's melanoma slowly grew in the spleen, lymph nodes, and an area near the spine. When the disease progressed, the patient received localized radiation therapy to the melanoma tumor near the spine to help with pain relief. After the radiation treatment, the targeted tumor near the patient's spine shrank significantly. Unexpectedly, other areas where the melanoma had spread (the spleen and the lymph nodes) but that were not directly targeted by the radiation therapy also benefited, consistent with the abscopal effect. The patient continues to do well more than one year since receiving the radiation therapy.

Scientists are not certain how the abscopal effect works to eliminate cancer in patients. Studies in mice suggest that the effect may depend upon activation of the [immune system](#). In the case study reported by Dr. Wolchok and colleagues at Memorial Sloan Kettering, changes in the patient's immune system were measured over the course of treatment. The team observed changes in tumor-directed antibody levels and immune cell populations that occurred at the time of the abscopal effect. These findings support the idea that radiation may help stimulate the immune system to fight cancer.

Ipilimumab is an immunotherapy that exploits the body's own immune system to attack cancer. It was approved by the FDA in March of 2011 and is the first drug ever to show an improvement in overall survival for patients with advanced melanoma. The therapy blocks a target called

CTLA-4 and was developed by James Allison, PhD, Chair of the Sloan Kettering Institute's Immunology Program.

This patient's dramatic response provides new insight into how radiation may help activate the immune system to fight cancer and suggests novel therapeutic avenues to pursue. Clinical trials are under way now to validate the approach of combining [radiation therapy](#) with ipilimumab for the treatment of [melanoma](#) and prostate cancer.

Provided by Memorial Sloan-Kettering Cancer Center

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