Personalized Cancer Vaccines

Individually tailored vaccines help T cells recognize tumors.

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Some immune-based therapies take the brakes off T cells, but vaccines are more like stepping on the accelerator, boosting T cells' ability to recognize and kill cancer cells. Personalized vaccines designed to target each patient's particular tumor type have shown promising activity in people with melanoma in two small studies.

Researchers at the Dana-Farber Cancer Institute in Boston and the University of Mainz in Germany used gene sequencing to identify the unique set of protein markers expressed on a tumor to produce an individualized vaccine for each patient. These so-called neoantigens make good targets because they're not found on healthy cells.

One study enrolled six patients whose melanoma tumors were surgically removed but who were at high risk for recurrence. Four people were still free of cancer 25 months after vaccination. The other two had recurrent disease but achieved complete remission after adding Keytruda (pembrolizumab), a checkpoint inhibitor, suggesting that the greatest benefits may come from combining vaccines with other types of immunotherapy.

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