

Is there a vaccine for cancer?

Scientists in many countries are working on vaccines to treat cancer, while more traditional vaccines protect against cancer-causing viruses.

February 15, 2024 By [Liz Highleyman](#)

On February 14, [Reuters reported](#) that President Vladimir Putin said Russian scientists “have come very close” to creating vaccines for cancer that could soon be available to patients.

Putin’s comments were too optimistic about the timeline, but scientists in many countries are indeed working on [vaccines to treat cancer](#). Researchers are taking several approaches, some of which use the same [messenger RNA \(mRNA\) technology](#) used to create COVID-19 vaccines.

As previously reported, Moderna and Merck are developing an [experimental mRNA vaccine for melanoma](#) dubbed V940 (mRNA-4157). In a Phase II clinical trial, people with Stage III or IV melanoma who were randomized to the vaccine along with the immune checkpoint inhibitor Keytruda (pembrolizumab) after surgery had a 49% lower risk of recurrence and a 62% lower risk of distant metastasis compared with those who received Keytruda alone. The vaccine has [now moved on to a Phase III trial](#).

Similarly, BioNTech—Pfizer’s COVID vaccine partner—and Roche/Genentech are evaluating an mRNA vaccine known as autogene cevumeran [for pancreatic cancer](#). In a small Phase I trial, patients who received the vaccine with the checkpoint inhibitor Tecentriq (atezolizumab) and chemotherapy after surgery had a lower-than-expected rate of recurrence.

These are both personalized cancer vaccines designed to target an individual’s specific cancer. Scientists genetically sequence a sample from a patient’s tumor and identify neoantigens (abnormal proteins) that are most likely to trigger an immune response. While mRNA COVID vaccines deliver genetic blueprints for the SARS-CoV-2 coronavirus spike protein, cancer vaccines contain DNA for the selected neoantigens.

Researchers are also exploring vaccines that train the immune system to recognize common cancer antigens. These “off the shelf” vaccines do not have to be customized for each patient, thereby saving time and money. An [experimental vaccine that targets HER2](#) showed promising activity in a Phase I study of patients with advanced breast cancer.

All these vaccines are intended for people who already have cancer. But more traditional vaccines can [prevent cancer from arising in the first place](#).

The Gardasil 9 vaccine protects against nine types of [human papillomavirus \(HPV\)](#) that cause genital warts or cervical, anal or oral cancer. The vaccine is recommended for both girls and boys ages 9 to 12, with catch-up vaccination through age 26. But some older people can still benefit, and the Food and Drug Administration has approved Gardasil 9 for those up to age 45.

There is also a vaccine to prevent [hepatitis B virus \(HBV\)](#) infection, which over time can lead to cirrhosis and hepatocellular carcinoma, the most common type of [liver cancer](#). The vaccine is included in the routine immunization schedule for infants, and the Centers for Disease Control and Prevention [now recommends](#) vaccination for all children, adolescents and adults, not only those considered to be at higher risk.

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