Personalized and Off-the-Shelf Cancer Vaccines Show Promise

Therapeutic vaccines train the immune system to recognize and attack malignant cells.

March 9, 2026 By Liz Highleyman

Therapeutic vaccines that train the immune system to recognize and attack malignant cells continue to show promise for cancer treatment.

Merck and Moderna recently announced that people with advanced melanoma who received a customized messenger RNA (mRNA) vaccine dubbed intismeran autogene (mRNA-4157) plus the immune checkpoint inhibitor Keytruda (pembrolizumab) after surgery had a 49% lower risk of relapse or death at five years compared with Keytruda alone.

Personalized vaccines like intismeran autogene are produced using neoantigens, or mutated proteins on cancer cells, derived from a patient's tumor biopsy sample. But this process is expensive and time-consuming, so researchers are also testing off-the-shelf vaccines that don't require customization.

One approach targets PD-L1 and IDO1, two proteins that help tumors evade the immune system. Results from a Phase III trial presented at the European Society for Medical Oncology Congress showed that patients with advanced melanoma who received IO Biotech's Cylembio vaccine plus Keytruda showed a 23% improvement in progression-free survival compared with Keytruda alone. The combination also showed promise for non-small-cell lung and head and neck cancers in Phase II.

An earlier-stage study showed that 24% of patients with immunotherapy-resistant melanoma who received Moderna's PD-L1/IDO1 vaccine, dubbed mRNA-4359, plus Keytruda experienced tumor shrinkage, rising to 67% for those with PD-L1–positive tumors. Both vaccines promote activation and proliferation of target-specific T cells.