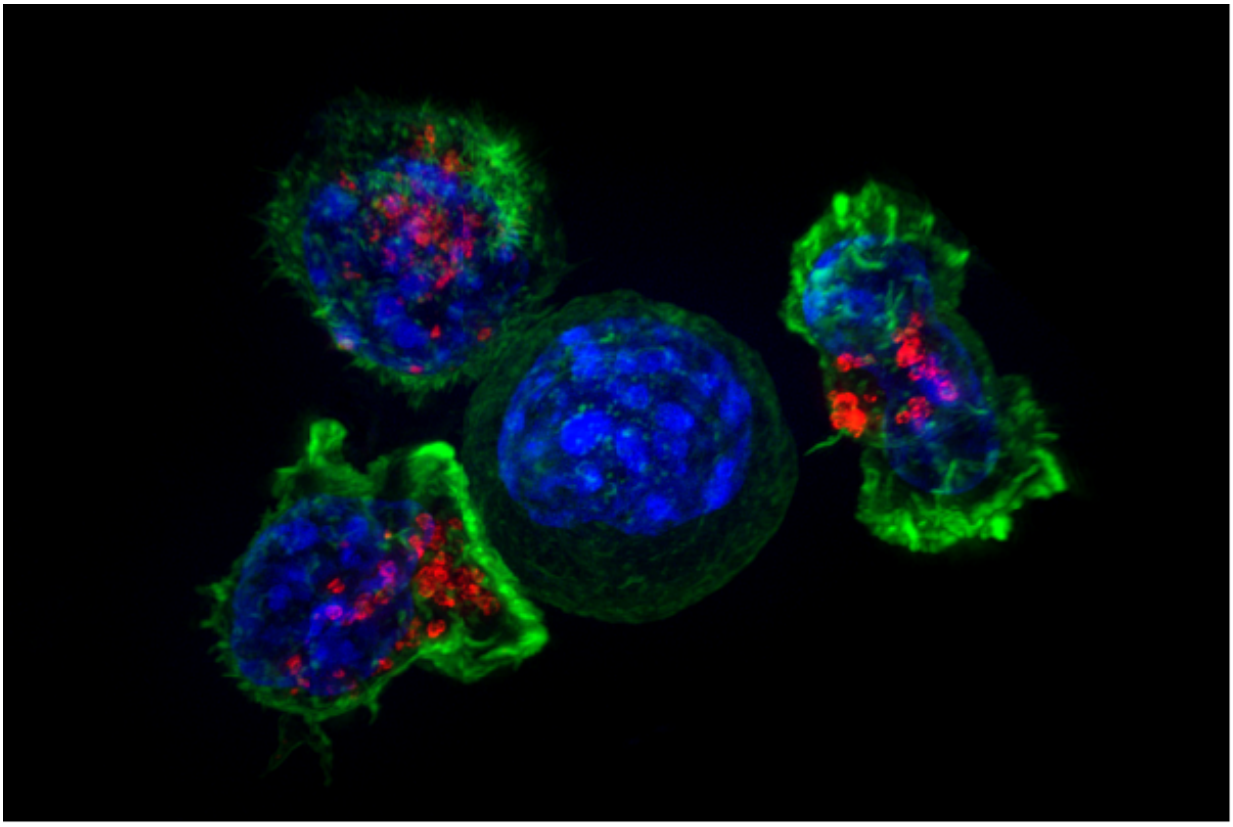
MedicalXpress

Researchers discover way to prime cancer tumors for immunotherapy

February 7 2020



Killer T cells surround a cancer cell. Credit: NIH

A cancer tumor's ability to mutate allows it to escape from chemotherapy and other attempts to kill it. So, encouraging mutations would not be a logical path for cancer researchers. Yet a Mayo Clinic

team and their collaborators took that counterintuitive approach and discovered that while it created resistance to chemotherapy, it also made tumors sensitive to immunotherapy. They also found that this approach worked successfully across tumor types and individual patient genomes. Their findings involving mouse models and human cells appear in *Nature Communications*.

The international team of researchers based in Rochester, Minn. and London, led by Richard Vile, Ph.D., a Mayo Clinic professor of pediatric oncology, studied models of both pediatric brain tumors and melanoma. They found that, in mice, high levels of the protein APOBEC3B drove a high rate of tumor mutations. Yet at the same time, these levels of APOBEC3B also sensitized cells to treatment with immune checkpoint blockade, a major mechanism of immunotherapy.

"When you put that in the context of vaccine therapy, the mutations generate neoepitopes—a type of peptide that is a prime target for killer T cells," says Dr. Vile. "So that, combined with the checkpoint blockade, make for a potential cross-tumor therapy."

The results showed a high rate of cures in subcutaneous melanoma and brain tumor models, and effectiveness no matter the tumor type or location. The results also showed that an individualized approach for each patient is not required. The team are hoping to translate this work into clinical trials for pediatric brain tumors within the next year.

Provided by Mayo Clinic