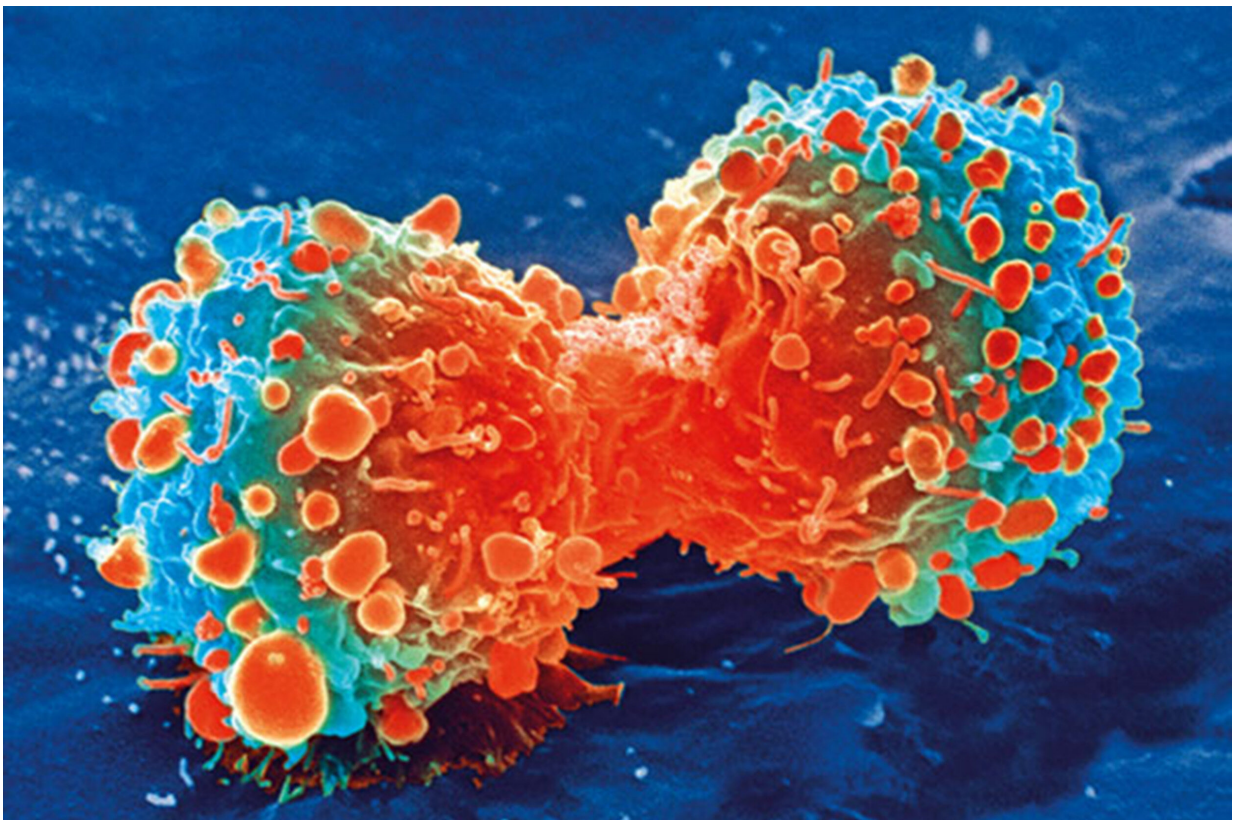
MedicalXpress

Tumor-infiltrating lymphocyte therapy marks a milestone in cancer treatment, researchers say

July 19 2024



Cancer cell during cell division. Credit: National Institutes of Health

The recent U.S. Food and Drug Administration approval of lifileucel, the first commercial tumor-infiltrating lymphocyte (TIL) therapy for

advanced melanoma, marks a significant breakthrough in cancer therapy. In a new commentary published in *Cancer Cell*, Moffitt Cancer Center scientists provide a comprehensive overview of the therapy's development and highlight its transformative potential.

"TIL therapy represents a major advancement in personalized cancer treatment, offering new possibilities for patients with treatment-resistant cancers," said Amod Sarnaik, M.D., lead author and senior member of the Cutaneous Oncology Department at Moffitt.

Tumor-infiltrating lymphocyte therapy has been in development for several decades. Preclinical studies evaluating its efficacy began at the National Cancer Institute (NCI) in the early 1980s. James J. Mulé, IPh.D., a world-renowned immunologist and associate center director of Translational Science at Moffitt, brought TIL research to the cancer center in 2003. Since then, Moffitt has played a pivotal role in developing and validating the immunotherapy.

In 2010, Moffitt opened its first TIL trials, the first center outside of the NCI to treat patients with the investigational therapy. This initial study, treating 13 patients with advanced metastatic melanoma, yielded promising results: five responses, including two complete responses lasting beyond five years. The commentary examines Moffitt's subsequent clinical trials, which aimed to address the high dropout rate due to disease progression during TIL manufacturing. These trials combined TIL therapy with newly approved anti-melanoma agents, significantly reducing the dropout rate from 32% to 5%.

Moffitt is also working on the next generation of TIL therapy. Shari Pilon-Thomas, Ph.D., and other immunologists at the center are investigating innovative ways to stimulate and improve TIL therapy growth and manufacturing and determine the best infusion timing to ensure optimal patient outcomes. Moffitt researchers are also expanding

this therapeutic approach to treat other solid tumor cancer types, such as lung, sarcoma, cervical and bladder.

"We are at the beginning of unlocking the potential of T-cell and cell therapies for treating advanced cancers. The FDA's approval of lifileucel is a monumental step to inspire further investment and innovation in T-cell therapies, particularly TIL therapy," said Moffitt President and CEO Patrick Hwu, M.D. "Our pioneering research at Moffitt into next-generation TIL therapies aims to extend these lifesaving treatments to a broader range of cancer patients."

More information: Amod A. Sarnaik et al, Tumor-infiltrating lymphocytes: A new hope, *Cancer Cell* (2024). DOI: 10.1016/j.ccell.2024.06.015

Provided by H. Lee Moffitt Cancer Center & Research Institute