OUR JOURNEY of HOPE®

What You Should Know About IMMUNOTHERAPY

What is immunotherapy?

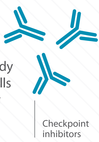
Immunotherapy is a broad category of cancer therapies that uses the body's immune system to recognize and attack cancer cells. Immunotherapy may be used in combination with other cancer treatments, such as chemotherapy, radiation and surgery.

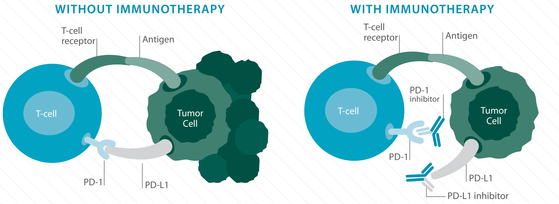
T-cells and other immune cells are our bodies' police officers. When an infection or invader is detected, immune cells are alerted through a series of chemical signals, like a police station would radio officers. Cancer cells have ways of disguising themselves from the patrolling immune cells. Immunotherapy is intended to strip that disguise and expose the cancer cells to the immune system.

Types of immunotherapy

CHECKPOINT INHIBITORS

A key function of the immune system is to distinguish normal cells in the body from foreign cells. To do this, it uses receptor proteins on certain immune cells that need to be activated (or deactivated) at certain checkpoints. If not for these checkpoints, the immune system would attack healthy cells.





Current checkpoint inhibitor drugs target the PD-1 and CTLA-4 receptors. Cancer cells are able to send signals to those receptors, tricking the immune system into seeing them as healthy cells. Checkpoint inhibitors disrupt those signals and expose the cancer cells to an immune attack.

COMMON CHECKPOINT INHIBITOR DRUGS:

- Ipilimumab (Yervoy®)
- Pembrolizumab (Keytruda®)
- Nivolumab (Opdivo®)
- Atezolizumab (Tecentriq®)

** These types of drugs have been approved by the U.S. Food and Drug Administration to treat several types of cancer, including advanced melanoma, non-small cell lung cancer, kidney cancer, bladder cancer and/or Hodgkin lymphoma.*

CYTOKINES

Cytokines are chemicals made by some immune system cells. They are crucial in controlling the growth and activity of other immune system cells and blood cells.

COMMON CYTOKINES USED IN CANCER THERAPY:

- Interleukin-2 (IL-2) helps immune system cells grow and divide more quickly.
- Interferons-alpha (IFN-alpha) boosts the ability of certain immune cells to attack cancer cells.

** These types of drugs have been approved by the FDA to treat several types of cancer, including kidney cancer and melanoma and/or circulatory cancers such as leukemia and lymphoma.*

VACCINES

Vaccines take on a variety of roles in cancer treatment. Like traditional vaccines, human papillomavirus (HPV) treatments are intended to prevent cancer of the cervix. Other cancer vaccines are given after the disease has been diagnosed and are designed to get the immune system to attack cancer cells.

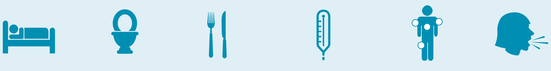
COMMON CANCER VACCINES:

- Human papillomavirus quadrivalent (Gardasil®)Human Papillomavirus 9-valent (Gardasil 9®)
- Human papillomavirus bivalent (Cervarix®)
- Sipuleucel-T (Provenge©)
- Bacillus Calmette-Guerin (BCG) vaccine

** HPV vaccines are approved to help prevent cervical cancer and genital warts. Sipuleucel is approved by the FDA to treat prostate cancer. The BCG vaccine was designed to treat tuberculosis, but is now approved to treat bladder cancer.*

Side effects

Because immunotherapy helps activate immune cells in the body, some of those cells may attack healthy cells. Common side effects of immunotherapy drugs include:



How some drugs get their names

The generic names of most drugs may seem like an unpronounceable alphabet soup. But there is a pattern to how some drugs are named, to indicate their structure and pharmacological class.

Antibody names are distinguished by four main differentiators:

The prefix, or first and/or second syllables, are designated by the manufacturer. These must follow certain guidelines, and should sound alike.

Drugs with the suffix "umab," such as ipilimumab and nivolumab, are human monoclonal antibodies.

Drugs with the suffix "zumab," such as pembrolizumab and trastuzumab, are humanized monoclonal antibodies.

Drugs with the suffix "ximab," such as rituximab, are chimeric antibodies.

Clinical trials

Many clinical trials are being conducted on immunotherapy cancer treatments.

TO LEARN MORE

Call 1-800-296-9333

Email the clinical trials team at clinicaltrials@ctca-hope.com

OUR JOURNEY of HOPE®

SOURCES
cancer.org, cancer.gov