A Recommendation of the Cancer Moonshot Blue Ribbon Panel

IOTN

THE IMMUNO-ONCOLOGY TRANSLATIONAL NETWORK

Advancing Research Progress to Improve Immunotherapy and Immunoprevention

Blue Ribbon Panel's Recommendation:

Create A Translational Science Network Devoted to Immunotherapy

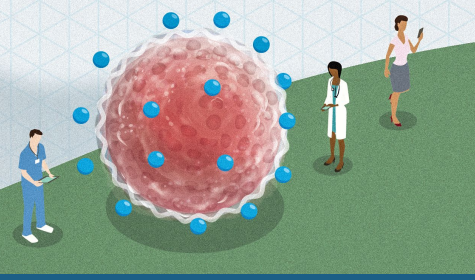
Immunotherapies leverage the ability of the immune system to recognize tumors as "foreign" and kill them. Immunoprevention approaches enhance immunity to prevent the development of cancer.

Despite advances in immunotherapy and immunoprevention that have been reported over the last decade, several research challenges need to be addressed to improve their effectiveness for diverse populations of cancer patients. To overcome these challenges, researchers need to understand the basic mechanisms of tumor immunity and effective immuno-oncology approaches, which can lead to the successful development of preclinical immunotherapeutic and immunoprevention strategies.

To address research challenges in immunotherapy and immunoprevention, the Cancer Moonshot℠ Blue Ribbon Panel recommended the creation of a translational science network to advance immunotherapy for adult cancer patients. In response to this recommendation, the Immuno-Oncology Translational Network (IOTN) was formed. This collaborative network of researchers is performing preclinical studies to 1) increase the understanding of the immune system that will improve the efficacy, durability, and safety of immunotherapies across the spectrum of adult cancers, and to 2) design immune-based approaches to prevent cancers before they occur. The IOTN ultimately aims to translate immuno-oncology findings into clinically effective immunotherapy and immunoprevention approaches.

WHY DO WE NEED AN IMMUNOTHERAPY NETWORK?

- To understand complex tumor-immune system interactions
- To identify immunological targets expressed by tumors
- To determine mechanisms of effective immunotherapies
- To examine the biology of side effects from immunotherapy
- To develop immuno-oncology approaches to prevent cancer



The **Power** of **Collaboration** and **Immunology**

Multidisciplinary researchers are working together in the IOTN consortium to improve immunotherapy and immunoprevention strategies for many different types of cancers.

HOW WE'RE IMPROVING IMMUNOTHERAPY AND IMMUNOPREVENTION

Investigators involved in Immunotherapy Research Projects of the IOTN are performing preclinical studies to define immune interactions within tumors, identify new targets for immunotherapies, understand mechanisms of resistance to immunotherapies, and test the effectiveness of new immunotherapeutic approaches.

The IOTN Immunoprevention Research Projects are identifying targets of the immune system found in pre-cancerous tissues and developing early interventions, such as cancer vaccines, based on these targets to prevent cancer. These studies are focusing on the prevention of high-risk adult cancers, such as colon cancer, breast cancer, and ovarian cancer.

The Immuno-Engineering to Improve Immunotherapy (i3) Centers of the IOTN are using bioengineering and systems biology approaches to build more effective, safer, and broadly available immunotherapies for a diverse adult cancer patient population.

IOTN researchers working on Research Projects for Mitigating Immune-Related Adverse Events are investigating ways to improve cancer immunotherapies by eliminating or reducing harmful side effects.

Along with these research projects, the IOTN includes a Cellular Immunotherapy Data Resource (CIDR) and a Data Management Resource Center (DMRC). The CIDR is collecting data about adult cancer patients being treated with cell-based immunotherapies that can be used to inform the design of future preclinical and clinical studies. The DMRC coordinates data sharing across the network, promotes outreach of IOTN findings and resources with the broader research community, and facilitates collaborations of the network.

Patient advocates of the IOTN provide input from the cancer patient perspective on research directions for the IOTN, contribute to the development of IOTN collaborative activities, and help IOTN researchers communicate scientific findings about immunotherapy and immuno-prevention to the public. The researchers and patient advocates involved with the various multidisciplinary IOTN projects are collaborating across the network to achieve the IOTN goals of improving the understanding of tumor-immune system interactions and developing successful immunotherapy and immunoprevention strategies.

OUR GOALS

- Increase understanding of tumor immunity and identify new targets
- Develop improved immunotherapy and immunoprevention strategies
- Advance cancer research by sharing data, knowledge, and resources
- Mitigate harmful side effects caused by immunotherapies
- Accelerate immuno-oncology through collaboration

HOW WE CONTRIBUTE TO THE CANCER MOONSHOT

The IOTN is part of the Cancer Moonshot, which aims to accelerate progress in cancer research, encourage collaboration, and enhance data sharing. The IOTN is contributing to these goals by advancing research to improve the effectiveness of immunotherapy and immunoprevention for diverse cancer patient populations.

Researchers, patient advocates, staff from the National institutes of Health, and the IOTN are collaborating and sharing resources to accelerate preclinical research progress in immuno-oncology across the spectrum of cancers. Additionally, groups within the IOTN are working together to identify barriers for IOTN research in different scientific areas and to develop approaches to overcome these barriers.

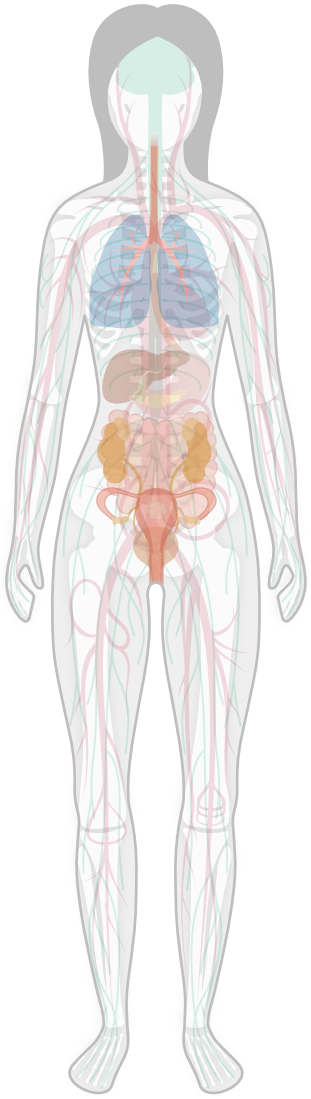
Along with interactions within the network, the IOTN is collaborating with other Cancer Moonshot initiatives and NCI programs investigating tumor immunity to enhance the design of successful immunotherapy and immunoprevention strategies.

Further, the IOTN is sharing data, knowledge, and resources with the broader research community to accelerate studies of cancer. Ultimately, the findings from the IOTN could be translated into the development of safer and more effective clinical immunotherapies and the design of successful immune-based approaches to prevent cancers.

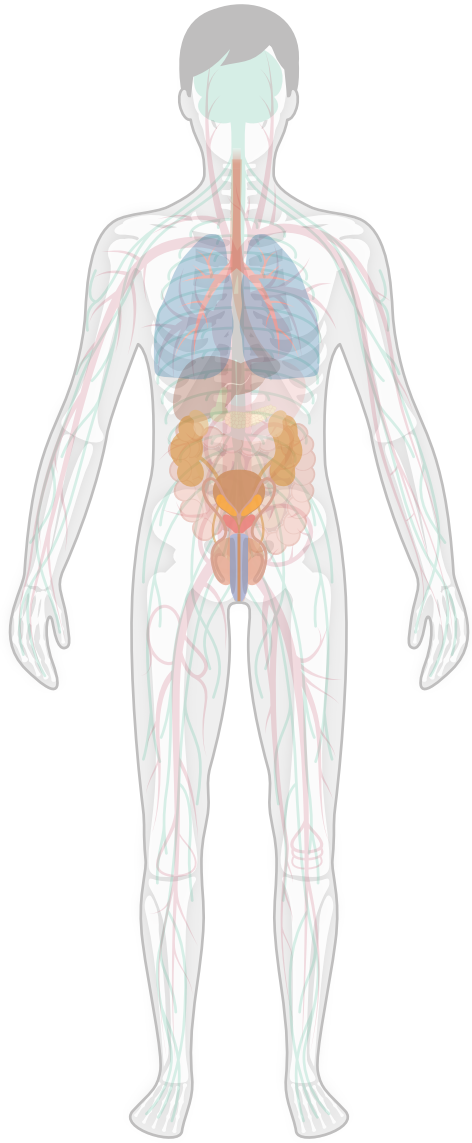
> "The IOTN is working to extend early successes in cancer immunotherapy to virtually all tumor types through improved understanding of the mechanisms that enable and limit immunotherapy."
>
> **Douglas R. Lowy, M.D.**
> Acting Director
> National Cancer Institute

IOTN **Research Areas**

The IOTN is studying immuno-oncology in cancers across different organs of the body. To target this spectrum of tumors, our network is integrating a wide range of preclinical approaches to understand mechanisms of tumor immunity and effective immunotherapy and immunoprevention approaches. Additionally, the IOTN is working to reduce health disparities, enhance data sharing, and encourage collaborations.



- antibody engineering
- B cells
- cancer vaccine
- CAR T cells
- cell therapy
- checkpoint blockade
- collaboration
- combination therapy
- data sharing
- exosomes
- genomics
- health disparities research
- immune evasion
- immune microenvironment
- immune modulators
- immuno-radiotherapy
- immunoprevention
- immunosuppression
- inflammation
- lymphocyte trafficking
- metabolism
- mitigating adverse events
- multidisciplinary research
- neoantigen
- NK cells
- overcoming resistance
- stem cell transplantation
- TCR discovery
- technology
- translation



NIH NATIONAL CANCER INSTITUTE

IOTN Immuno-Oncology Translational Network

NCI CANCER MOONSHOT
Immuno-Oncology Translation Network
A program of the National Cancer Institute of the National Institutes of Health

LEARN MORE ABOUT **IOTN**

Find information about collaborative IOTN research and resources:
iotnmoonshot.org | cancer.gov/iotn | @IOTNmoonshot | cancer.gov/brp