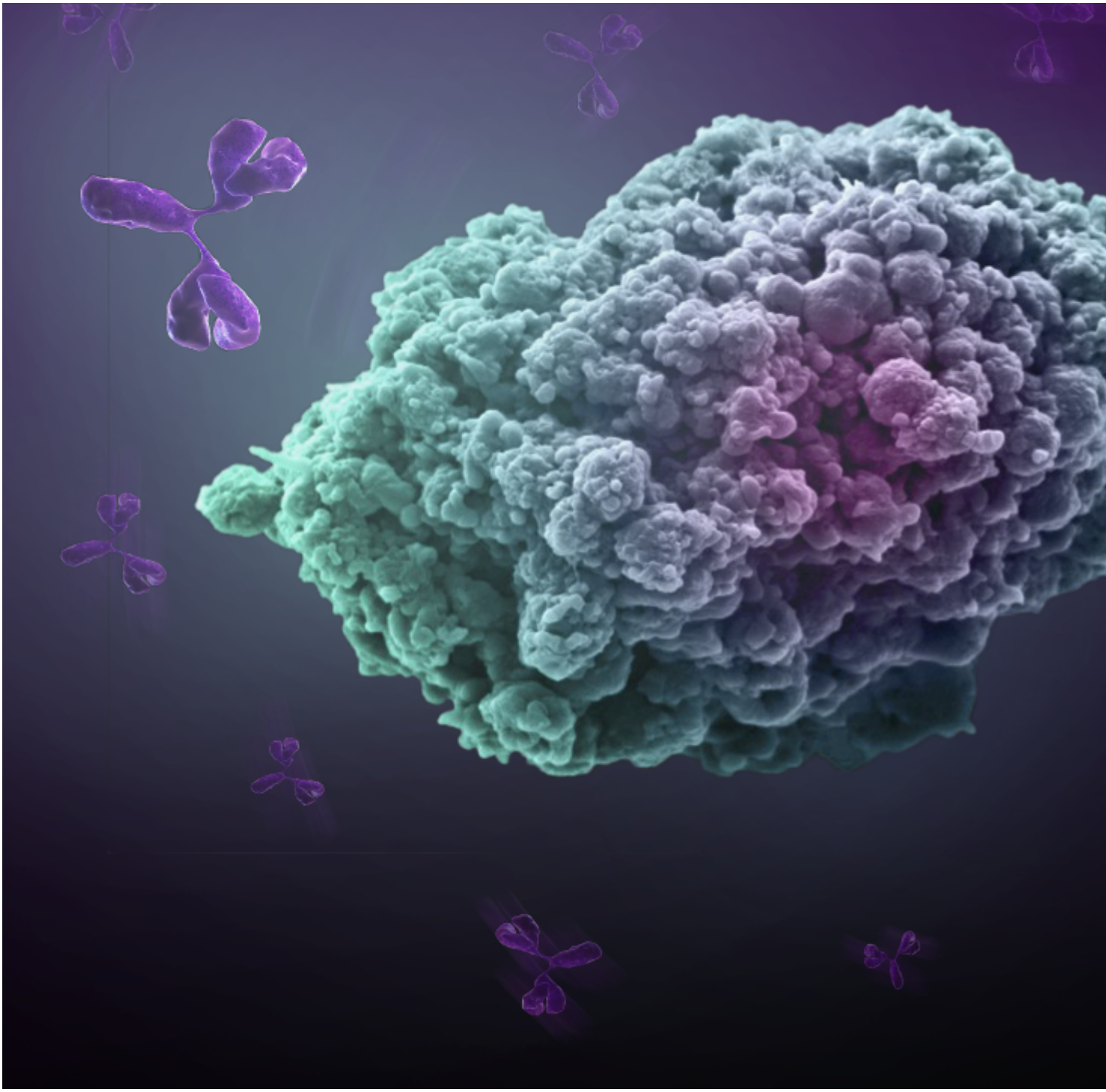
Immuno-oncology [1]

How can we treat patients so they become immune to their cancers?

Tumors are masters of defense and deception, evading our immune systems with many molecular tricks. But new immunotherapies are outsmarting tumors and achieving dramatic early successes in patients.

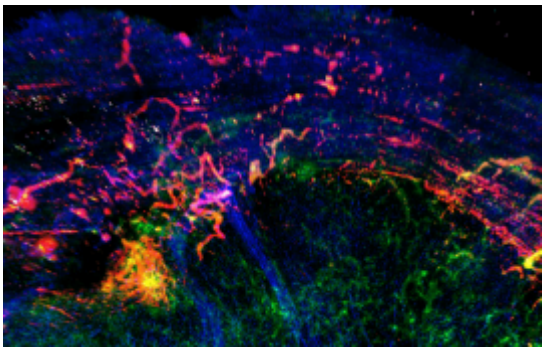


“Cancer cells retain parts of healthy cells that can prevent damage by the immune system, resulting in a condition of immune gridlock,” says Glenn Dranoff, Global Head of Immuno-oncology, at the Novartis Institutes for BioMedical Research [2](NIBR). “Cancer immunology zeroes in on this dynamic of competing signals and drives the immune response toward recognizing cancer as dangerous.”

Our immuno-oncology researchers are developing a diverse and deep portfolio of potential immune treatments.

Led by Dranoff, the team investigates three key steps in the immune response to cancer—education, activation and dissemination of immune cells to destroy tumors. We are seeking ways to improve immune cell activity at each step, and to combine these therapies

with other treatments to offer the best outcomes for each patient.



Discovery [3]

Visualizing immuno-oncology research [4]

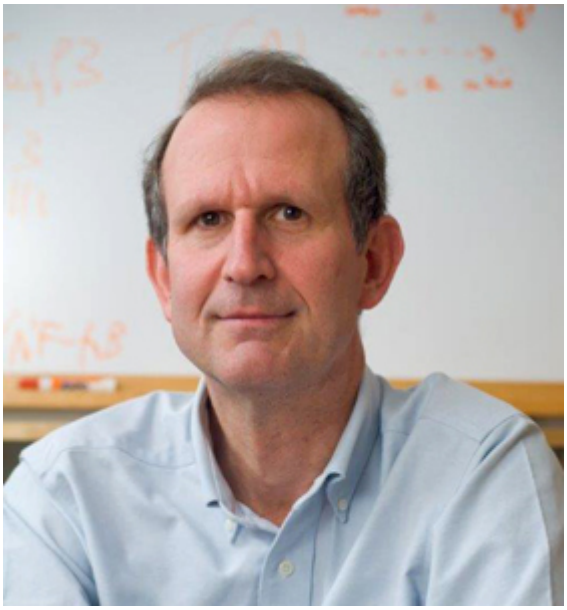
One of our efforts is a landmark collaboration with the University of Pennsylvania on chimeric antigen receptor T (CAR-T) cell technology, which trains a patient's own T cells to seek and destroy specific cancer cells.

Another highly promising approach is "checkpoint inhibitor" drugs that can remove the brakes that cancer places on T cells. We have early clinical trials underway for inhibitors of PD-1 (programmed cell death protein 1), LAG-3 (lymphocyte activation gene 3), and other key molecular targets in certain solid tumors.

We also are expanding our pipeline of potential immune therapies through collaborations. For instance, we work with Aduro Biotech to develop therapies that target the STING (stimulator of interferon genes) molecular pathway, which activates several signaling pathways that target disease. In animal models, agents that activate STING have completely eliminated certain tumors.

All our efforts build on the long history of cancer immunotherapy research. In the 1890s, for example, surgeon William Coley sought to spark immune reactions against cancer by injecting bacteria into patients with bone and soft-tissue tumors. Over 100 years passed before immune therapy showed consistent results in treating many types of cancers.

> One of the exciting aspects of this work is that rather than developing treatments for very small subsets of patients, we're now contemplating treatments that are broadly active for patients.
>
> **Glenn Dranoff** , Global Head of Immuno-oncology, Novartis Institutes for BioMedical Research


Glenn Dranoff, Global Head of Immuno-oncology, Novartis Institutes for BioMedical Research

In recent years, however, we have seen an explosion of positive clinical evidence for a few newer types of cancer immunotherapies—primarily CAR-T and checkpoint blockade drugs.

Checkpoint inhibitors have shown early promise for melanoma. “About 20% of advanced melanoma patients are surviving now beyond 10 years with no other therapy, which illustrates that if you can trigger an effective immune response it has memory that goes on and on,” Dranoff says.

Rapid advances across the field of cancer immunotherapy now are driving other approaches toward clinical trials at an extraordinary pace. “Our understanding of the real underpinnings of how the STING pathway works on dendritic cells, for example, is only a few years old,” he notes.

Importantly, clinical trials are also uncovering the potential benefits of combining immunotherapies with other immune treatments and targeted small molecules, to hit multiple trigger points for the immune system.

“Our goal will be to take most human tumors, which don’t have evidence of an immune response, and convert them to have a response so that they become highly sensitive to treatment,” says Dranoff. “One of the exciting aspects of this work is that rather than developing treatments for very small subsets of patients, we’re now contemplating treatments that are broadly active for patients.”

Video of The science behind CAR-T cell therapy

Work with us

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Links
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