Hope in Action: A Patient's Guide to Cancer Immunotherapy

A Patient's Perspective

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Melanoma Survivor

My name is Brendan Connors, and I'm a stage 4 metastatic melanoma cancer survivor. I was diagnosed in 2011, at a time when there wasn't a clear path for treatment. I was fortunate to get into 2 immunotherapy clinical trials: first at the National Institutes of Health (NIH) and the National Cancer Institute (NCI), where I started on interleukin-2, and then later at Memorial Sloan Kettering Cancer Center, where I was treated with a combination of ipilimumab (Yervoy®) and nivolumab (Opdivo®). I've been cancer-free since completing those trials.

When I was diagnosed at 27-years-old, I didn't even know how many stages of cancer there were. It was a lot to take in when the doctor explained that "stage 4 metastatic" meant the cancer had spread from its original area.

Being on the cutting edge of these trials meant that there wasn't a lot of existing research. The doctors didn't have all the answers about what to expect or a clear timeline. In a way, I was helping them figure out the timeline as we went along. I always said "yes" to any requests for additional blood samples or tumor retesting because I realized that for them to do the research, I had to help them. I understood that the data I provided, even if it was just for melanoma, could eventually help patients with other types of cancer.

The way this guide starts – 'You Are Not Alone' – reframes everything. You're not alone. There are people to help and support you. There's information available to you – the Q&A section of this guide answers questions you didn't even know you had. It's going to sound cliché, but stay positive. I wore a Superman shirt to treatment.

That mindset? It matters.

What to Know After a Cancer Diagnosis

You are not alone.

Hearing the words "You have cancer" is overwhelming. You may feel scared, confused, or uncertain about what comes next. It's okay to feel this way. Many people have been where you are and are here to support you.

Every person's cancer journey is unique, and there are many treatment options, more than ever before. This guide from the Cancer Research Institute (CRI) was created to help you understand a treatment option called immunotherapy and, if it's right for you, what to expect throughout your treatment journey and beyond.

Making a Decision: Understanding Immunotherapy

What are the common types of cancer treatment?

There are many good options for cancer treatment, and most treatment plans will include a combination of multiple treatment types, including surgery, radiation, chemotherapy, and/or immunotherapy.

- **Surgery** is a medical procedure that involves removing cancerous tissue, such as a tumor, from the body. Surgery is most effective for solid tumors that are in one place in the body and have not spread.
- **Radiation therapy** is usually delivered through a special machine, but some radiotherapies can be delivered by an implant or intravenously. Radiation treatment works by damaging DNA in cells and tissue and can be used to target cancer cells.
- **Chemotherapy** can be delivered intravenously (via infusion or IV), as an injection, or sometimes even a pill. Chemotherapy treatments are designed to target fast-dividing cells – these could include both cancer cells and healthy ones.
- **Immunotherapy,** like chemotherapy, is often delivered intravenously, topically, or as an injection. Immunotherapy treatment activates, trains, and supercharges your immune system to detect and attack cancer cells.

How does immunotherapy work?

Immunotherapy uses the power of your body's own immune system to prevent, control, and eliminate cancer. Your immune system is precise and is able to distinguish between healthy and cancer cells. It can also adapt to changes in cancer cells over time and can remember what cancer cells look like. Immunotherapies work by helping to educate your immune system to recognize and attack cancer cells. This can involve providing your body with additional tools, such as proteins or antibodies, to strengthen your immune response. Immunotherapy is sometimes also called immuno-oncology.

What types of cancers can immunotherapy treat?

Immunotherapies are used to treat more than 30 different types of cancers, including bladder, brain, breast, cervical, childhood cancer, colorectal, esophageal, head and neck, kidney, leukemia, liver, lung, lymphoma, melanoma, multiple myeloma, ovarian, pancreatic, prostate, sarcoma, skin, stomach, and uterine (endometrial). As of 2024, the U.S. Food and Drug Administration (FDA) has approved 40 immunotherapies, and there are ongoing clinical trials for nearly every type of cancer.

What types of immunotherapy treatments are available?

There are several types of immunotherapies, and each works differently to enhance your immune system's response to cancer. This table can help you learn more.

Immunotherapy types	How they work with your immune system	What types of cancer they treat
Immune checkpoint inhibitor (ICI)	ICIs are drugs that help your immune system recognize and attack cancer cells. They block proteins called checkpoints that stop immune cells from attacking cancer.	There are 12 ICIs that have been approved for more than 20 specific cancers. ICIs can usually treat more than 1 cancer type and often have good responses in patients with advanced or hard-to-treat cancers.
Bispecific antibody	Bispecific antibodies are proteins that are designed to bind to 2 different targets at the same time. One part of the protein attaches to a cancer cell, and the other part connects to an immune cell, bringing them together so the immune cell can attack the cancer.	There are 8 bispecific antibodies that have been approved to treat leukemia, melanoma, multiple myeloma, non-Hodgkin lymphoma, and small cell lung cancer. Some bispecific antibodies are also called bispecific T-cell engagers (BiTEs).
Adoptive cell therapy	Adoptive cell therapies involve taking your own immune cells and expanding or modifying them to enhance their cancer-fighting capabilities. Your cells are then reintroduced to your body, where they can seek out and eliminate cancer cells.	Most adoptive cell therapies that have been approved (8 out of 9) are CAR T-cell therapies. CAR T-cell therapies can be used to treat a variety of blood cancers (including leukemia, multiple myeloma, non-Hodgkin lymphoma), bladder cancer, melanoma, and sarcoma.
Non-ICI immunomodulator	Immunomodulators are drugs that boost your body's overall immune response. They can kick start your immune system or promote immune cell growth and activity.	There are 8 non-ICI immunomodulators that have been approved to treat basal cell carcinoma, bladder cancer, leukemia, non-Hodgkin lymphoma, melanoma, and renal cell carcinoma.
Oncolytic virus	Oncolytic viruses infect tumor cells and cause them to self-destruct. This can attract the attention of your immune cells to eliminate the main tumor and potentially other tumors throughout your body.	T-VEC (Imlygic®) is the only oncolytic virus that has been approved to treat cancer, specifically melanoma. T-VEC is a modified herpes simplex virus (HSV) that infects tumor cells and promotes their destruction.
Cancer vaccine	Cancer vaccines are designed to help your immune system recognize and attack cancer cells that have cancer-specific proteins.	Only 2 vaccines have been approved to treat cancer: a bladder cancer vaccine that uses weakened bacteria and a prostate cancer vaccine made of your own stimulated immune cells.

What tests do I need before starting immunotherapy?

Your doctor will likely consider several factors before starting you on an immunotherapy treatment – including what type of cancer type you have, what stage the cancer is, and any previous treatments you've received. Your doctor may also order imaging scans, a biopsy, or further lab testing, such as genetic or DNA sequencing, to see if your cancer has certain features or unique characteristics called biomarkers. Biomarkers can help predict how well you might respond to certain immunotherapies.

How expensive is immunotherapy, and will my insurance cover it?

Immunotherapy can be very expensive, often ranging from $100,000 to $200,000 or more per year. The exact cost will depend on the type of treatment, how often it's given, and how long you need it. Luckily, in many cases, private insurance, Medicare, and Medicaid will cover immunotherapy, especially if it's FDA-approved for the type of cancer that you have. If you're uninsured or underinsured, you can ask your doctor about financial aid, drug assistance programs, or clinical trials.

Will immunotherapy cure my cancer?

Immunotherapy is a very effective treatment for many kinds of cancer, but it doesn't always work for everyone. For some people, immunotherapy can lead to remission. For others, it can help manage cancer or prolong survival. Your doctor can help you better understand how effective immunotherapy may be for your specific case.

Starting Treatment: What to Expect

What is the treatment process like?

The treatment process depends largely on what type of cancer you have, the specific immunotherapy your doctor prescribes, and your treatment plan. Many immunotherapies are given through an IV in a doctor's office, outpatient clinic, hospital, or cancer center. Appointments may vary, often every 2 to 6 weeks, and last about 30 minutes to a few hours. Immunotherapies can also come in the form of pills, topical creams that are applied to the skin, or be given directly into the bladder (intravesical).

What are the possible side effects of immunotherapy?

Because immunotherapies work differently than other cancer treatments, their side effects are also different. Immunotherapy side effects can appear early, within days of starting treatment, but they usually develop several weeks or months later. The most common side effects are fatigue and skin reactions, including rash, itchiness, and redness, particularly at an injection site. Other common side effects you may experience include diarrhea, flu-like symptoms, and mouth sores. Hair loss is not a common side effect of immunotherapy but can occur if your treatment is given in combination with chemotherapy.

More serious side effects of immunotherapy are rare and can be similar to autoimmune disorders, like type 1 diabetes or severe arthritis. In most cases, immunotherapy-related side effects can be managed safely as long as the potential side effects are recognized and addressed early.

How will I know if my immunotherapy treatment is working?

Throughout your treatment, you will have regular checkups with your doctor, and they may order lab tests or imaging scans to check whether your cancer has responded to the treatment. It is important to know that immunotherapy treatments may take longer to produce detectable signs of tumor shrinkage compared to other cancer treatments. Sometimes tumors may even appear to grow on scans before getting smaller. This effect may be caused by immune cells infiltrating and attacking the cancer, which can cause the tumor mass to initially appear larger before it starts to shrink.

How long will I need to stay on immunotherapy?

The length of time you will receive immunotherapy treatment depends on the type of cancer you have, the specific immunotherapy your doctor prescribes, and your treatment plan. Some people stay on immunotherapy for a set number of months, while others continue for a year or longer. Clinical studies have shown that the benefits of immunotherapy may extend beyond the time of treatment and can result in longer-lasting remissions because the immune system can "remember" cancer cells.

How will getting immunotherapy affect my daily life?

Many people maintain daily routines, including work and exercise, while receiving cancer immunotherapy treatment. However, your energy level may fluctuate. It is generally important to stay hydrated and eat a balanced diet, stay as physically active as you are able, avoid alcohol and smoking, manage stress (such as through yoga, mindfulness, or support groups), and get plenty of rest. Most importantly, listen to your body and talk to your doctor about any changes or concerns.

Looking and Living Forward: After Treatment and Ongoing Support

What ongoing care and monitoring will I need?

After you finish treatment, you will still need regular checkups with your doctor to monitor for signs of recurrence and manage any long-term side effects. You may be asked to complete physical exams, blood tests, imaging scans, and have conversations about how you're feeling physically and emotionally.

What if immunotherapy doesn't work?

Not every patient responds to immunotherapy, and it's okay to feel frustrated or discouraged if you don't see the results you hoped for. Sometimes cancer cells can hide from the immune system or the immune system isn't strong enough to respond. If immunotherapy doesn't help your cancer, your doctor may recommend another immunotherapy, a different type of treatment, or a clinical trial that could be a better fit for your specific case.

What are clinical trials, and how do they work?

Clinical trials are research studies that test the effectiveness and safety of new drugs and treatments. For patients with cancer, they offer potential access to cutting-edge therapies that are not yet approved by the FDA, in a very carefully regulated setting. To learn more about clinical trials, ask your doctor or use CRI's Clinical Trial Finder at **www.cancerresearch.org/cancer-clinical-trials** to find trials that you may be eligible for.

What if the cancer comes back?

It's scary to think about, but recurrence is a possibility. Cancer can come back if some cancer cells were not fully destroyed or if they become active again over time. In some cases, immunotherapy can be restarted or combined with other treatments, or your doctor may recommend a clinical trial.

Where can I find support groups or other patients I can talk to who are going through or have completed immunotherapy treatment?

Support groups, online forums, and one-on-one peer support can help you connect with others going through similar experiences. You can explore personal stories from patients with cancer and survivors on CRI's website at **www.cancerresearch.org/immunotherapy-stories#patients**. You can find additional programs and services that may be helpful on the American Cancer Society's website at **www.cancer.org/support-programs-and-services.html**.

Honor Your Strength

Cancer is a journey, not a sprint. While the road can be tough, scientific research and clinical advancements are transforming what it means to live with, and beyond, a cancer diagnosis. Many patients today are living longer, healthier lives thanks to immunotherapy.

Choosing a cancer treatment path is deeply personal. What matters most is finding the treatment that's right for you, with the support and guidance you need every step of the way. Let this guide be your starting point. Stay curious; ask questions. Hope isn't just an idea – it's something science is turning into reality every day.

Acknowledgements

We extend our deepest gratitude to the CRI ImmunoAdvocates, a group of patients with cancers treated by immunotherapy, who generously and graciously shared their experiences, insights, and time to help shape this guide. By telling your stories and offering your perspectives, you've helped ensure that newly diagnosed patients feel seen, supported, and empowered as they begin their cancer immunotherapy journey.

Appendix

10 Questions to Ask Your Doctor About Cancer and Immunotherapy

Being diagnosed with cancer can feel overwhelming, and understanding your treatment options can make a big difference. Asking the right questions can help you take an active role in your care, make informed decisions, and feel more confident as you move forward. Here are 10 key questions you can use in your conversations with your doctor:

1. What type and stage of cancer do I have, and what does it mean for my treatment options?
2. Is immunotherapy a treatment option for my cancer, and how would it work for me?
3. Are there any tests such as biomarker or genetic tests that can show if immunotherapy might work for me?
4. What are the benefits and risks of immunotherapy compared to other treatments like chemotherapy or radiation?
5. Will I receive immunotherapy alone or combined with other treatments?
6. What side effects should I expect, and how can we manage them?
7. How will we know if the treatment is working, and how often will we monitor my progress?
8. Am I eligible for any clinical trials involving immunotherapy?
9. What are the costs of treatment, and is it covered by my insurance?
10. What supportive resources – emotional, mental, or financial – are available for me and my family?

Types of Cancers that Immunotherapies Can Treat

This table shows the immunotherapies that have been approved by the FDA to treat different types of cancers. Many immunotherapies may only be recommended for a subset of patients with these cancers so ask your doctor to better understand if a certain immunotherapy is right for you. The color dots in the table indicate what type of immunotherapy that drug is.

- Immune checkpoint inhibitor (ICI)
- Non-ICI immunomodulator
- Adoptive cell therapy
- Bispecific antibody
- Cancer vaccine
- Oncolytic virus

Immunotherapy	Cancers treated	Immunotherapy	Cancers treated
Afamitresgene autoleucel (Tecelra®): a modified T cell that targets MAGE-A4 on tumor cells	Sarcoma	**Durvalumab (Imfinzi®):** a checkpoint inhibitor that targets the PD-1/PD-L1 pathway	Biliary tract cancer, bladder cancer, hepatocellular carcinoma (a type of liver cancer), non-small cell lung cancer, small cell lung cancer
Aldesleukin (Proleukin®): a cytokine that targets the IL-2 /IL-2R pathway	Melanoma, renal cell carcinoma (a type of kidney cancer)	**Elranatamab-bcmm (Elrexfio®):** a bispecific B-cell maturation antigen (BCMA)-directed CD3 T-cell engager	Multiple myeloma
Atezolizumab (Tecentriq®): a checkpoint inhibitor that targets the PD-1/PD-L1 pathway	Alveolar soft part sarcoma, bladder cancer, breast cancer, hepatocellular carcinoma (a type of liver cancer), melanoma, non-small cell lung cancer, small cell lung cancer	**Epcoritamab (Epkinly®):** a bispecific antibody that targets CD20 on tumor cells and CD3 on T cells	Non-Hodgkin lymphoma
Avelumab (Bavencio®): a checkpoint inhibitor that targets the PD-1/PD-L1 pathway	Bladder cancer, Merkel cell carcinoma (a type of skin cancer), renal cell carcinoma (a type of kidney cancer)	**Filgrastim (also called Granulocyte Colony-Stimulating Factor, G-CSF; many brand names):** an immunomodulatory cytokine	Leukemia
Axicabtagene ciloleucel (Yescarta®): a CD19-targeting CAR T-cell immunotherapy	Non-Hodgkin lymphoma	**Idecabtagene vicleucel (Abecma™):** a B-cell maturation antigen (BCMA)-targeting CAR T-cell immunotherapy	Multiple myeloma
Bacillus Calmette-Guérin (BCG) vaccine: uses weakened bacteria to stimulate the immune system	Bladder cancer	**Imiquimod (many brand names):** an immune adjuvant targeting the Toll-like receptor 7 (TLR7) pathway	Basal cell carcinoma (a type of skin cancer)
Blinatumomab (Blincyto®): a bispecific antibody that targets CD19 on tumor cells and CD3 on T cells	Leukemia	**Ipilimumab (Yervoy®):** a checkpoint inhibitor that targets the CTLA-4 pathway	Colorectal cancer, hepatocellular carcinoma (a type of liver cancer), malignant pleural mesothelioma, melanoma, non-small cell lung cancer, renal cell carcinoma (a type of kidney cancer)
Brexucabtagene autoleucel (Tecartus®): a CD19-targeting CAR T-cell immunotherapy	Non-Hodgkin lymphoma	**Lifileucel (Amtagvi™):** a tumor-derived T-cell immunotherapy	Melanoma
Cemiplimab (Libtayo®): a checkpoint inhibitor that targets the PD-1/PD-L1 pathway	Basal cell carcinoma (a type of skin cancer), cutaneous squamous cell carcinoma (a type of skin cancer), non-small cell lung cancer	**Lisocabtagene maraleucel (Breyanzi®):** a CD-19-targeting CAR-T cell immunotherapy	Non-Hodgkin lymphoma
Ciltacabtagene autoleucel (Carvykti®): a B-cell maturation antigen (BCMA)-targeting CAR T-cell immunotherapy	Multiple myeloma	**Mogamulizumab (Poteligeo®):** a monoclonal antibody that targets the CCR4 pathway	Non-Hodgkin lymphoma
Cosibelimab-ipdl (Unloxcyt™): a checkpoint inhibitor that targets the PD-1/PD-L1 pathway	Cutaneous squamous-cell carcinoma (a type of skin cancer)	**Mosunetuzumab (LunsumioTM):** a bispecific antibody that targets CD20 on lymphoma cells and CD3 on T cells	Non-Hodgkin lymphoma
Dostarlimab (Jemperli): a checkpoint inhibitor that targets the PD-1/PD-L1 pathway	Endometrial cancer, solid tumors that have DNA mismatch repair deficiency (dMMR)	**Nadofaragene firadenovec-vncg (Adstiladrin®):** adenoviral vector-based gene therapy	Bladder cancer

- Immune checkpoint inhibitor (ICI)
- Bispecific antibody
- Non-ICI immunomodulator
- Cancer vaccine
- Adoptive cell therapy
- Oncolytic virus

Immunotherapy		Cancers treated	Immunotherapy		Cancers treated
●	**Nivolumab (Opdivo®):** a checkpoint inhibitor that targets the PD-1/PD-L1 pathway	Bladder cancer, colorectal cancer, esophagus cancer, gastric (stomach) cancer, hepatocellular carcinoma (a type of liver cancer), head and neck cancer, Hodgkin lymphoma, malignant pleural mesothelioma, melanoma, non-small cell lung cancer, renal cell carcinoma (a type of kidney cancer), small cell lung cancer	●	**Talimogene laherparepvec (also called T-VEC, Imlygic®):** a modified herpes simplex virus (HSV) that infects tumor cells and promotes their destruction	Melanoma
●	**Nogapendekin alfa inbakicept-pmln (Anktiva®):** a cytokine that targets the IL-15 pathway	Bladder cancer	●	**Talquetamab-tgvs (Talvey®):** a bispecific antibody that targets G-protein coupled receptor family C group 5 member D (GPRC5D) on tumor cells and CD3 on T cells	Multiple myeloma
●	**Obecabtagene autoleucel (Aucatzyl®):** a CD19-targeting CAR T-cell immunotherapy	Acute lymphoblastic leukemia (ALL)	●	**Tarlatamab-dlle (Imdelltra™):** a bispecific antibody that targets Delta-like ligand 3 (DLL3) on cancer cells and CD3 on T cells	Small cell lung cancer
●	**Peginterferon alfa-2b (also called as Peg-Intron):** a cytokine that targets the interferon pathway	Melanoma	●	**Tebentafusp-tebn (Kimmtrak®):** a bispecific antibody that targets the gp100 protein on tumor cells and CD3 on T cells	Melanoma
●	**Pembrolizumab (Keytruda):** a checkpoint inhibitor targets the PD-1/PD-L1 pathway	Biliary tract cancer, bladder cancer, breast cancer, cervical cancer, colorectal cancer, cutaneous squamous cell carcinoma (a type of skin cancer), endometrial cancer, esophagus cancer, gastric (stomach) cancer, hepatocellular carcinoma (a type of liver cancer), head and neck cancer, Hodgkin lymphoma, malignant pleural mesothelioma, melanoma, Merkel cell carcinoma, non-small cell lung cancer, renal cell carcinoma (a type of kidney cancer), small cell lung cancer, cancers that have microsatellite instability-high (MSI-H) or mismatch repair deficient (dMMR), tumors that have a high mutational burden (TMB)	●	**Teclistimab-cqyv (Tecvayli®):** a bispecific antibody that targets B-cell maturation antigen (BCMA) on tumor cells and CD3 on T cells	Multiple myeloma
●	**Retifanlimab (Zynyz®):** a checkpoint inhibitor that targets the PD-1/PD-L1 pathway	Merkel cell carcinoma	●	**Tisagenlecleucel (Kymriah®):** a CD19-targeting CAR T-cell immunotherapy	Leukemia, non-Hodgkin lymphoma
●	**Sargramostim (also called Granulocyte Macrophage Colony-Stimulating Factor, GM-CSF; Leukine®):** an immunomodulatory cytokine	Hodgkin lymphoma, leukemia	●	**Tislelizumab (Tevimbra):** a checkpoint inhibitor that targets the PD-1/PD-L1 pathway	Esophageal squamous cell carcinoma, esophagus cancer, gastroesophageal junction adenocarcinoma
●	**Sipuleucel-T (Provenge®):** a vaccine composed of patients' own stimulated dendritic cells	Prostate cancer	●	**Toripalimab-tpzi (Loqtorzi™):** a checkpoint inhibitor that targets the PD-1/PD-L1 pathway	Nasopharyngeal carcinoma

Glossary

Adjuvant therapies

Adjuvant therapies are additional cancer treatments given after the primary treatment, such as surgery, to lower the risk of recurrence. Immunotherapies are often used as adjuvant therapies.

Adoptive T-cell therapy

Adoptive T-cell therapy is a type of immunotherapy that enhances the natural cancer-fighting ability of your body's T cells by removing immune cells, growing and/or making changes to them outside of your body, and then re-infusing them back into your body.

Antibodies

Antibodies are proteins that bind to antigens on harmful invaders in your body (such as germs and viruses). They also mark cells for attack and destruction by other immune cells.

Antibody-drug conjugates (ADCs)

Antibody-drug conjugates are a type of targeted cancer treatment in which a chemotherapy drug is attached to an antibody that delivers the drug directly to cancer cells.

Antigen

An antigen is any substance (such as a protein) that causes the immune system to respond. Cancer cells often have antigens that the immune system can learn to recognize and attack.

B cells

B cells are cells that release antibodies to defend against harmful invaders in your body. Each B cell is programmed to make one specific antibody (such as an antibody to the common cold virus).

Biomarkers

Biomarkers are proteins or genes that provide a more detailed understanding of a tumor, its prognosis, and the potential response to treatment.

Biopsy

A biopsy is a procedure in which a doctor removes a small sample of tissue. This sample is then examined under a microscope so that cellular abnormalities can be observed.

Bispecific antibodies

Bispecific antibodies are specially engineered proteins that can bind to two different targets at the same time to help the immune system attack cancer.

Cancer vaccines

Cancer vaccines are a type of immunotherapy that train the immune system to recognize and attack cancer. Some cancer vaccines prevent cancer, while others treat existing cancer.

Chemotherapy

Chemotherapy, often called "chemo", is a cancer treatment with drugs that kills fast-dividing cells. Chemotherapy can be used alone or with surgery, radiation, and/or immunotherapy.

Chimeric antigen receptor T-cells (CAR T-cells)

Chimeric antigen receptor (CAR) T-cells are a type of engineered T cell used in adoptive T-cell therapy. They have special receptors called CARs that recognize specific proteins on cancer cells and eliminate those cells.

Clinical trials

Clinical trials are an important part of medical research that form the basis for the approval of all new treatments. The primary goals of clinical trials are to figure out whether a treatment works and if it is safe.

Cytokines

Cytokines are messenger molecules that help control the growth and activity of your immune system cells and blood cells.

Genetic mutations

Genetic mutations are changes in your DNA sequence. Some genetic mutations are associated with some types of cancer, and some genetic mutations may indicate a better chance of response to a specific immunotherapy treatment.

Immune checkpoint inhibitors (ICIs)

Immune checkpoint inhibitors are a type of immunotherapy used to "release the brakes" on the immune system, allowing your body to respond more aggressively to cancer. ICIs are a type of immunomodulator.

Immune system

The immune system is a highly evolved network of organs, cells, and molecules that helps defend your body against threats such as bacteria, viruses, and cancer.

Immune-related side effects (irAEs)

Immune-related side effects are reactions that happen when the immune system becomes overactive and starts affecting healthy parts of the body. These side effects can impact organs like the skin, liver, lungs, or intestines and often need prompt treatment.

Immuno-oncology

Immuno-oncology is the study and development of cancer treatments that use your body's own immune system.

Immunomodulators

Immunomodulators, sometimes called immune modulators, are drugs that boost or modify how your immune system responds to cancer. They can enhance the activity of your immune cells or increase the production of signals (like cytokines) that help your body fight cancer more effectively.

Immunotherapy

Immunotherapy is a form of cancer treatment that uses the power of the body's own immune system to prevent, control, and eliminate cancer. Immunotherapy can be used for many types of cancer, either alone or in combination with other treatment types.

Monoclonal antibodies

Monoclonal antibodies are a special type of protein designed to target antigens, or markers, located on the surface of cancer cells. Antibodies locate antigens and recruit immune cells to attack.

Neoadjuvant therapies

Neoadjuvant therapies are additional cancer treatments given before the primary treatment, such as surgery, to make the primary treatment more effective. Immunotherapies are often used as neoadjuvant therapies.

Oncolytic virus therapy

Oncolytic virus therapy is a type of immunotherapy that uses a modified virus that can both cause tumor cells to self destruct and activate a greater immune response.

Personalized (or precision) medicine

Personalized or precision medicine uses information about a person's genes, proteins, and/or other factors to create a treatment plan for their specific cancer.

Proteins

Proteins are molecules made up of amino acids. They are the basis of your body's structures, such as skin and hair, and of other substances such as enzymes, cytokines, and antibodies.

Radiation

Radiation, or radiation therapy, uses high-energy particles or waves to destroy or damage cancer cells. It is one of the most common treatments for cancer and can be used alone or with other forms of treatment.

Recurrence

Recurrence is a term used to describe the return or progression of cancer following treatment.

Remission

Remission refers to a complete or partial disappearance of the signs and symptoms of cancer in response to treatment. It is a period in which the disease is considered under control.

Staging

Staging is used to determine the extent (or "stage") of cancer. It is based on whether a tumor is local to its area of origin or has spread to the lymph nodes or other parts of your body as well as how deeply it has invaded surrounding tissues.

T cells

T cells are cells that help identify and destroy infected or abnormal cells in your body. Some T cells directly kill their target cells, while others coordinate your immune response by signaling other immune cells.

Tumor

A tumor is an abnormal lump or mass of tissue. Tumors can be benign (non-cancerous) or malignant (cancerous).

Tumor microenvironment (TME)

The tumor microenvironment includes the cells, blood vessels, and other substances that surround and support a tumor. It can affect how the cancer grows and responds to treatment, including immunotherapy.

About CRI

The Cancer Research Institute (CRI) is a nonprofit organization dedicated to advancing the field of cancer immunotherapy through rigorous scientific research and global collaboration. Since 1953, CRI has been instrumental in uncovering the fundamental biology of the immune system and its application to cancer treatment, laying the groundwork for breakthroughs such as checkpoint blockade, cancer vaccines, and engineered cell therapies.

CRI's mission is to create a world immune to cancer by driving scientific discovery, accelerating collaboration, and turning breakthroughs into life-saving treatments. Our work bridges the gap between discovery and patient impact, ensuring that scientific innovation translates into real-world treatments.

To date, CRI has committed over $560 million to research impacting more than 30 cancer types. Our funding strategy is built on the framework of People × Biology × Data: supporting world-class scientists, deepening understanding of tumor–immune system interactions, and harnessing data to guide discovery and translation. By uniting these elements, CRI catalyzes innovation through our global research ecosystem to drive the next generation of discoveries forward.

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