

IMMUNOTHERAPY

THE FACTS | IMMUNE CHECKPOINT INHIBITORS

IMMUNE CHECKPOINT INHIBITORS →

A drug that blocks certain proteins like CTLA-4, PD-1, PDL-1 from interacting. By blocking the interaction of the protein with their receptors on the immune cells, the immune checkpoint inhibitors overcome one of cancer's main defenses against an immune system attack.

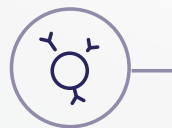
A protein or other molecule that is found only on cancer cells and not on normal cells. When the immune system detects a cancer antigen, it initiates an attack that can eliminate the cancer cell.

← **CANCER ANTIGEN**

MECHANISM OF ACTION



The human body's immune system has **T cells that constantly patrol the body** looking for signs of disease or infection



When a T cell encounters another cell, it **probes certain proteins on its surface to make sure that it is normal**. If the proteins indicate the cell is normal and healthy, the T cell leaves it alone.



If the cell is infected or cancerous, the **T cell will detect it and lead an attack against it**.



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Some cancer cells make high levels of immune checkpoint proteins that can pull the brakes of the T cell.

These cancer cells are essentially using a stop button on the immune system and the T cells can no longer kill them.



Drugs that block these checkpoint proteins are called **immune checkpoint inhibitors**.

THEY...



Inactivate the stop button



Turn the immune system back on

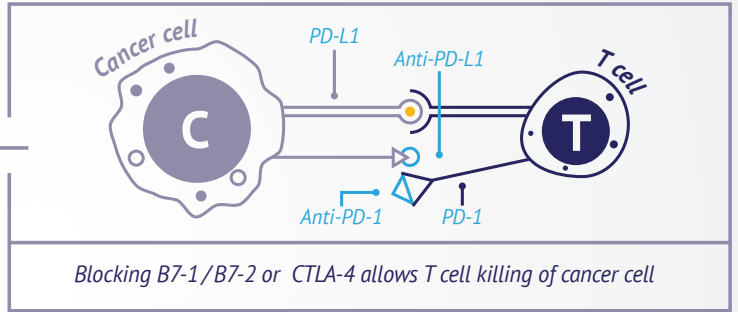
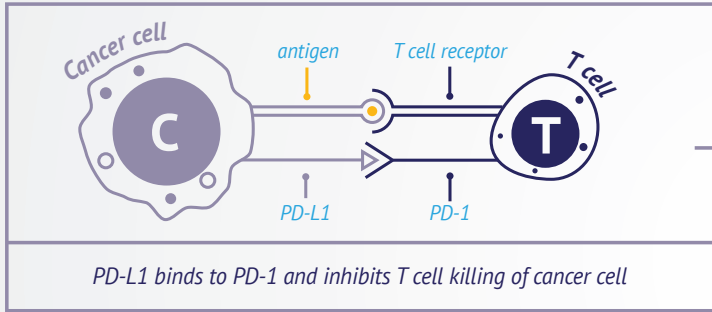
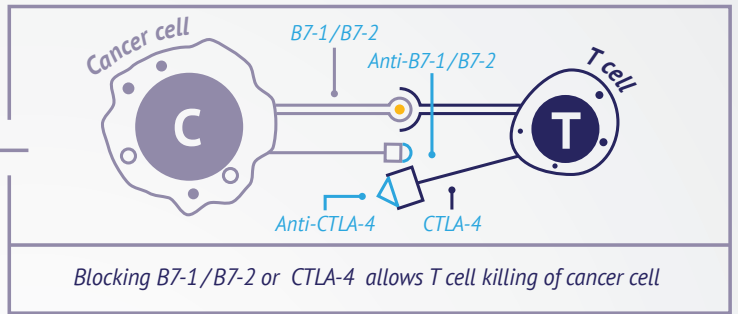
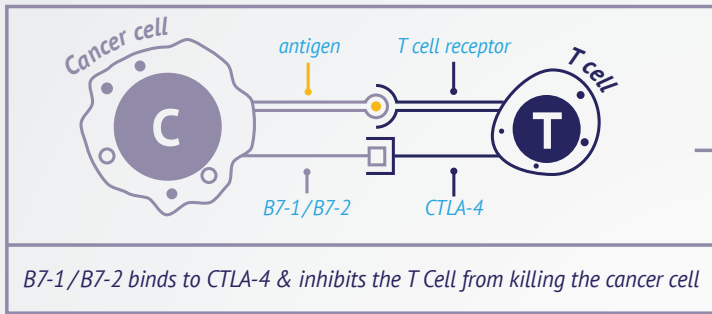


Allow the T cells to attack

SOME IMPORTANT IMMUNE CHECKPOINT PROTEINS FOUND ON CELLS...



CTLA-4 and PD-1 inhibitors (on immune cells) and PD-L1 inhibitors (on cancer cells)



WHAT CANCERS?

	MELANOMA		LUNG CANCER
	KIDNEY		HODKIN LYPHOMA

INDICATIONS

Immune checkpoint inhibitors approved in Canada

- ipilimumab (Yervoy®)
- pembrolizumab (Keytruda®)
- nivolumab (Opdivo®)
- avelumab (Bavencio)
- atezolizumab (Tecentriq)

SIDE EFFECTS

When you take the brakes off of the immune system and allow it to fight the cancer, it may also attack the healthy tissue in the body. **COMMON SIDE EFFECTS INCLUDE:**

- Rash
- Diarrhea
- Low thyroid hormone
- Fatigue

KNOWN SIDE EFFECTS EXTEND TO:

inflammation of the lung, intestines or liver			hormonal abnormalities			kidney, heart, or neurologic problems		