DEEP DIVE MOLECULES THAT MATTER

Dr.Reddy's

Toripalimab

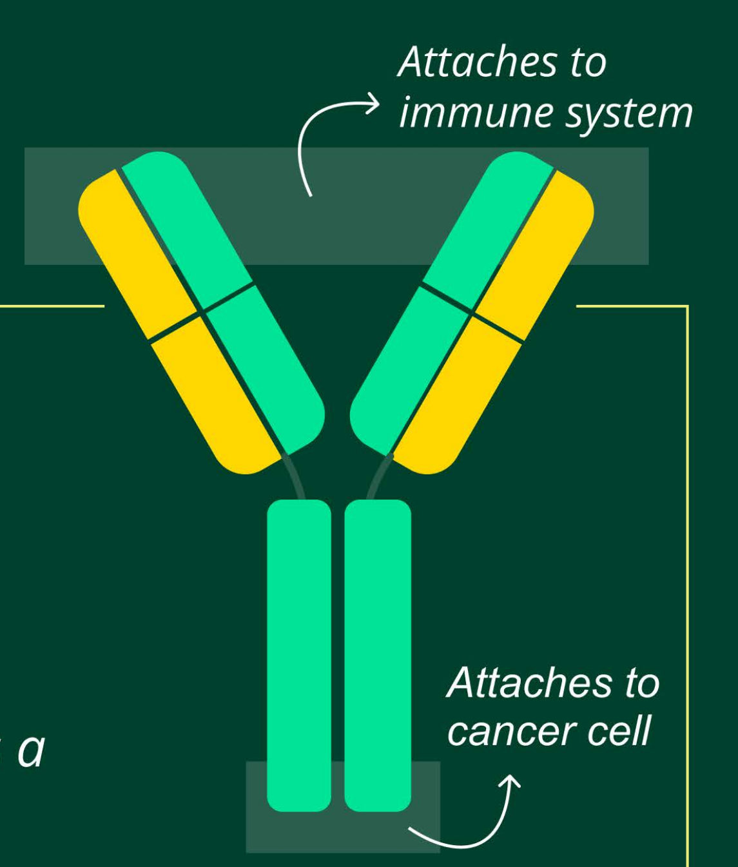
1st immuno-oncology drug approved for the treatment of adults with **recurrent or metastatic NASOPHARYNGEAL CARCINOMA.**

An immuno-oncology drug boosts the immune system to recognize and attack cancer cells.

3rd India is the 3rd country to receive access to Toripalimab, **launched by Dr. Reddy's.**

Toripalimab is an immunoglobulin G4 (IgG4) humanised monoclonal antibody (mAb).

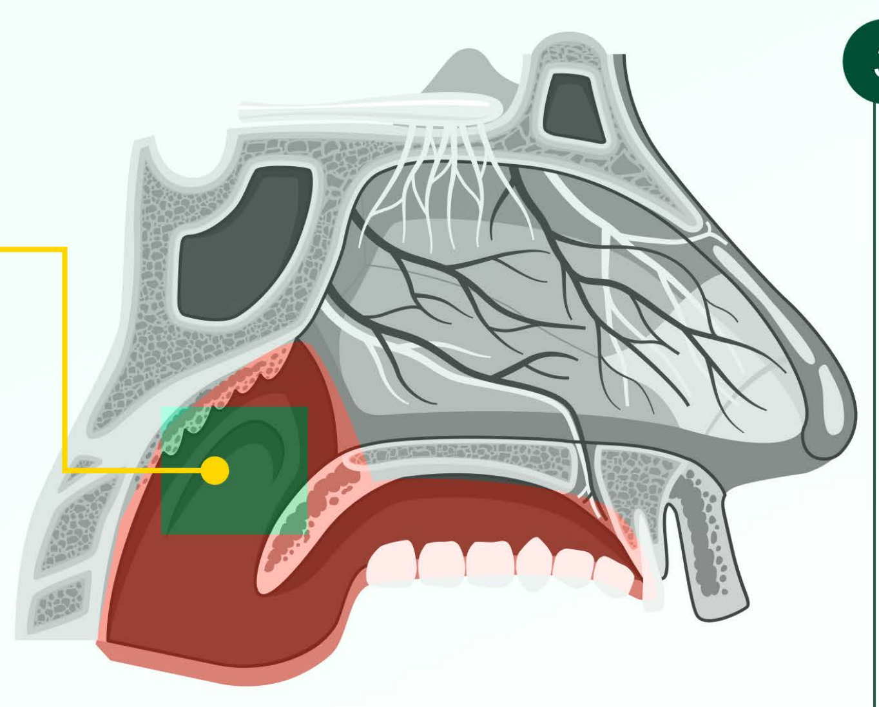
closely resembles a human antibody while retaining elements from the original source, like hamster ovary cells.



Monoclonal antibody structure

1 What is Nasopharyngeal Carcinoma?

Nasopharyngeal carcinoma is a rare cancer that originates from the nasopharynx, the area behind the nose, that connects to the back of the mouth.



2 What are the Risk Factors?

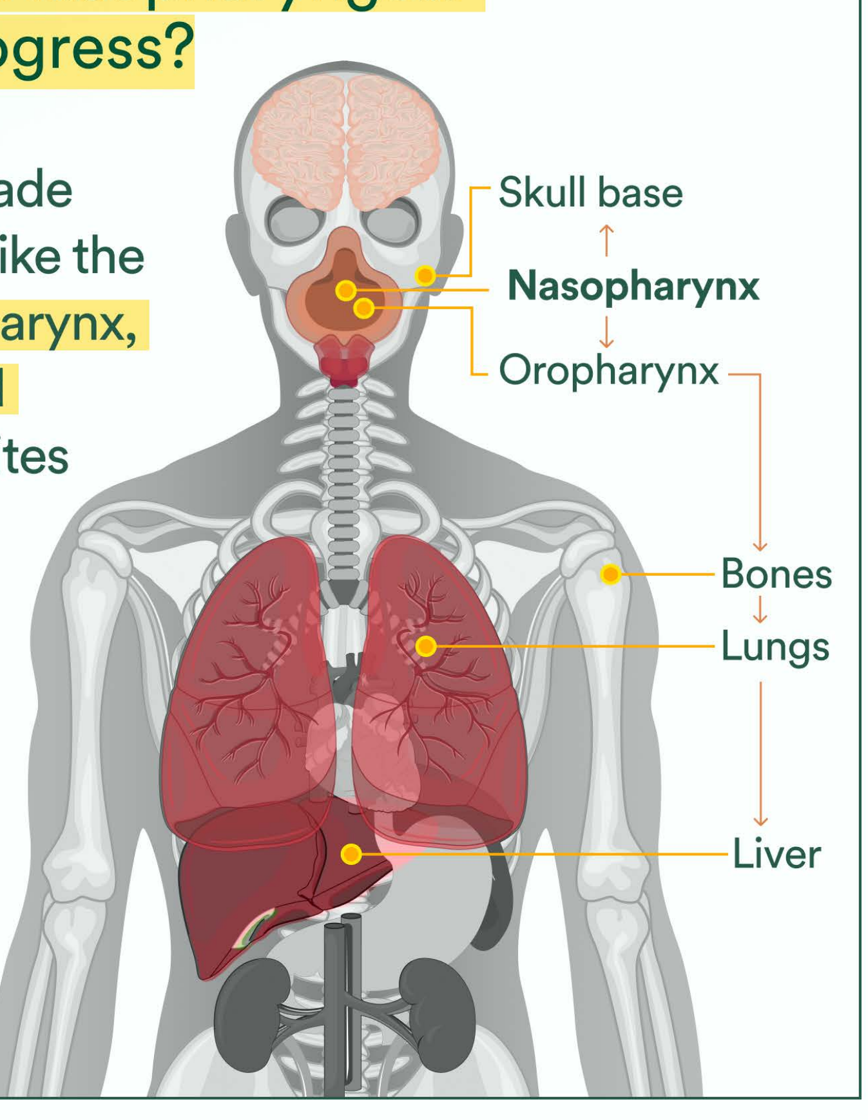
Constant **Epstein-Barr virus (EBV)** infection and **over-consumption of preserved foods (like salted fish).**

Gender distribution

The disease is more prevalent globally in men than in women, with a male-to-female ratio of about 2:1.

3 How does the Nasopharyngeal Carcinoma Progress?

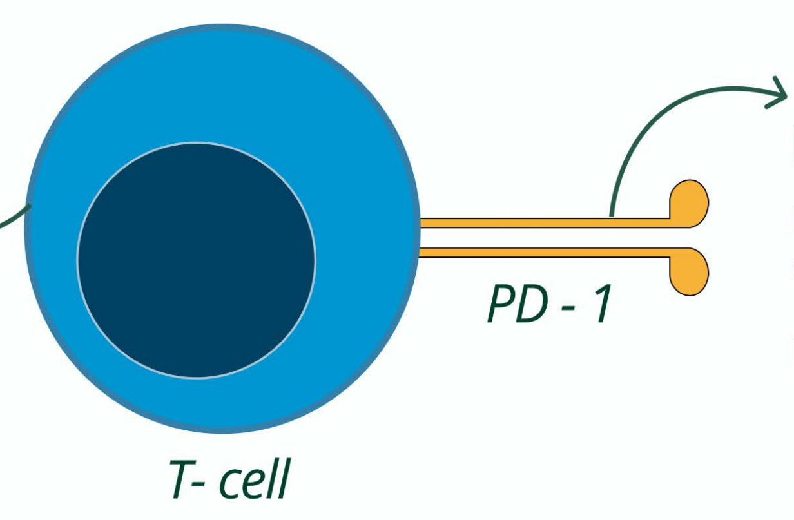
Nasopharyngeal carcinoma can invade nearby structures like the nasal cavity, oropharynx, and skull base, and spread to distant sites such as bones, lungs, and liver.



How does Toripalimab work?

HEALTHY PERSON'S IMMUNE SYSTEM

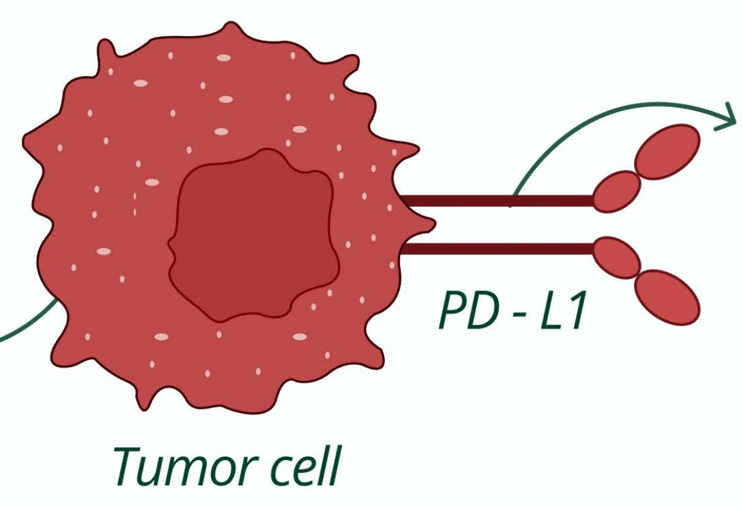
T-cells are **white blood cells** produced in **bone marrow** and matured **thymus.**



PD-1 (Programmed Cell Death Protein 1) regulates the immune system by acting as a "brake" to **prevent overactive immune responses.**

CANCER PATIENT'S IMMUNE SYSTEM

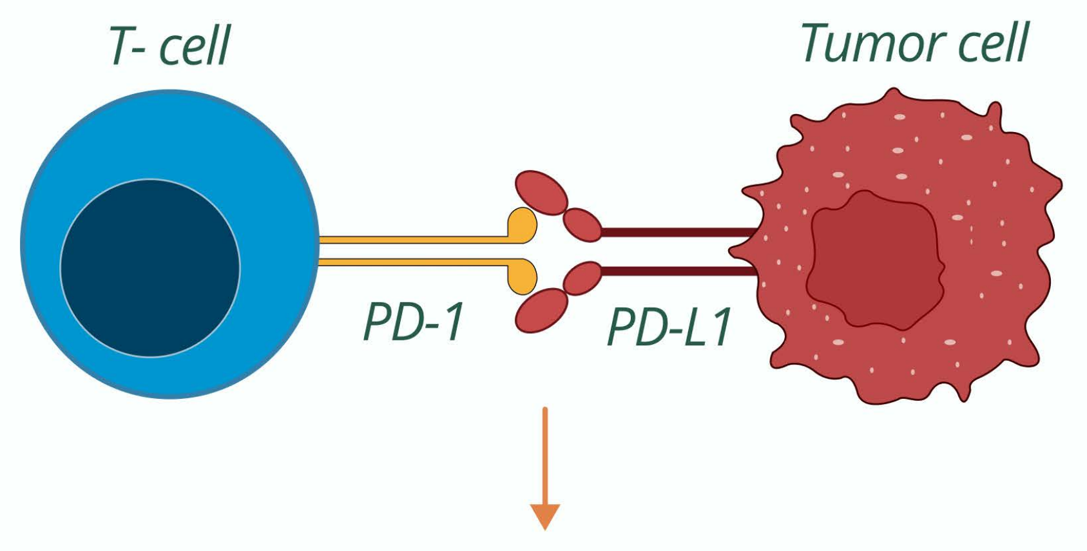
Cancer cell - an abnormal cell that has undergone **genetic changes**, causing **uncontrolled growth** and division.



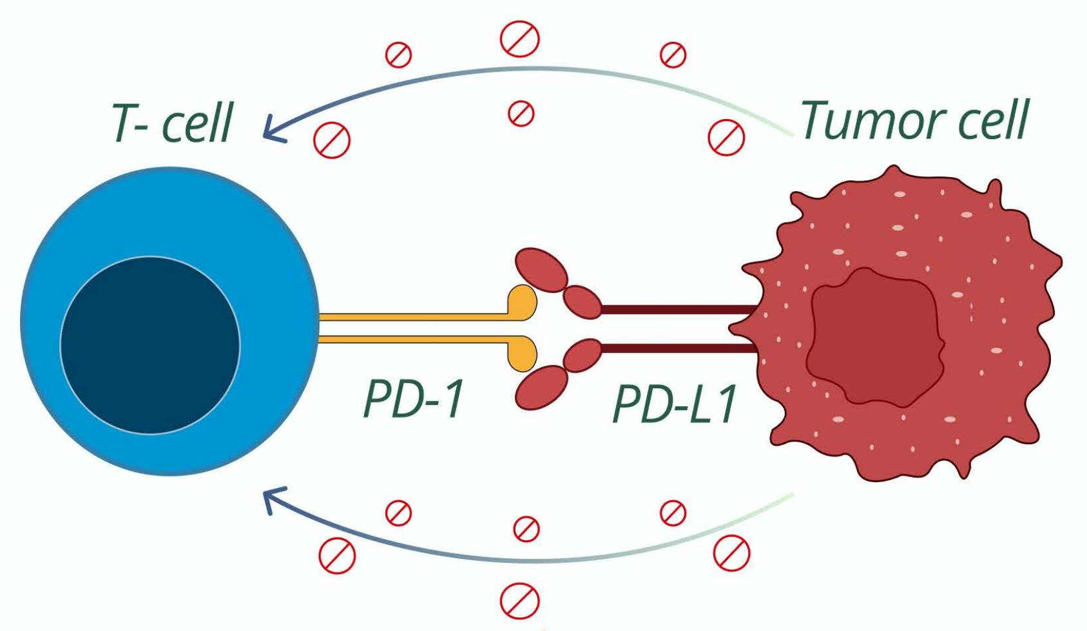
PD-L1 (Programmed Death Ligand 1) **slows T-cell activity, and excess PD-L1 allows tumors to evade the immune system** and avoid immune attack.

BEFORE INTRODUCING **TORIPALIMAB**

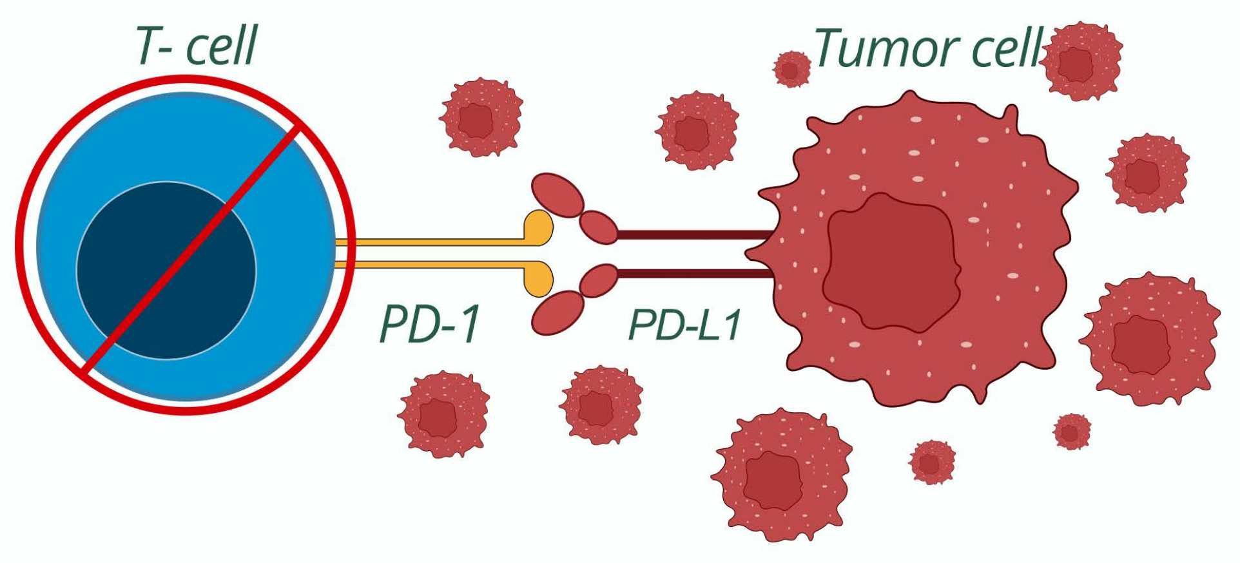
1 **Binding of PD-1 and PD-L1:** PD-1 on T- cell, binds with PD-L1, found on the surface of tumor cells.



2 **PD-L1 turns off the immune response:** The binding of PD-1 to PD-L1 sends a "brake" signal to the T- cell, effectively turning off its immune response.

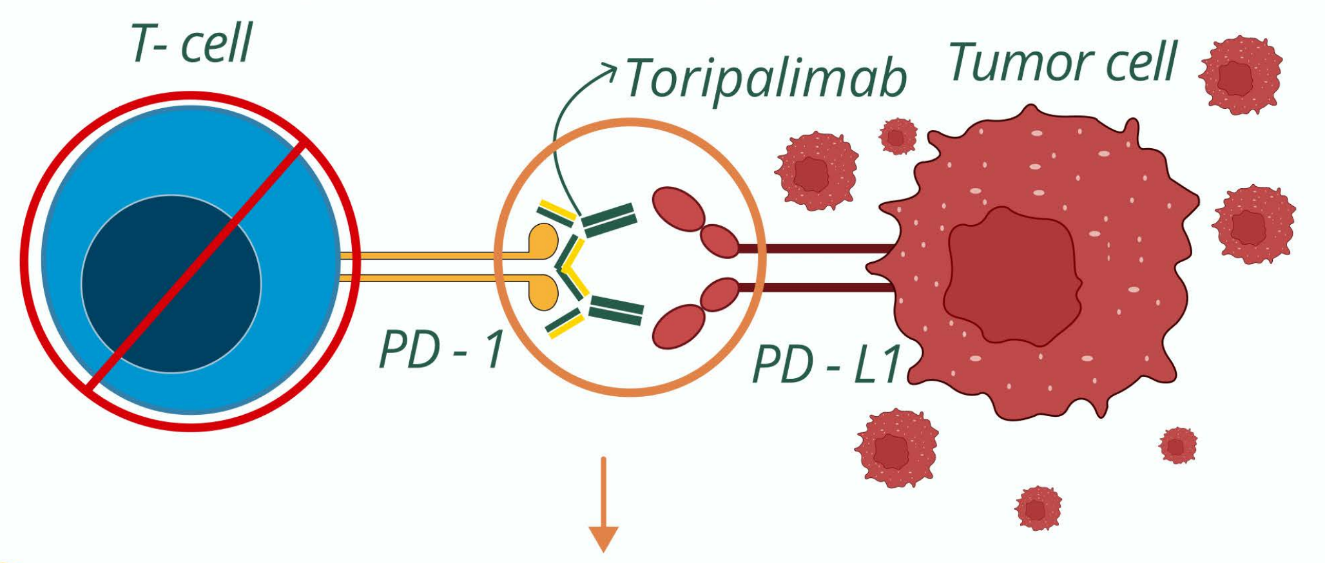


3 **T- cells disabled and tumor grows:** As a result of this brake signal, the T- cell is unable to attack the tumor cell, allowing the cancer to continue growing and spreading.

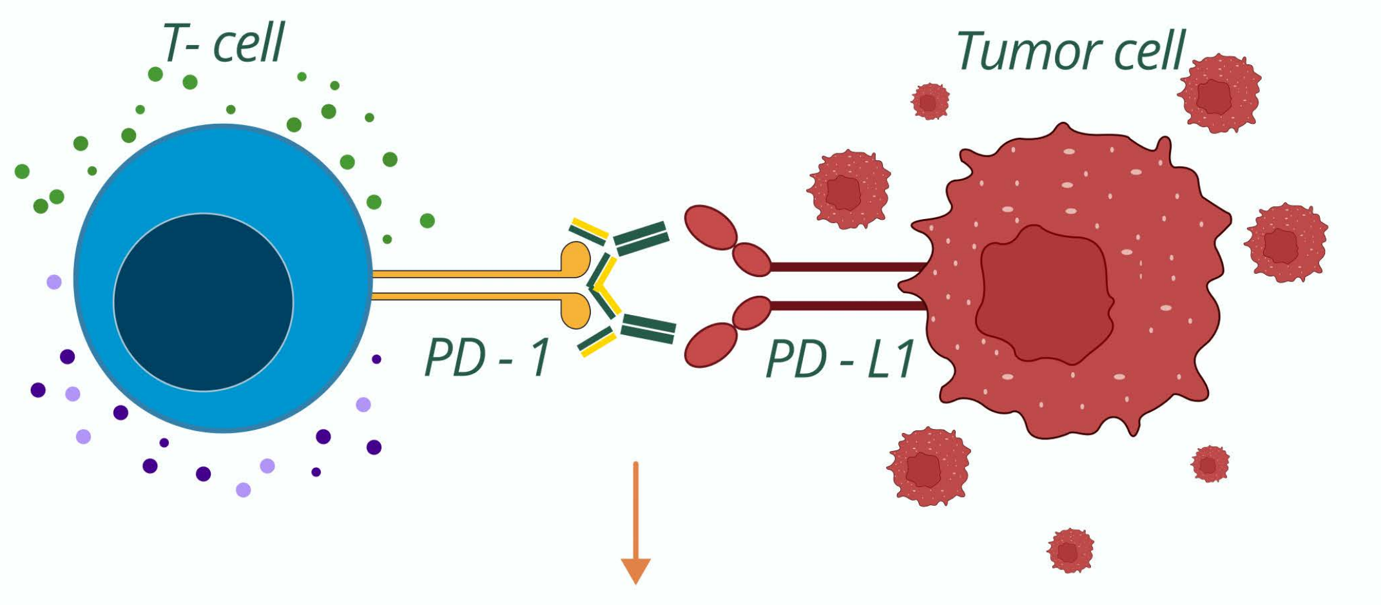


AFTER INTRODUCING **TORIPALIMAB**

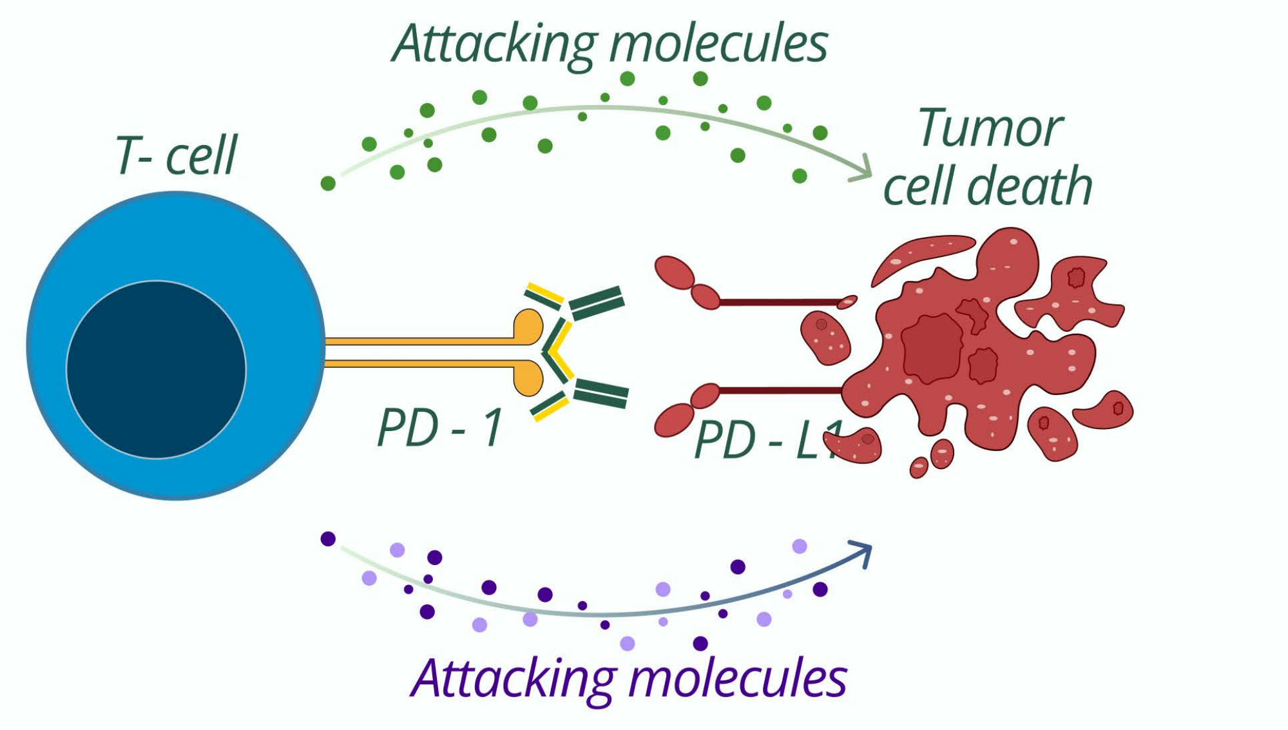
1 **Toripalimab binds to PD-1:** Toripalimab binds directly to the PD-1 receptor on T- cells, preventing it from interacting with PD-L1 on tumor cells.



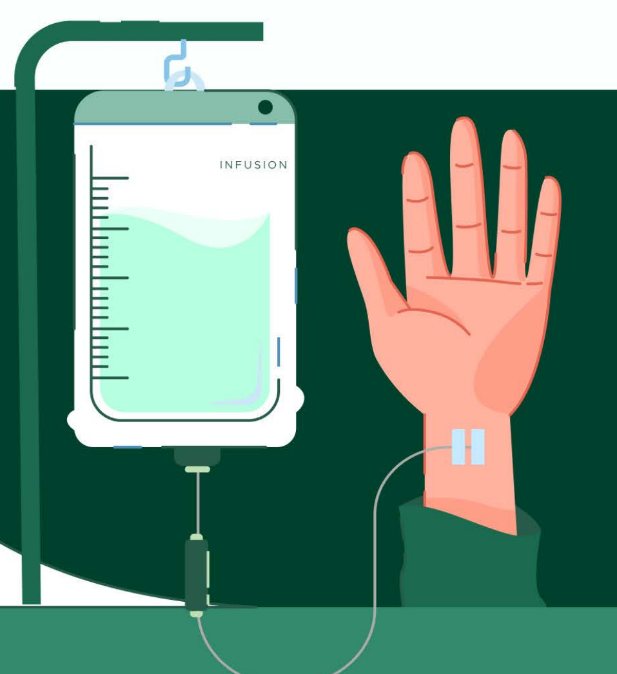
2 **Toripalimab disables the PD-L1's brake signal:** By preventing the PD-1/PD-L1 interaction, Toripalimab removes the inhibitory "brake" signal, allowing T- cells to become active again.



3 **T- cells attack the tumor cells:** With the brake released, T- cells are free to function properly, recognizing and attacking the tumor cells.



Toripalimab, in combination with chemotherapy is recommended by National Comprehensive Cancer Network (NCCN) guidelines as the **preferred category 1 first-line treatment** for Metastatic/Recurrent nasopharyngeal carcinoma.



37% reduction in the risk of mortality with the **combination of Toripalimab and standard-of-care chemotherapy**

48% reduction in the risk of progression or death has been observed with the **combination of Toripalimab and chemotherapy**

Citations & Glossary:

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Mai, Hai-Qiang, et al. JAMA 330.20 (2023): 1961-1970.

FDA approves toripalimab-tpzi for nasopharyngeal carcinoma. FDA [Internet]. 2023 Oct 30; Available from: https://www.fda.gov/drugs/resources-information-approved-drugs/fda-approves-toripalimab-tpzi-nasopharyngeal-carcinoma; Accessed on 28/08/2024

Good Health Can't Wait.