

# MEDICINE NOBEL FOR UNLEASHING BODY'S ABILITY TO FIGHT CANCER

To many, it is a disease that defies treatment. But what if the body that appears seemingly helpless against cancer were to be converted into the weapon for eliminating deadly tumours? Dr James P Allison and Dr Tasuku Honjo, who were on Monday named the 2018 Nobel laureates in medicine, showed that it is possible to stimulate the inherent ability of our immune system to attack cancer, thus establishing "an entirely new principle for cancer therapy". Here's why their research has been described as "a landmark in our fight against cancer"

## Breaking new ground in fight against cancer

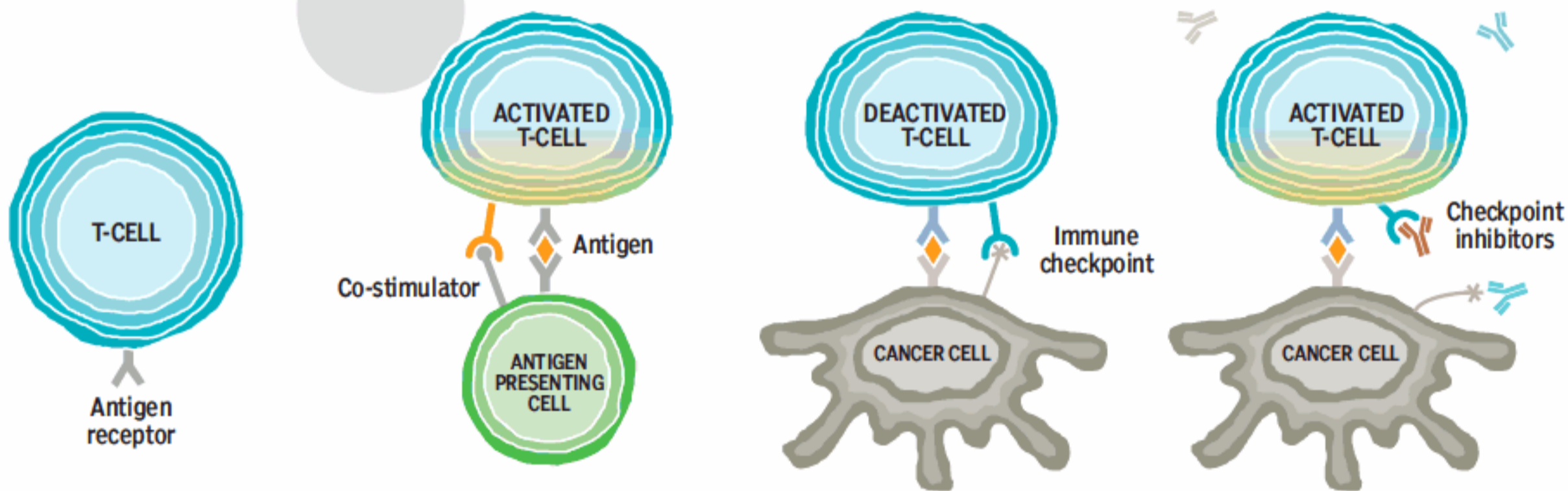
This year's Nobel laureates in medicine powered a breakthrough in cancer treatment. They showed that the body's immune system could be engineered to take on and eliminate cancer cells, opening the path to a fourth category of cancer treatment, which was limited to surgery, radiation and chemotherapy prior to this work

## Taking off the 'brakes' to help body attack tumours

Dr Allison and Dr Honjo, working separately, showed in the 1990s how certain proteins act as "brakes" on the immune system's T-cells, limiting their ability to attack cancer cells, and that suppressing those proteins could transform the body's ability to fight cancer

## How Immunotherapy Works

Cancer immunotherapy is the method that helps cells of the immune system identify and attack cancer cells



### T-CELLS

T-cells are a type of white blood cell that can identify and kill infected, damaged or cancerous cells. Each T-cell has clawlike receptors on its surface that can recognise and lock onto **antigens**, which are foreign or abnormal protein fragments on the surface of infected or cancerous cells

### ACTIVATING A T-CELL

The T-cell must be activated before it can find and attack cancer cells. A specialised cell presents the T-cell with an antigen from a cancer cell, along with a **co-stimulator** protein. The T-cell begins to hunt down and kill any cells that are covered with the same antigen

### CANCER AND CHECKPOINTS

Cancer cells can avoid destruction by taking advantage of a switch on the T-cell called an **immune checkpoint**. The checkpoint can shut down the T-cell and suppress the immune response, allowing the cancer to grow undisturbed

### CHECKPOINT INHIBITORS

Drugs known as **checkpoint inhibitors** can physically block the checkpoint, which frees the immune system to attack the cancer. A single T-cell can kill thousands of cancer cells. Four checkpoint inhibitors have been approved by the US Food and Drug Administration

## The winning duo



**James P Allison, 70**

At present, chairman of immunology at the University of Texas MD Anderson Cancer Center in US, he studied a known protein that functions as a

brake on the immune system. He realised the potential of releasing the brake and thereby unleashing our immune cells to attack tumours



**Tasuku Honjo, 76**

Professor at Kyoto University, Japan, he discovered a protein on immune cells that also operates

as a brake, but with a different mechanism. Therapies based on his discovery proved to be strikingly effective against cancer

## The 'future of cancer treatment'

Immunotherapy is not the present of cancer care. It is the future. The (laureates) have been awarded for their long-standing scientific work in this field. However, I must add that it may take another 10 years for this path-breaking therapy to be applicable in cancer treatment

— **Dr GK Rath**, PROFESSOR & HEAD, BRA-INSTITUTE ROTARY CANCER HOSPITAL, AIIMS

Source: NYT, nobelprize.org