



# Using of Immunotherapy as a Treatment of Cancer



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## What's the immunotherapy?

- Immunotherapy is a type of biological therapy that use substances made from living organisms to treat cancer.<sup>1</sup>
- Some antibodies work direct against cell surface molecule on T cells cytotoxic T lymphocyte antigen 4 (CTLA-4).<sup>2</sup>
- A new molecule called PD-1 serves as inhibitor of T cells from killing cancer cells.<sup>2</sup>

## T-cell therapy

- In T-cell therapy, some T cells are removed from a patient's blood and change it in a laboratory to have specific proteins called receptors. These receptors allow those T cells to recognize the cancer cells.
- The changed T cells are grown in large numbers in the laboratory and returned to the patient's body. Then it will be able to destroy cancer cells.<sup>2</sup>

## Checkpoint inhibitors

- Drugs that help the immune system to release "brakes" that keep T cells from killing cancer cells.
- PD-1/PD-L1 and CTLA-4 pathways are able to control cancer growth, cancers use these pathways to escape the immune system.<sup>3</sup>

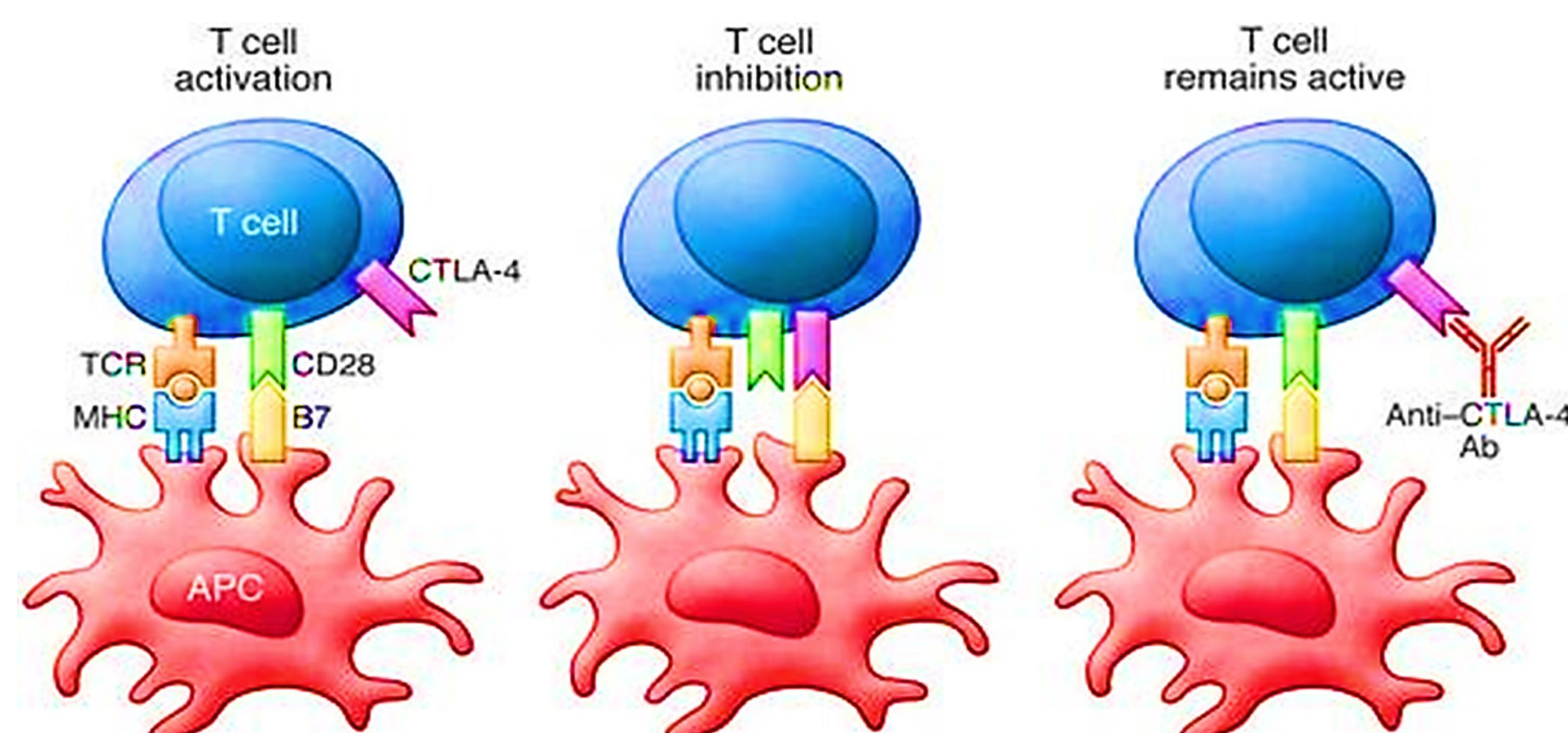


Figure ( 1 ) Immune Checkpoint Inhibitor<sup>3</sup>

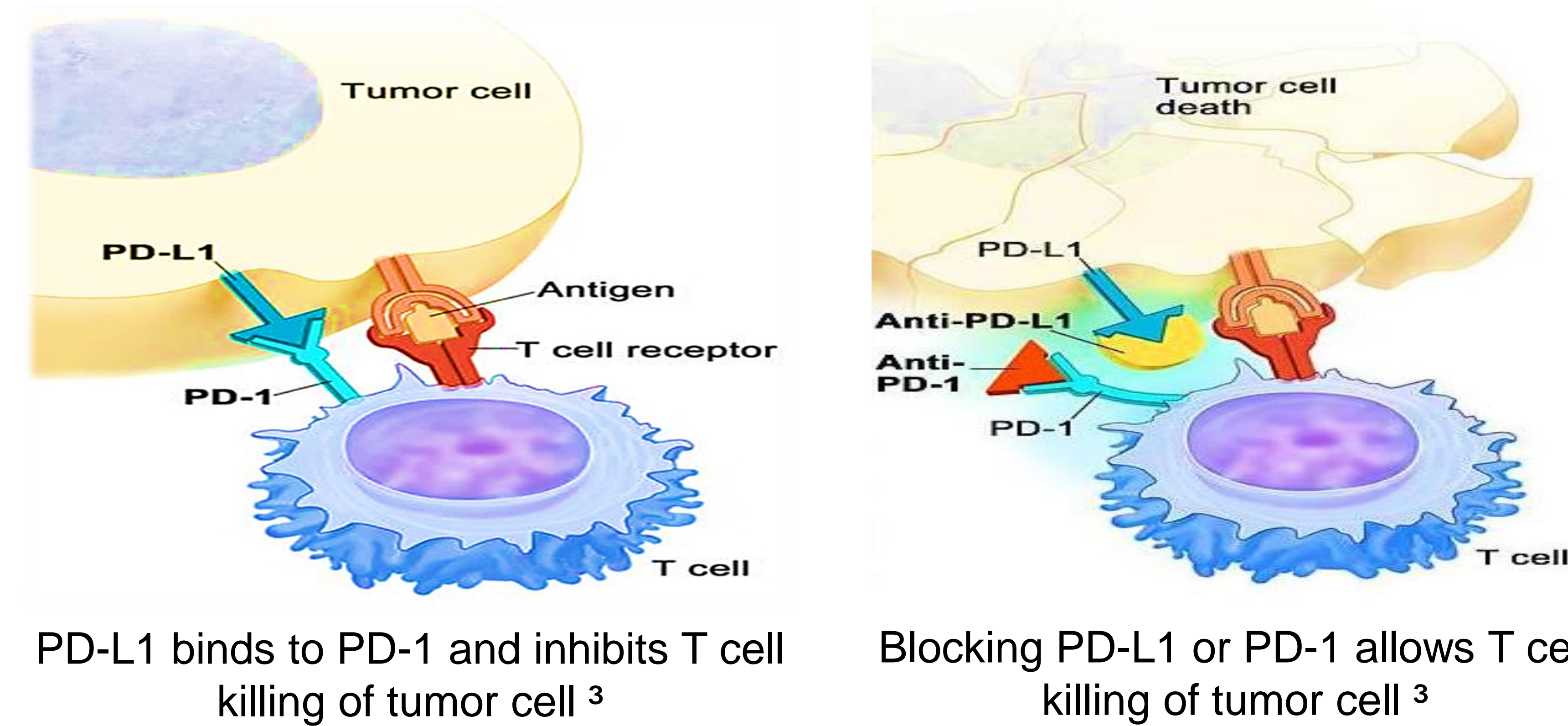


Figure ( 2 )

## Oncolytic virus therapy

- They inject a virus into the tumor then virus enter the cancer cells and makes copies of itself, then cells burst and die after that it releases specific substances called antigens, then the patient's immune system to target all the cancer cells in the body that have those same antigens.<sup>1</sup>

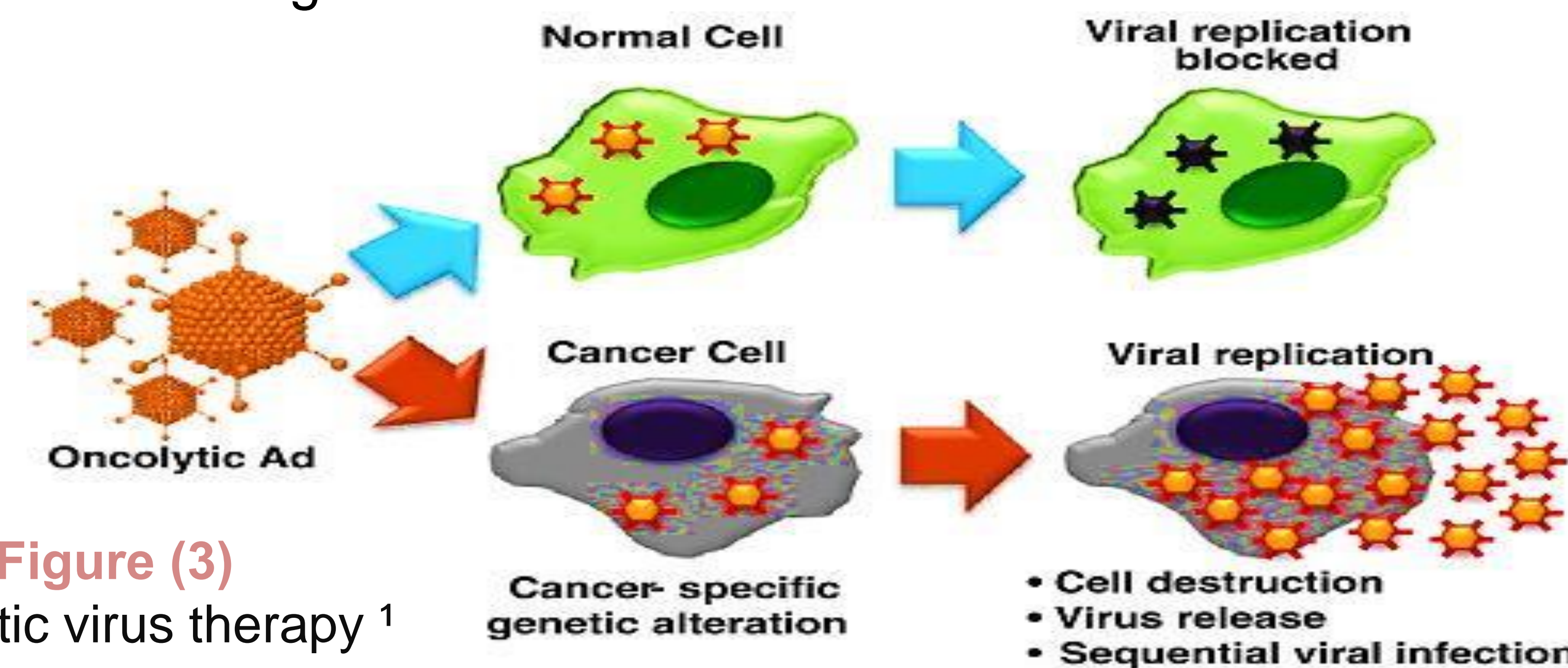


Figure (3)  
Oncolytic virus therapy<sup>1</sup>

## Cancer vaccines

- Vaccine exposes the immune system to an antigen. These triggers the immune system to recognize and destroy that antigen or related materials.<sup>1</sup>

## Nonspecific immunotherapy

**Interferons :** help the immune system to fight cancer or slow the growth of cancer cells.

- Interferon alpha, is the most common type of interferon used in cancer treatment.<sup>1</sup>

**Interleukins :** help the immune system produce cells that destroy cancer.

- interleukin-2, IL-2, use it to treat kidney cancer and skin cancer, including melanoma.<sup>1</sup>

## Conclusions

- Immunotherapy based on removal of the brakes in T cells.
- Types of immunotherapy are : checkpoint inhibitors, T-cell therapy, oncolytic virus therapy, cancer vaccines, nonspecific immunotherapy

## References

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- [3] G. X. Wang, F. Justin, R. J. Sullivan, K. T. Flaherty, and S. I. Lee, "Immune Checkpoint Inhibitor Cancer Therapy : Spectrum of," no. 1, pp. 2132–2144, 2011.