

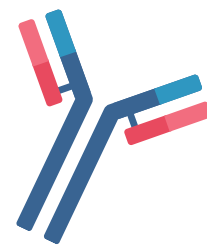
WHAT IS THE IMMUNE SYSTEM?

B-Cells

B-cells are also activated by the innate system and have one of two fates:

Either they will become cells that make specific **antibodies** against the specific intruder, contributing to the adaptive system's **specificity**.

OR

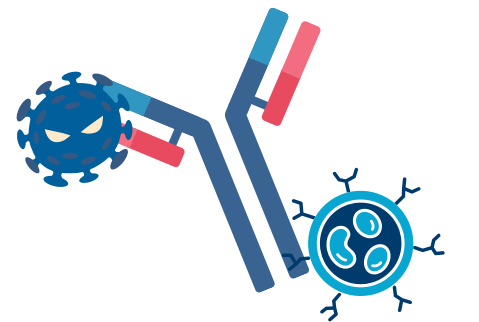
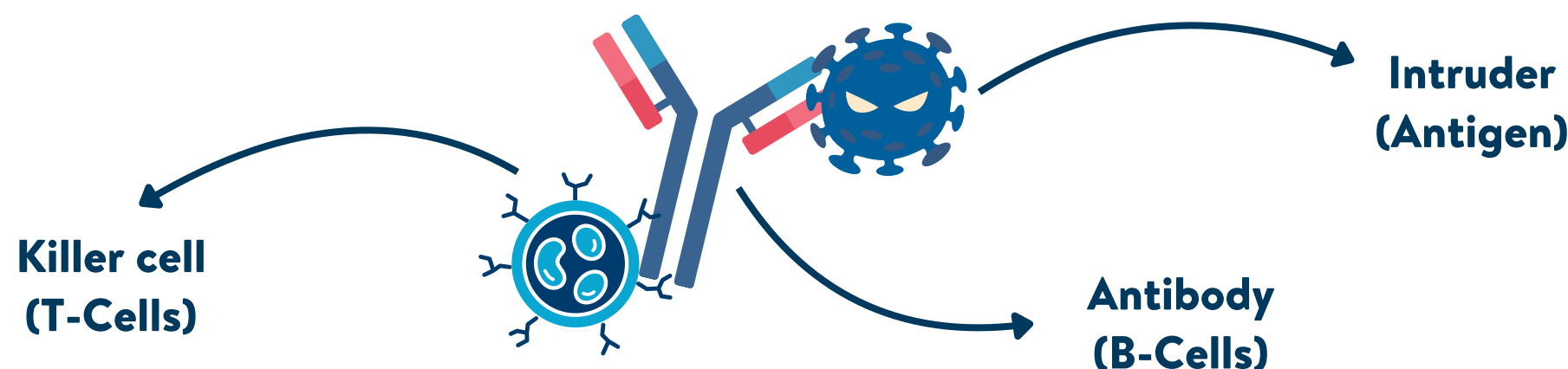


They will become **memory cells**, saving themselves for future intrusions, which accounts for the adaptive system's **ability to remember**.

Antibodies

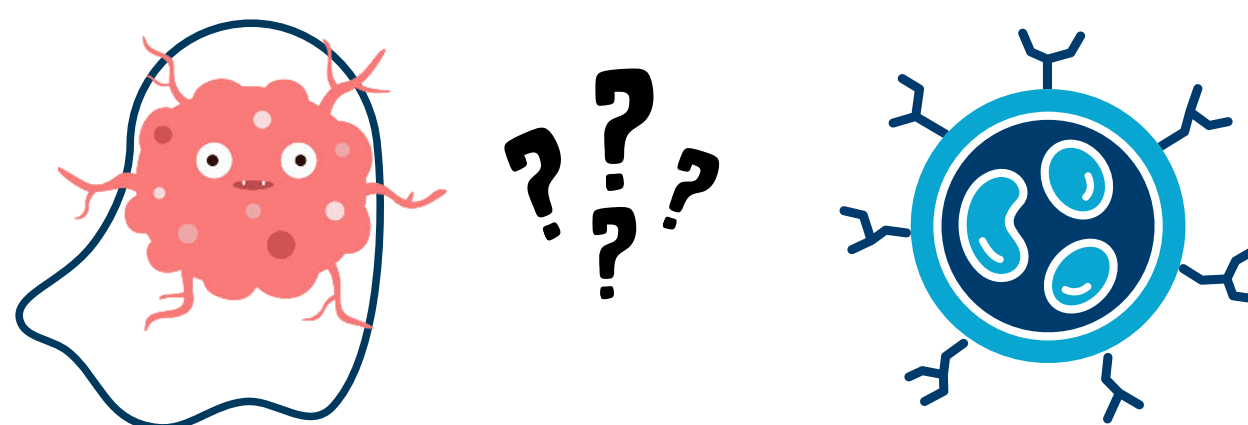
So, what is an **antibody**?

Antibodies (made by B cells) attach to the intruders on one side, and recruit killer cells (T-cells) on the other to destroy them, which helps neutralize threats quickly and efficiently.



Cancer and the Immune System

For the most part, the immune system, specifically T-cells, should be able to recognize and remove cancer cells. However, sometimes as the cancer cells develop, they can learn to fool the T-cells and escape. This means that the immune system cannot properly attack and kill them, which lets the cancer cells continue to grow, which then forms tumors.



WHAT IS THE IMMUNE SYSTEM?



References

1. Brown GC. Cell death by phagocytosis. *Nat Rev Immunol*. 2024 Feb;24(2):91-102. doi: 10.1038/s41577-023-00921-6. Epub 2023 Aug 21. PMID: 37604896.
2. Gonzalez H, Hagerling C, Werb Z. Roles of the immune system in cancer: from tumor initiation to metastatic progression. *Genes Dev*. 2018 Oct 1;32(19-20):1267-1284. doi: 10.1101/gad.314617.118. PMID: 30275043; PMCID: PMC6169832.
3. Jackson M, Marks L, May GHW, Wilson JB. The genetic basis of disease. *Essays Biochem*. 2018 Dec 2;62(5):643-723. doi: 10.1042/EBC20170053. Erratum in: *Essays Biochem*. 2020 Oct 8;64(4):681. doi: 10.1042/EBC20170053_COR. PMID: 30509934; PMCID: PMC6279436.
4. Johdi NA, Sukor NF. Colorectal Cancer Immunotherapy: Options and Strategies. *Front Immunol*. 2020 Sep 18;11:1624. doi: 10.3389/fimmu.2020.01624. PMID: 33042104; PMCID: PMC7530194.
5. Kontomanolis EN, Koutras A, Syllaios A, Schizas D, Kalagasidou S, Pagkalos A, Alatzidou D, Kantari P, Ntounis T, Fasoulakis Z. Basic principles of molecular biology of cancer cell-Molecular cancer indicators. *J BUON*. 2021 Sep-Oct;26(5):1723-1734. PMID: 34761575.
6. Marshall JS, Warrington R, Watson W, Kim HL. An introduction to immunology and immunopathology. *Allergy Asthma Clin Immunol*. 2018 Sep 12;14(Suppl 2):49. doi: 10.1186/s13223-018-0278-1. PMID: 30263032; PMCID: PMC6156898.
7. Nicholson LB. The immune system. *Essays Biochem*. 2016 Oct 31;60(3):275-301. doi: 10.1042/EBC20160017. PMID: 27784777; PMCID: PMC5091071.
8. Stewart J. Immunological principles: Antigens and antigen recognition. In: Greenwood D, Barer M, Slack R, Irving W editors. *Medical Microbiology*. 18th ed. Edinburgh: Churchill Livingstone; 2012. p. 98-108.
9. Tortora GJ, Nielsen M. *Principles of human anatomy*. 13th ed. USA: Wiley; 2013.
10. Wright LS. Basic Immunology: An Overview. *Nephrol Nurs J*. 2020 Jul-Aug;47(4):299-304. PMID: 32830935.
11. Zhao P, Li L, Jiang X, Li Q. Mismatch repair deficiency/microsatellite instability-high as a predictor for anti-PD-1/PD-L1 immunotherapy efficacy. *J Hematol Oncol*. 2019 May 31;12(1):54. doi: 10.1186/s13045-019-0738-1. PMID: 31151482; PMCID: PMC6544911