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Commentary

Functions of adaptive immune system and lymphocytes

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DESCRIPTION

The adaptive immune system of the body, sometimes referred to as the acquired immune system, is made up of specialized, systemic cells and processes that either destroy infections or stop their growth. One of vertebrates' two primary methods of immunity is the acquired immune system (the other being the innate immune system).The adaptive immune system, which kills invasive pathogens, is similar to the innate immune system in that it consists of both humoral immunity components and cell-mediated immunity components. The adaptive immune system is very specialized to each unique pathogen the body has faced, in contrast to the innate immune system, which is pre-programmed to respond to common broad categories of pathogen (Alder, et al., 2005). After an initial reaction to a particular pathogen, adaptive immunity develops immunological memory, which results in an improved response to subsequent encounters with that pathogen. A crucial component of the adaptive immune system are antibodies. Adaptive immunity can offer enduring defence, sometimes for the duration of a person's lifetime. In certain circumstances, such as with chickenpox, it does not confer permanent protection; for instance, a person who recovers from measles is now protected against measles for the rest of their lives. The foundation of vaccination is this process of adaptive immunity (Flajnik, 2018).

The cells of the adaptive immune system are lymphocytes, specifically T and B lymphocytes. The overall mass of the body's 2 trillion lymphocytes, which make up 20%–40% of white blood cells, is comparable to that of the brain or liver (Hernández López, et al., 2014). Just 2% of all circulating lymphocytes are found in peripheral blood; the remaining 98% circulate within tissues and the lymphatic system, which includes the lymph nodes and spleen (Kasamatsu, 2013). To improve the likelihood that the cells will come into contact with the particular virus and antigen that they react to, about 1%-2% of the lymphocyte pool in humans circulates again every hour (Mikonranta, et al., 2014).

Both B cells and T cells are descended from the same multipotent hematopoietic stem cells and, up until they are activated, share a same appearance (Pham, et al., 2007). The humoral immune response is heavily influenced by B cells, whereas cell-mediated immune responses are heavily influenced by T cells. B cells and T cells are created by stem cells in the bone marrow in all vertebrates . Then, from the bone marrow, T cell progenitors move to the thymus, where they continue to grow (Sadd, et al., 2006).

A mixture of B and T cells in at least three different phases of differentiation can be found in the peripheral lymphoid organs of an adult animal:

- Naive B and T cells, which have emerged from the thymus or bone marrow but have not yet come into contact with their respective antigens.
- Effector cells that are actively engaged in eradicating a pathogen after being stimulated by their corresponding antigen
- Memory cells, which have survived earlier infections

Functions

When a disease evades the innate immune system, acquired immunity in vertebrates is triggered when it (1) produces a threshold quantity of antigen and (2) produces "stranger" or "danger" signals that activate dendritic cells. The recognition of particular "non-self" antigens in the presence of "self" during the antigen presentation process is one of the acquired immune system's main roles (Spencer, et al., 2010).

- Development of specialised reactions to completely eradicate particular diseases or pathogen-infected cells.
- The emergence of immunological memory, in which memory B cells and memory T cells "remember" pathogens.
- The adaptive immune system in humans takes 4–7 days to mount a substantial response.

REFERENCES

1. Alder MN, Rogozin IB, Iyer LM, Glazko GV, Cooper MD, Pancer Z(2005). Diversity and function of adaptive immune receptors in a jawless vertebrate. Science. 310(5756):1970-1973.

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2. Flajnik MF (2018). A cold-blooded view of adaptive immunity. Nat Rev Immunol.18 (7):438-453.
3. Hernández López J, Schuehly W, Crailsheim K, Riessberger-Gallé U (2014). Trans-generational immune priming in honeybees. Proc Biol Sci. 281(1785):20140454.
4. Kasamatsu J (2013). Evolution of innate and adaptive immune systems in jawless vertebrates. Microbiol Immunol. 57(1):1-2.
5. Mikonranta L, Mappes J, Kaukoniitty M, Freitak D (2014). Insect immunity: oral exposure to a bacterial pathogen elicits free radical response and protects from a recurring infection. Front Zool. 11:1-7.
6. Pham LN, Dionne MS, Shirasu-Hiza M, Schneider DS (2007). A specific primed immune response in Drosophila is dependent on phagocytes. PLoS Pathog. 3(3):e26.
7. Sadd BM, Schmid-Hempel P (2006). Insect immunity shows specificity in protection upon secondary pathogen exposure. Curr Biol.16 (12):1206-1210.
8. Spencer LA, Weller PF (2010). Eosinophils and Th2 immunity: contemporary insights. Immunol Cell Biol. 88 (3):250-256.