

6 PLASMA CELL - e.m. (37,000x)

Lymph cells can also change into B-cells. When the right B-cells are met by T-cells, the B-cells divide rapidly and become PLASMA CELLS. Plasma cells are super producers of ANTIBODIES. They are agents for AMI (Antibody Mediated Immunity). Some of the plasma cells

become MEMORY CELLS. Together with T-memory cells, these cells will be ready to prevent disease if the same antigen attacks again.

7 NORMAL RED CELLS - left side - e.s. (3,000x) AGGLUTINATED CELLS - right side - (100x)

The left side of this slide shows normal blood. If the person who has that blood type receives a TRANSFUSION of blood from someone with a different blood type, their blood cells could become clumped together or AGGLUTINATED (a-GLOO-tin-a-ted). This happens when a person's inborn antibodies react to the antigen in the foreign blood. To prevent this, people's blood types are checked before they are given blood transfusions to be sure the blood they receive "matches" their own blood (does not contain foreign antigens).

The antibody type produced by the plasma cells that causes blood clumping is called AGGLU-

TININ. Other antibodies formed include ANTI-TOXINS, which destroy harmful chemicals; LYSINS, which cause foreign cells to fall apart; OPSONINS, which coat germs and attract phagocytes; and PRECIPITINS, which change dissolved foreign chemicals into a powder that can be swallowed by phagocytes. When, through some defect in the system, the immune system attacks the body's own tissue instead of foreign tissue the result is AUTOIMMUNE REACTION. Diseases of this type include RHEUMATOID (RU-ma-toid) ARTHRITIS.

8 EOSINOPHIL - left side - (1,400x) BASOPHIL - right side - (1,400x)

On the left side of the slide, you can see a white blood corpuscle called an EOSINOPHIL (ee-oh-SIN-i-fill). It secretes enzymes that can dissolve blood clots. However, it can overreact against some antigens and cause ALLERGIC reactions such as a runny nose or ASTHMA (AZ-ma). A

BASOPHIL (BAY-zo-fill), seen on the right side of the slide, is also involved in allergic reactions.

Photocredits: Slides 7R, 8 H. Nestler; 4 Dr. J. Weber, 2R, 5 NIAID

IMMUNITY

SET 229

INTRODUCTION

When you are born, your body has built-in defenses against many diseases. These defenses are an extremely complex body system called the IMMUNITY (im-YOON-ity) SYSTEM. When the immunity system fails to do its job properly, diseases such as asthma, pneumonia, arthritis, cancer, and AIDS can result. Immunity to some diseases can also be *acquired* during your life. If you recover from an infectious disease such as measles, you are often immune to that disease for weeks, months, or for a lifetime. The same thing happens when you get a VACCINATION (vak-sin-A-shun). The "shot" contains weakened germs, dead germs, or weakened toxins. Your immune system reacts to this "foreign invasion" and you become immune to that disease.

The immunity system is of great interest to scientists because of its connection to many serious illnesses (see partial list above). This set will help you understand the basic facts about immunity. These facts will also help you understand stories on TV and in the newspapers about AIDS, CANCER, and ALLERGIES. As you study this set, refer to the accompanying slide.

The magnification given, for example - Slide 1 (900x), means that the microscope lenses were set at that power when the photograph was taken.

1 PHAGOCYTE - left side - stained (900x) PHAGOCYTOSIS - right side - e.m. (25,000x)

The left side of this slide shows white blood corpuscles called PHAGOCYTES (PAY-go-sites) (P), which are formed in the marrow of bones. They enter the bloodstream and tissue fluids, passing in and out of the capillaries. At the right side of the slide, we see an enlarged picture of the phagocyte (P) engulfing a bacterium (B). Bacteria that get past the defense barrier of your skin and the acid in your stomach are attacked by phagocytes. These white blood cells also

secrete a chemical called PROSTAGLANDIN (pross-ta-GLAND-in). This chemical allows more phagocytes to leak through capillary walls and gather at the site of an infection. They also warn of the danger by causing pain at the infection site.

2 MONOCYTE - top - e.s. (3,000x) MACROPHAGE - bottom - e.s. (4,000x)

If some invading germs escape destruction by phagocytes, they start to multiply and give off

wastes. These wastes attract special phagocytes called MONOCYTES (MO-no-sites).

By Herbert A. Nestler

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