

Physiology
Immune System Notes/Study Guide

Name: _____
Block: _____

Immunity –

Specific –

1.

2.

Non-specific

Immune response –

Passive immunity (not innate) –

Innate immunity –

Acquired (adaptive) immunity –

Innate immunity:

Physical –

Chemical –

Cellular -

Adaptive immunity –

- I. Naturally acquired adaptive immunity
 - A) Naturally acquired active immunity
 - B) Naturally acquired passive immunity

- II. Artificially acquired active immunity
 - A) Artificially acquired active immunity
 - B) Artificially acquired passive immunity

Humoral immunity –

Cell mediated immunity –

Antigens –

Microbes –

Non-microbes –

Haptens –

Epitopes –

Immune cells:

Lymphocytes –

Antigen presenting cells –

Effector cells –

MHC –

1.

2.

3.

T-lymphocytes –

B-lymphocytes –

Antibodies –

Sketch an antibody/antigen binding:

Monocytes:

Location –

Functions –

Macrophages:

Functions –

Phagocytic cells:

Neutrophils –

Pus –

Dendritic cells:

Location –

Functions –

Natural killer cells:

Functions –

Autoimmunity:

1.

2.

3.

Activation of the immune response:

1.

2.

3.

4.

5.

6.

Lymphoid organs:

Thymus:

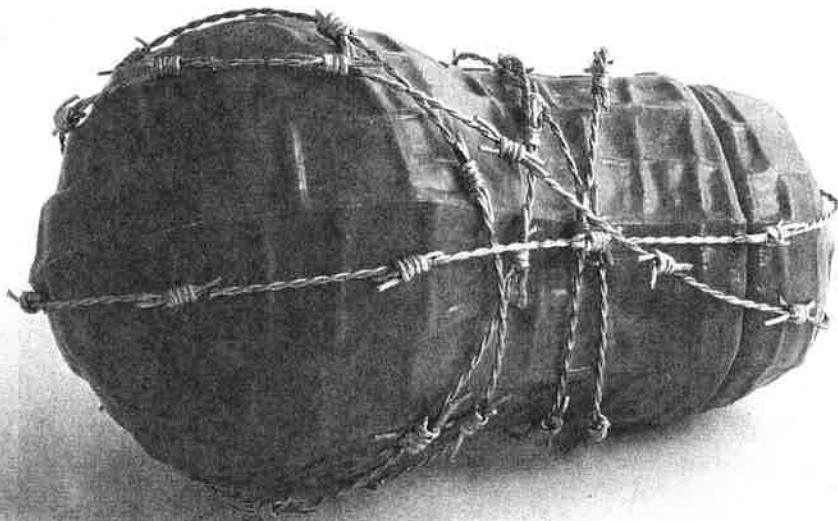
Spleen –

Tonsils –

Lymph nodes –

20 THINGS YOU DIDN'T KNOW ABOUT ALLERGIES

By Rebecca Coffey



1. Our immune system may be like those small bands of Japanese “holdout” soldiers after World War II. Not knowing that the war was over, they hid for years, launching guerrilla attacks on peaceful villages. **2.** With our living environment well scrubbed of germs, our body’s immune “soldiers” mistakenly fire on innocent peanuts and cat dander. **3.** According to the National Institutes of Health, more than half of all Americans have one or more allergies. **4.** The scariest allergy: penicillin, one of the most common causes of fatal anaphylaxis. The most disgusting allergy: cockroaches. **5.** Most food allergies result from an immune response to a protein. In 2004 a team at Trinity College Dublin tried to counter that reaction by injecting mice with parasites, giving the animals’ immune systems the sort of threat they evolved to fight, thus distracting them from the food proteins. **6.** The experiment worked. **7.** Excited by such findings, in 2007 British-born entrepreneur Jasper Lawrence flew to Cameroon and walked barefoot near some latrines. His aim was to

acquire hookworms, which he hoped would defeat his asthma and seasonal allergies. **8.** That worked too. **9.** Lawrence has since started a business shipping the parasites worldwide (but not here, where the FDA prohibits it). For \$3,000, customers receive up to 35 hookworm larvae. **10.** Simply apply the larvae to a bandage, slap it on, and in a few minutes they wriggle through your skin. No word yet on the success rate. **11.** Allergies to shellfish, nuts, fish, milk, eggs, and other foods cause an estimated 150 to 200 fatalities a year in the United States. **12.** Yum. Edible radio-frequency ID tags, currently under development, could be mixed into your meal to record its composition. A “smart plate” created by London-based industrial designer Hannes Harms would then warn allergic eaters of problem ingredients. **13.** Warning: A walk in the grass could turn you vegan. Scott Commins at the University of Virginia has shown that tick bites can cause the immune system to produce antibodies to alpha-gal, a carbohydrate in beef, pork, and lamb. These antibodies can induce allergic reactions to meat. “We’ve had people nearly die,” Commins says. **14.** Allergic to sex? Up to 40,000 U.S. women may be affected by seminal plasma hypersensitivity, an immune reaction to male ejaculate. Symptoms range from localized swelling to systemic shock. **15.** Even abstinence isn’t foolproof. Women with autoimmune progesterone dermatitis develop allergic rashes to their own sex hormones, in rare cases going into full-on shock. **16.** When your pets can’t stand the itching, can they send you to the pound? Human dander can cause allergic rashes in dogs and cats—and in other humans. **17.** One more reason to hate climate change: Researchers report that ragweed pollen season in North America has lengthened since 1995—by 16 days in Minneapolis, for instance. **18.** One more reason not to get pierced: According to the Mayo Clinic, jewelry containing nickel can trigger a lifelong metal allergy. **19.** Contrary to myth, desert cities are not the best place to escape allergy season. For real relief, spend the spring in San Diego and the fall in Portland, Oregon, but avoid Knoxville—named 2011 Allergy Capital by the Asthma and Allergy Foundation of America, based on pollen count, allergy prevalence, medicines consumed, and number of allergists per patient. **20.** Aquagenic urticaria is a rash caused by contact with water. It is exceedingly rare. Still, if your child claims he’s allergic to baths, consider he might *not* be lying. **D**

Rebecca Coffey is allergic to antibiotics and pollen. Her blog, The Excuses I’m Going With, is at rebeccacoffey.blogspot.com

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Immune System Disorders

Type I Immediate Hypersensitivity – IgE mediated hypersensitivity reaction that begins within minutes of antigen challenge. Allergic reactions.

Type II Antibody Mediated Hypersensitivity – IgE or IgM mediated – result from mismatched blood transfusions, ABO, Rh incompatibility, erythroblastosis fetalis.

Type III Immune Complex Mediated Hypersensitivity – Mediated by formation of insoluble antigen-antibody complexes, localized inflammation, usually in blood vessels. Vasculitis.

Type IV Cell Mediated Hypersensitivity – Typical in response to microorganisms, mediated by specific sensitive T-lymphocytes.

Anaphylaxis – Life threatening hypersensitivity reaction, widespread vasodilation causes a drop in blood pressure, and airway constriction.

Allergic Rhinitis – Sneezing, itchy, watery discharge from eyes and nose. Hay fever.

Autoimmune disease – Breakdown in the ability of the immune system to differentiate between self and non-self antigens.

Host-Versus-Graft-Disease – immune cells of transplant recipient attack the donor cells of the transplanted organ.

Graft-Versus-Host-Disease – Occurs when immunologically competent cells are transplanted into a recipient who is immunologically compromised.

Immunodeficiency disorders – Abnormality in one or more branches of the immune system that renders a person susceptible to diseases normally protected by an intact immune system.

Acquired Immunodeficiency syndrome – profound immunosuppression with associated opportunistic infections, malignancies, and CNS degeneration.