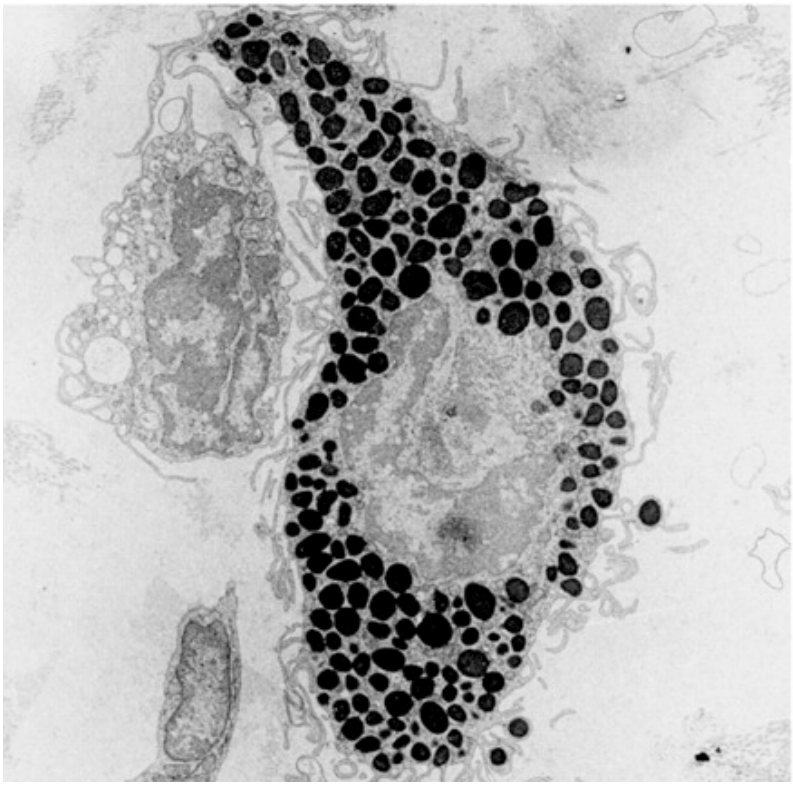
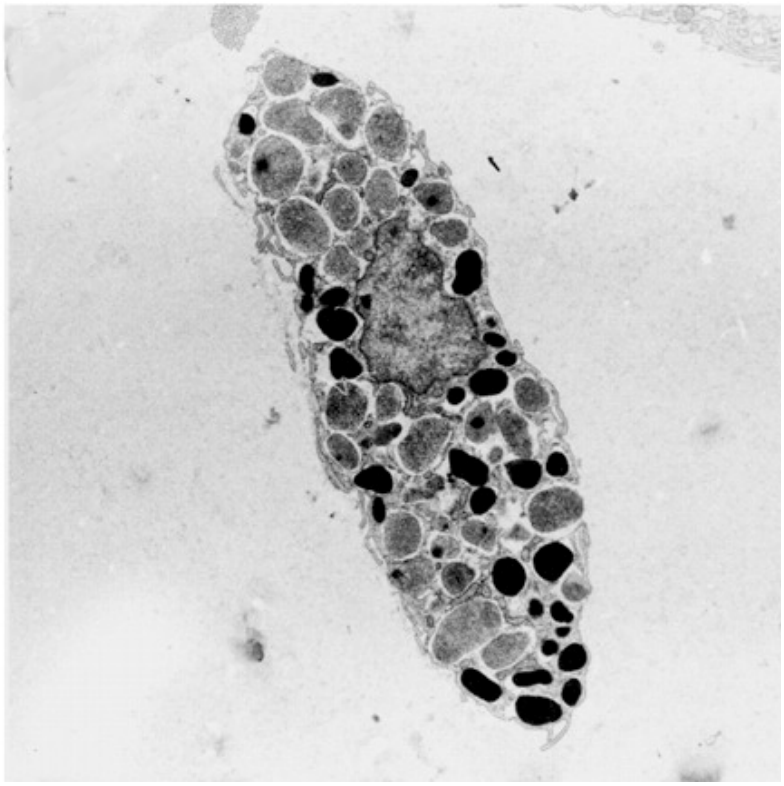
Lecture 15. Hypersensitivity

Learning Objectives and Summary





Lecture 15. Hypersensitivity

Learning objectives:

1. Recognize how hypersensitivity and allergy derive from “mis-direction” of normal adaptive immune responses.
2. Understand the importance of the requirement for sensitization prior to reaction.
3. Become familiar with the classification of hypersensitivity types with respect to the participating immune effectors and mechanisms of tissue damage.
4. Understand how normal T cell and B cell antigen recognition, signaling, and effector functions contribute to hypersensitivity.
5. Appreciate the contributions of mast cells and eosinophils to normal immune response and to hypersensitivity states.
6. Understand that many of the same mechanisms mediating hypersensitivity to foreign antigen can also mediate autoimmunity to self-antigen.
7. Understand the concept of a hapten-directed immune response.
8. Recognize the common clinical manifestations of the 4 types of hypersensitivity.

SUMMARY

1. The phenomenon of hypersensitivity was recognized more than a century ago, long before our understanding of the adaptive immune system which drives it.

2. Gel & Coombs divided hypersensitivity syndromes into 4 types based on the underlying immune players. The first three represent antibody-associated mechanisms of tissue damage, while the fourth is cell-mediated.

3. Type I (or immediate) hypersensitivity can range from acute episodic reactions to chronic debilitating disease, and is generally recognized to be increasing in prevalence within the “developed world” over the past 30 years.

4. Type II (or bystander) hypersensitivity represents damage resulting when the humoral immune system becomes directed against self. The mechanisms of type II hypersensitivity are those of antibody effector function.

5. Type III (or immune complex) hypersensitivity results from the interaction of antibodies with antigen to form immune complexes; an example of this is serum sickness. Activation of Fcγ receptors and complement contribute to tissue injury.

6. Type IV (delayed-type) hypersensitivity represents a T cell-mediated immune response and may be orchestrated by $CD4^+$ or $CD8^+$ T cells, depending on the nature of the target antigen.