

Allergy and Hypersensitivity

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Text (required reading): Immunobiology, 6th edition, by Janeway et al.: Chapter 12

Introduction: What is hypersensitivity?

Immediate (Type I) Hypersensitivity (IgE:Mast Cell/Basophil:allergen)

I. Sensitization & IgE Production

Allergens

IgE: class switching (CD40/IL-4, IL-13/Stat6)

Genetics v Environment

II. Effector Mechanisms in Allergic Reactions

IgE Receptors

FcεRI and FcεRII (CD23)

Mast cells

development: SCF

heterogeneity

mediators

Basophils and eosinophils

development: IL-3 & IL-5

mediators

Allergic reactions

early (humoral) and late (cellular) phase

anaphylaxis, rhinitis, conjunctivitis, asthma, eczema, urticaria and angioedema, and food allergy

Treatment of allergic disease (sensitization v effector phases)

environment

medical

immunotherapy

immunomodulation

III. Hypersensitivity Diseases

Types II (cell and tissue antigen) and III (soluble antigen) hypersensitivity

antigen:IgG/M:FcγR:C':neutrophils

ADCC (antibody-dependent cell-mediated cytotoxicity)

Arthus reaction

serum sickness

autoimmune hemolytic anemia

systemic lupus erythematosus

Goodpastures syndrome

hypersensitivity pneumonitis

Type IV hypersensitivity

Th1 helper T cells:CD8 cytotoxic T cells:macrophages:giant cells

contact hypersensitivity (poison ivy, Nickel)

tuberculin hypersensitivity

chronic granulomatous diseases (sarcoidosis)

Celiac disease (IgA, IgG & T cells)

Chemokines/Cytokines: facilitate inflammatory response

Genetics: autoinflammatory diseases

FMF (pyrin)

TRAPS (TNFR-1)

Crohn's (NOD2)