

## IMMUNOPATHOLOGY REVIEW 2011

Immunopathology	Mechanism	Effector cells	Typical example	Diagnosis	Treatment
<b>Type 1</b>	IgE on mast cells  ► Early phase: histamine release (15 min) ► Late phase: PG and LT production, cytokines (6-8 hr.) ► Eosinophil chemotaxis	(B cells make IgE) (excessive Th2-like Tfh help) Mast cells  Various, including M2 macrophages  Eosinophils	► Seasonal rhinitis (mostly early phase) ► Asthma (eventually mostly late phase) ► Eczema ► Anaphylaxis (early phase)	Skin prick tests History CAP-FIA (lab test for specific IgE) Challenge tests	► Antihistamines ► Corticosteroids ► Leukotriene antagonists ► mAb to IgE (omalizumab, Xolair) for chronic asthma ► Epinephrine for anaphylaxis
<b>Type 2</b>	IgG autoAb (occasionally IgA, IgM)	(B cells make IgG) (excessive or illicit Tfh help; cross-reaction; exposure of sequestered Ag)  Neutrophils	► Graves' disease ('LATS' Ab to TSH receptor <i>stimulates</i> ) ► Goodpasture's (Ab to collagen Ag in kidney and lung) ► Rheumatic heart disease (cross-reaction with Strep)	Fluorescent antibody techniques using patient's or normal tissue (linear pattern) Some specific immunoassays	► Corticosteroids ► NSAIDs (nonsteroidal anti-inflammatory drugs) ► DMARDs (disease-modifying anti-rheumatic drugs) ► mAbs to decrease T or B cells
<b>Type 3</b>	IgG, IgA (IgM) immune complexes to intrinsic or extrinsic Ags	(B cells make Ab) (excessive or illicit Tfh help)  Neutrophils	► Serum sickness ► Poststreptococcal glomerulonephritis ► Hypersensitivity pneumonitis (Farmer's Lung: develops into a Type 4 disease) ► Arthus reaction	"Mixed cryoglobulins" Biopsy shows lumpy-bumpy pattern	Supportive care for self-limited conditions Corticosteroids

<b>Type 4</b>	T cell mediated (delayed hypersensitivity)	Th1, Th2, Th17 (insufficient Treg) M1 macs (Th1) M2 macs (Th2) CTL	<ul style="list-style-type: none"> <li>▶ Multiple sclerosis</li> <li>▶ Hashimoto's thyroiditis</li> <li>▶ Type 1 diabetes (T1D)</li> <li>▶ Rheumatoid arthritis (like T1D, starts with autoAb then → T cell dominated)</li> </ul>	Biopsy shows mononuclear cell infiltrate Research tests show Ag-specific T cells	Immunosuppression Anti-inflammatories mAbs to T cells
<b>'Chronic Frustrated Immune Response'</b>	T cells against non-removable Ags → chronic inflammation	Th1, Th2, Th17 (insufficient Treg) M1 macs (Th1) M2 macs (Th2) CTL	<ul style="list-style-type: none"> <li>▶ celiac disease: gluten</li> <li>▶ inflammatory bowel disease (Crohn's, ulcerative colitis): normal gut flora</li> <li>▶ Chronic beryllium disease: Be</li> <li>▶ psoriasis: normal skin flora</li> </ul>	Biopsy shows characteristic pathology Research tests show Ag-specific T cells, insufficient Treg	Immunosuppression Anti-inflammatories mAbs to T cells