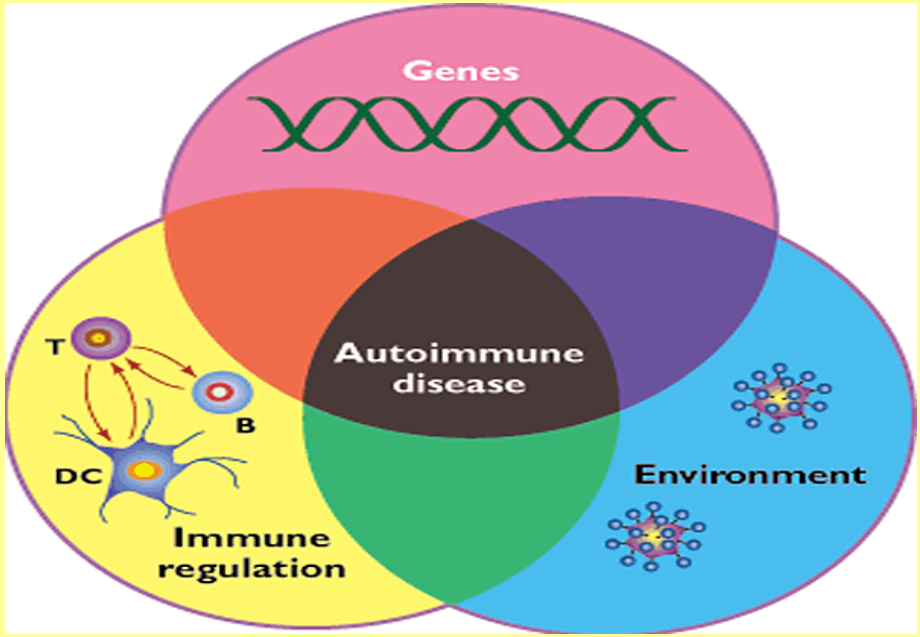
Autoimmune diseases
Autoantibodies - detection

- One common theory across all of the autoimmune diseases is:
- some outside agent is required to start the process.
- Even with a genetic tendency, a person may not develop an autoimmune disease without an environmental influence or physical trauma to set it off.

- List of possibly identified suspects for some common autoimmune conditions:
- **Lupus:** hair dye and certain drugs, smoking
- **Scleroderma:** silica exposure
- **Diabetes:** gluten, coxsackie virus
- **Rheumatoid Arthritis:** mycoplasmas, smoking
- **Thyroid:** smoking
- **Multiple Sclerosis:** hepatitis B infection



What Are Some of the Most Common Autoimmune Diseases?

- (SLE)
- Crohn disease – ileum
- Goodpasture´s disease – kidney, lung
- Hashimoto thyreoiditis – thyroid gland
- IDDM type I – β cells of pancreas
- Sclerosis multiplex (white matter of nerves)
- Sjorgen sy – tear chanals

Disease is based on by cell mediated or humoral immunity

Affected Tissue	Disease	Target Antigen
Anterior parts of the eye	Uveitis (anterior)	Beta B1-crystalin, other proteins of the ciliary body epithelium
Connective tissue	Scleroderma	Scl-70, PM-Scl antigens
Erythrocytes	Autoimmune hemolytic anemia	Erythrocyte surface molecules
Heart valves and sarcolemmal membranes	Rheumatic fever	Streptococcal M protein, cardiac muscle antigens
Joints of lower extremities; sometimes eyes and genital, urinary, or GI systems	Reiter's disease (reactive arthritis)	Possible association with infectious agents
Kidneys, lungs	Goodpasture's syndrome	Type IV collagen of basement membranes
Large intestine	Ulcerative colitis	Unknown
Lower spine	Ankylosing spondylitis	Unknown
Myelin of the central nervous system	Multiple sclerosis	Myelin proteins (several)
Pancreatic islet β cells	Type I insulin-dependent diabetes mellitus (IDDM)	Glutamate decarboxylase, preproinsulin, other β cell products
Platelets	Thrombocytic purpura	Platelet integrin molecules
Skeletal muscle	Myasthenia gravis	Acetylcholine receptor
Skeletal muscle	Polymyositis	Jo-1, PM-Scl antigens
Skin	Pemphigus vulgaris	Desmoglein-3
Skin	Psoriasis	Unknown, but there is some association with streptococcal infections
Skin, vasculature, muscle, joints, kidney	Systemic lupus erythematosus (SLE)	Nucleic acids, chromosomal proteins
Small intestine	Crohn's disease	Unknown
Spermatogonia, sperm	Male sterility (??)	Unknown
Synovial membranes, joints	Rheumatoid arthritis	Unknown
Tear ducts	Sjögren's syndrome	Ro/SS-A antigens
Thyroid gland	Graves' disease	TSH receptor
Thyroid gland	Hashimoto's thyroiditis	Thyroglobulin

- Diagnosing an autoimmune disease involves identifying which antibodies body is producing.
- **Antinuclear antibody tests (ANA) -** a type of autoantibody test that looks for antinuclear antibodies, which attack the nuclei of cells in the body
- **Autoantibody tests -** any of several tests that look for specific antibodies to own tissues
- **Complete blood count** (CBC) - measures the numbers of red and white cells in blood
- **Erythrocyte sedimentation rate (ESR) -** this test indirectly measures how much inflammation is in body

Detection of autoantibodies

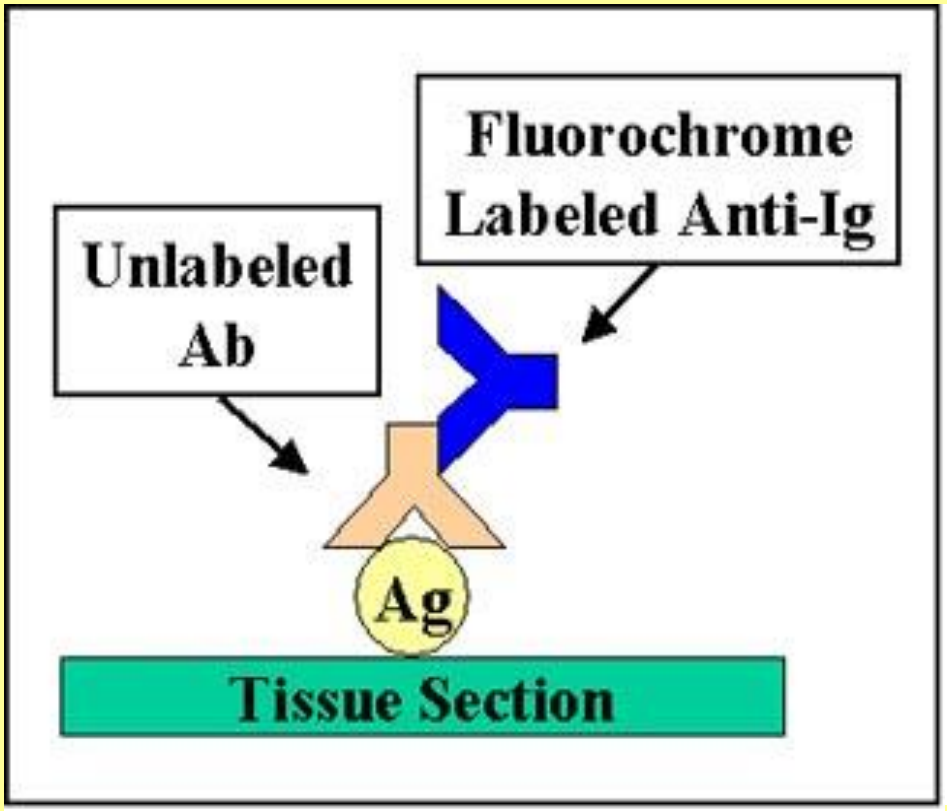
anti nuclear antibodies ANA – homogenous, specled, rought specled, centromer.....

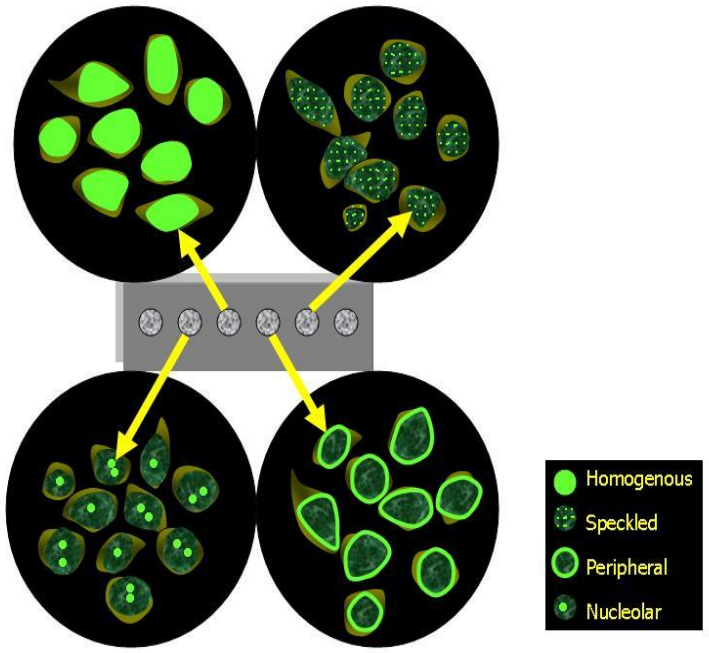
- - extracted nuclear antibodies ENA
- - anti ds DNA antibodies dsDNA
- - anti ss DNA antibodies ssDNA
- - anti myeloperoxidase antibodies – anti MPO
- ELISA test

immunofluorescence detection of antibodies

cells + patient´s serum + conjugate (anti hu IgG labelled by fluorochrome)

IFA method





HLA – connection with autoimmune diseases

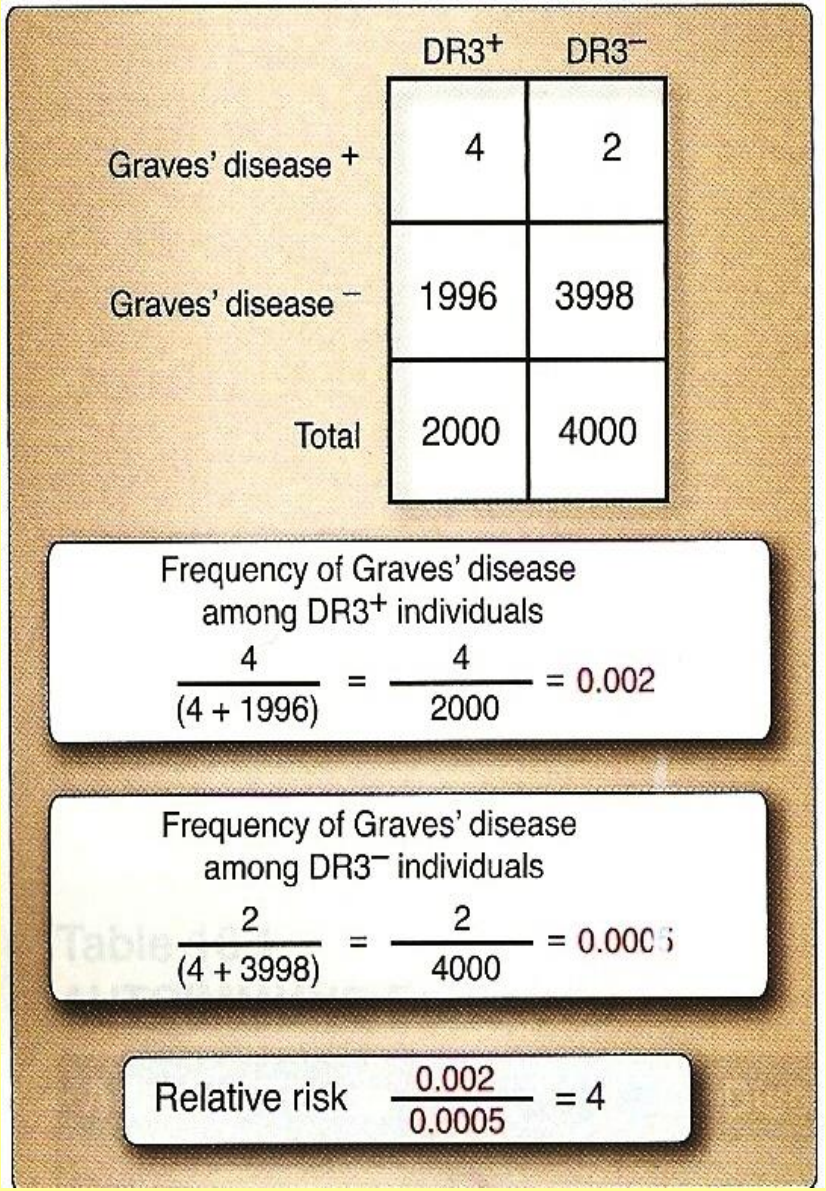
- Risk of autoimmune disease can be connected with HLA genes
- Sometimes one HLA gene is connected with several diseases
- Mechanisms are not clear, statistical connection influenced by processing and presentation of epitopes to T cells
- Strenghth of statistical connection = RR = relative risk

HLA connection to autoimmune diseases RR

Disease	HLA Gene[a]	Relative Risk[b]
Acute uveitis	B27	10
Ankylosing spondylitis	B27	100
Goodpasture's syndrome	DR2	15
Graves' disease	DR3	4
Hashimoto's thyroiditis	DR5	3
Type I insulin-dependent diabetes mellitus	DR3/DR4 heterozygote	20–25
Multiple sclerosis	DR2	5
	DR3	10
Myasthenia gravis	DR3	3
	B8	3
Pemphigus vulgaris	DR4	15
Psoriasis vulgaris	Cw6	5–13
Reiter's disease	B27	35
Rheumatoid arthritis	DR4	4
Systemic lupus erythematosus	DR3	6

Relative risk-RR

- compare frequency of of disease in carriers of gene to not carriers of the gene
- calculated for a certain group of people



- (HLA B 27:ankylosing spondylitis = 100)