

# • **Autoimmune disease** •

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# ***Autoimmune diseases***

- Immune reaction against self Ags.



*Disease ( autoimmune)*

- *Chronic*
- *Irreversible*

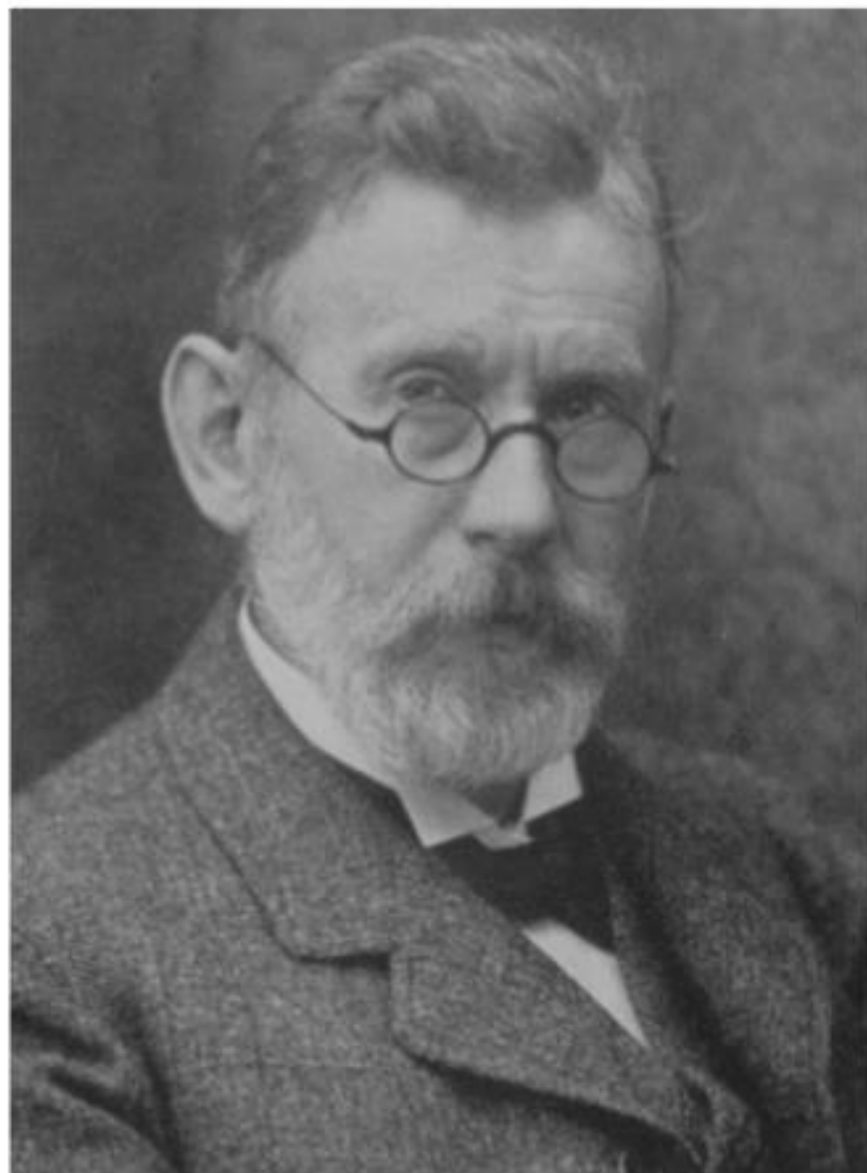
# Paul Ehrlich

The term cited by the German immunologist Paul Ehrlich (1854-1915) •

To describe the body's innate aversion •

to immunological self - •  
destruction

## **Paul Ehrlich (1854 – 1915)**



# Autoimmune disease

## **Autoimmunity :** •

**Normally the immune system known its •  
own tissues as self and does not react to  
them . Rarely, however there is a breakdown  
in this recognition and the immune system  
destroy its own tissue a phenomena termed  
autoimmunity As specificity repertoires  
that are expressed by both T- and B-Cells  
are random .**

**it is no surprising that antiself •  
specificites occur ,there are  
mechanism which kill these self -  
reactive cell ,as described earlier ,but  
some escape this surveillance ,some  
autoimmune disease are triggered by  
microbial antigen which mimic or  
cross – react with self components.**

# Causes of Autoimmunity

Autoimmune diseases is a group of disorders in which tissue injury is caused by humoral (by auto-antibodies) or cell mediated immune response (by auto-reactive T cells) to self antigens. •

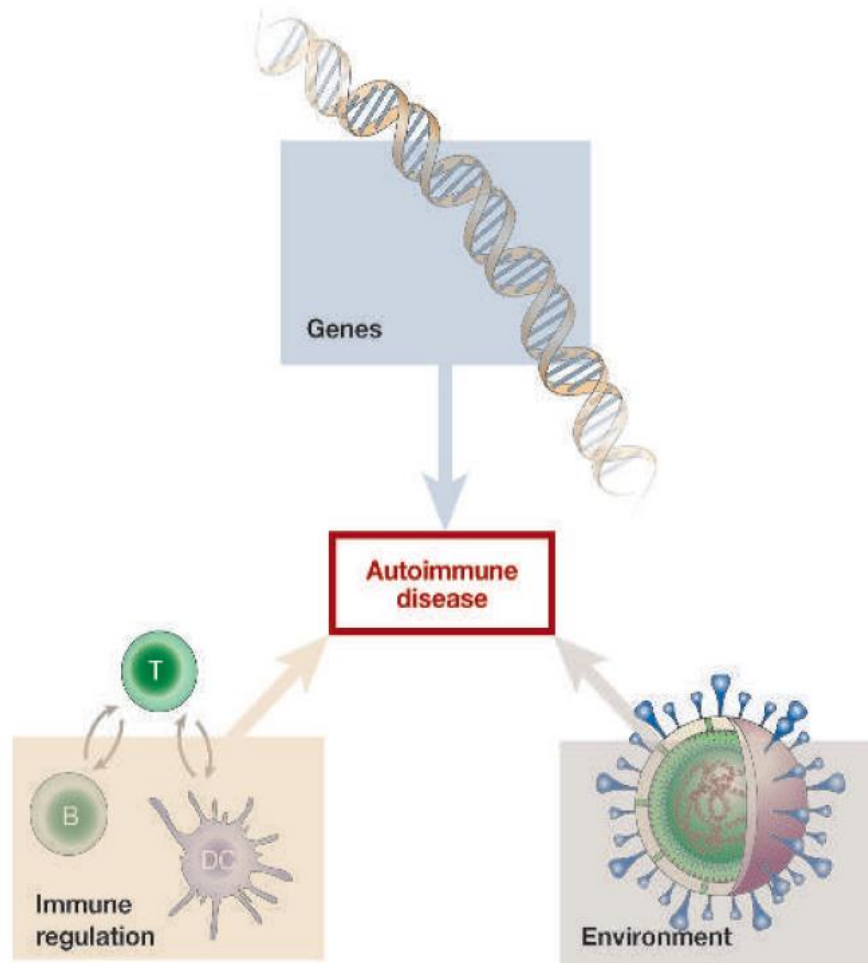
-An autoimmune disorder may result in: •

1-The **destruction** of one or more types of body tissue •

2-**Abnormal growth** of an organ •

3-**Changes** in organ function •

# Causes of Autoimmunity

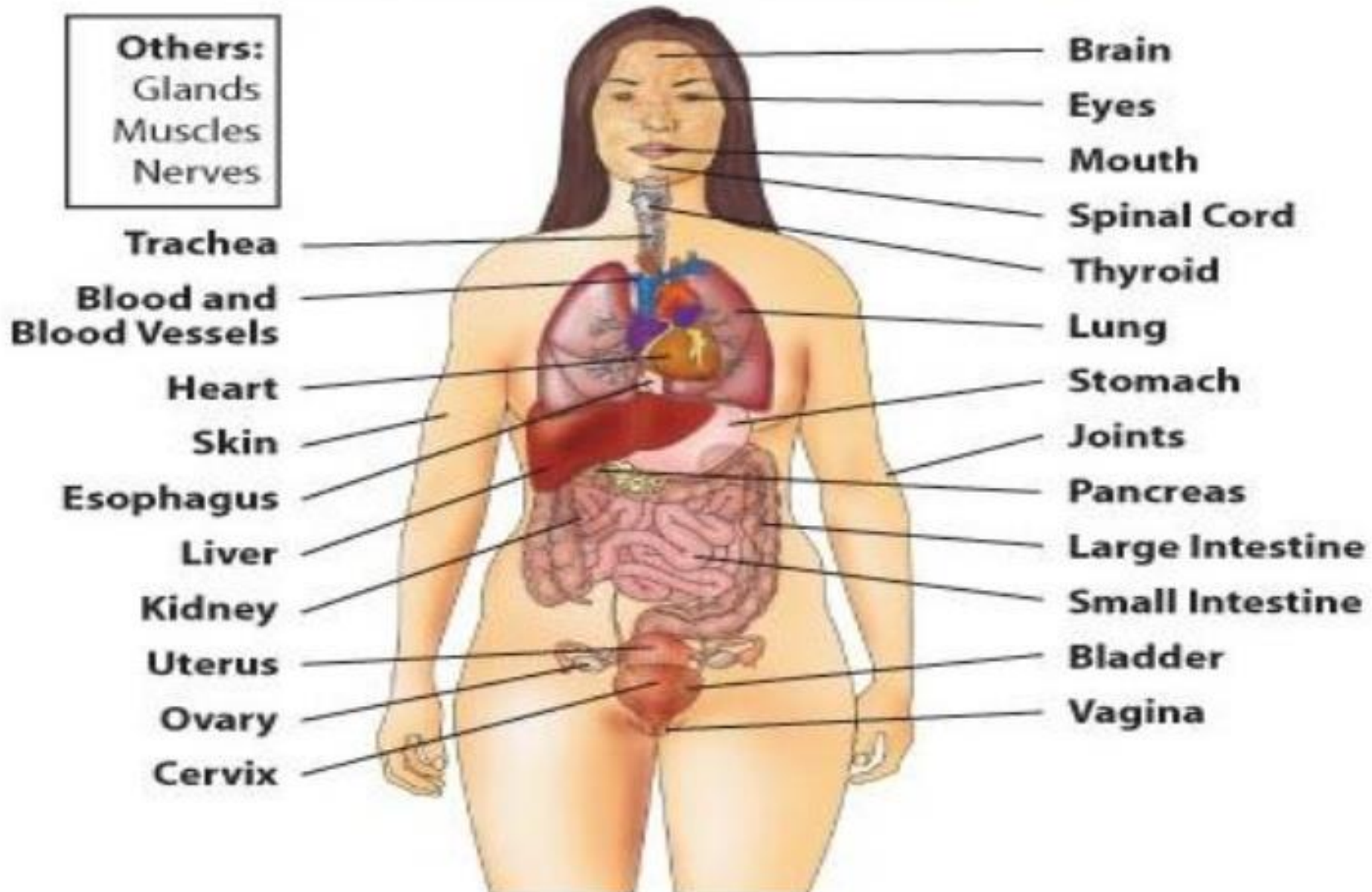




# Autoimmune disease:

An autoimmune disorder is a condition •  
that occurs when the immune system  
attacks and destroys healthy body tissue.

# Body Parts That Can Be Affected by Autoimmune Diseases

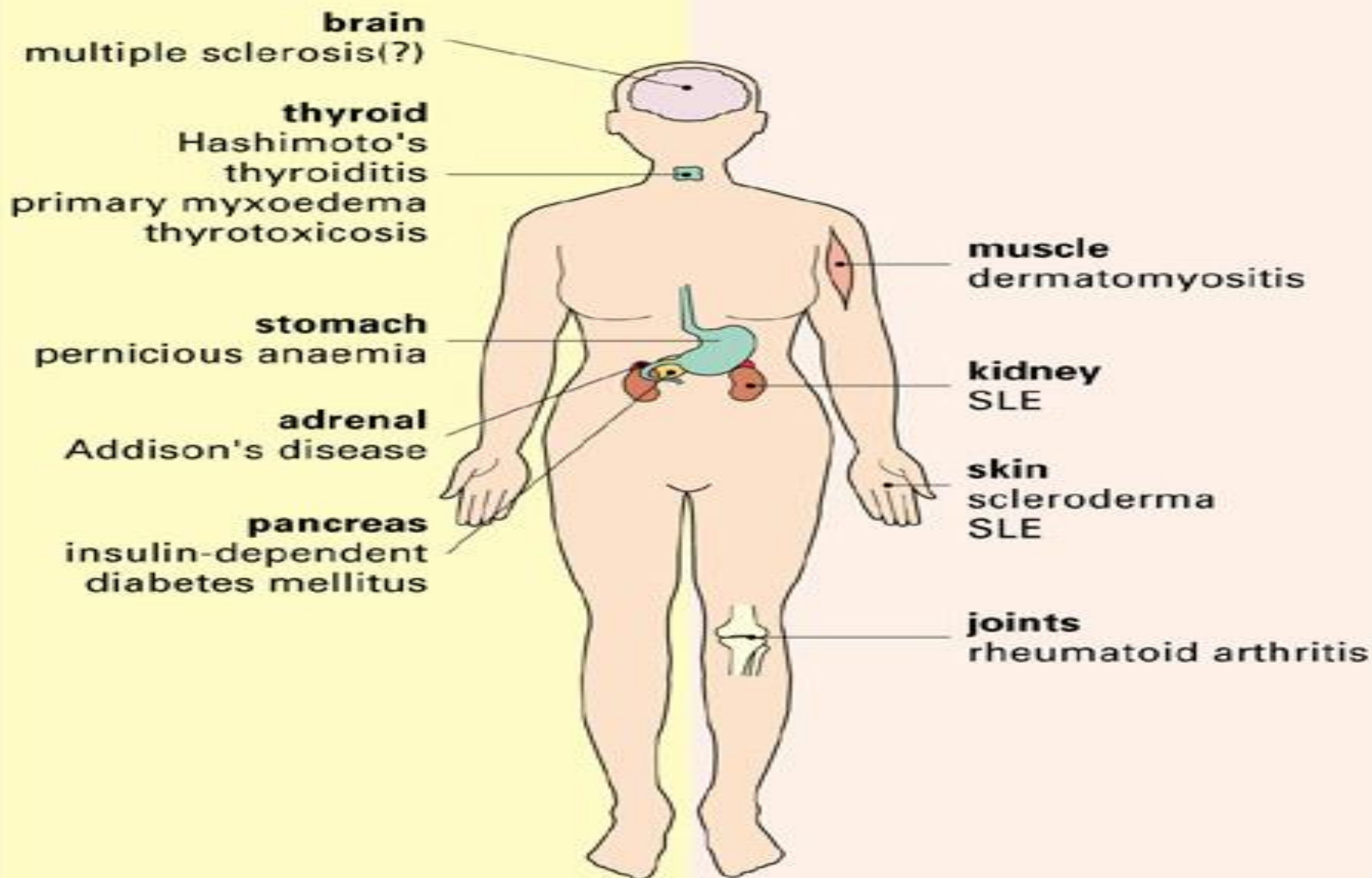


# Autoimmunity Classification

Can be classified into clusters that are either  
*organ-specific* or *systemic*

Organ-specific autoimmune diseases	Systemic autoimmune diseases
Type I diabetes mellitus	Rheumatoid arthritis
Goodpasture's syndrome	Scleroderma
Multiple sclerosis	Systemic lupus erythematosus Primary Sjögren's syndrome Polymyositis
Graves' disease Hashimoto's thyroiditis Autoimmune pernicious anemia Autoimmune Addison's disease Vitiligo Myasthenia gravis	

Dr. TM Rao MD

**organ-specific****non-organ-specific**



# **Classification of autoimmune disease:**

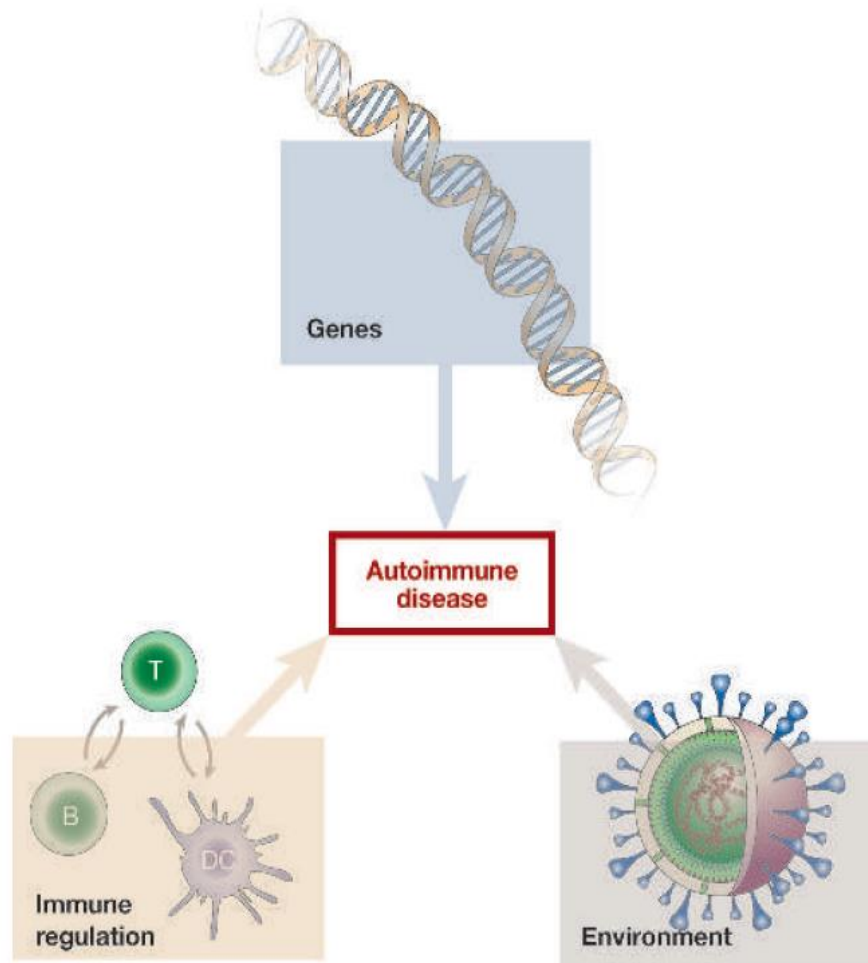
**The organ specific when the specific pathology is confined to particular organ :  
(eg:Hashimotos disease ,pernicious anaemia ,Addisons disease )**

**And when the pathology is not confined to particular organ the disorder were placed under the head non-organ specific .  
systemic lupus erythrematosis, rheumatoid arthritis, dermatomyositis**

**Moreover autoimmune disorder may •  
overlap that mean a patient have more than  
one organ-specific disease & more than one  
systemic disease**

**Based on the clinical experimental studies •  
it has been suggested that autoimmunity  
may arise due to an  
immunologic imbalance with excessive B- •  
cell activity & diminished suppressor T-cell  
activity. This imbalance may occur as a  
consequence of genetic ,viral and  
environmental mechanisms acting singly  
or combination .**

# Causes of Autoimmunity



# Organ specific autoimmune diseases

A particular organ is affected due to auto Abs. •

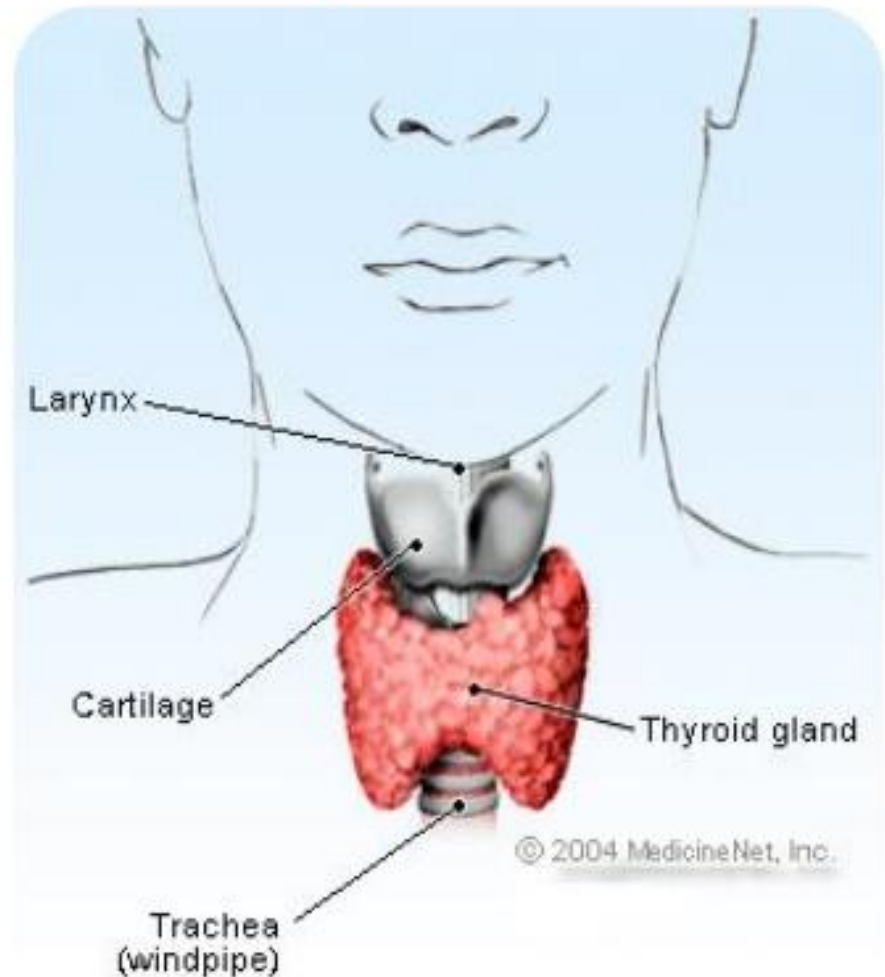
For example:

- 1-Thyroiditis ➤
- 2-Multiple sclerosis ➤
- 3-Myasthenia gravis ➤
- 4-Type I Diabetes Mellitus ➤
- 5-Perinocous anaemia ➤
- 6-Addisons disease ➤
- 7-Hashimotos disease ➤
- 8-Graves' Disease ➤

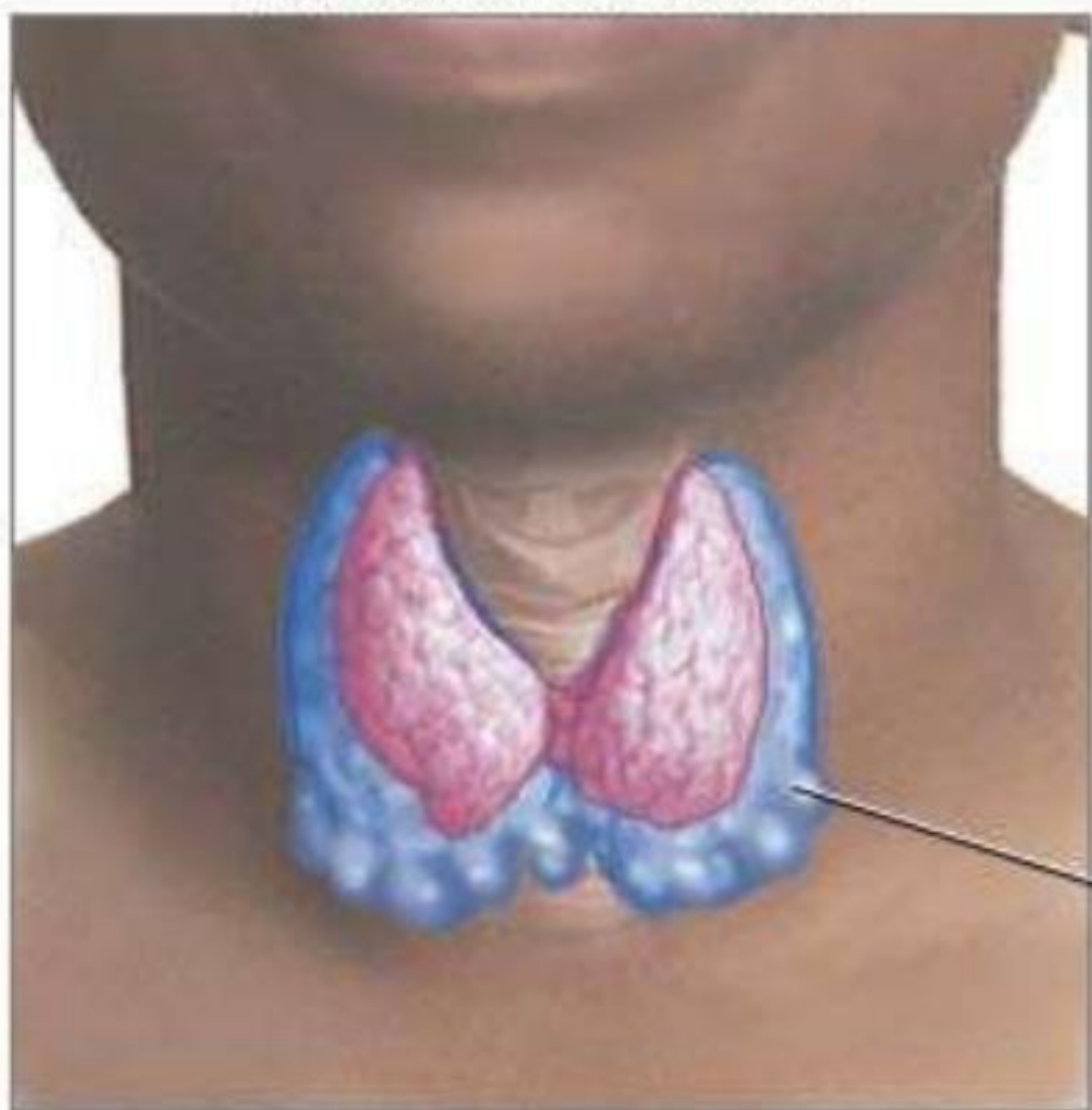


# HASHIMOTO'S DISEASE (THYROIDITIS)

- Alternative names
  - Chronic lymphocytic thyroiditis
  - Autoimmune thyroiditis
- Female to male ratio of 12:1
- Effector mechanisms
  - Autoantibodies specific for
    - Thyroglobulin
    - Thyroid peroxidase
  - CD8 T cells



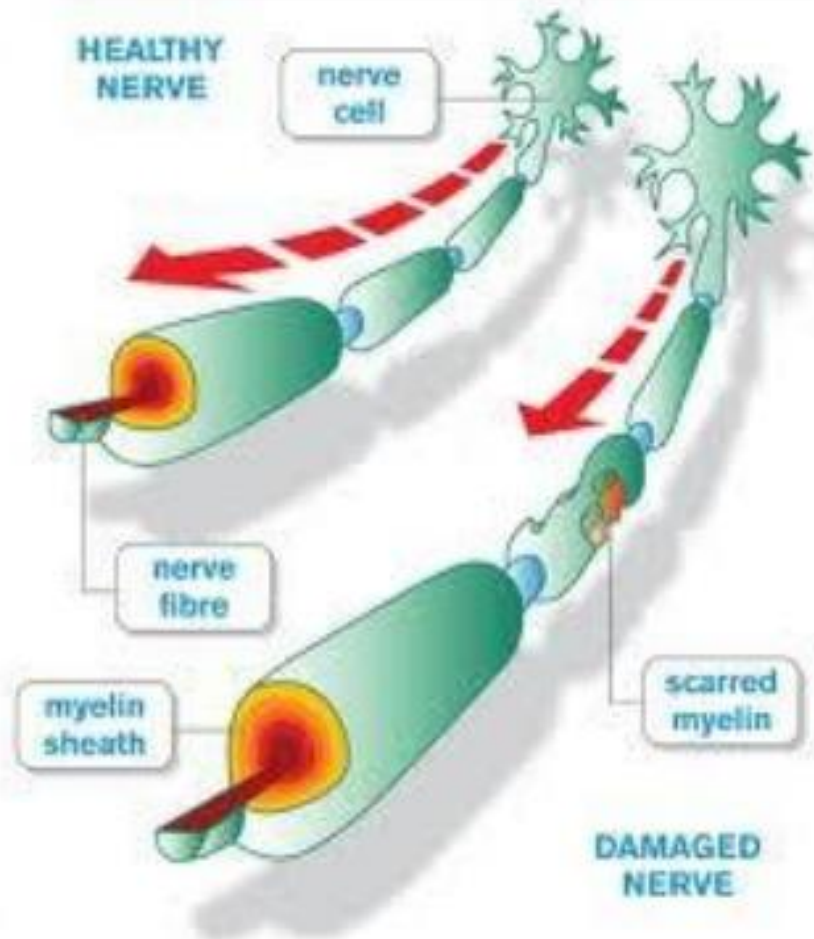
## Hashimoto's disease



Enlarged, inflamed  
hypofunctioning  
thyroid (goiter)

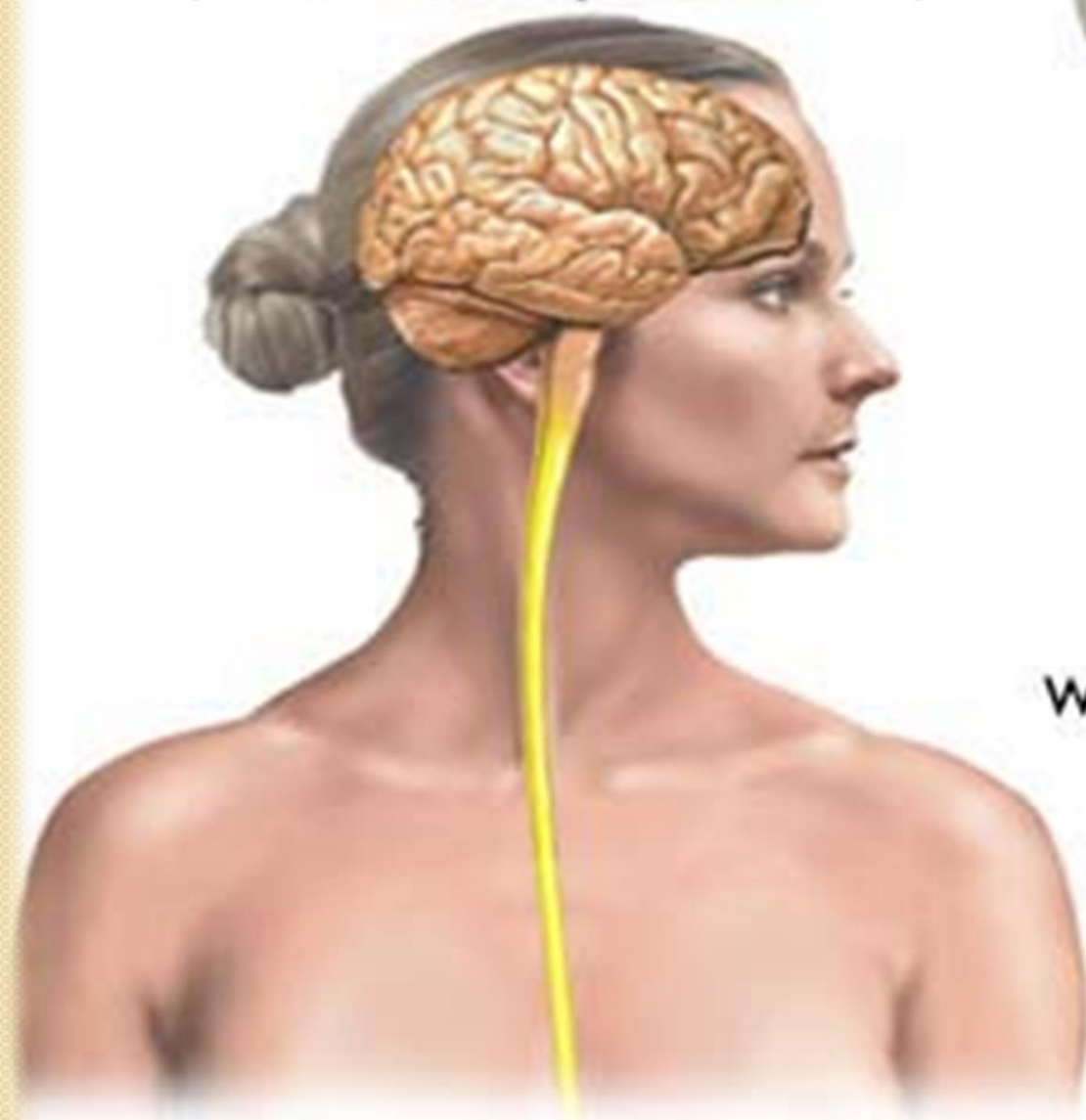
# MULTIPLE SCLEROSIS (MS)

- **Effector mechanisms**
  - Myelin basic protein is primary auto antigen for CD4 TH1 cells
- **Radiology diagnosis**
  - MRI for detecting demyelinating lesions (plaques)
- **Laboratory diagnosis**
  - High resolution protein electrophoresis for
    - Oligoclonal bands in CSF





## Central nervous system (brain and spinal cord)



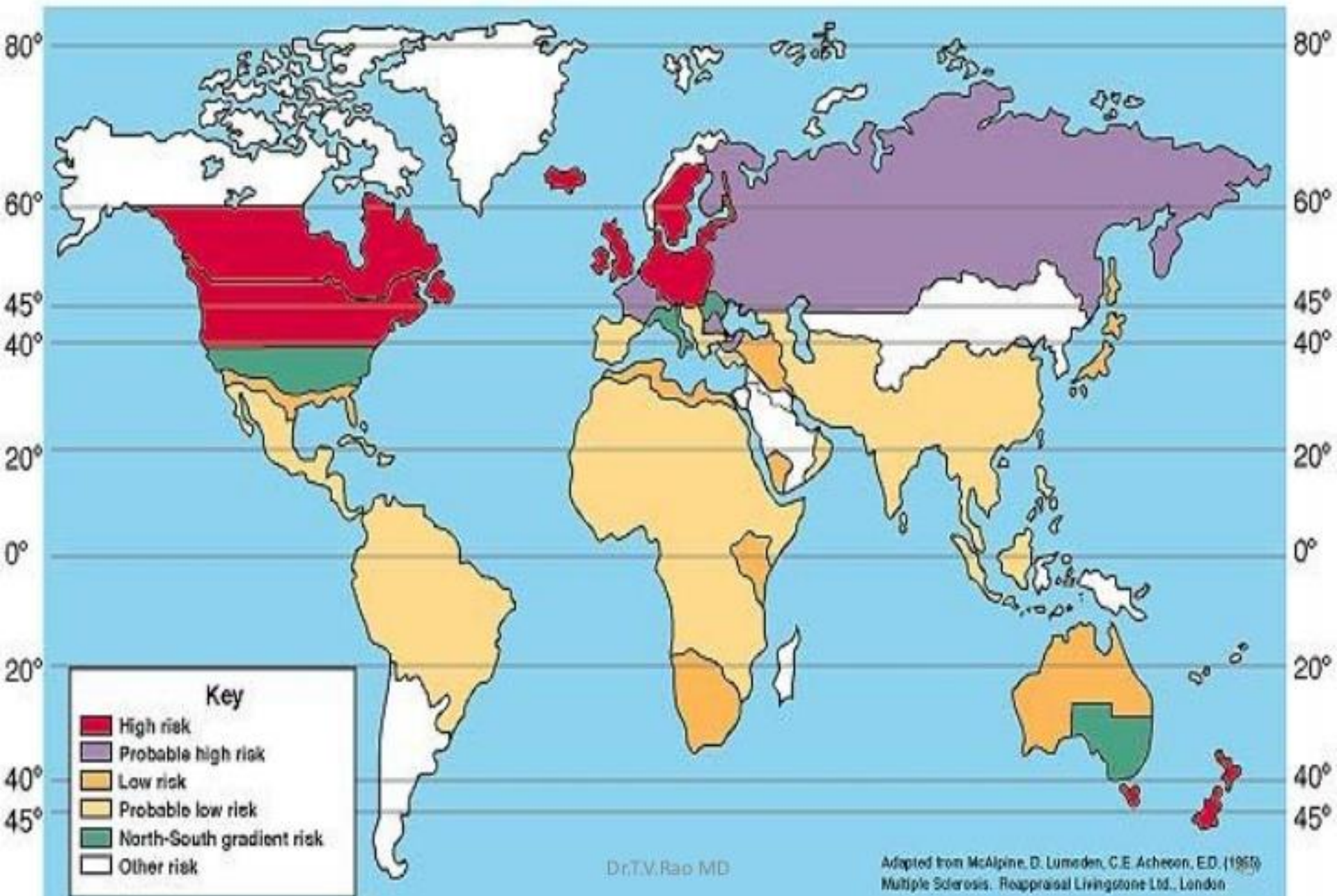
In multiple sclerosis the myelin sheath, which is a single cell whose membrane wraps around the axon, is destroyed with inflammation and scarring

# Multiple Sclerosis

Degeneration of nerves CNS (brain and spinal cord). •

Myelin disappear due inflammation. •

# World Distribution of Multiple Sclerosis





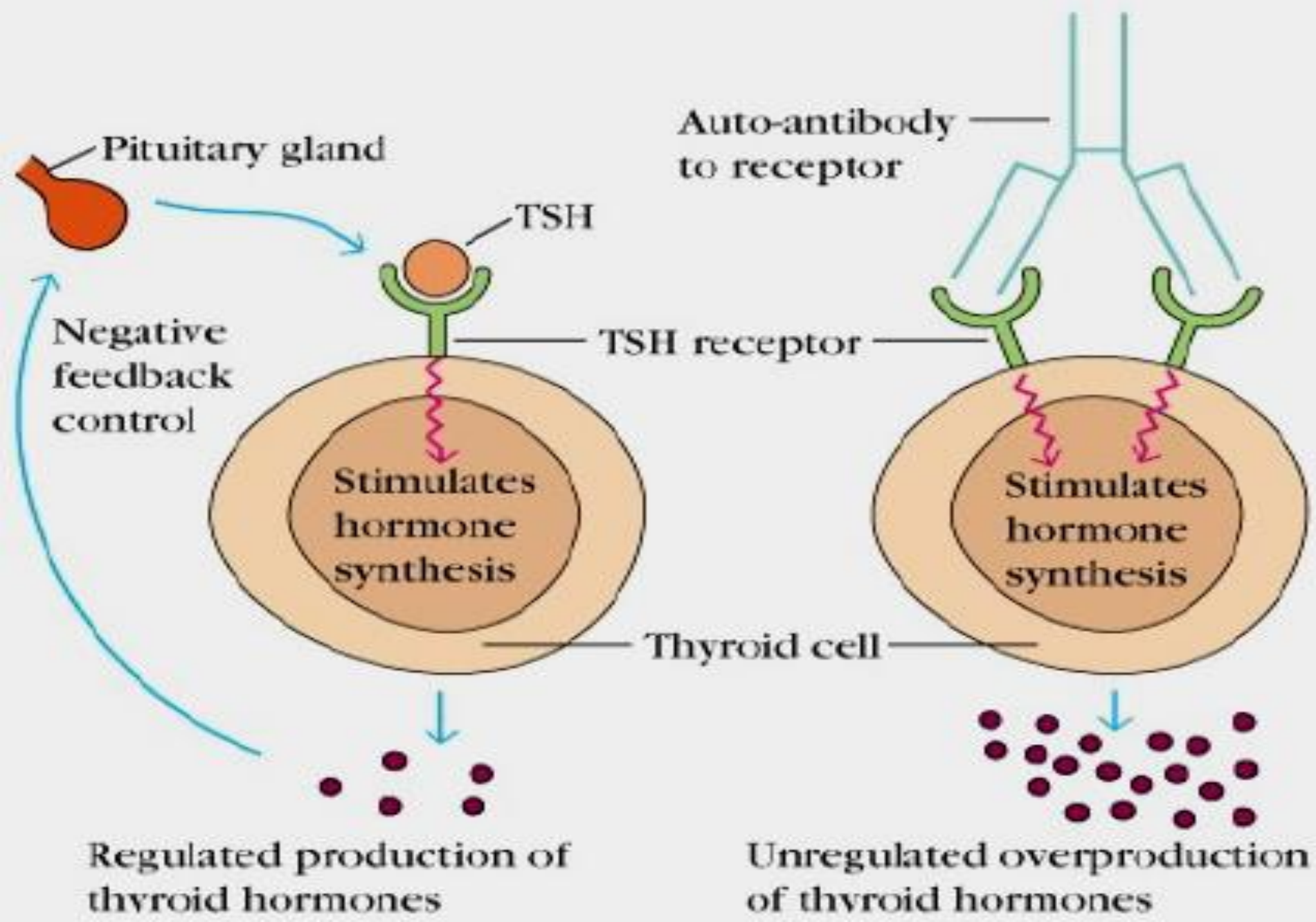
# Graves' Disease...

This causes the • stimulation of Thyroid gland to secrete more TH (Hyperthyroidism) resulting in Exophthalmus , bulging eyes & Goitre.



Davidson's book

# STIMULATING AUTO-ANTIBODIES (Graves' disease)





## . non-specific autoimmune disease

Immune complexes accumulate in many tissues •  
and cause inflammation and

Affects many organs or the whole body •

1-Systemic lupus erythematosus➤

2-polymyositis➤

3-primary sjogrens syndrome➤

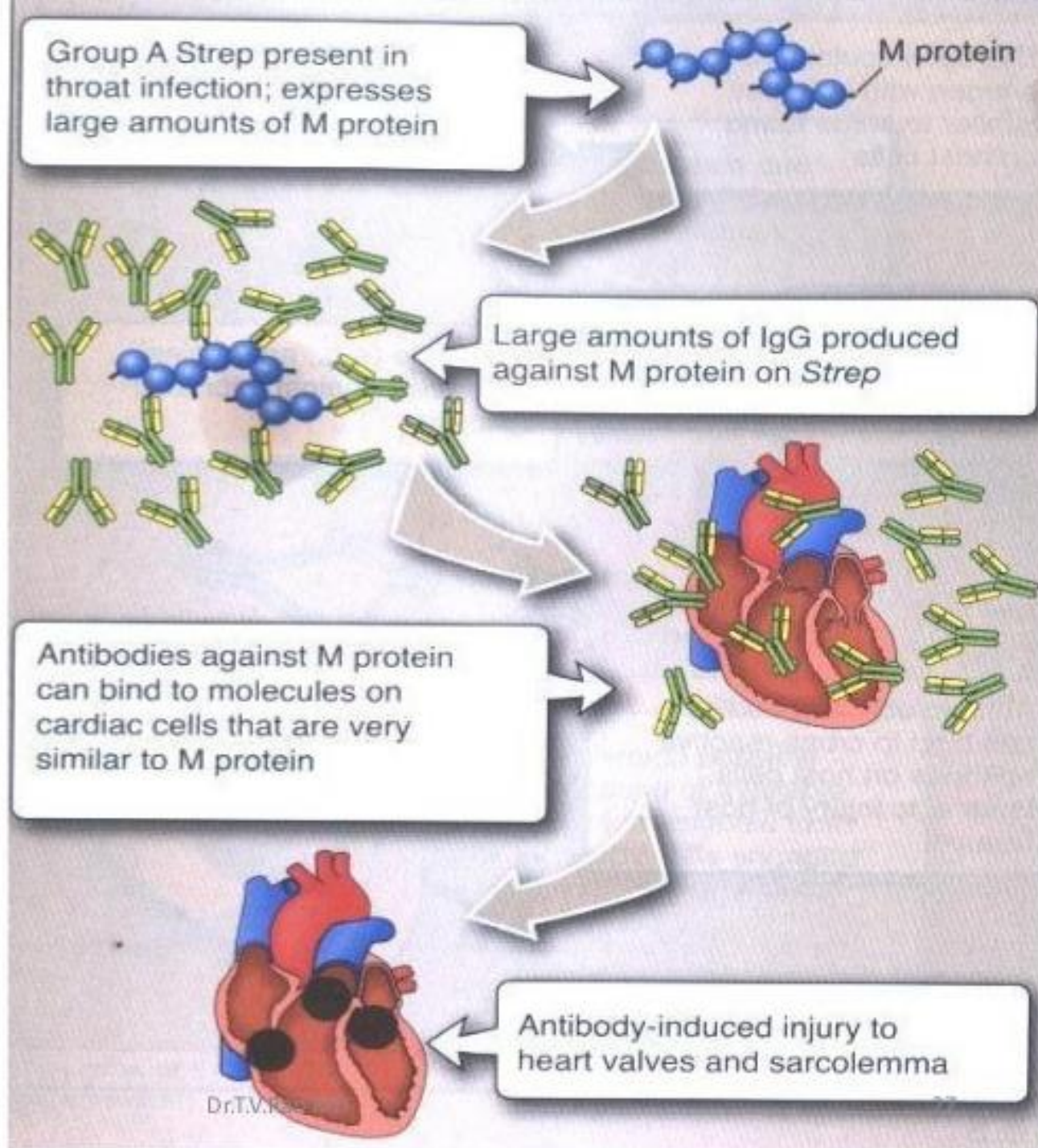
4-dermatomyositis➤

5-scleroderma➤

6-Rheumatoid arthritis➤

7-Rheumatic fever➤

# Rheumatic fever is a classic example of molecular mimicry



# Rheumatoid Arthritis

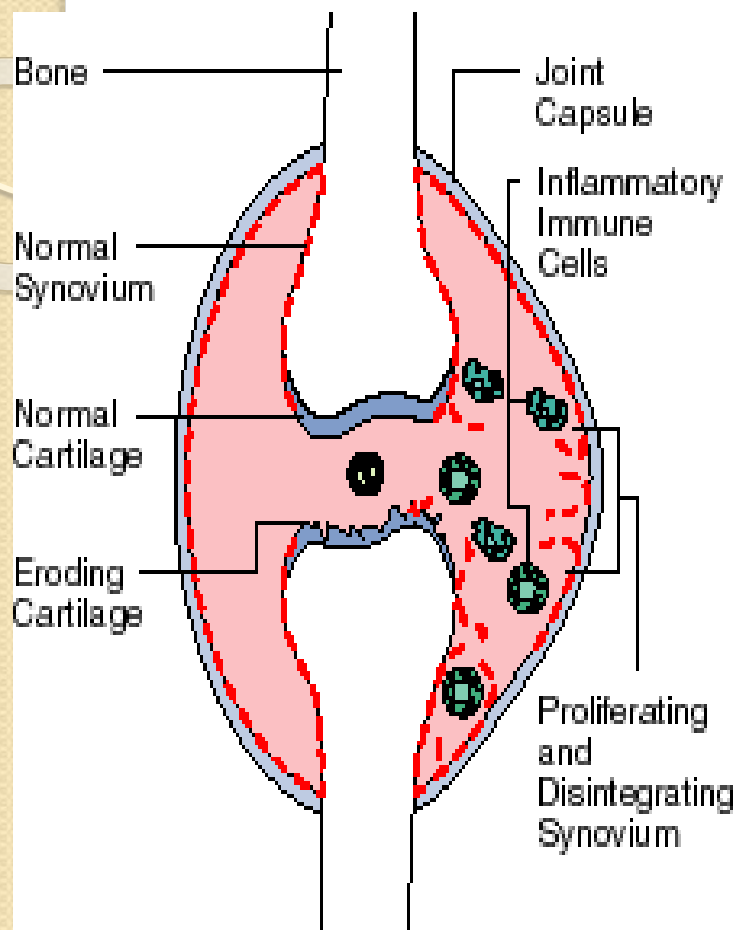
Disease of the joints. •

Caused by the auto Antibody of IgM type, •  
called as rheumatoid factors.

The synovial fluid of these patients contain •  
increased no. of T-cells & macrophages.

Marked by inflammatory changes in the •  
synovial membrane.

In later stage, deformity develops. •



Condition of Rheumatoid Artheritis



# Systemic Lupus Erythematosus (SLE)

Skin disease due to the production of antinuclear factor (ANF) symptoms include butterfly rash on face, fatigue, headaches .

In these patients, **LE cell** (a mature neutrophil) appears in blood & bone marrow

Function – Phagocytosis in the presence of ANF

strikes women nine times more often than men

Complex of anti-self antibodies & Antigen deposit in and cause damage to Renal tissue (glomerulonephritis) Triggered by environmental effects in persons who are genetically

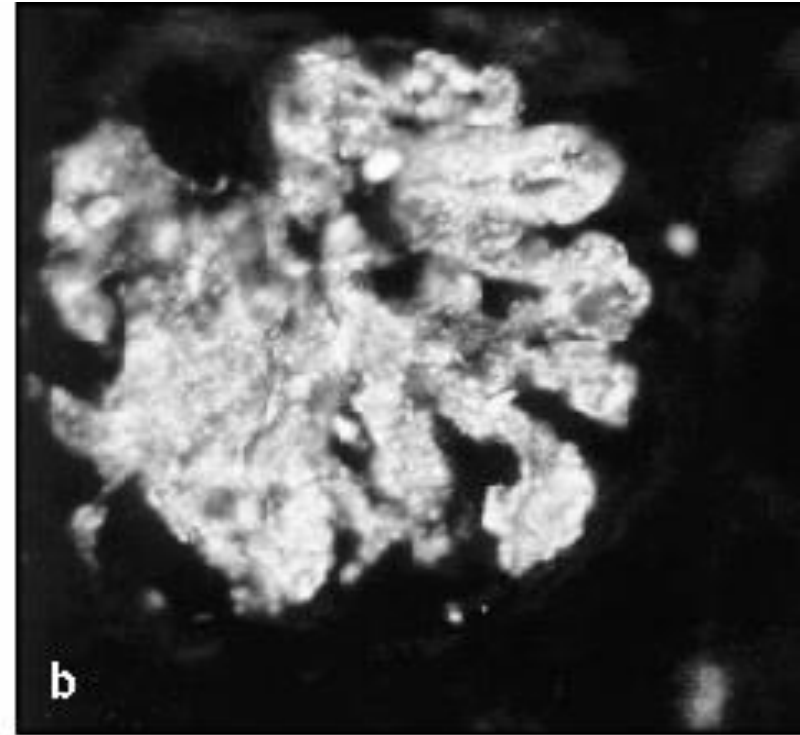
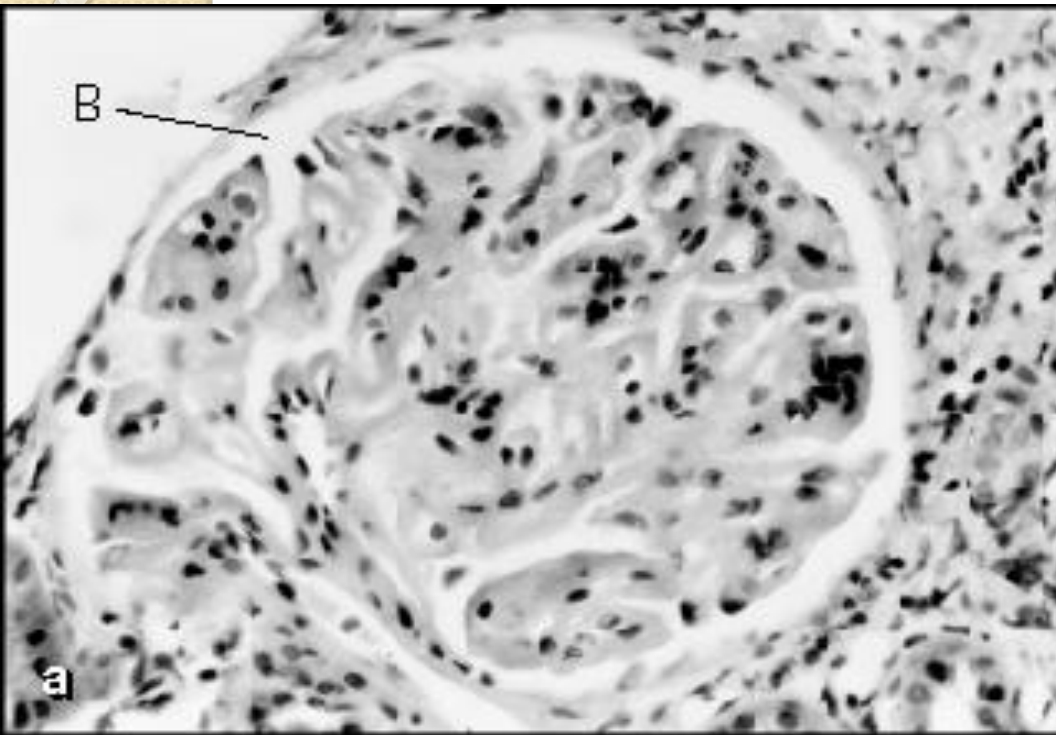
# SYSTEMIC LUPUS ERYTHEMATOSUS (SLE)

- Chronic, multi-system inflammatory disease with protean manifestations and remitting course
- **Clinical manifestations**
  - Musculoskeletal (joint and muscle pain)
  - Dermatological (malar rash)
  - Renal (glomerulonephritis)
- **Female to male ratio of 9:1**
- **Etiology is unknown**
  - Genetics, race, hormones, environment



Figure 11-10 The Immune System, 2/e (© Garland Science 2005)

# Damaged kidney (left) caused by immunoglobulin deposits (right)



**Diagnosis autoimmune disease: •**

**General signs of autoimmune disease that •  
may have diagnostic value include :**

**1-Elevated serum gamma globuline •**

**2-presence of autoantibodies •**

**3-Depress levels of serum complement •**

**4-Immune complex in serum •**

**5-lesion detected on biopsy (e.glomerular •  
lesions) resulting from deposition of immune  
complexes.**



# Treatment:

-The goals of treatment are to:

1-Reduce symptoms •

2-Control the autoimmune process •

3-Maintain the body's ability to fight disease •

if the autoimmune disorder affects the blood-may •  
need blood transfusions.

Medicines are often prescribed to control or •  
reduce the immune system's response- called  
immunosuppressive medicines.

in the future gene therapy •

**vaccines to turn off the autoimmune response** ◦

**THANK  
YOU**

THANK

