









## STEVENS-JOHNSON SYNDROME



## TOXIC EPIDERMAL NECROLSIS (TEN)



# What Makes us Sick?

- “Enemies” in the environment like microbes and chemicals are constantly attacking our bodies, disrupting homeostasis.
- Sometimes immune system homeostasis is disrupted on its own.

it may **over-react** to antigens such as with allergies

it may **under-react** as with human immunodeficiency virus infection (HIV)

it may **react to self** proteins as with autoimmune disease







# Auto-Immune Diseases

**The immune system sees “self” antigens as “non-self”.**

- **The autoimmune response results in tissue damage;**
  - **Some damage occurs in only one or a few organs;**
  - **In other cases it may be body-wide (systemic).**
- **~ 3.5 % of people have autoimmune diseases;**  
**On average, women are 2.7 times more likely to develop these diseases than men.**
- **The cause may be due to genetic factors, infectious agents, gender, and age.**  
**Most auto-immune diseases have no known cause or cure - treatment is aimed at controlling symptoms.**

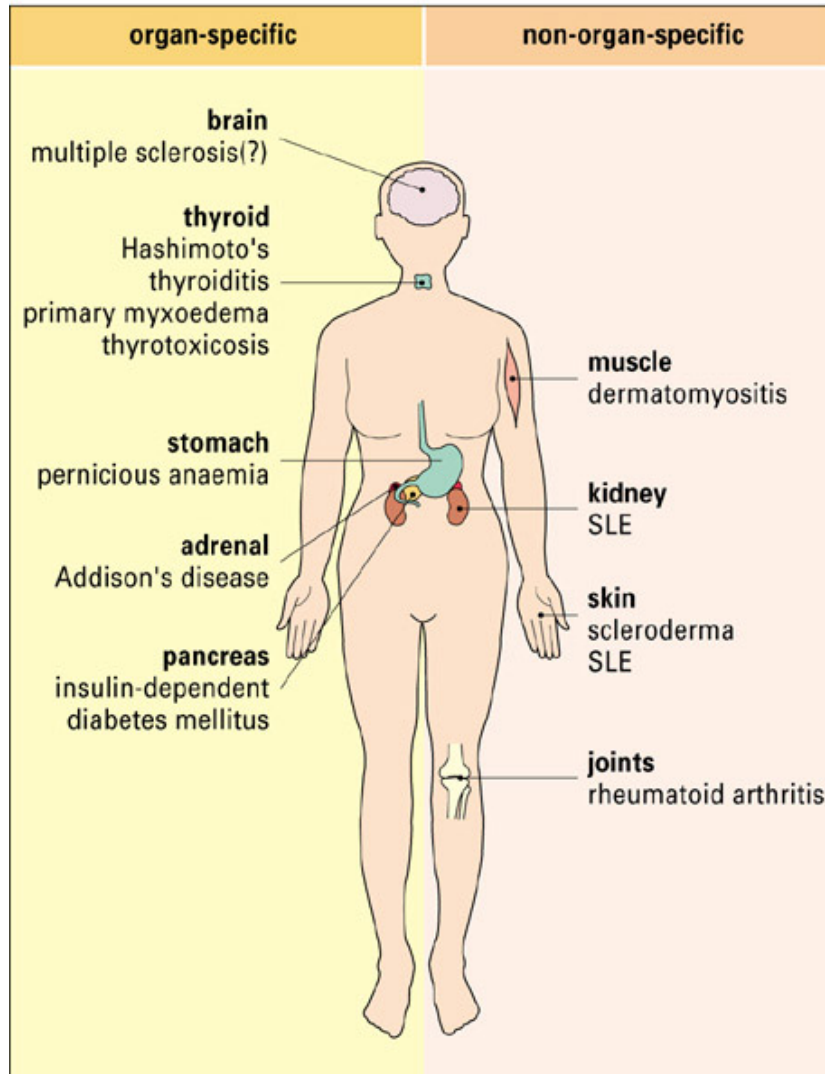


# Why Does the Immune System Attack What it's Supposed to Protect?

- **Failure to recognize some cells as “self”**
  - In rheumatic fever, the streptococcus antigen is very similar to a protein in heart tissue, so the body mistakenly identifies heart tissues as foreign.
- **Cells seen as foreign are attacked and destroyed**
  - May be organ-specific, targeting a few select cells or organs;
  - May be systemic.



# Auto-Immune Diseases



© [Fleshandbones.com](http://Fleshandbones.com) Roitt et al: Immunology 6E

- Organ-Specific

- Multiple Sclerosis
- Juvenile Diabetes

- Systemic

- Systemic Lupus Erythematosus
- Rheumatoid Arthritis

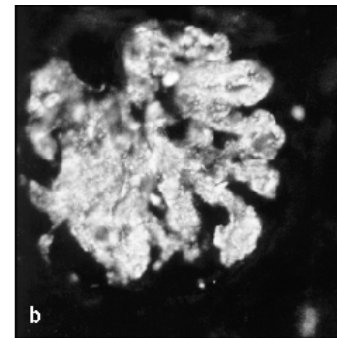
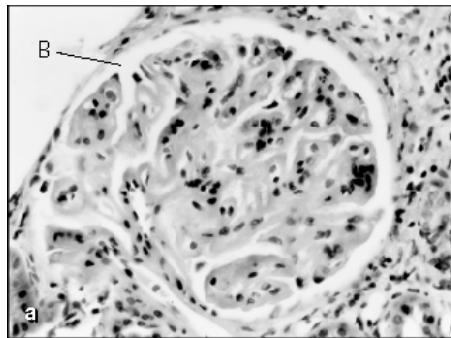
# Systemic Lupus Erythematosus (SLE)<sup>85</sup>

- **A chronic systemic autoimmune disease.**
  - Complexes of anti-self antibodies and antigen deposit in, and cause tissue damage.
- **1 million sufferers in the U.S.**
  - **SLE strikes women nine times more often than men.**
- **Symptoms may include a butterfly-shaped rash on face, fatigue, and headaches.**
- **Triggered by environmental effects in persons who are genetically susceptible.**



© 2000 Garland Publishing/Elsevier Science

Lupus “butterfly” rash



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



# Rheumatoid Arthritis (RA)

- **A chronic systemic autoimmune disease.**
  - **Anti-self antibodies that react with the constant regions of other antibodies (rheumatoid factor).**
- **Disease onset occurs most often between the ages of 25 – 55.**
  - **Women are 3 times more likely to develop this than men.**
- **Symptoms include weakness, fatigue, and joint pain.**
- **Infections, hormones and genetic factors may be involved.**

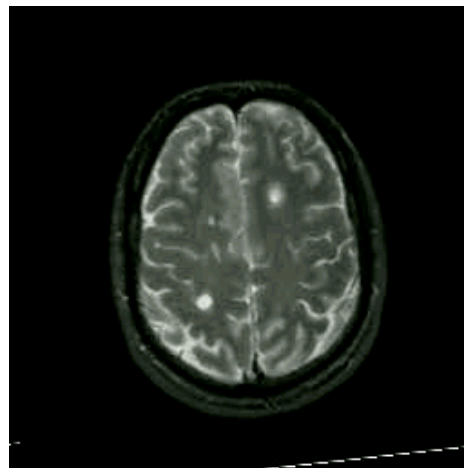


**X-ray shows severe arthritis affecting the joints and limiting mobility**

# Multiple Sclerosis (MS)

87

- A chronic organ-specific disease - may be mild or severe.
  - MS involves the destruction of the myelin sheath that covers cells of the spinal cord and brain.
- Affects ~ 1 in 1,600 people.
  - 60% of the cases occur in women.
- Symptoms include weakness, tremors or paralysis of one or more extremities, numbness, decreased memory and attention span and may disappear and recur over time.
- Infections, hormones and genetic factors may be involved.



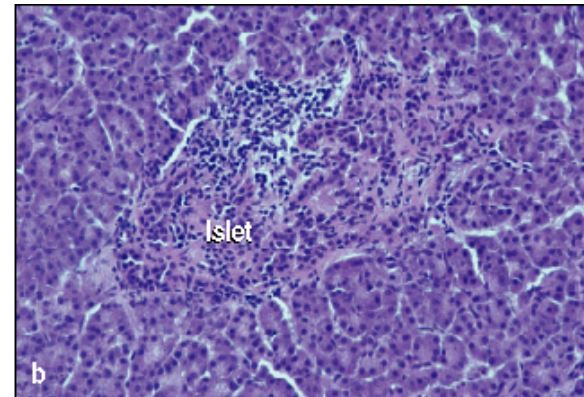
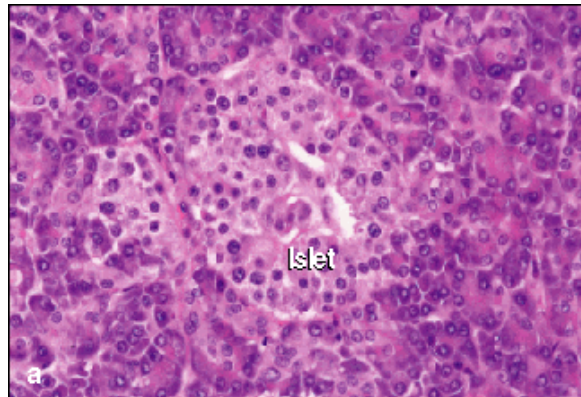
**Magnetic resonance image of brain of patient with chronic form of multiple sclerosis, showing characteristic lesions of MS (white spots)**



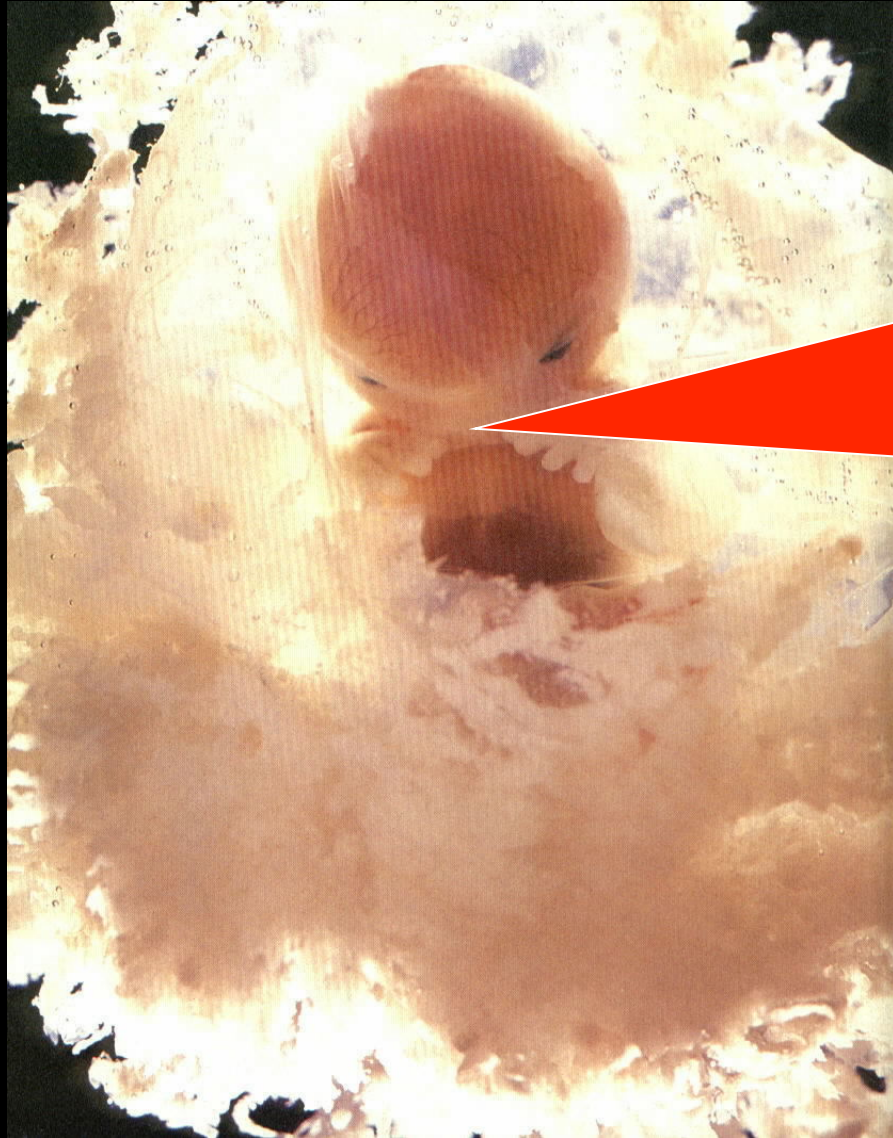
# Juvenile Diabetes

- Also known as Type - I diabetes or insulin-dependent.
  - Beta-cells in the pancreas produce little or no insulin.
- Usually occurs before the age of 30.
  - Occurs in 1 in 7,000 children each year.
  - The incidence decreases after the age of 20.
- Symptoms include increased thirst and urination, weight loss, nausea, and fatigue.
- Cause is linked to genetic, viral, and autoimmune factors.

**Normal  
pancreas**

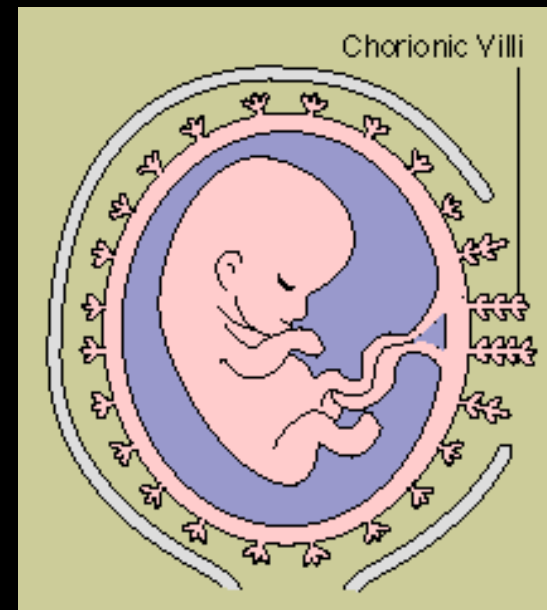


**Diabetic  
pancreas**

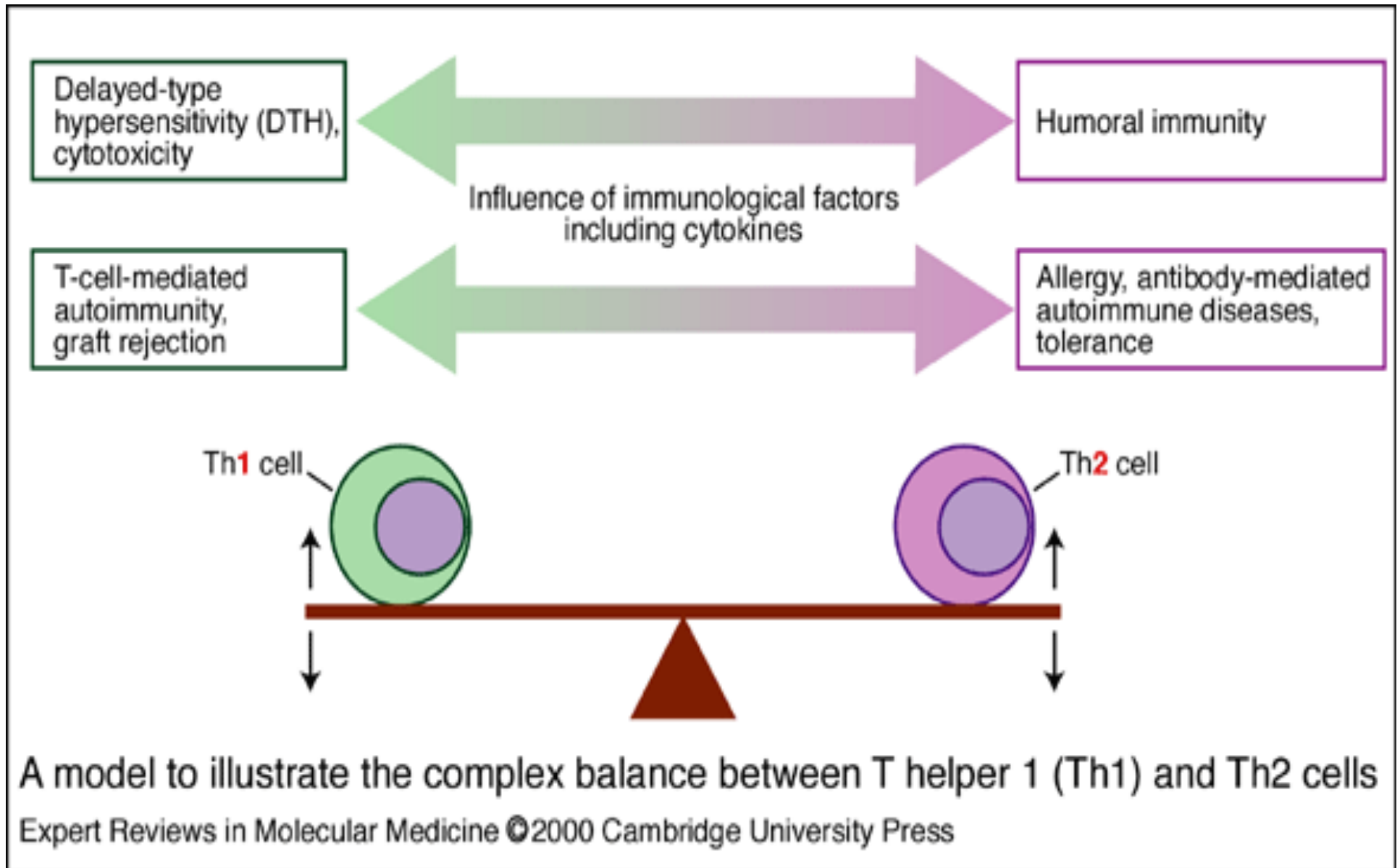


**I am only  
half my mom!**

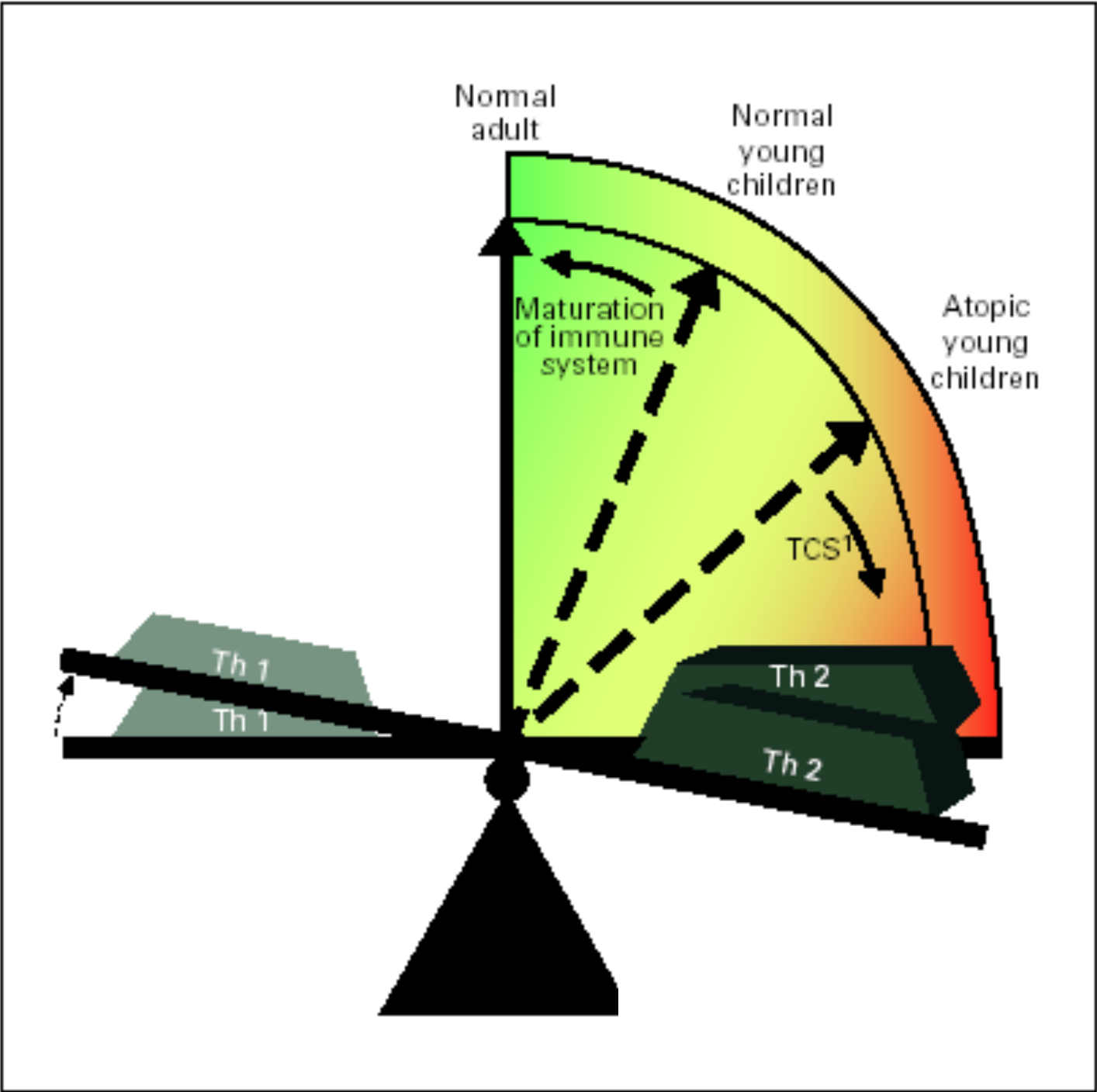
**How does  
mom's  
immune  
system  
tolerate me?**



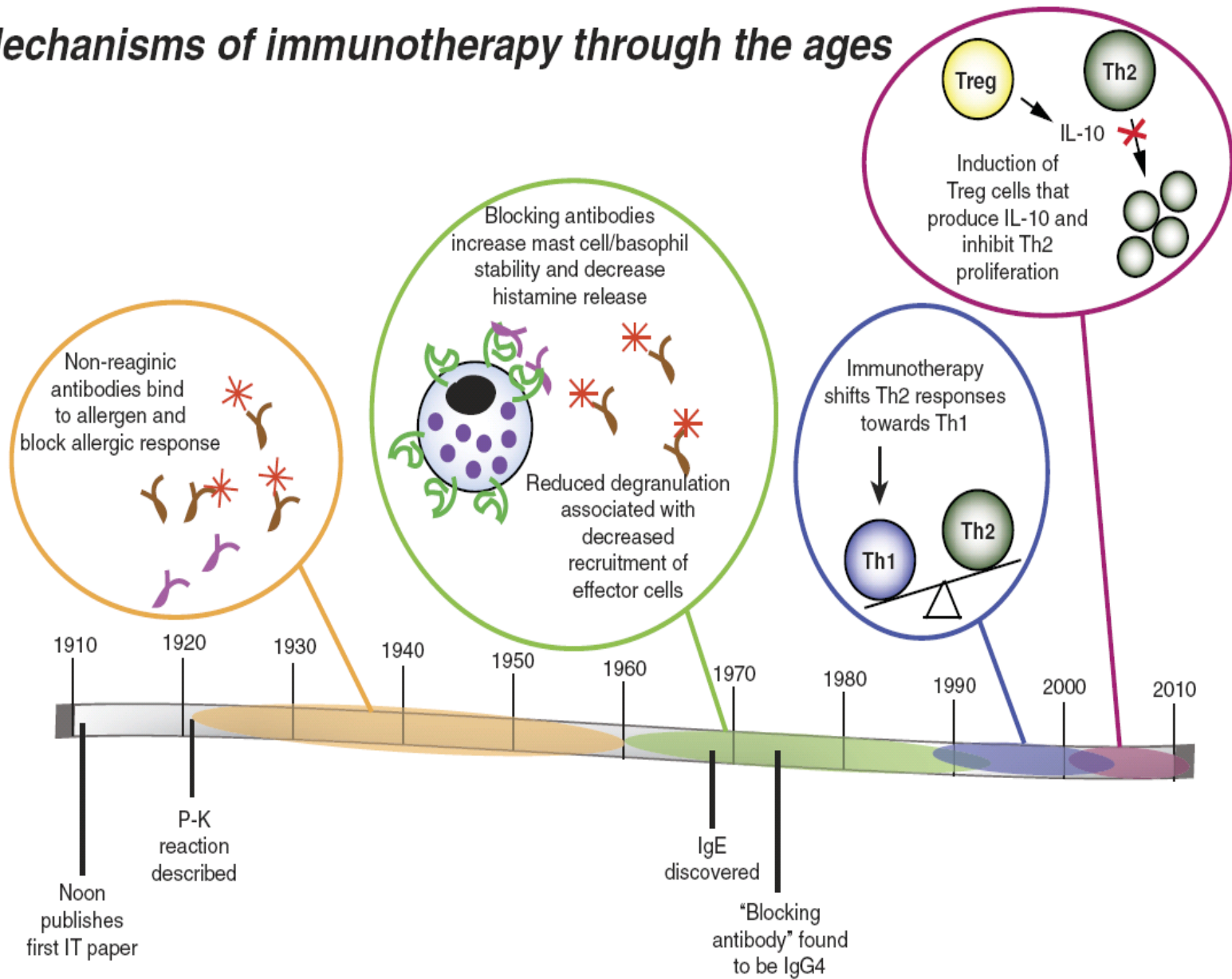
# TH1 and TH2 Balance

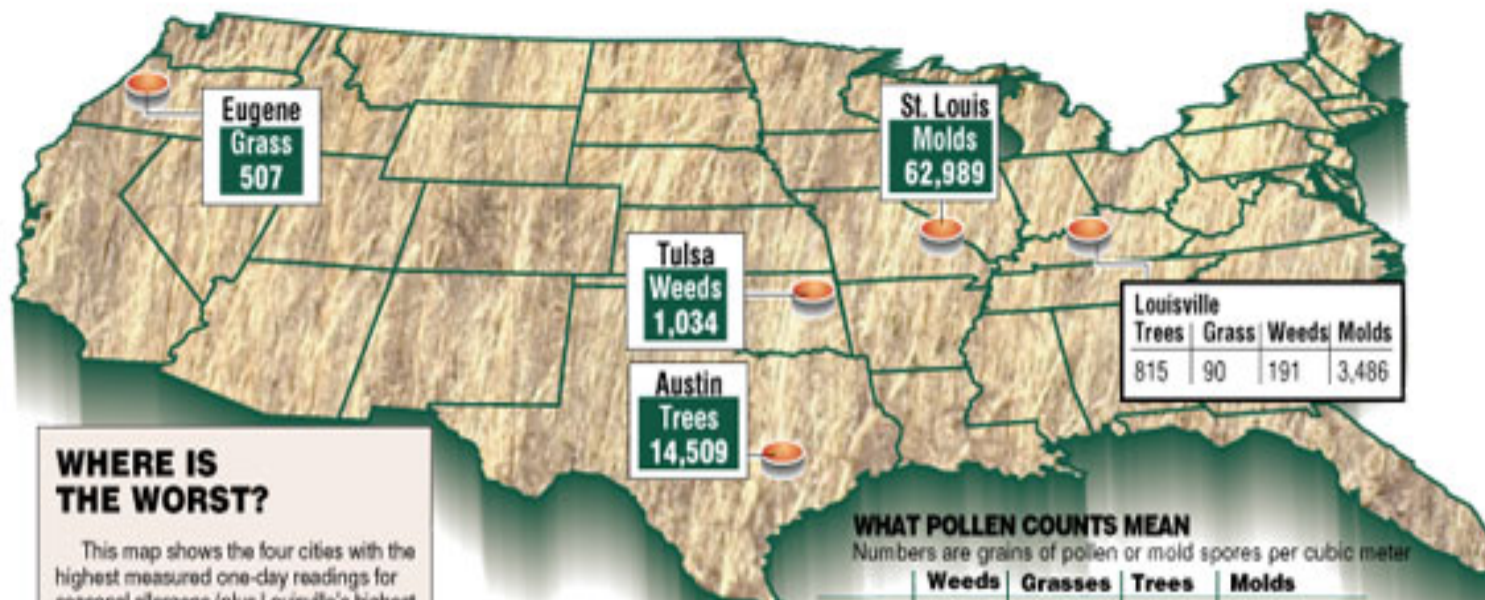






# Mechanisms of immunotherapy through the ages





### WHERE IS THE WORST?

This map shows the four cities with the highest measured one-day readings for seasonal allergens (plus Louisville's highest readings) in the year 2000, as reported by the National Allergy Board.

For comparative readings from other cities, see the chart on Page 2. (Note: Readings are not taken in all cities, and monitoring methods vary.)

Source: National Allergy Board of the American Academy of Allergy, Asthma and Immunology (aaaai.org). Used by permission.

BY JOANNE MESHAW AND KIM KOLARIK, THE C-J

### WHAT POLLEN COUNTS MEAN

Numbers are grains of pollen or mold spores per cubic meter

	Weeds	Grasses	Trees	Molds
Low	0-10	0-5	0-15	0-6,500
Moderate	10-50	5-20	15-90	6,500-13,000
High	50-500	20-200	90-1,500	13,000-50,000
Very high	500 +	200 +	1,500 +	50,000 +

#### Symptoms

- Low** Only individuals extremely sensitive to these pollens and molds will experience symptoms.
- Moderate** Many individuals sensitive to these pollens and molds will experience symptoms.
- High** Most individuals with any sensitivity to these pollens and molds will experience symptoms.
- Very high** Almost all individuals with any sensitivity to these pollens and molds will experience symptoms.



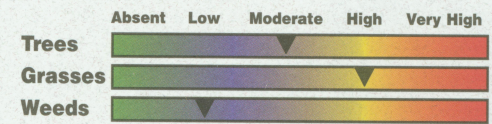
# What is in the Air Now?

## Tree Pollen

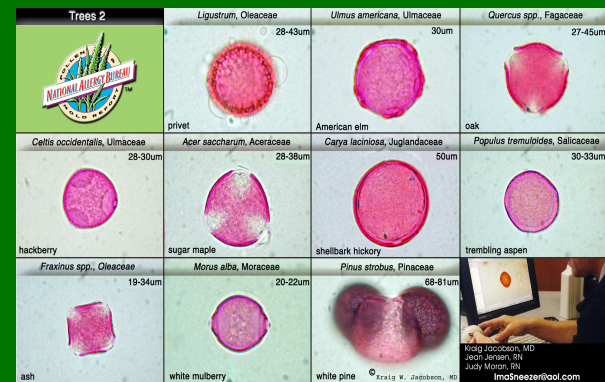




## Pollen Forecast



Kraig W. Jacobson, M.D. and Robert F. Jones, M.D.,  
Allergy & Asthma Research Group



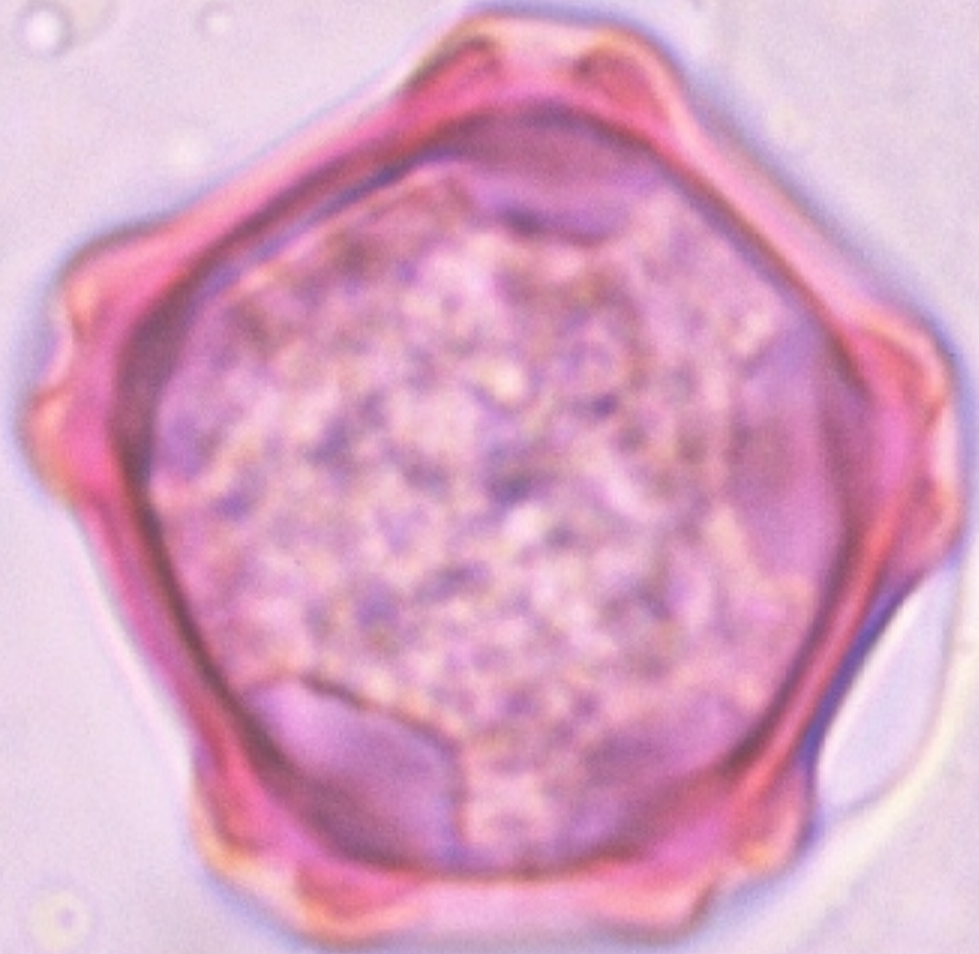


**Corylus=Hazelnut**






**Alnus = Alder**



**Betula = Birch**

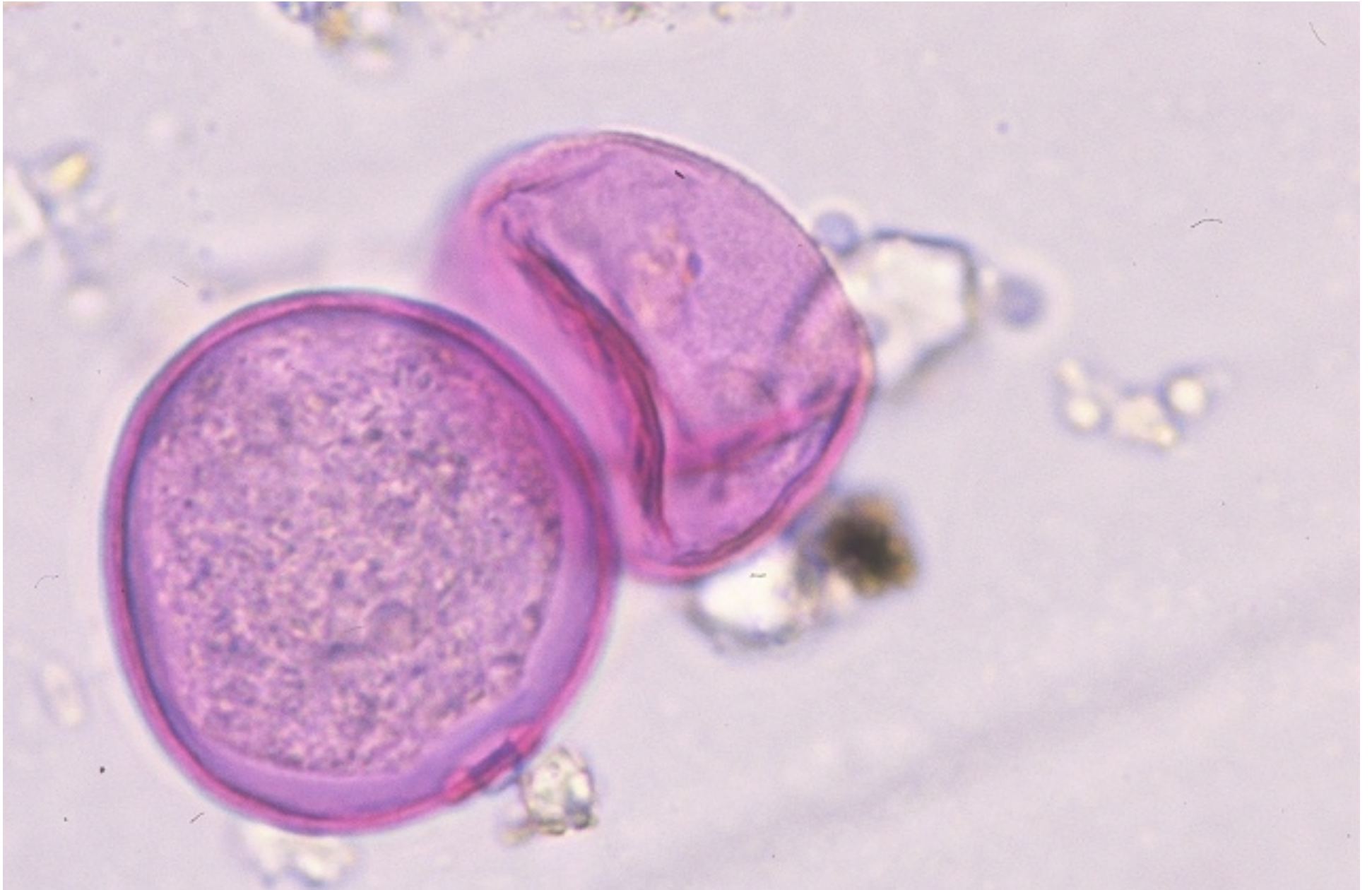




A microscopic image showing several large, spherical pollen grains of Ambrosia (Ragweed). The grains are reddish-brown with a distinct, textured surface. They are surrounded by smaller, blue-stained spherical particles. The background is a light, uniform color.

**Ambrosia=Ragweed**





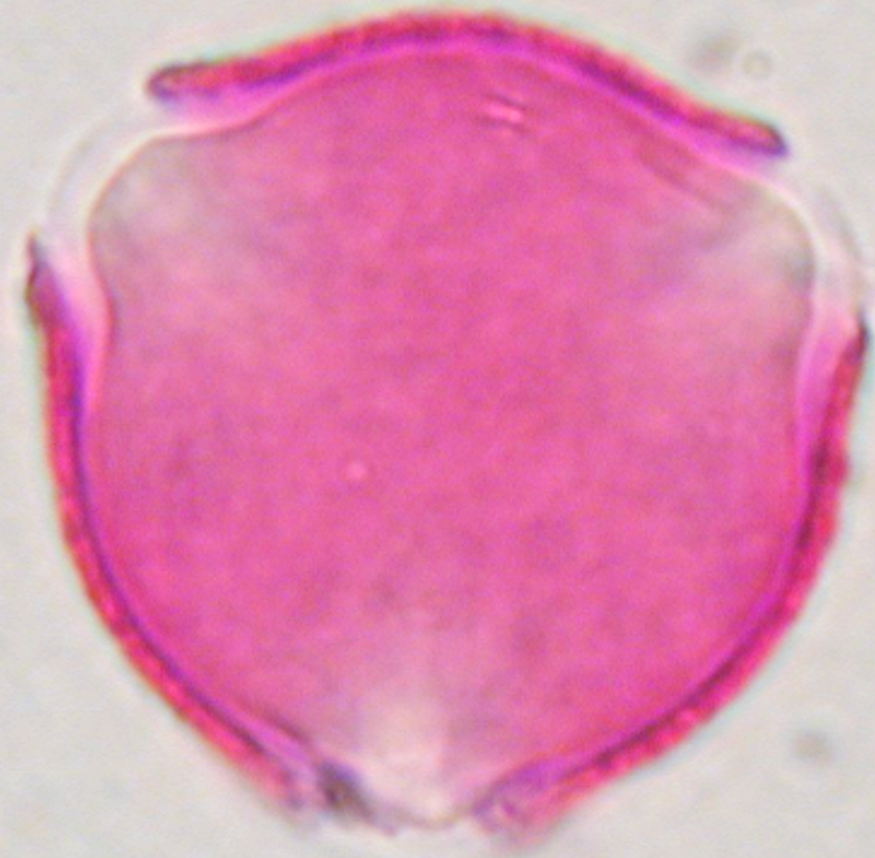
**Gramineae / Poaceae = Grass**

***Ulmus americana* (Ulmaceae) 30um**  
***American Elm***





***Quercus* spp. (Fagaceae) 27-45um**  
**Oak**





***Celtis occidentalis* (Ulmaceae) 28-30um  
Hackberry**



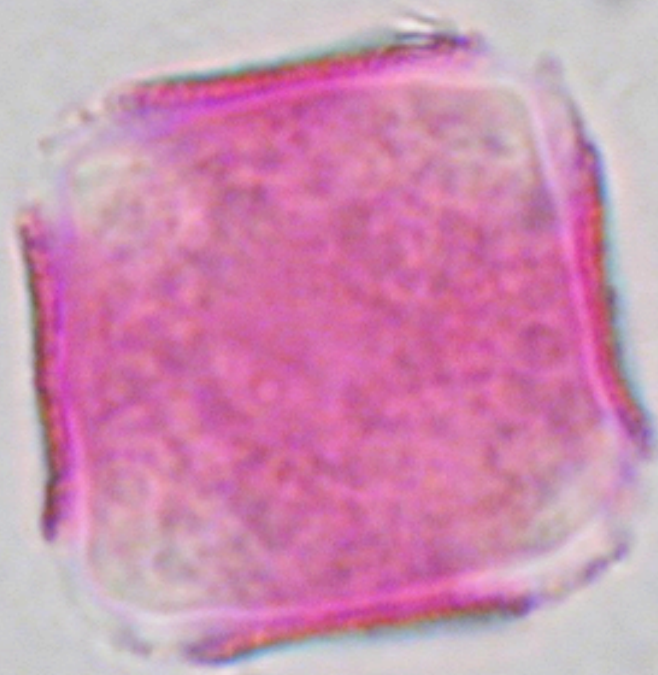


***Acer saccharum* (Aceraceae) 28-38um**  
***Sugar Maple***





***Fraxinus* spp. (Oleaceae) 19-34um**  
**Ash**



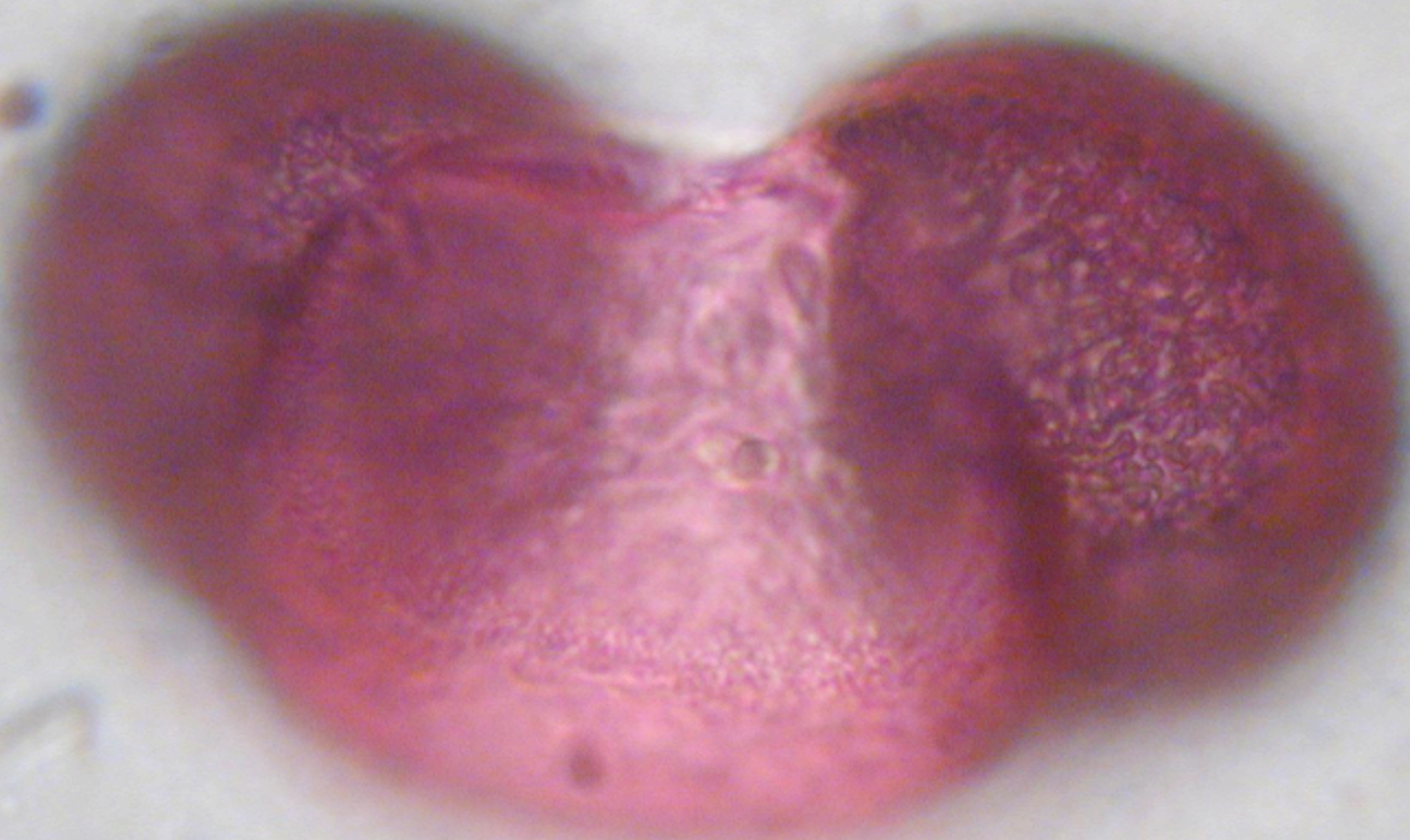


***Morus alba* (Moraceae) 20-22ug**  
***White Mulberry***





***Pinus strobus* (Pinaceae) 68-81um**  
***White Pine***









# What Makes The Willamette Valley Unique?

