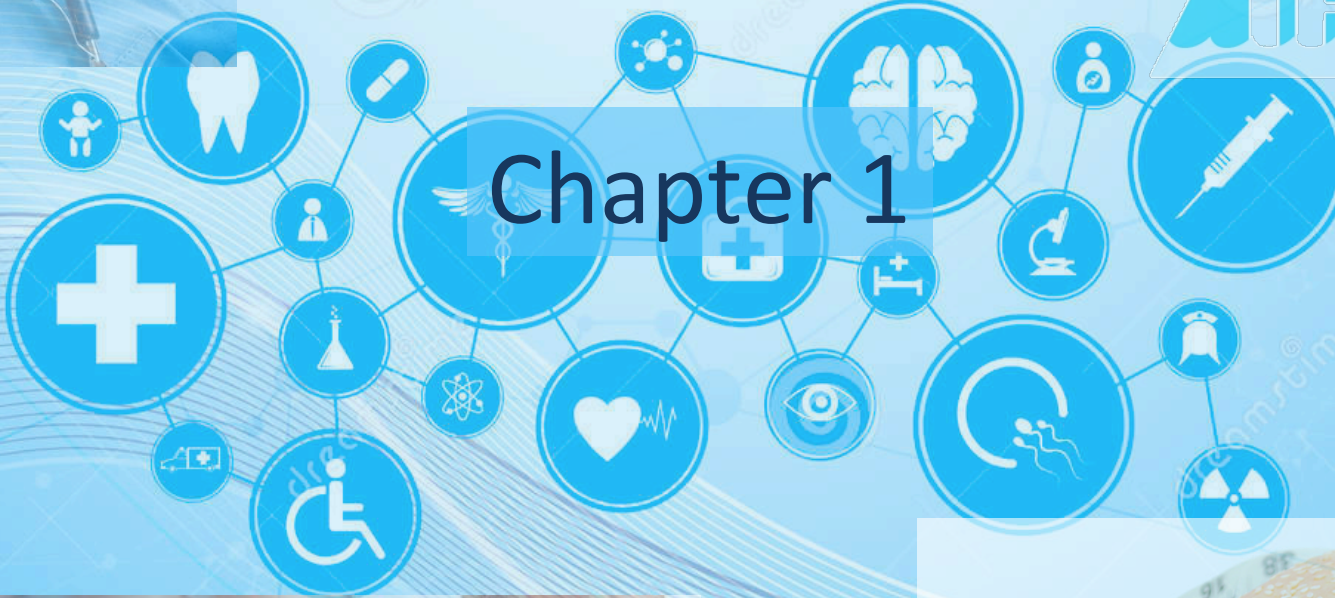


Basics

Chapter 1



Dr. Isom

Chem 1402

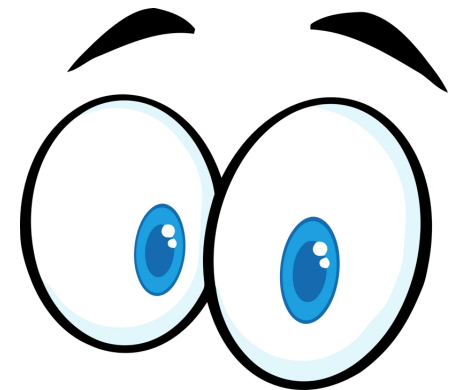


Looking ahead

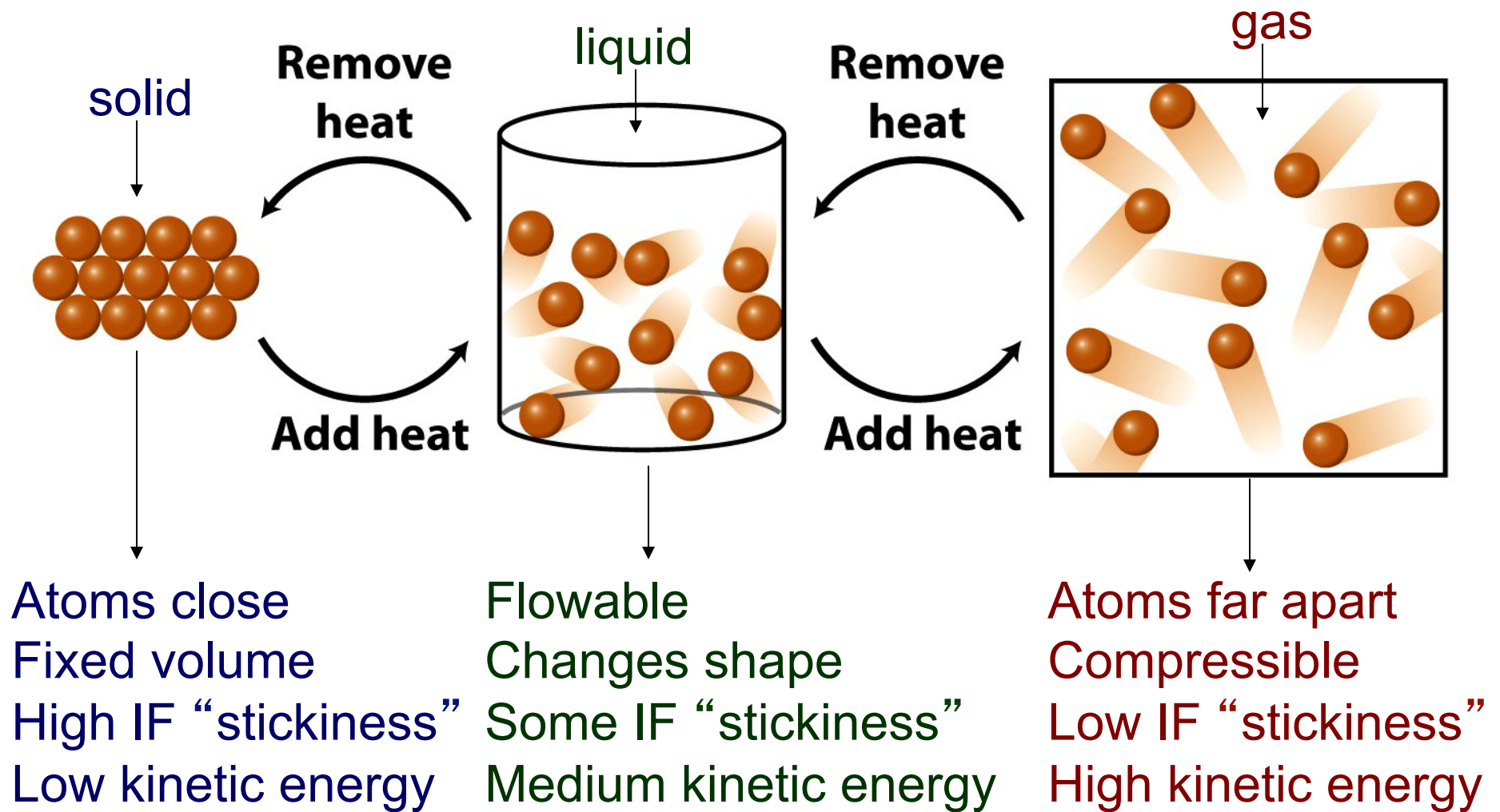
(to be completed before next lecture)

Chapter 1 problems: 3, 5-7, 38, 44, 46-47, 51-56

Read: Chapter 1.7-1.8, 1.12, 1.14, 6.1-6.2



States of Matter

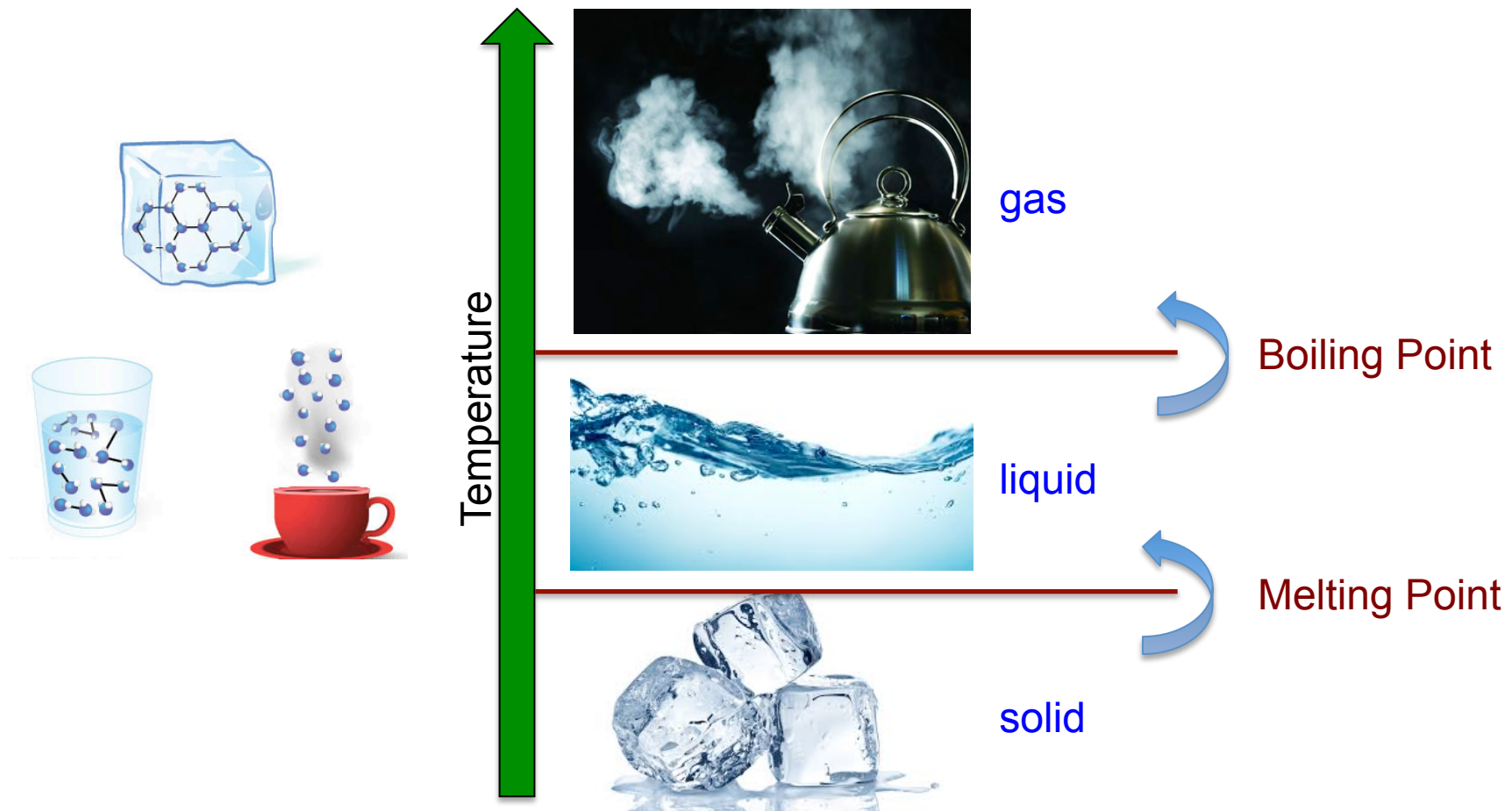


States of Matter

How much do molecules in a sample like each other?

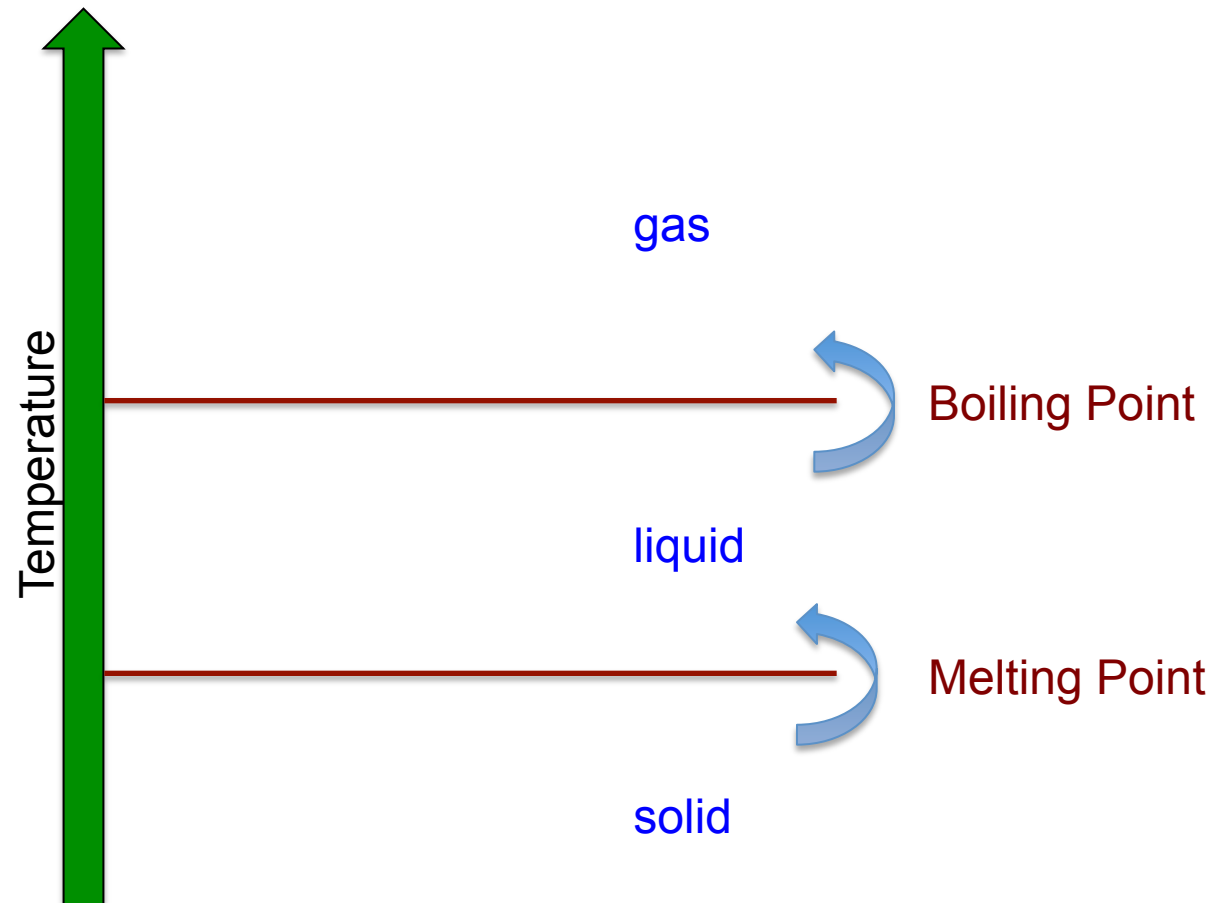
Boiling point: Temperature at which a liquid turns to gas

Melting point: Temperature at which a solid turns to liquid



Problem 1.2

Acetic acid, which gives the sour taste to vinegar, has a melting point of $16.7\text{ }^{\circ}\text{C}$ and a boiling point of $118\text{ }^{\circ}\text{C}$. Predict the physical state of acetic acid when the ambient temperature is $10\text{ }^{\circ}\text{C}$.





Types of Changes



Physical Change: A change that doesn't affect chemical makeup of a substance

Chemical Change: A change in the chemical composition of a substance



Problem 1.1

Identify each of the following as a physical change or a chemical change:

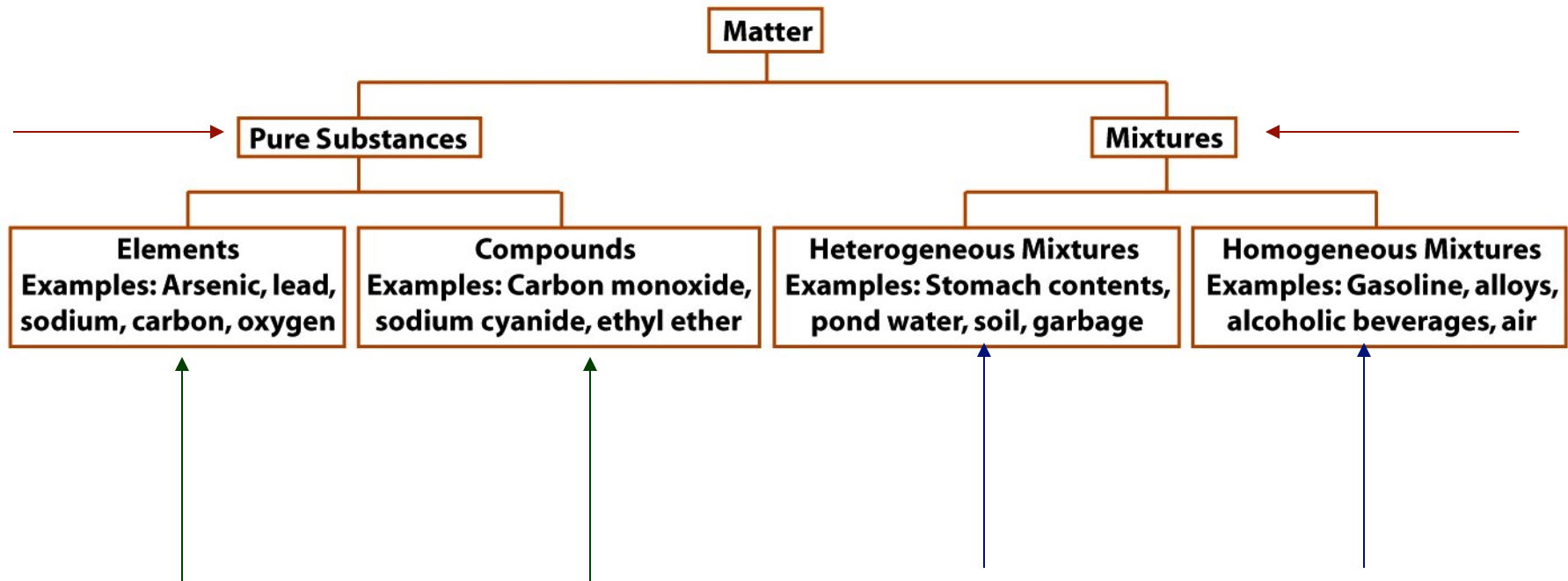
- a. Grinding of a metal **P**
- b. Fruit ripening **C**
- c. Wood burning **C**
- d. A rain puddle evaporating **P**

Problem 1.4

Classify each of the following as a physical change or a chemical change:

- a. Dissolving sugar in water **P**
- b. Producing carbon dioxide gas and solid lime by heating limestone **C**
- c. Frying an egg **P**
- d. The conversion of salicylic acid to acetylsalicylic acid (see the following Chemistry in Action) **C**

Types of Matter

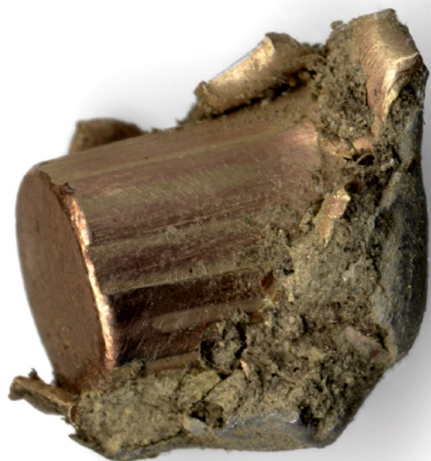


Homogeneous Mixtures



Metal Alloys

Figure 1-2a
Investigating Chemistry, First Edition
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Bullet

Figure 1-2c
Investigating Chemistry, First Edition
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Figure 1-2b
Investigating Chemistry, First Edition
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Lighter Fluid

Heterogeneous Mixtures



Figure 1-3a
Investigating Chemistry, First Edition
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Figure 1-3c
Investigating Chemistry, First Edition
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Figure 1-3b
Investigating Chemistry, First Edition
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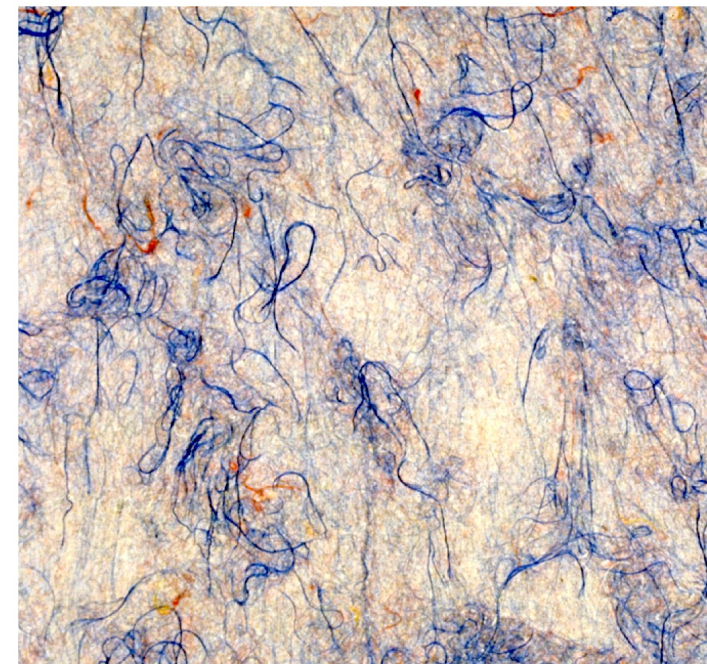


Figure 1-3d
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Healthy Booze???

Tannins are antioxidant molecules found in grape skin and seeds

Called Oligomeric Proanthocyanidins or OPC's

- Help repair collagen and elastin
 - Maintain blood vessels
 - Prevent wrinkles
- 20X more powerful than Vit C and 50X than Vit E
- Decrease histamine production



Allergies and Antihistamines

The substances that cause an allergic reaction are called allergens or antigens

They bind to white blood cells called B-lymphocytes

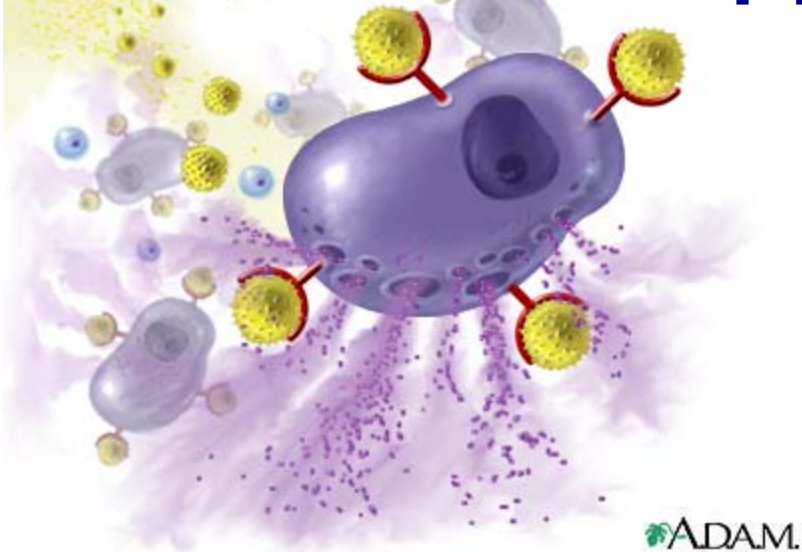
B-cells make Antibodies (Ab) against the allergen



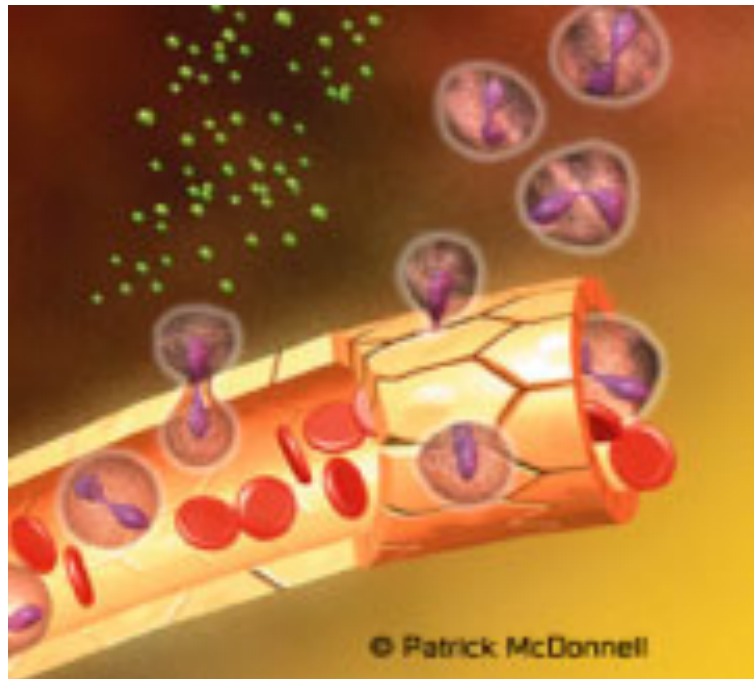
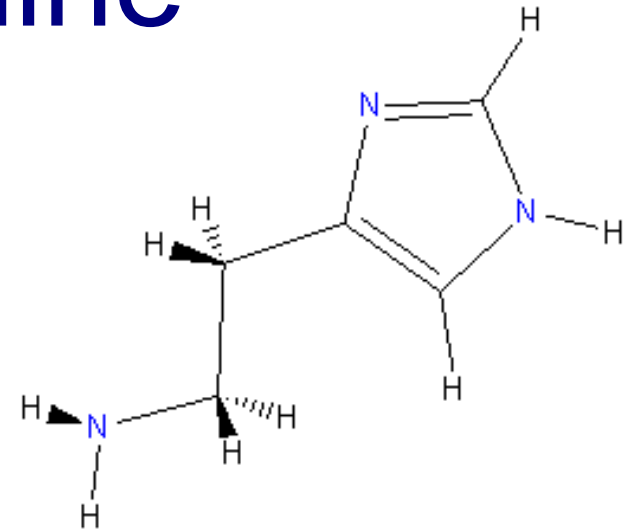
The Ab bind to mast cells and become receptors for the allergens

Next time the allergen enters the body, they bind to the Ab bound to the mast cell and cause histamine to be released.

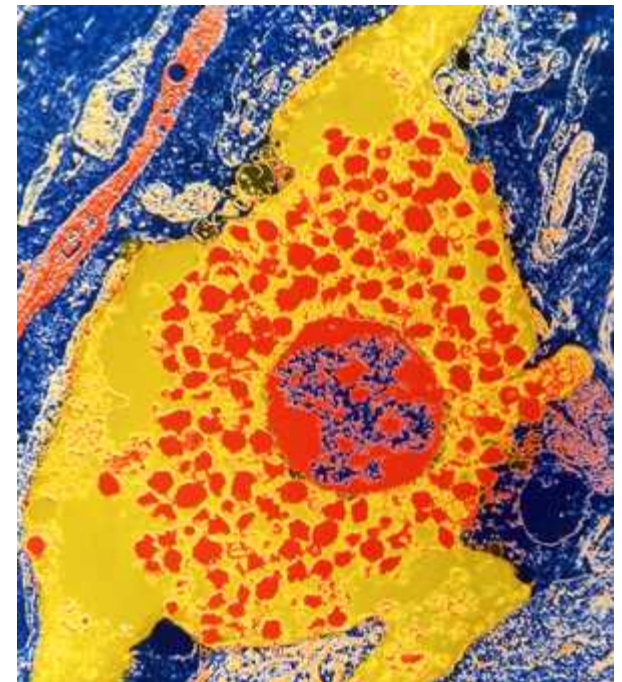
Mast cells release histamines when the allergen is encountered



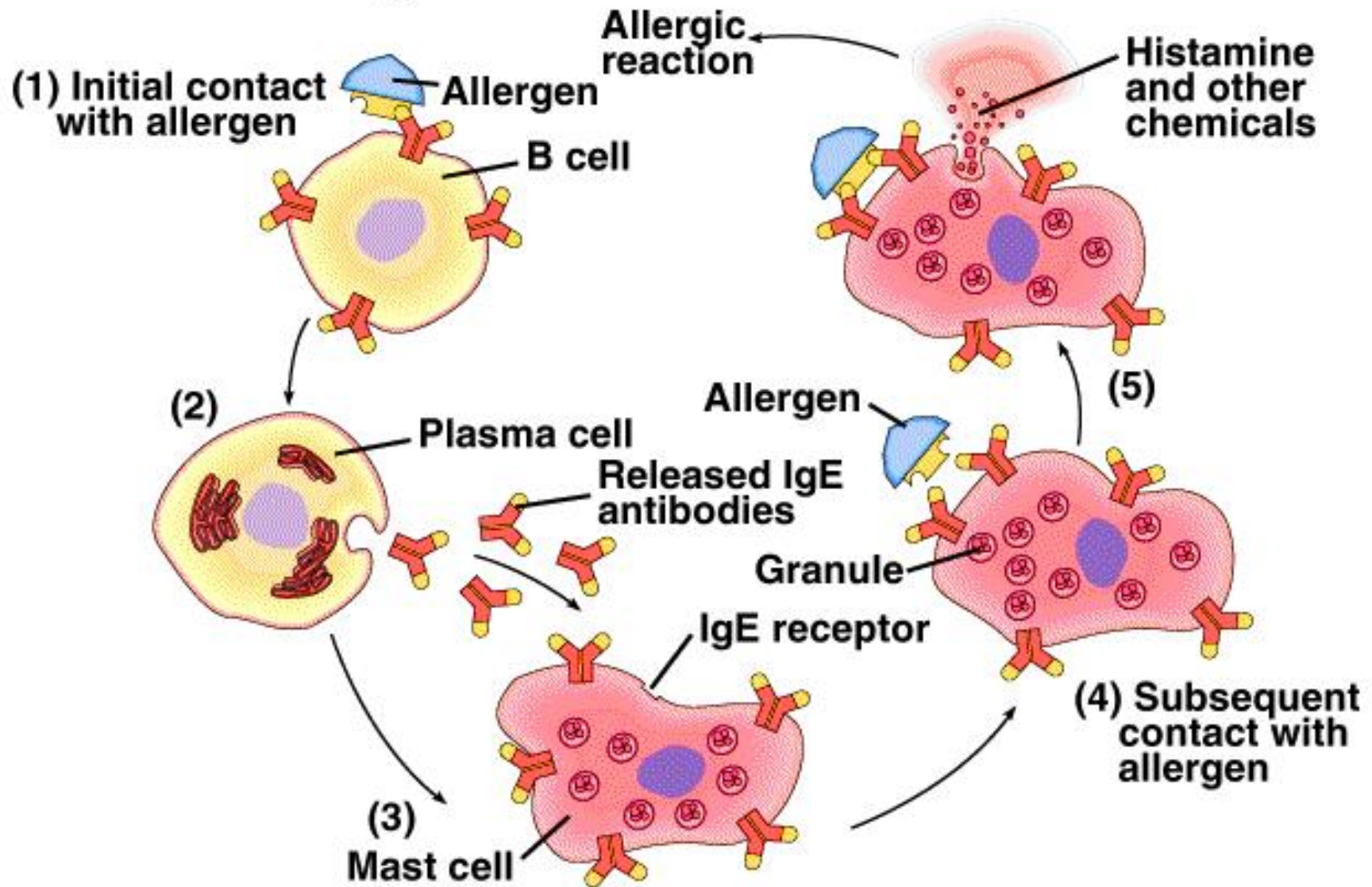
Histamine



Mast Cell with histamine granules



An Allergic Reaction — Overview



OPC's Cont.

Fight smoke, alcohol, chemical damage
~~ Free Radicals

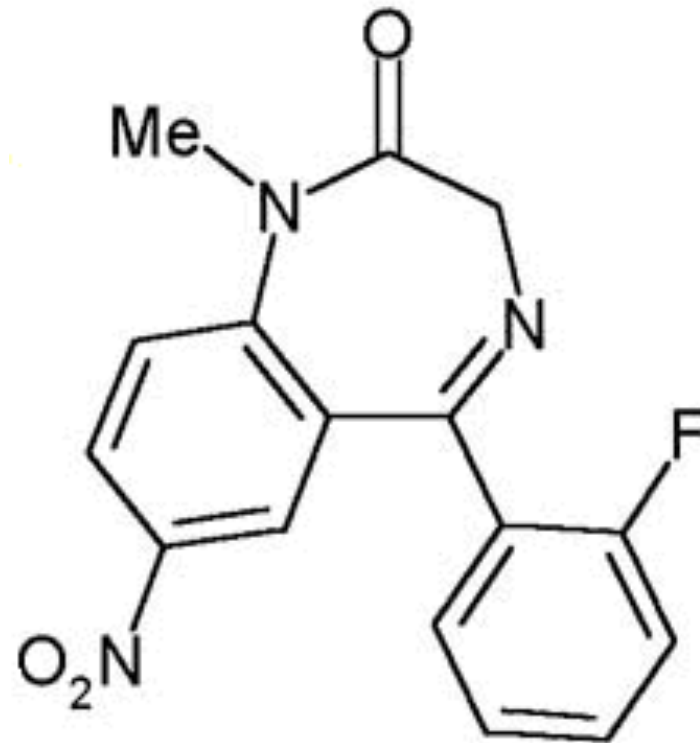
Internal sunscreen

Cross blood-brain barrier

Explains French paradox



Rohypnol



Rohypnol tablets are white and are single or cross-scored on one side with "ROCHE" and "1" or "2" encircled on the other.

(Graphics courtesy of the U.S Dept. of Justice)



2 H atoms

1 O atom



1 C atom

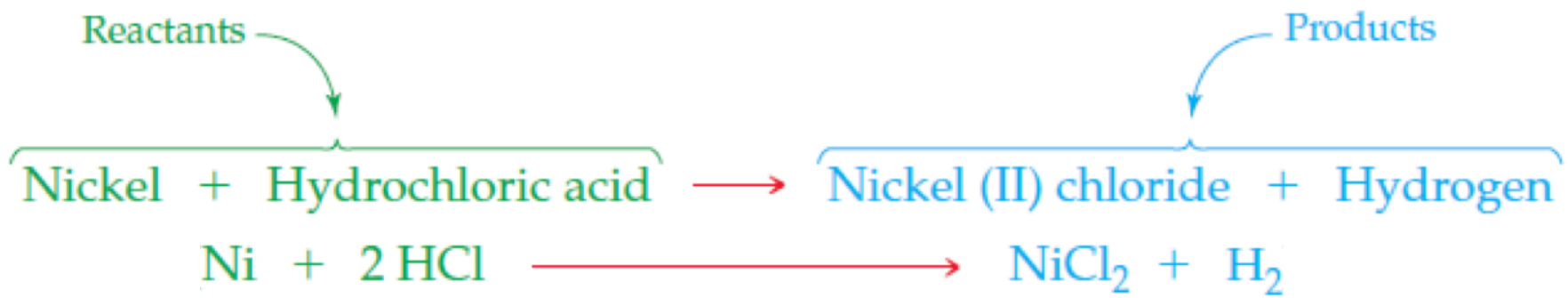
4 H atoms



12 C atoms

22 H atoms

11 O atoms



(a)



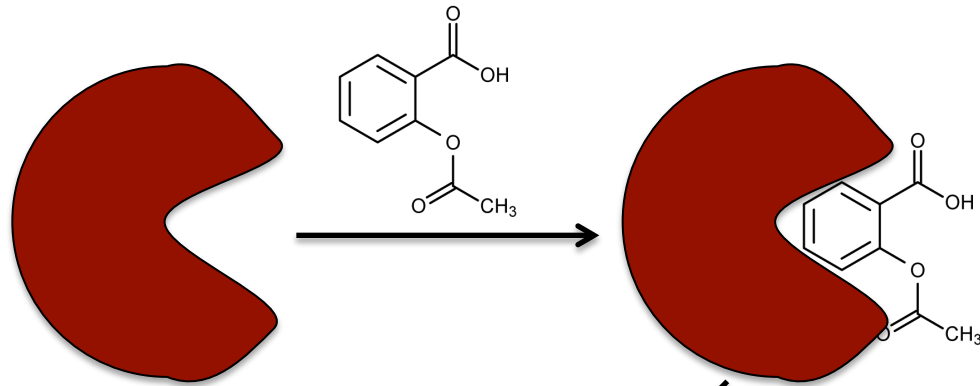
(b)



(c)



Aspirin



COX enzyme
protein

responsible for inflammation
helps with blood clotting
makes stomach lining

