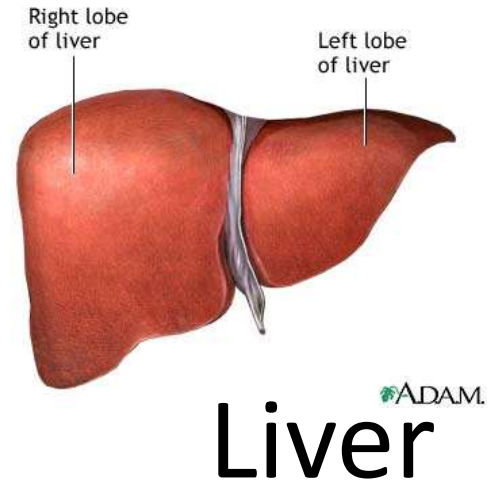
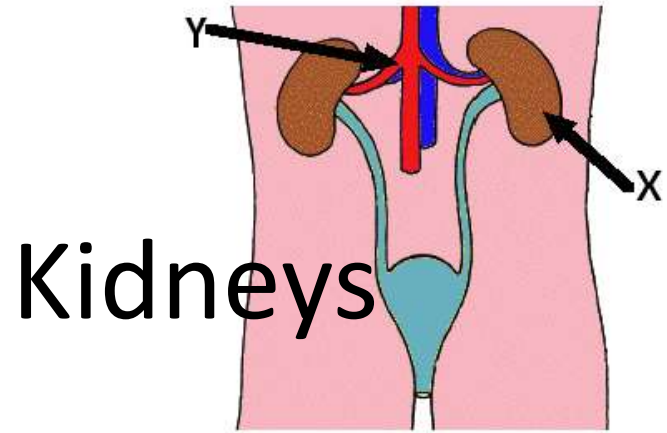
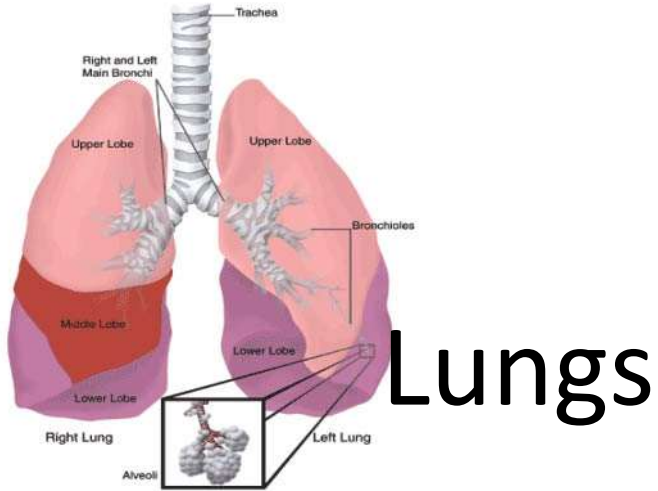


Excretion

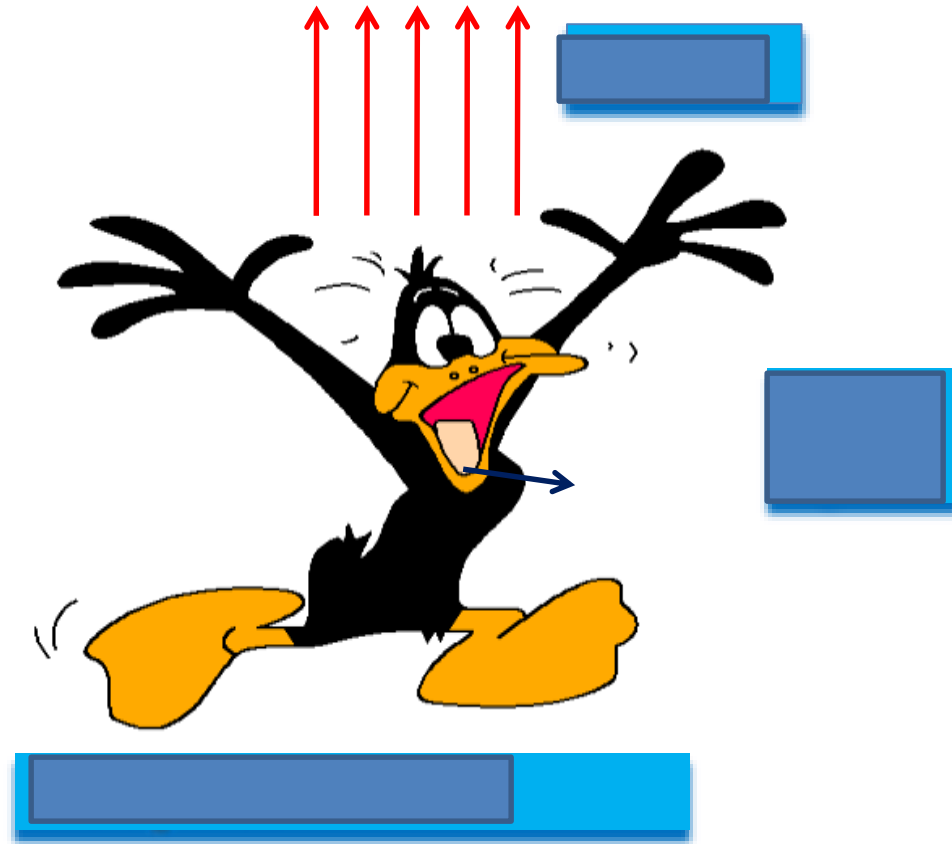
# Organs involved



# Excretion

- Excretion = Getting rid of cellular waste = metabolic wastes
- Excretion ≠ Egestion
  - Excretion removes wastes produced during chemical reactions
  - Metabolism = all the chemical reactions needed to survive
  - Egestion removed unused food leftover after digestion.

# Things We Excrete

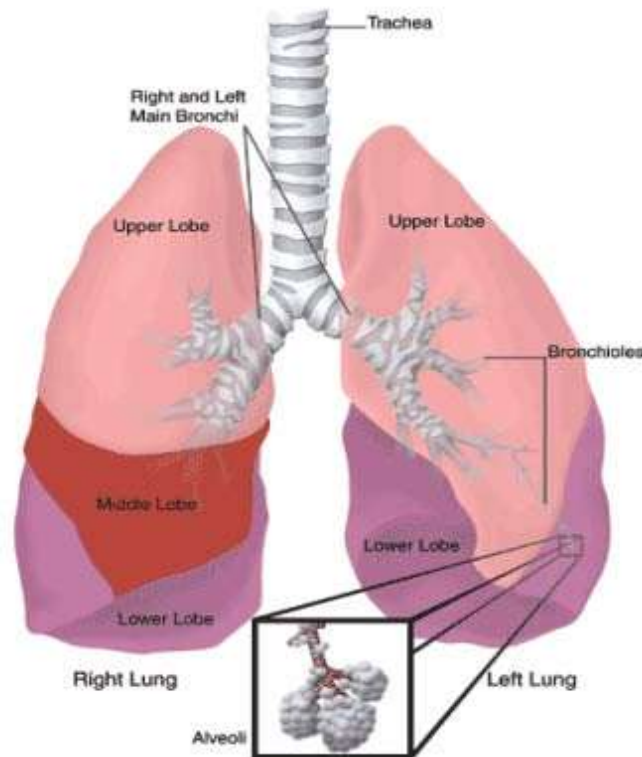


# Chemical reactions → wastes

- Aerobic cellular Respiration
- Formula =
  - $C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O + \text{ATP (energy)}$
- WASTES =
  - $CO_2$
  - $H_2O$
  - Heat

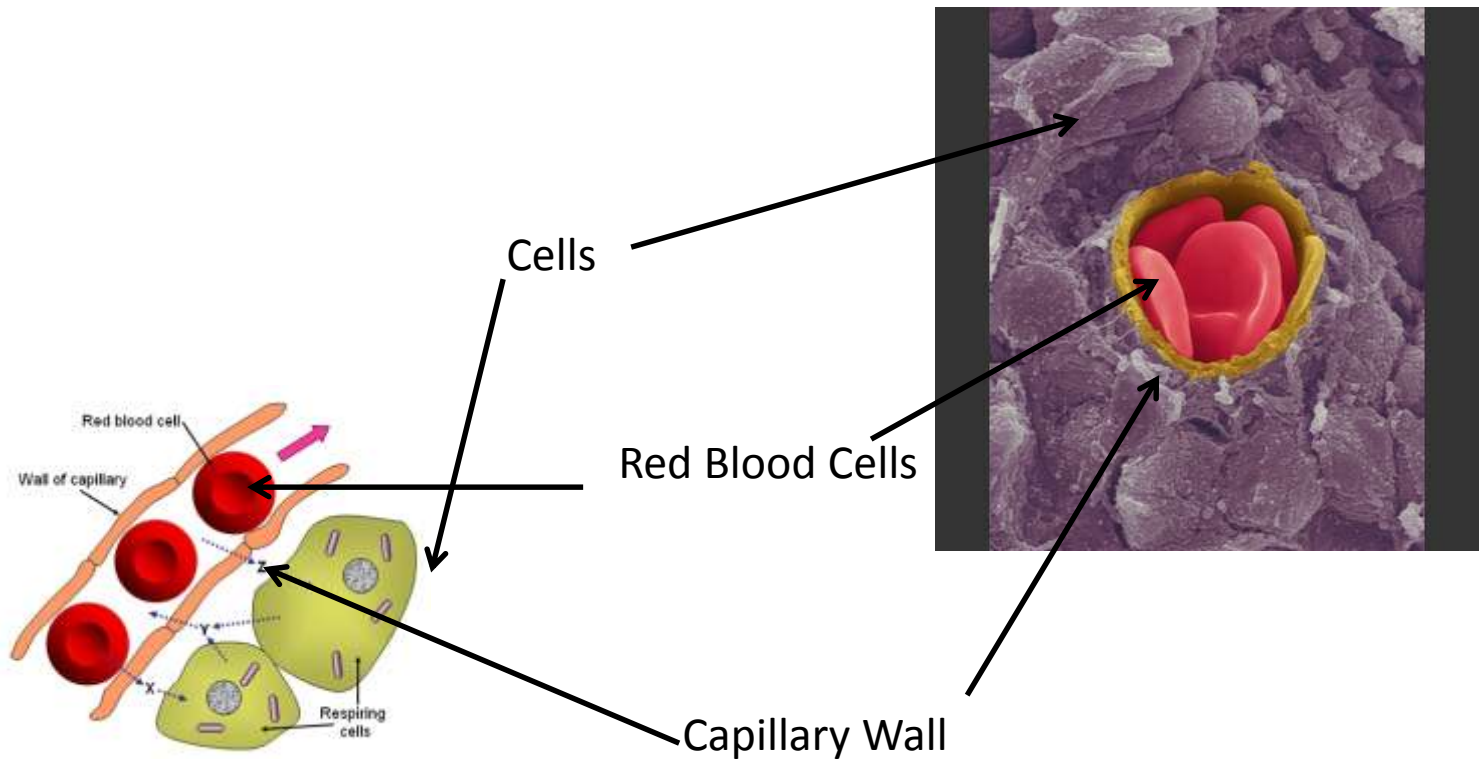
# Lungs excrete $\text{CO}_2$ and $\text{H}_2\text{O}$

And heat



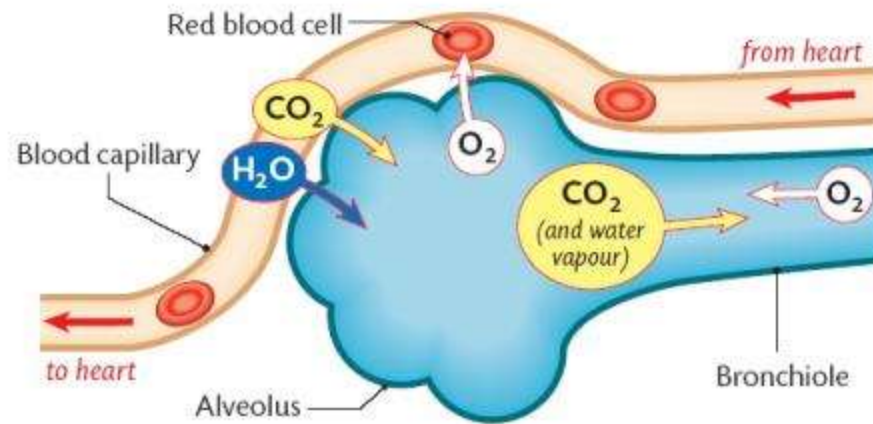
# Respiration wastes

1. CO<sub>2</sub> and H<sub>2</sub>O diffuse from cells to blood



# CO<sub>2</sub> and H<sub>2</sub>O

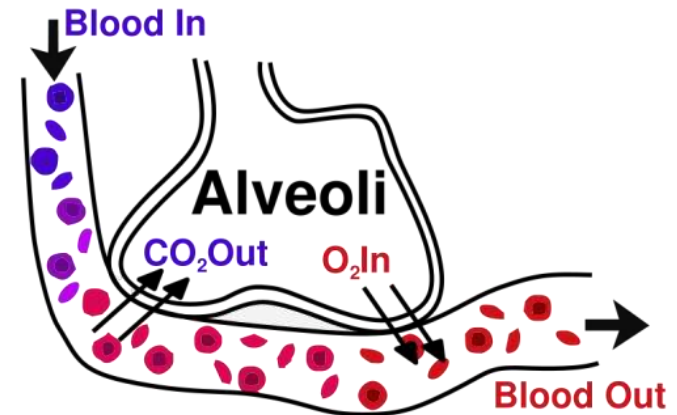
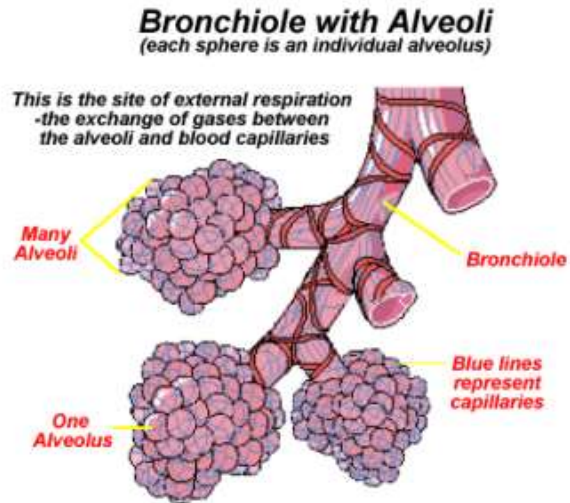
2. Travel to lungs
3. diffuse from blood to alveoli
4. exhaled





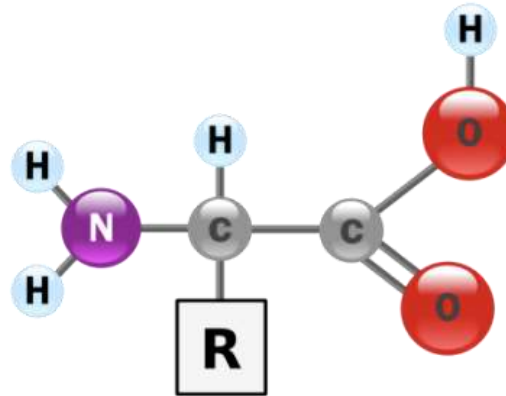
# Diffusion in lungs

Alveoli surrounded by capillaries  
gases diffuse between them



# Some reactions → nitrogenous wastes

- Nitrogenous wastes come from the breaking down of amino acids (protein building blocks)



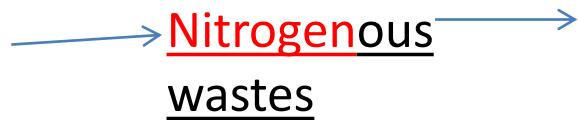
# Types of nitrogenous wastes

- Fish → ammonia
- Birds and insects → uric acid
- Humans convert uric acid → urea
  - Note: gout = build up of uric acid in joints

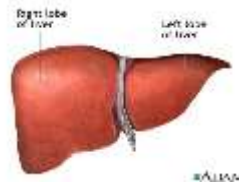
# Liver → urea from amino acids

## Kidneys excrete urea

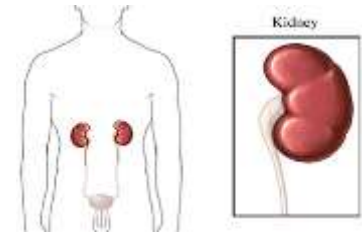
Amino Acids



Urea



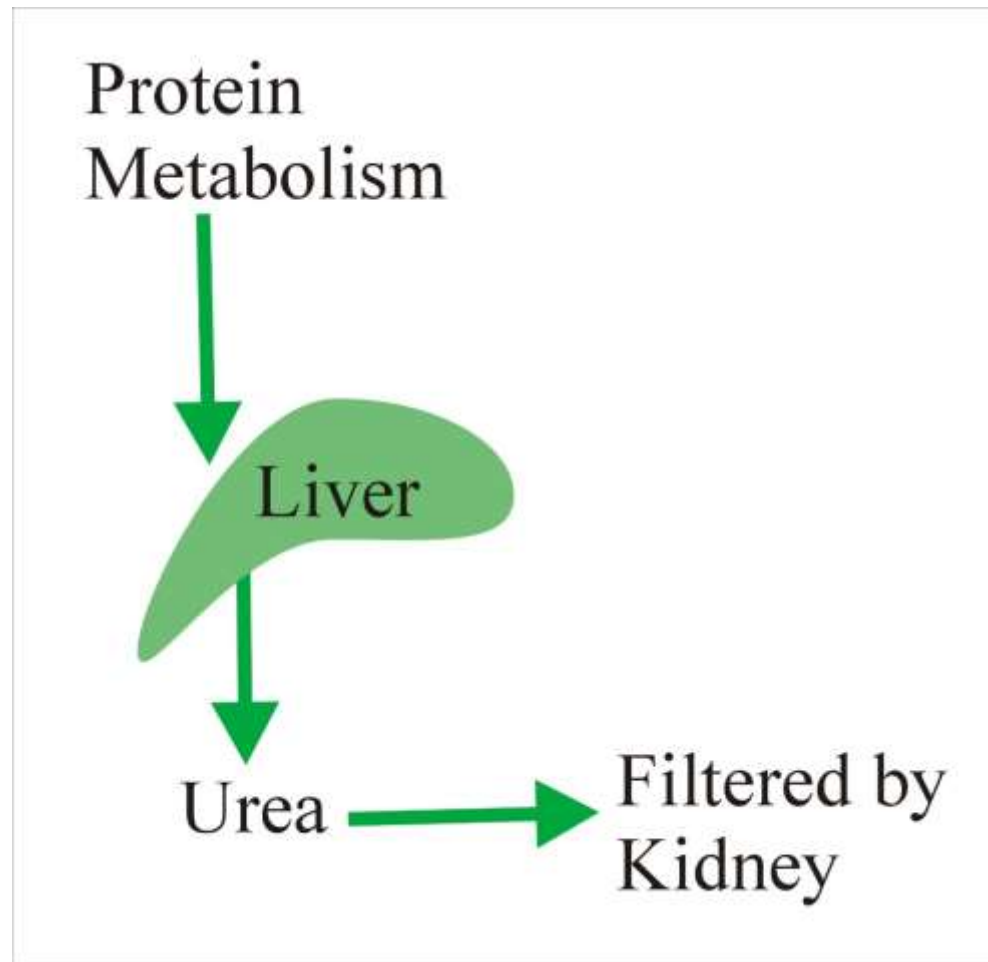
Urine



Sweat



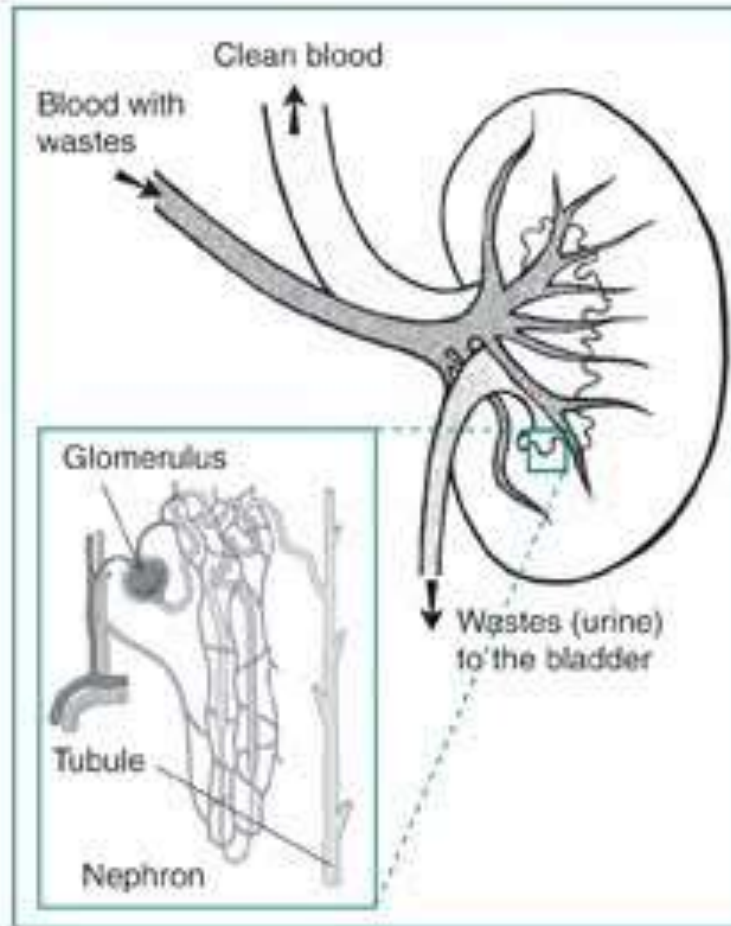
1. Liver change nitrogenous wastes to urea → diffuses into blood



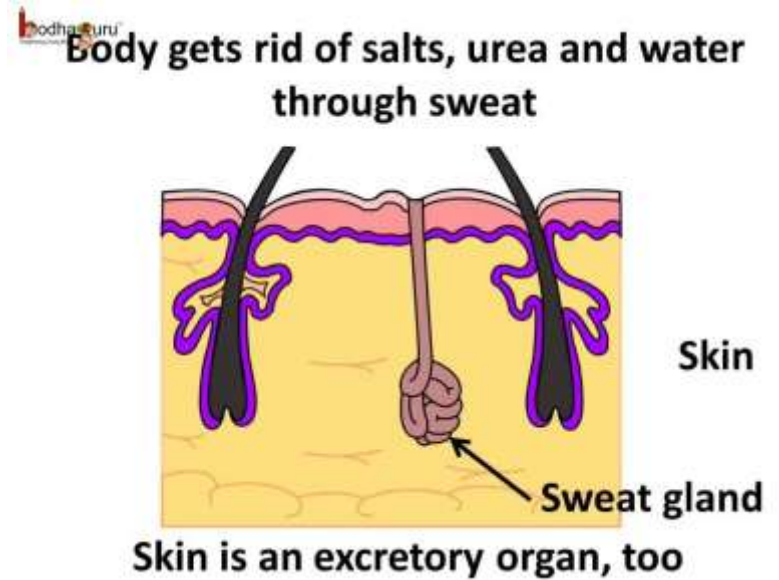
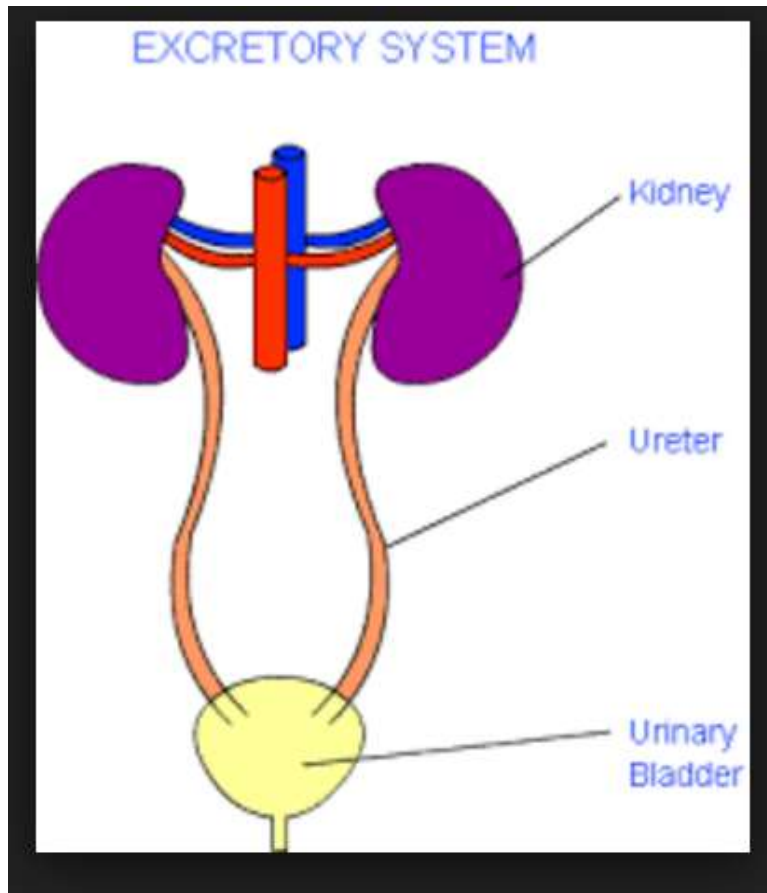
## 2. Blood plasma transports urea to kidneys



3. Diffuses into nephrons
  - (part of kidney surrounded by capillaries)



## 4. Excreted as urine or sweat

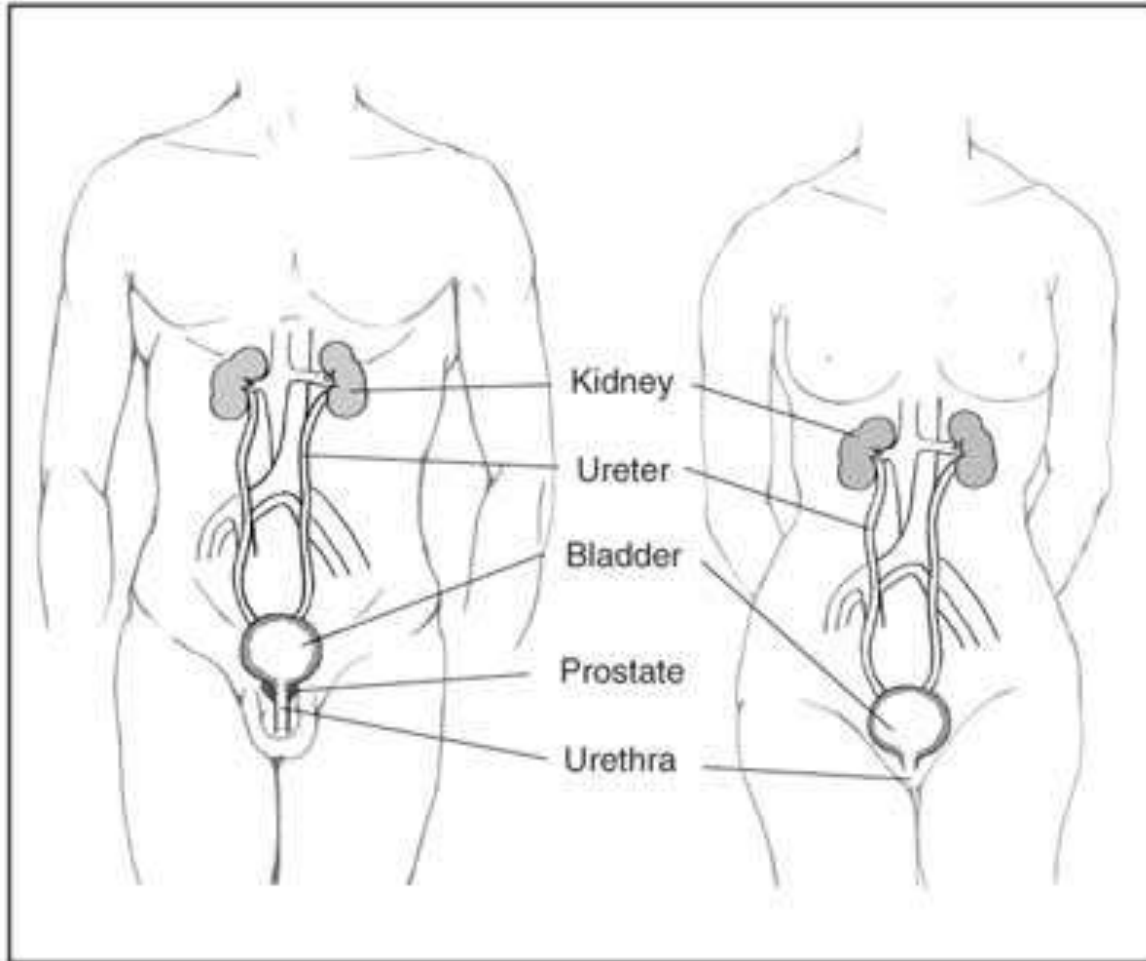




# Urine

- Kidneys → urine
  - We have 2 kidneys
- Ureters = connect kidneys to bladder
- Urinary bladder stores urine
- Urethra = “thrusts” urine out of body

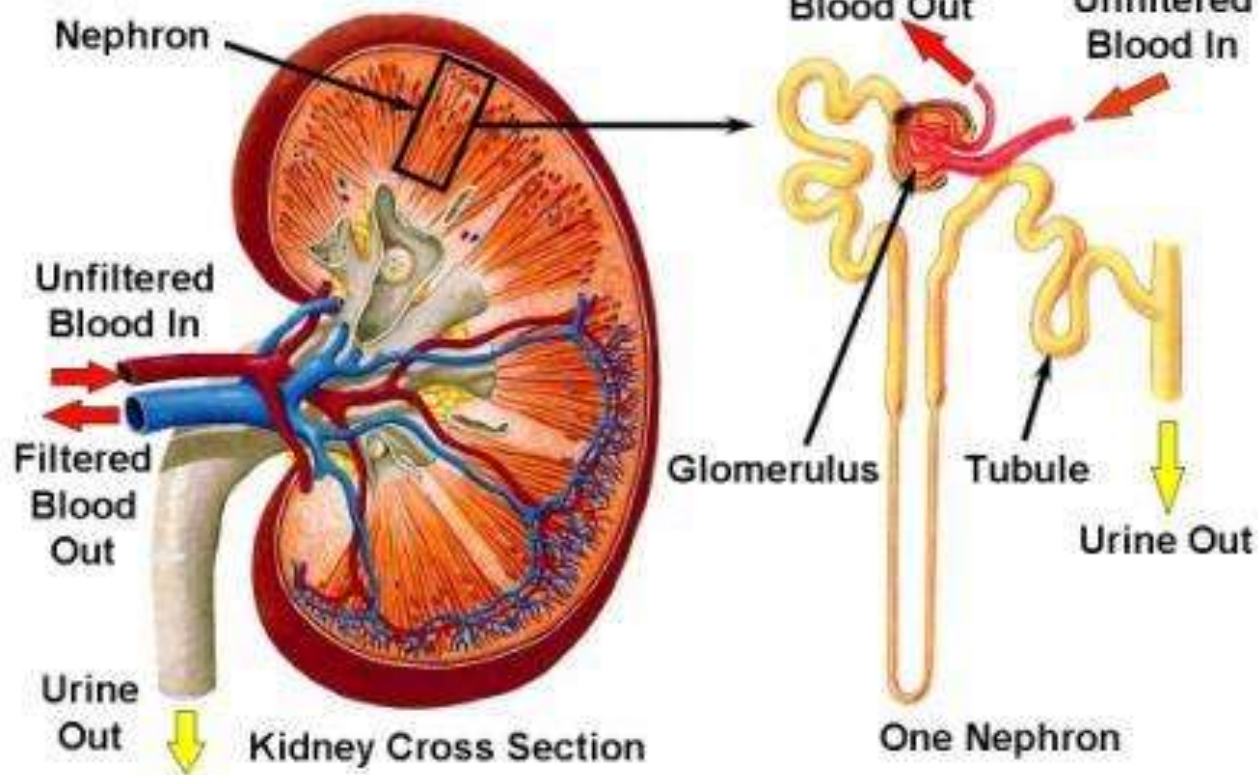
# Excretory system



# Jobs of Kidneys

## Kidneys filter blood and → urine

### Parts of the Nephron

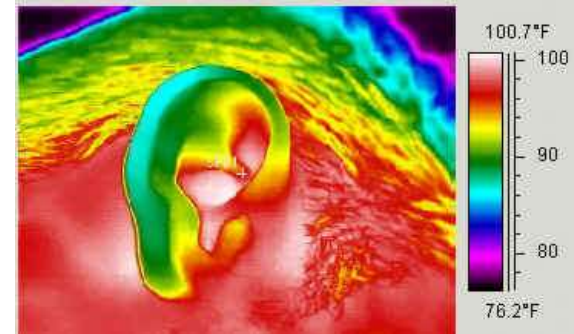


# Jobs of Liver

- Liver → bile to break down fats and neutralize stomach acid
- Break down amino acids → urea
- Detox center (removes and breaks down medicines, alcohol and drugs)
- Recycle red blood cells
- Make lots of proteins

# Most chemical reactions → waste heat

- Energy transformations → heat.
- Muscle cells have lots of mitochondria for respiration → ATP and heat
- Body removes heat by sweating
- Sweat removes water, heat, urea, and salts



# Failure to maintain homeostasis

- Liver diseases
  - Cirrhosis = caused by excessive alcohol → toxins build up in blood → jaundice (yellowing)
  - Hepatitis = inflammation of liver (virus)
  - Gout = hereditary or alcoholism → can't break down uric acid → builds up in joints → pain
- Kidney diseases
  - Kidney stones = calcium deposits
  - Kidney failure → death (can treat with dialysis)
  - [https://www.youtube.com/watch?v=fKIY2SKi\\_dk](https://www.youtube.com/watch?v=fKIY2SKi_dk)

# Placenta

- Organ → excretion and nutrition in developing babies
- Nutrients and wastes diffuse between mother and baby
- Molecules diffuse back and forth but the blood cells do not mix

**placenta**

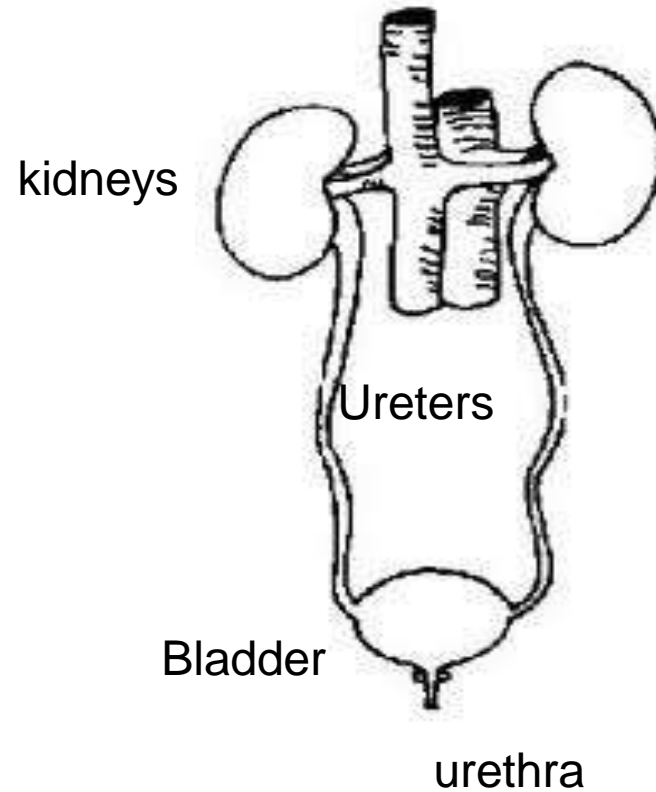




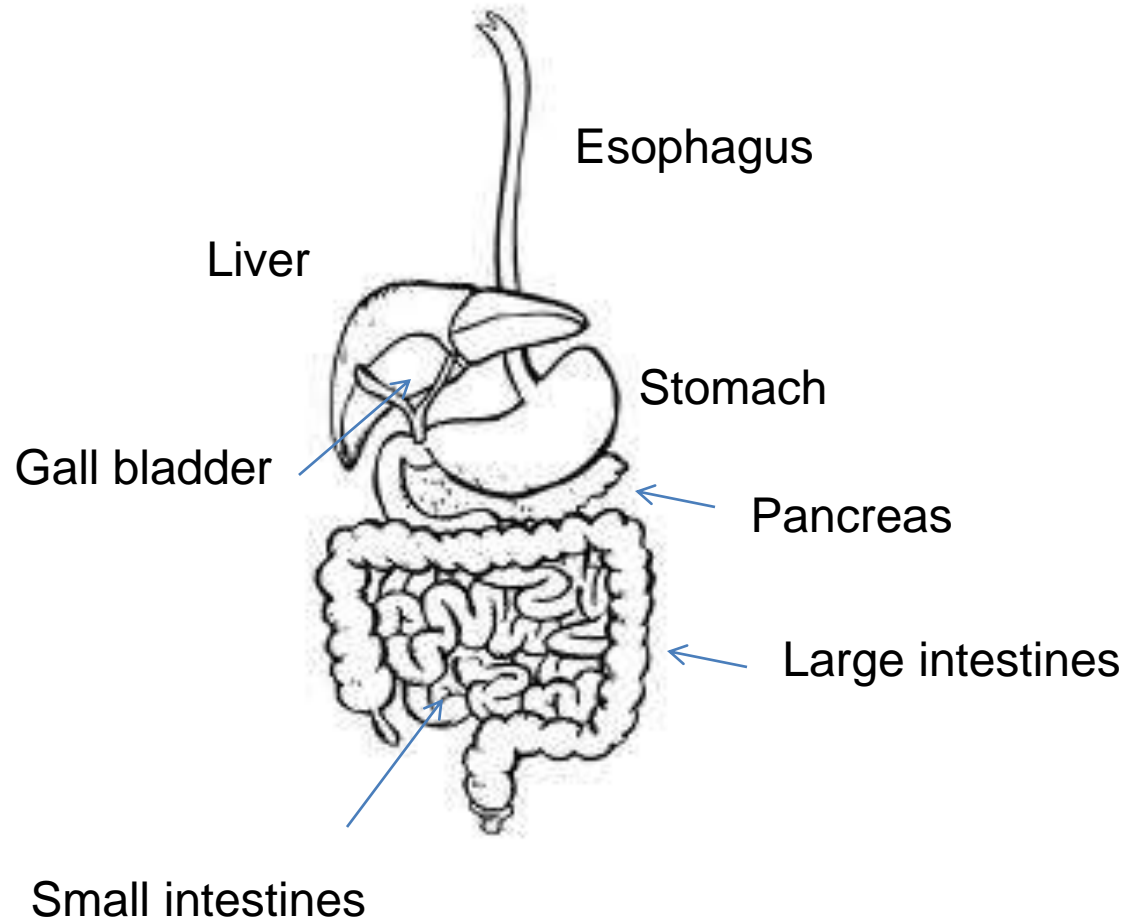
# Study Guide for Test Wednesday

## digestion and excretion

# Excretory system



# Digestive System



# Enzymes

- Bind to specific substrates
- Optimum pH and temperature
- Enzyme activity decreases higher or lower than optimum.

# State one specific function of each organ

- Kidneys
- Bladder
- Stomach
  - Liver
- Pancreas
- Large intestines
- Small intestines

List life functions involved in  
getting and using energy

# Experimental design

- Thing being measured in an experiment = \_\_\_\_\_ variable
- Thing being tested = \_\_\_\_\_ variable
- For each state control group, experimental group, and what will be measured.
- Does fertilizer cause algae to grow
- Does oil prevent birds from flying