

# MODULE 10 L04

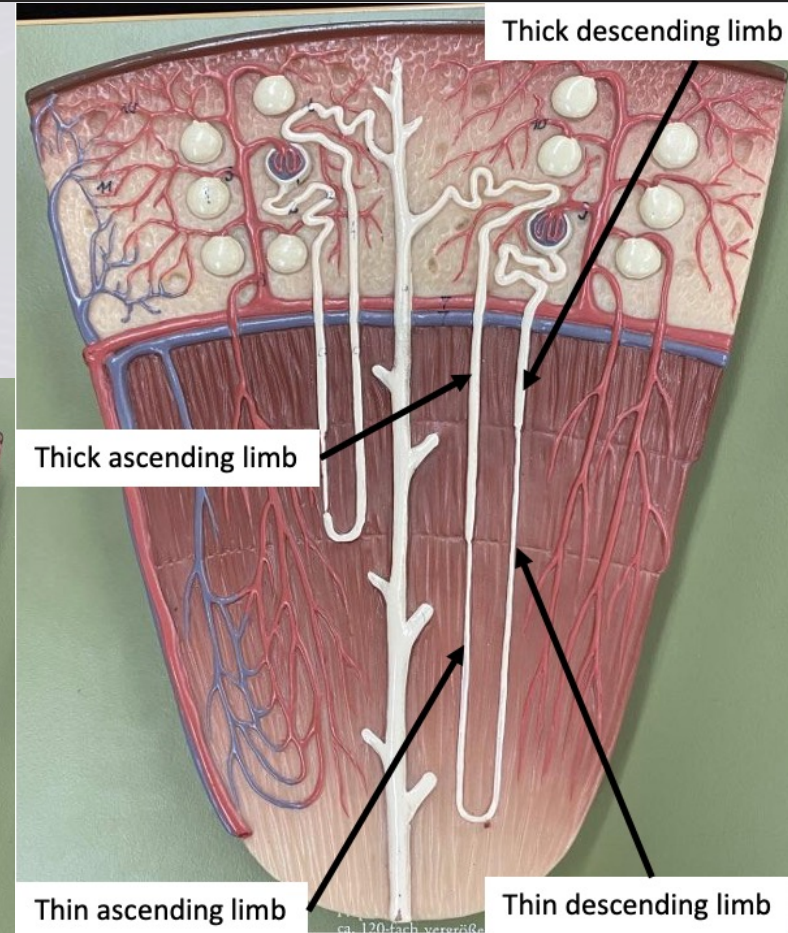
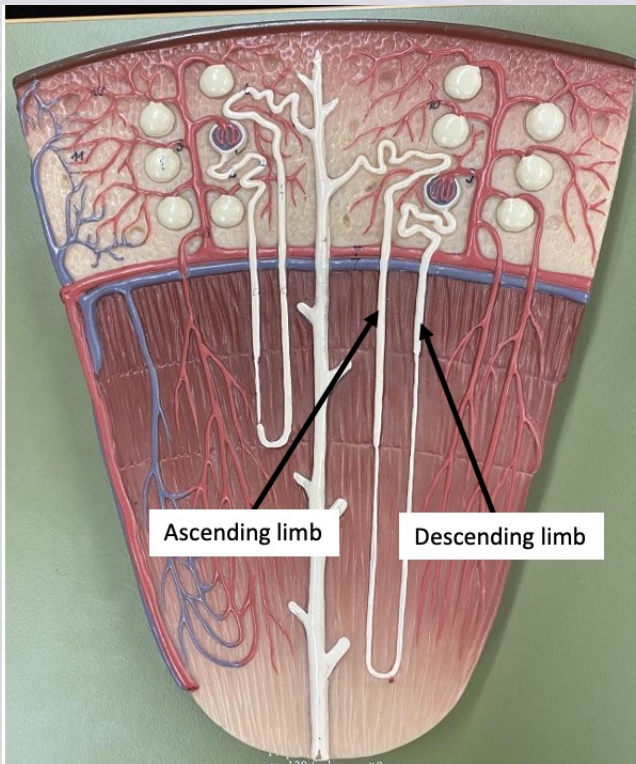
## From Nephron Loop to Collecting System

Dr. Lisa Brinn  
[lbrinn@fiu.edu](mailto:lbrinn@fiu.edu)



# Nephron Loop

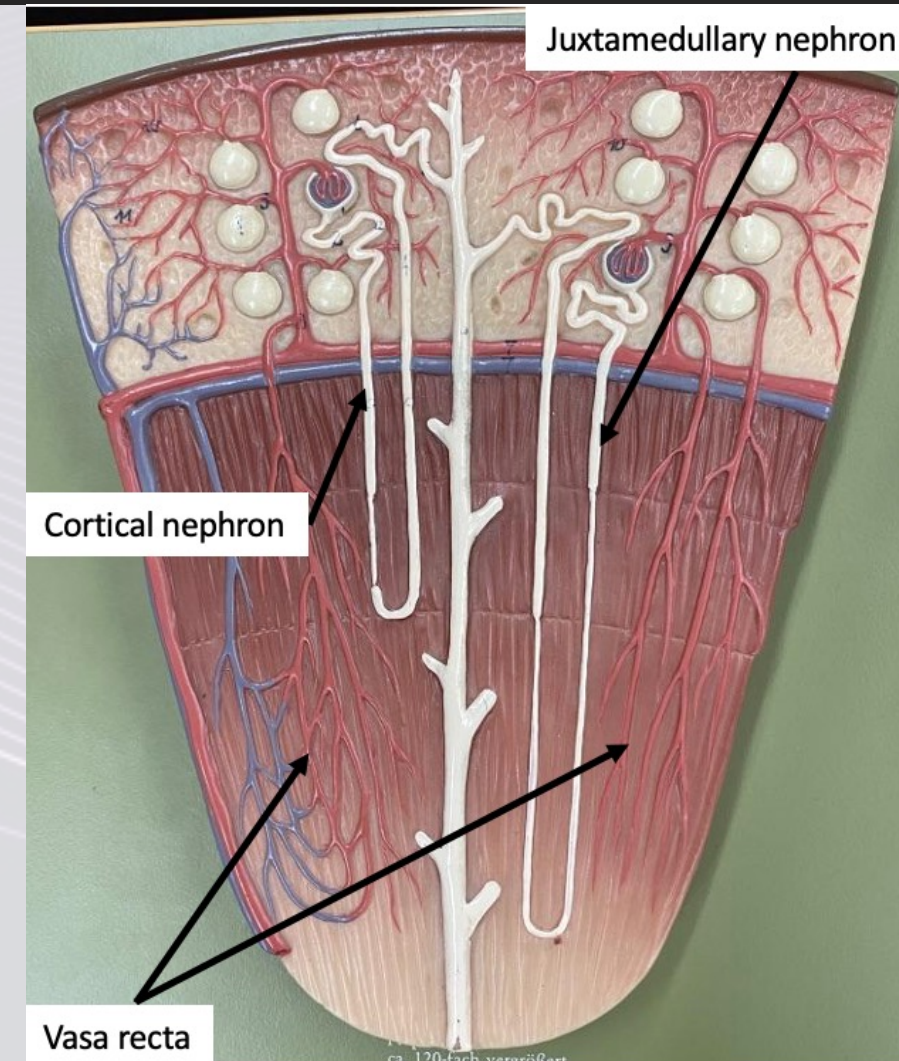
- Also known as loop of Henle
- Components
  - ❖ Thick descending limb
    - Simple cuboidal
  - ❖ Thin descending limb
    - Simple squamous
  - ❖ Thin ascending limb
    - Simple squamous
  - ❖ Thick ascending limb
    - Simple cuboidal





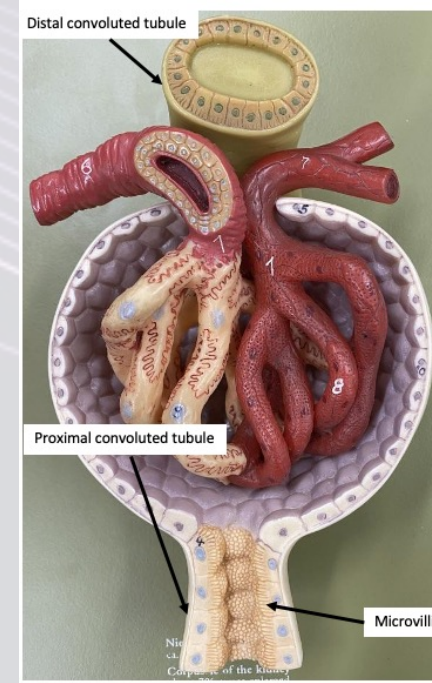
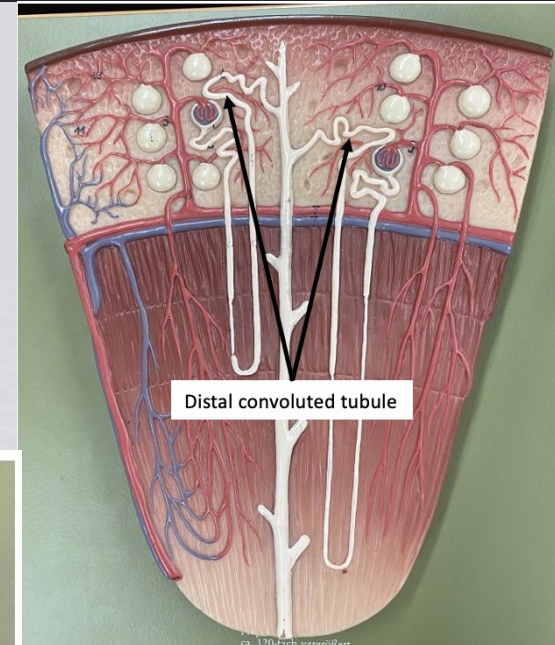
# Nephron Types

- Cortical nephron
  - ❖ Renal corpuscle found in middle of cortex
  - ❖ Short nephron loops
  - ❖ 85%
- Juxtamedullary nephron
  - ❖ Renal corpuscle found in cortex closer to medulla
  - ❖ Long nephron loops
  - ❖ 15%



# Distal Convoluted Tubule

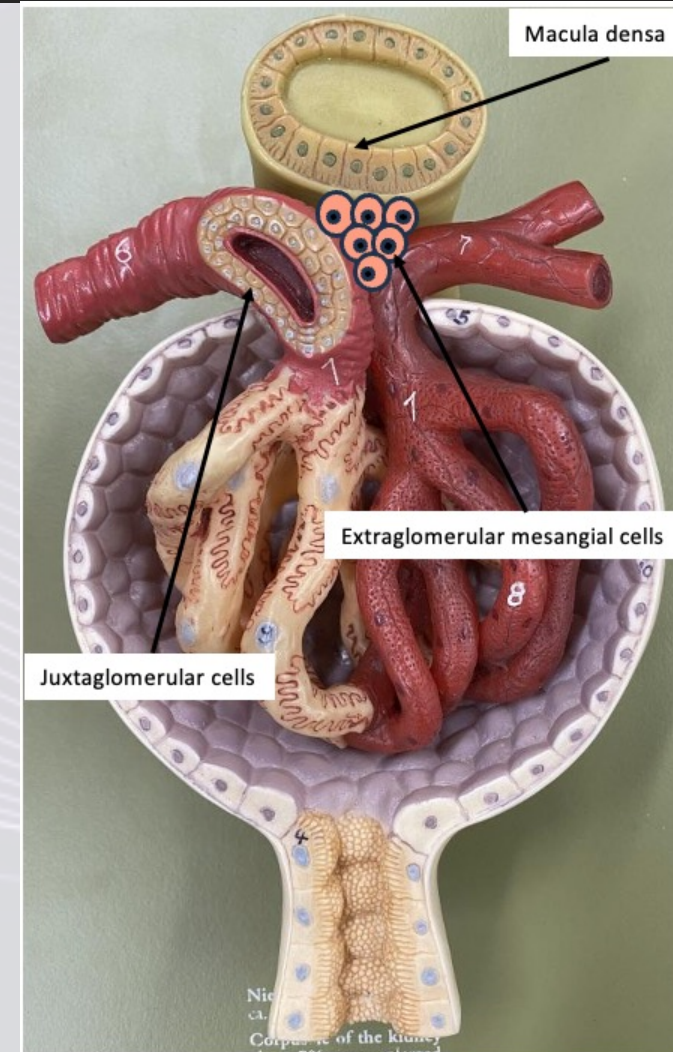
- Passes between afferent and efferent arterioles
- DCT X PCT
  1. DCT has smaller luminal diameter
  2. DCT epithelial cells lack microvilli
  3. DCT epithelial cells boundaries are easily seen
- Functions
  - ❖ initial adjustments made to filtrate
    - Aldosterone
      - Reabsorption of  $\text{Na}^+$  and  $\text{Cl}^-$
      - Secretion of  $\text{K}^+$  and  $\text{H}^+$
      - Reabsorption of  $\text{HCO}_3^-$
      - Small  $\text{H}_2\text{O}$  reabsorption





# Juxtaglomerular Complex

- Functions
  - ❖ Regulates blood pressure and filtrate formation
  - ❖ Releases:
    - Renin
      - Promotes production of angiotensin
        - Promotes aldosterone secretion
        - ✓ Promotes sodium absorption
        - Raises blood pressure
    - Erythropoietin
      - ↑ RBCs production when  $O_2$  ↓
- Components
  - ❖ Macula densa – regulate the release renin
  - ❖ Juxtaglomerular cells - release erythropoietin and renin
  - ❖ Extraglomerular mesangial cells – provide feedback control between macula densa and juxtaglomerular cells



# Collecting System

- Components
  - ❖ Connecting tubules
  - ❖ Collecting duct
  - ❖ Papillary duct
- Final adjustments
  - ❖ ADH – antidiuretic hormone
    - Antidiuretic drug
- Urine composition
  - ❖ Water
  - ❖ Urea
  - ❖ Sodium
  - ❖ Chloride
  - ❖ Potassium
  - ❖ Creatinine
  - ❖ Inorganic substances

