

# Development of Urogenital Systems

ANHB 2212 – 2008  
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## Back to Mesoderm...!

- Intermediate mesoderm
  - After lateral folding... under coelomic epithelium
  - Lengthwise column
- Urinary system :
  - Nephric tubules
  - Open in the coelomic cavity, later...
  - Draining duct



## The Kidney Story...

- Developmental and evolutionary
- Successive parts of intermediate mesoderm
- Begins high up
- Three sets of “kidneys”
  - First, middle and ‘other’ (final).
  - Pronephros, mesonephros and metanephros



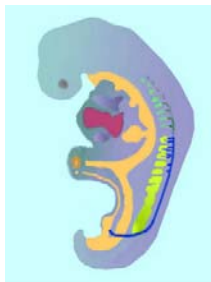
## Pronephros

- 8 to 10 “segments” – cervical
- Cell groups... craniocaudal sequence
- Disappear completely
- Do not function as kidneys (only some species of fishes)



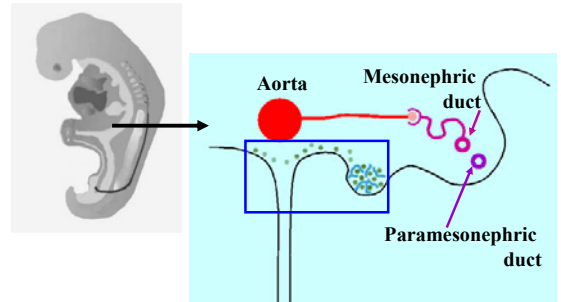
## Mesonephros

- Thoracolumbar region
  - Tubules
  - Duct : mesonephric duct (Wolffian)
- Caudal end :
  - Cloaca → urogenital part
- 2<sup>nd</sup> month events
  - Functional for a short period



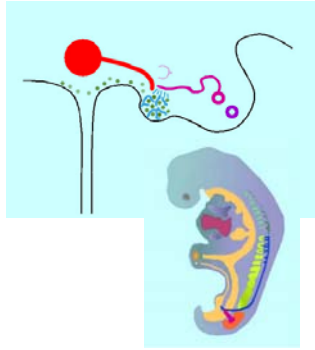
## Step-by-step ...

Sectional view...



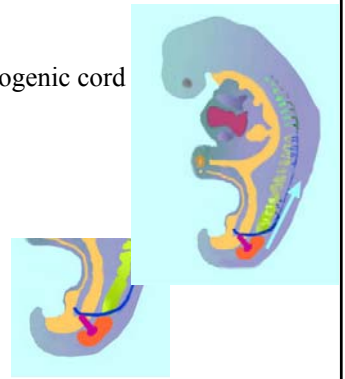
## Mesonephros disappears

- Tubules regress
- Duct persists...  
...put to some use!



## Metanephros

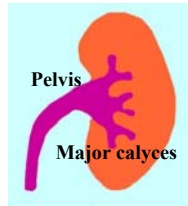
- Caudal end of nephrogenic cord
- Duct :  
diverticulum from mesonephric duct  
→  
Ureteric bud
- Migrates cranially



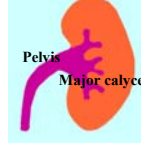
## Metanephros



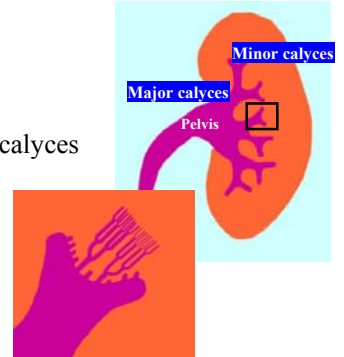
- Metanephric cap  
→ Urine-forming part
- Ureteric bud  
→ Collecting system



## Collecting System



- Major and minor calyces
- Collecting ducts
- Metanephric cap  
→ tubules



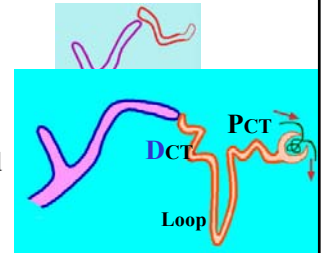
## The Nephron

- Cell clusters around blind ends of tubules
- Hollow
- Thin part → Bowman's capsule
- Rest → tubule



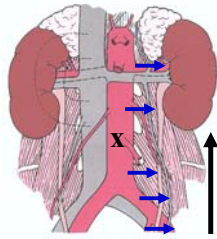
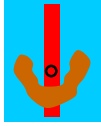
## The Nephron...

- Glomerulus
- Parts of the tubule
  - Proximal convoluted
  - Loop of Henle
  - Distal convoluted
- **Communication essential !**



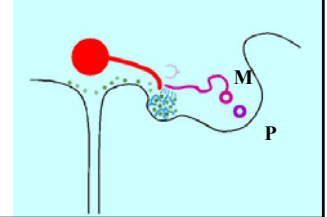
## Ascent of Kidney

- Blood vessels : successive sources
- Fused kidneys : Arrested by IMA



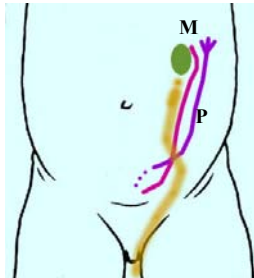
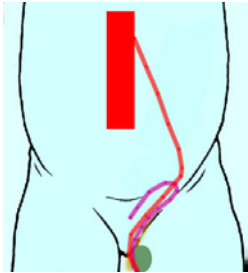
## Reproductive Organs

- Gametogenic cells...
- Gonadal ridge
- Mesonephric and paramesonephric ducts
- Gonads descend
- Common plan... Differentiation



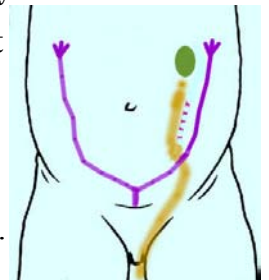
## Male System

- "Gubernaculum"
- Mesonephric duct



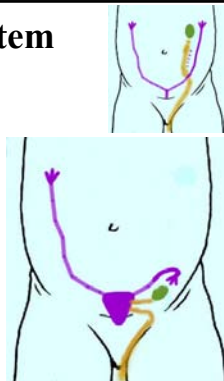
## Female System

- Paramesonephric duct
- Fusion : caudal part → Uterus
- Cranial : Tube
- Uterine abnormalities.

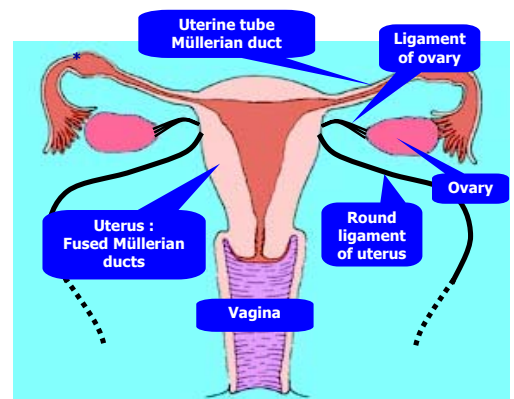


## Female System

- Descent stops in the pelvis
- Gubernaculum → Fibrous cords
- Ligaments :
  - Of ovary
  - Round ligament of uterus



## Final Picture



## **Implications of Descent**

- Blood supply
- Veins
- Nerves
- Lymphatics
- Inguinal canal and its contents