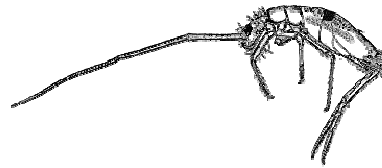
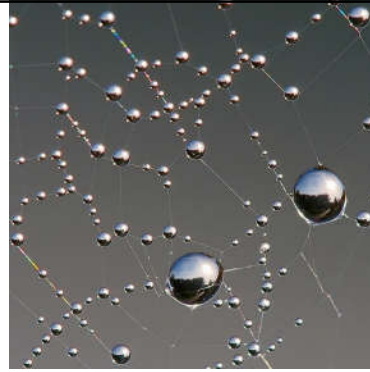


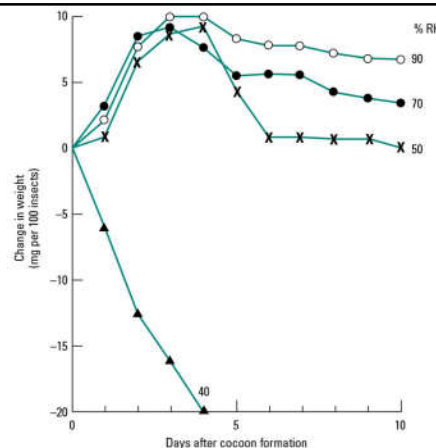
Terrestrial Osmoregulation

- Issue is having an adequate source of water and preventing evaporative loss
- Uptake from air or soil:
 - Dew – **hygroscopic substances**
 - Osmosis from standing water or soils
 - Active Na transport in springtail ventral tubules
 - Capillary action from soils



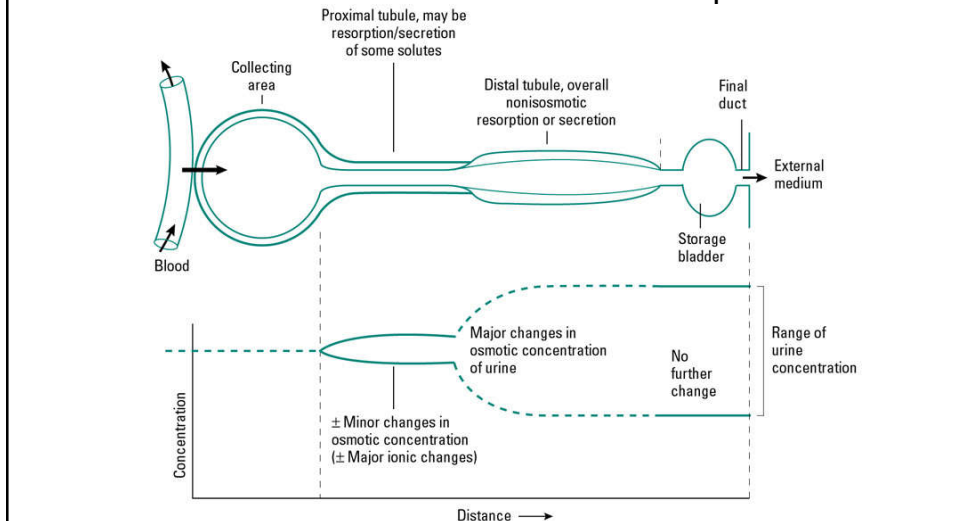
Vapor uptake

- Glands in numerous small invertebrates
 - Water condenses on surfaces with high osm and hygroscopic substances
- **Critical Equilibrium Humidity**
 - lowest humidity at which animals can have a net gain of water from air alone.

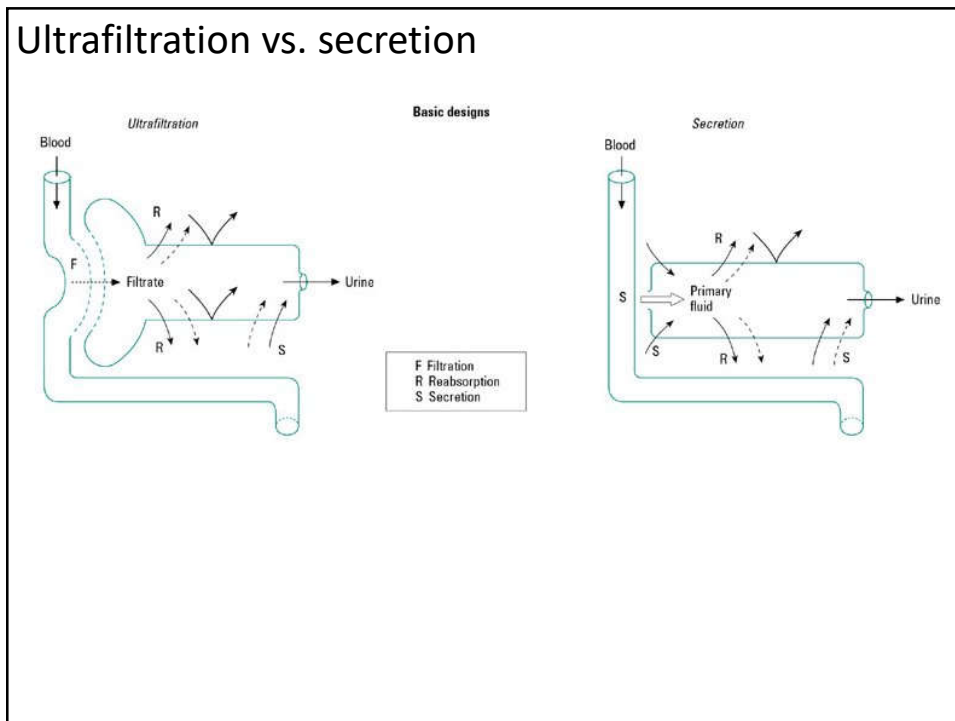


Excretion and Secretion

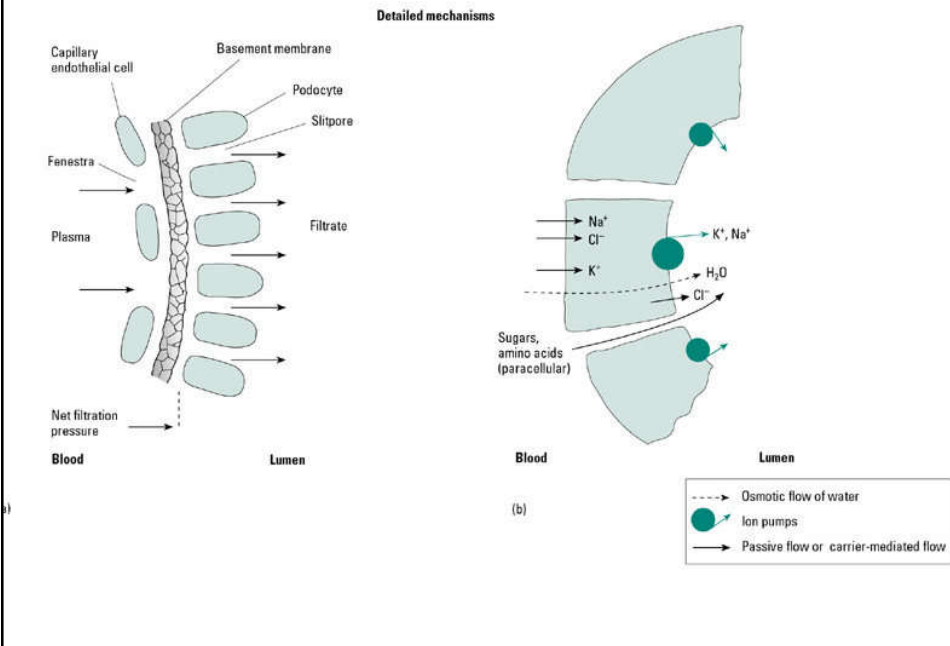
- **Secretion** – release of substance from a cell or gland, substance often serves a purpose
- **Excretion** – release of waste or unwanted products



Ultrafiltration vs. secretion



Ultrafiltration vs. secretion



Kidney Dialysis and Failure

