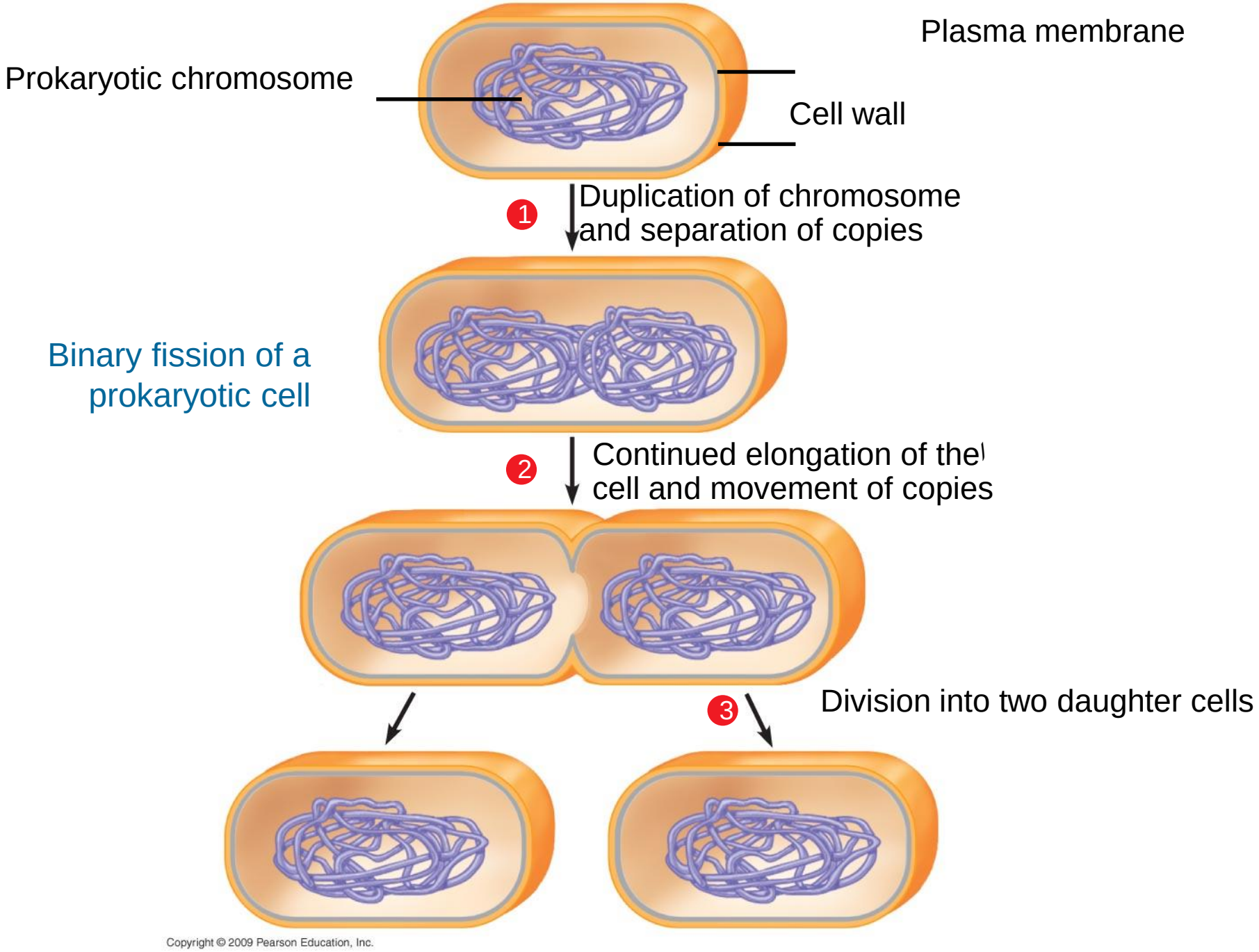
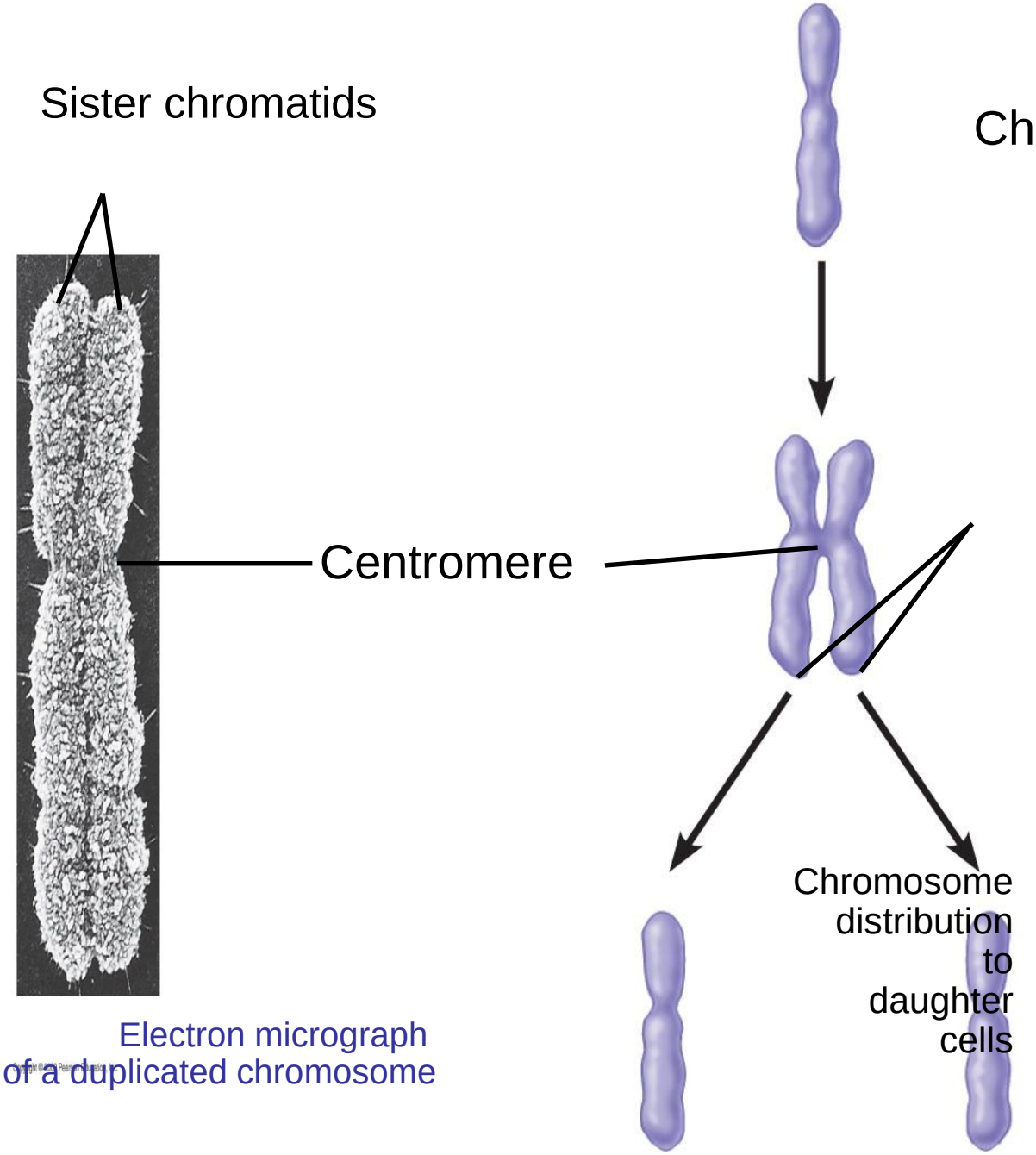
Chapter 8

Binary fission of a prokaryotic cell





Electron micrograph of a duplicated chromosome

Chromosome duplication and distribution

Cleavage furrow

Contracting ring of Microfilaments

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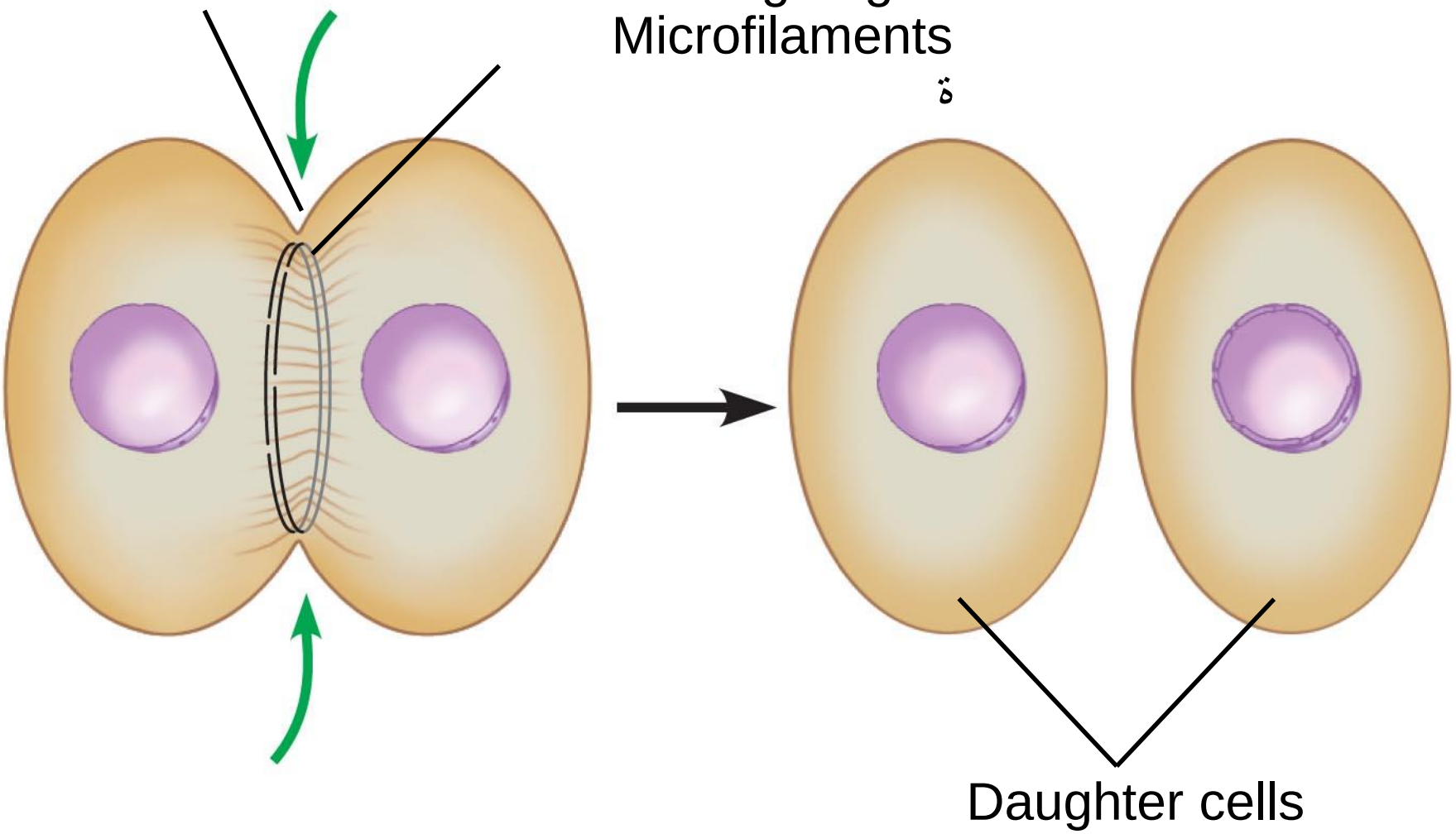
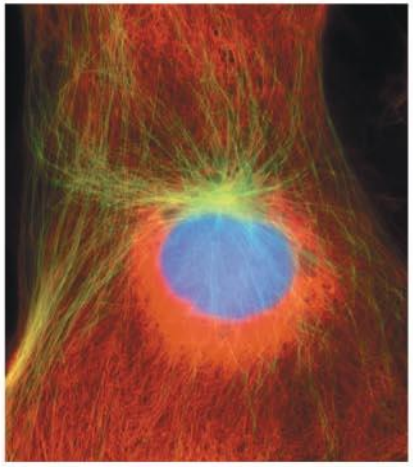
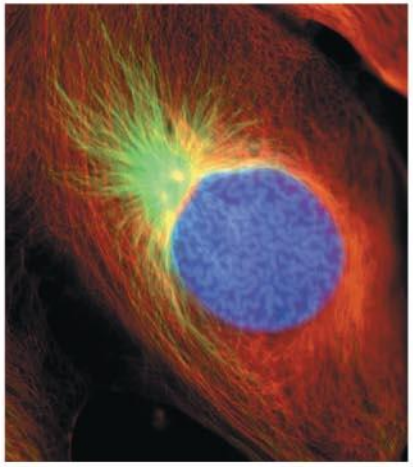


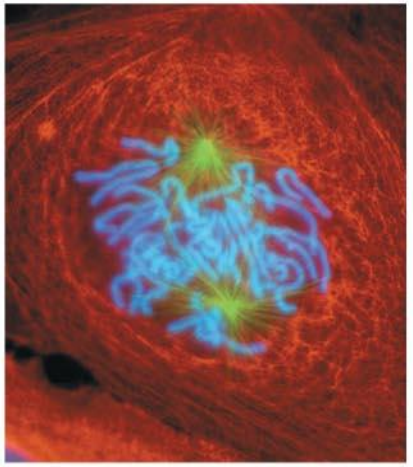
Daughter cells



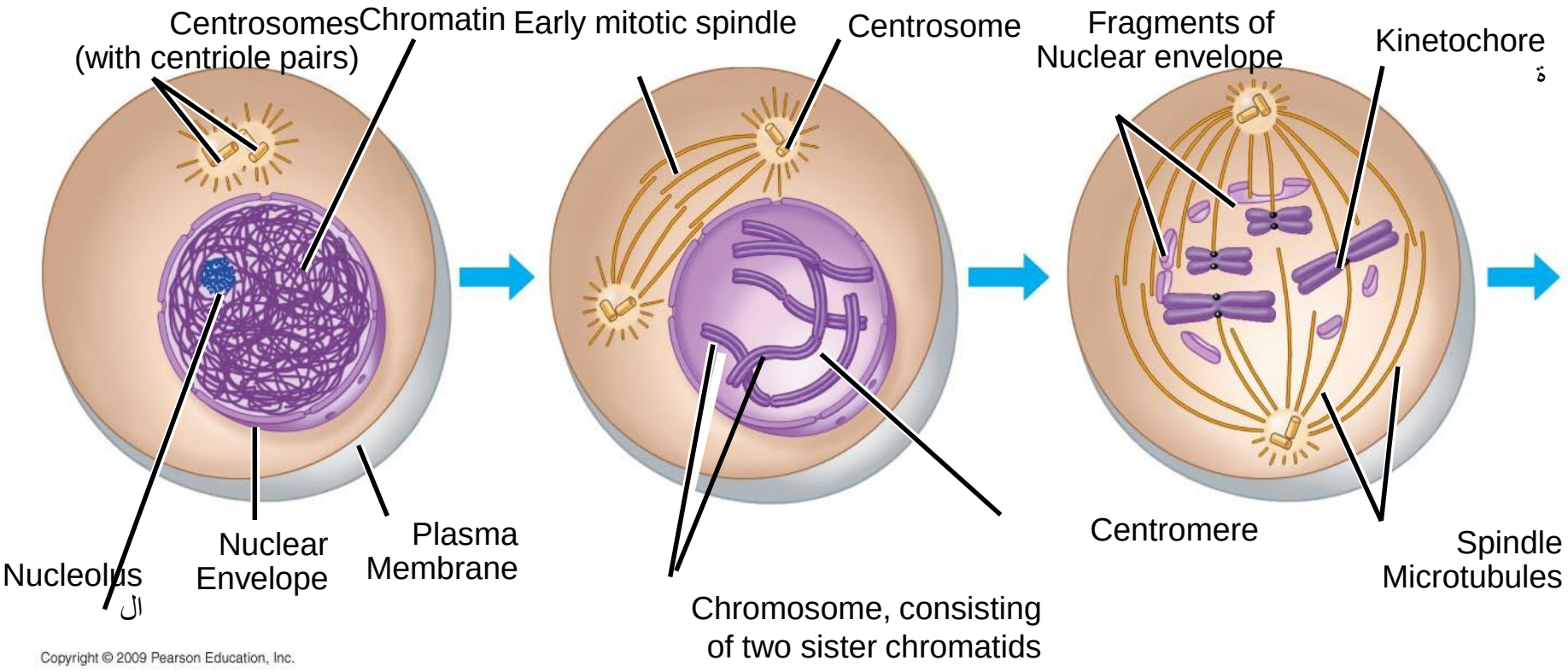
INTERPHASE

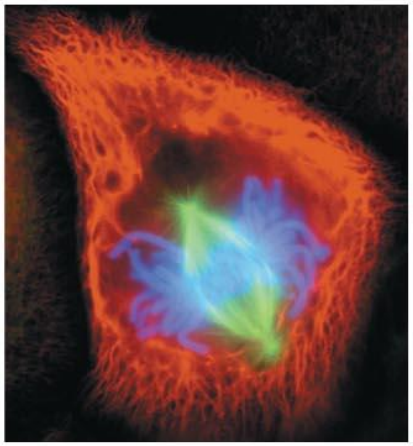


PROPHASE

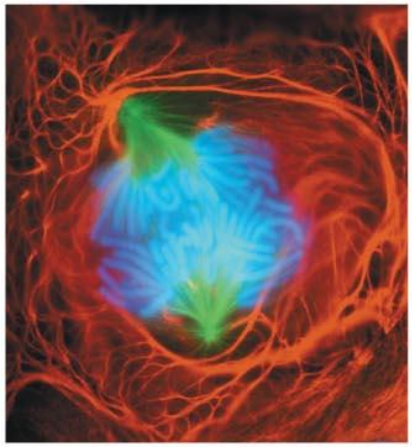


PROMETAPHASE

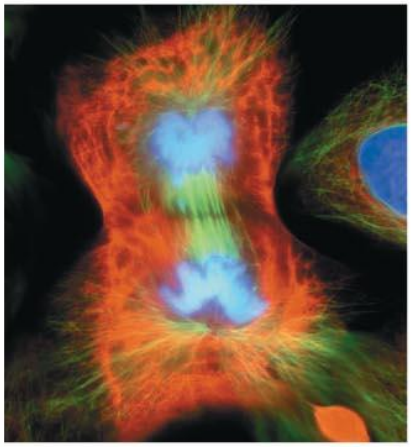




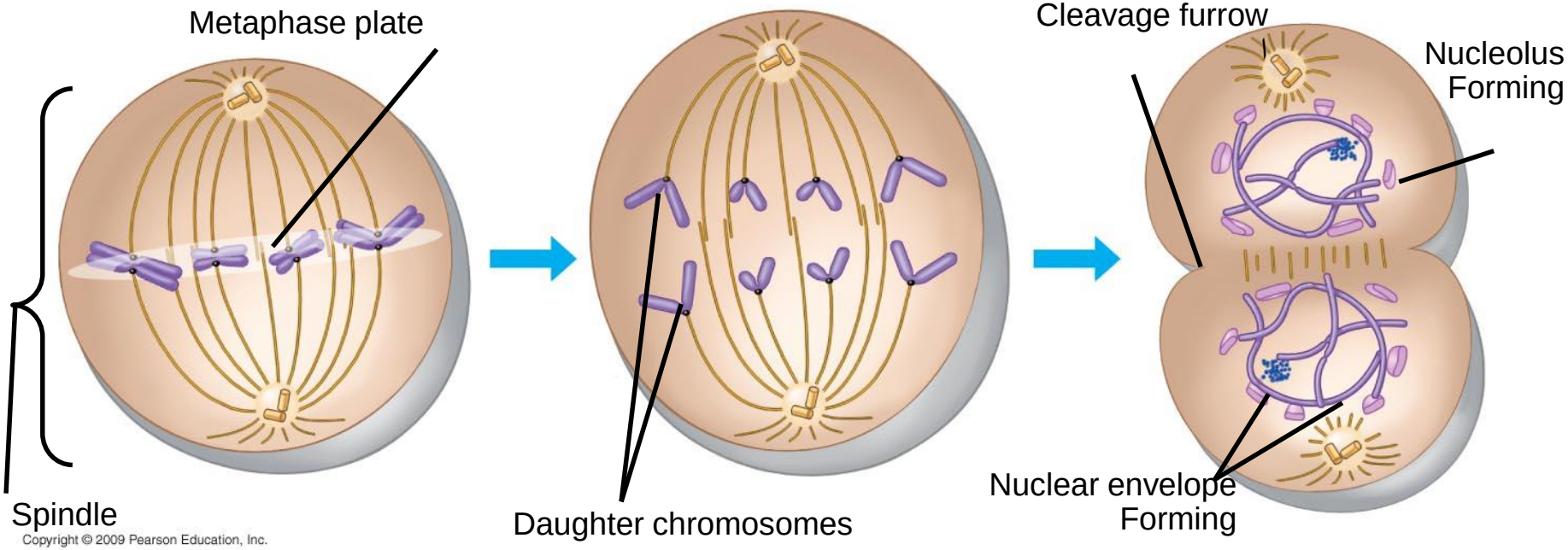
METAPHASE



ANAPHASE



TELOPHASE AND CYTOKINESIS



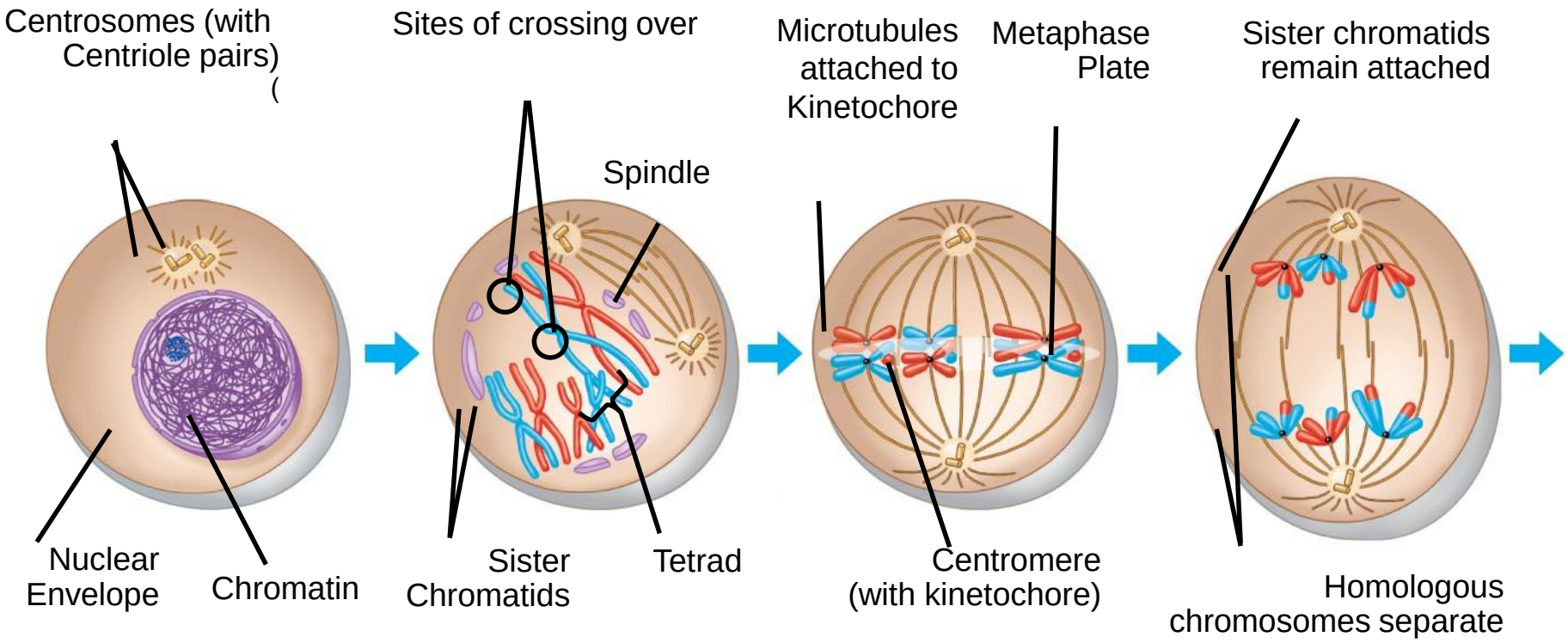
MEIOSIS I: Homologous chromosomes separate
الانقسام الاختزالي الأول: انفصال الأزواج الكروموزمومية المتماثلة

INTERPHASE
الطور البيني

PROPHASE I
الطور التمهيدي الأول

METAPHASE I
الطور الاستوائي الأول

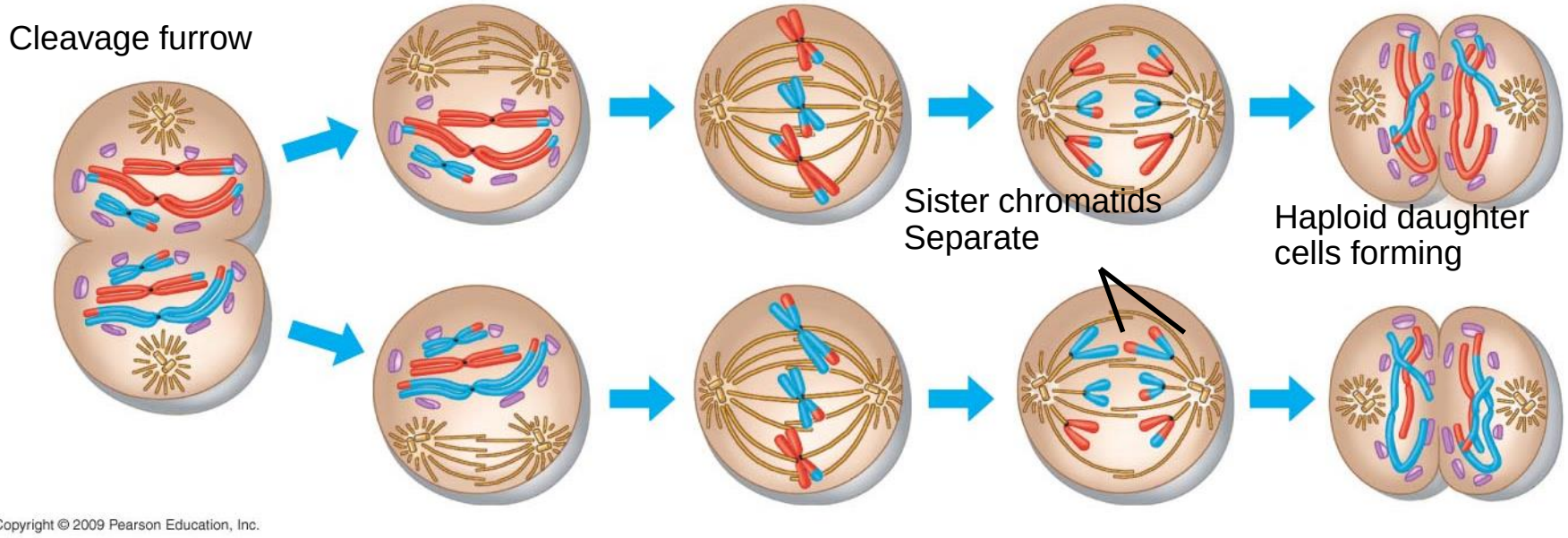
ANAPHASE I
الطور الانفصالي الأول



The stages of miosis I

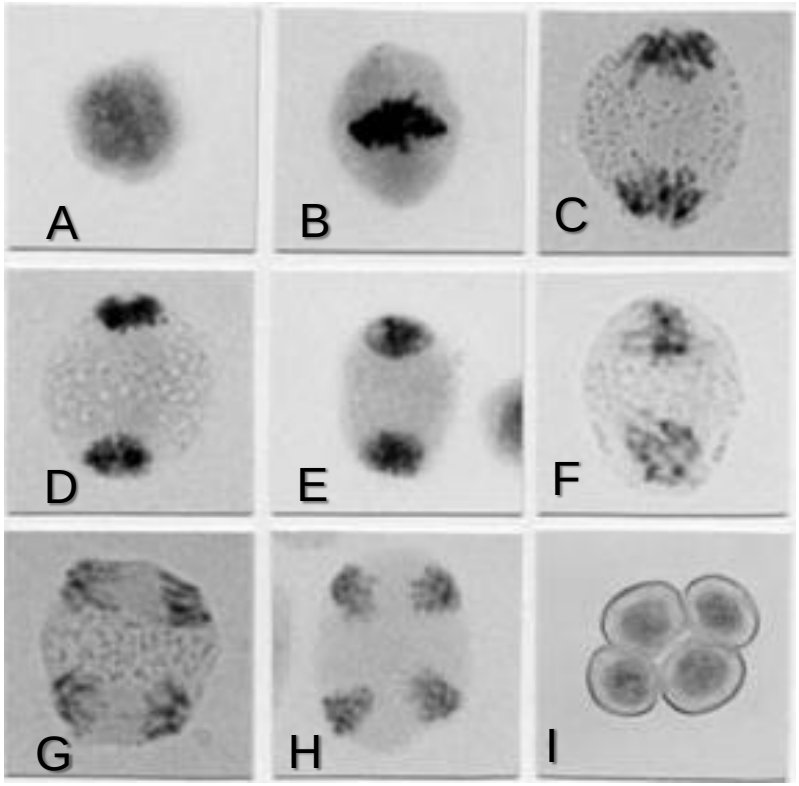
MEIOSIS II: Sister chromatids separate
الانقسام الاختزالي الثاني: انفصال الكروماتيدات الشقيقة

TELOPHASE I AND CYTOKINESIS | PROPHASE II | METAPHASE II | ANAPHASE II | TELOPHASE II AND CYTOKINESIS

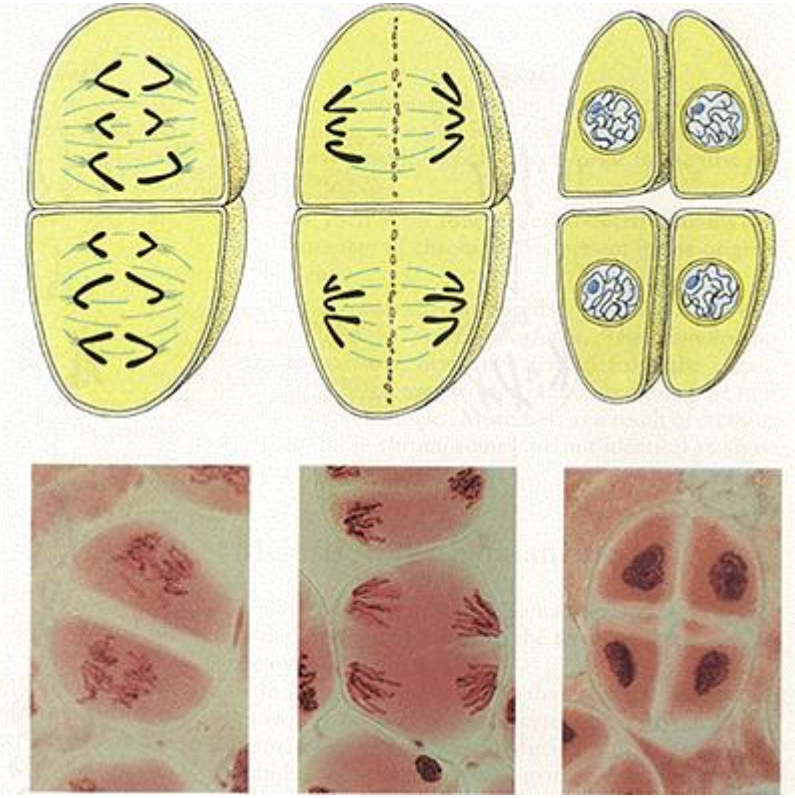


The stages of miosis II

MEIOSIS

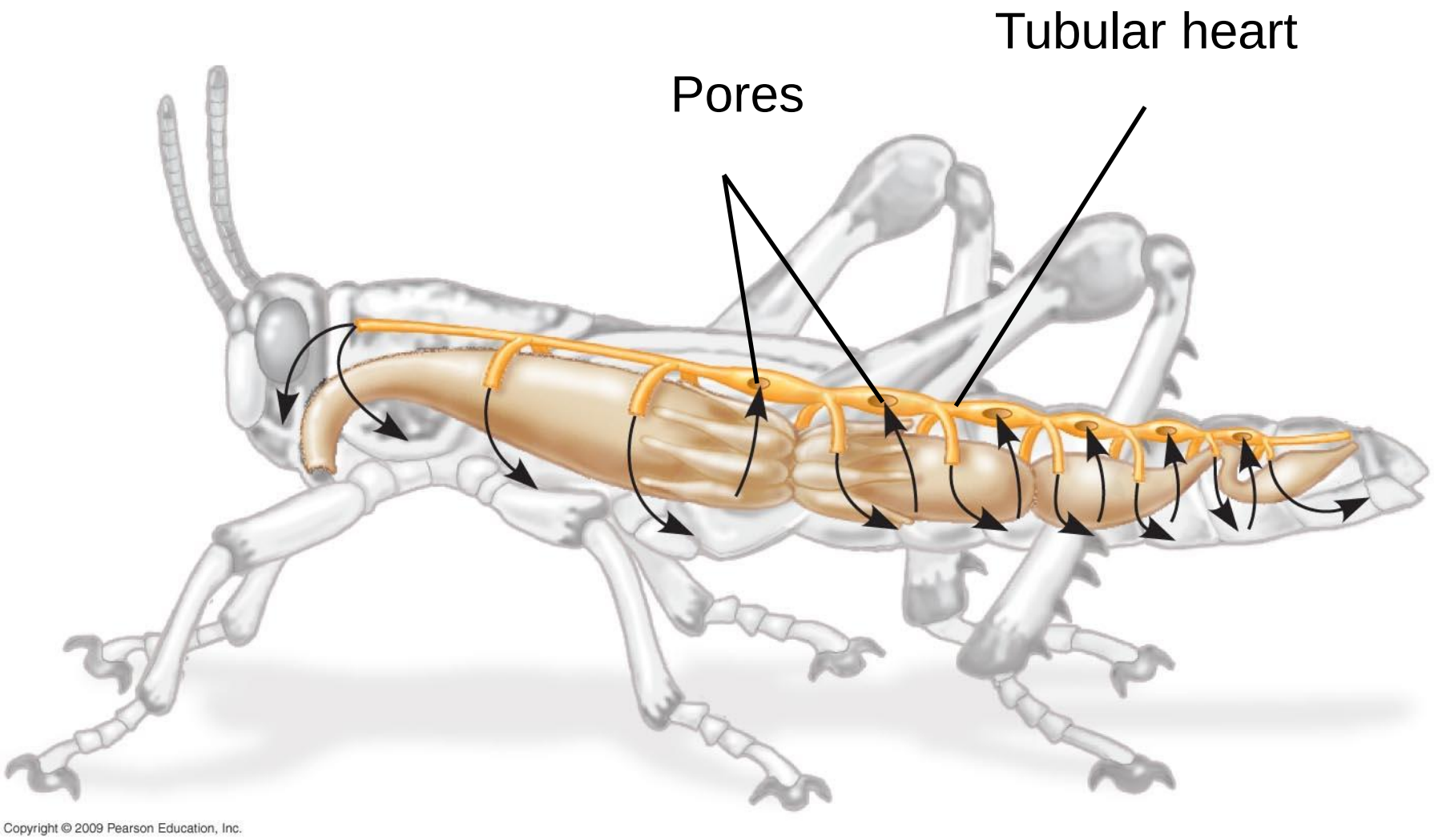


A. PROPHASE I
B. METAPHASE I
C. ANAPHASE I
D. TELOPHASE I
E. PROPHASE II
F. METAPHASE II
G. ANAPHASE II
H. TELOPHASE II
I. TETRAD

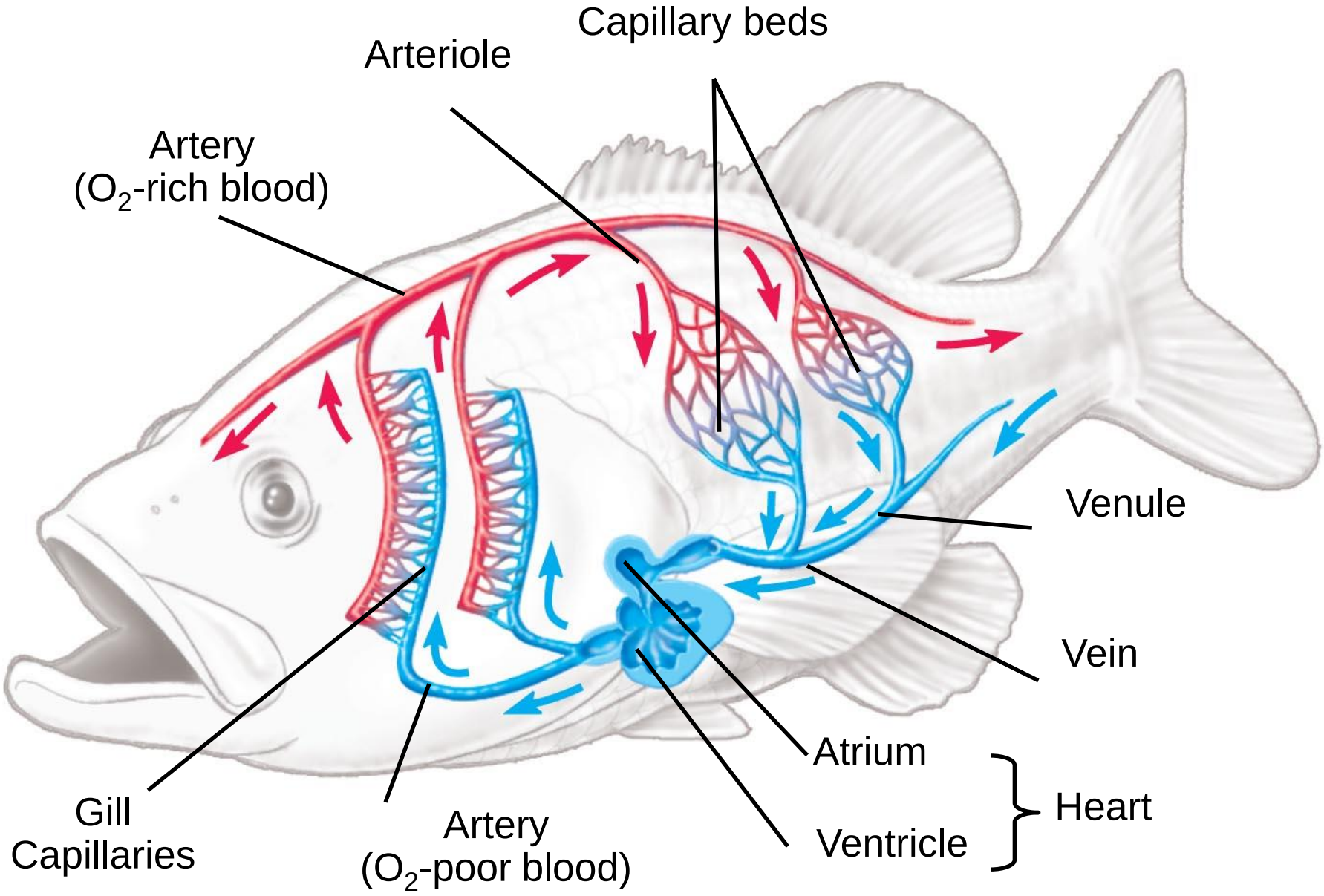


ANAPHASE II TELOPHASE II TETRAD

Chapter 23



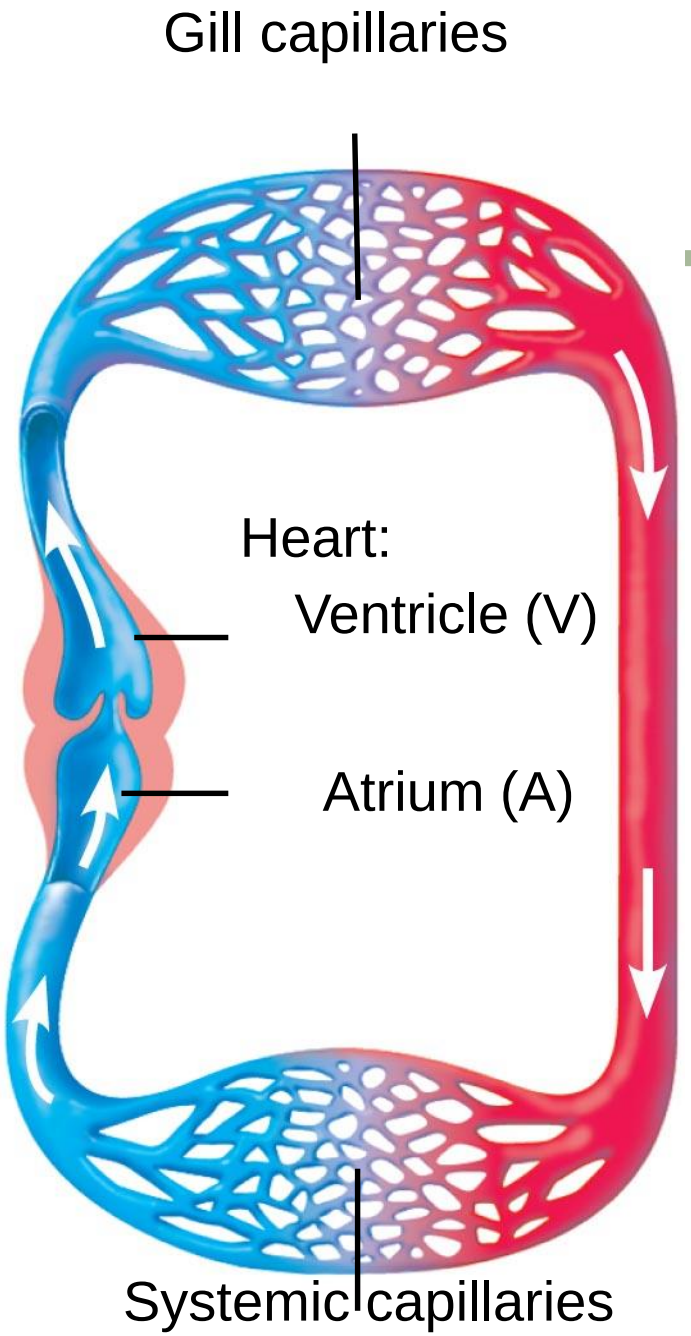
The open circulatory system (vessels in gold) in a grasshopper



The closed circulatory system in a fish

23.2 EVOLUTION CONNECTION: Vertebrate Cardiovascular systems reflect evolution

- **Two-chambered heart** in fish pumps blood in a single circuit From gill capillaries To systemic capillaries Back to heart



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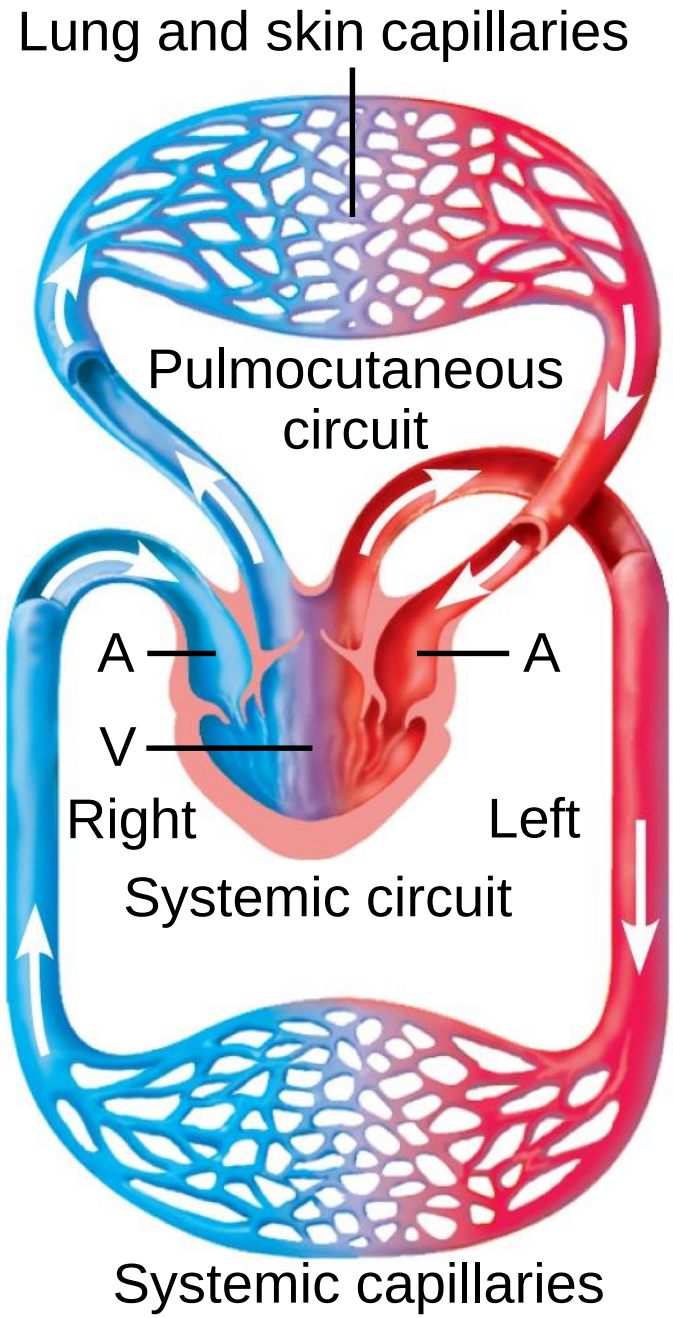
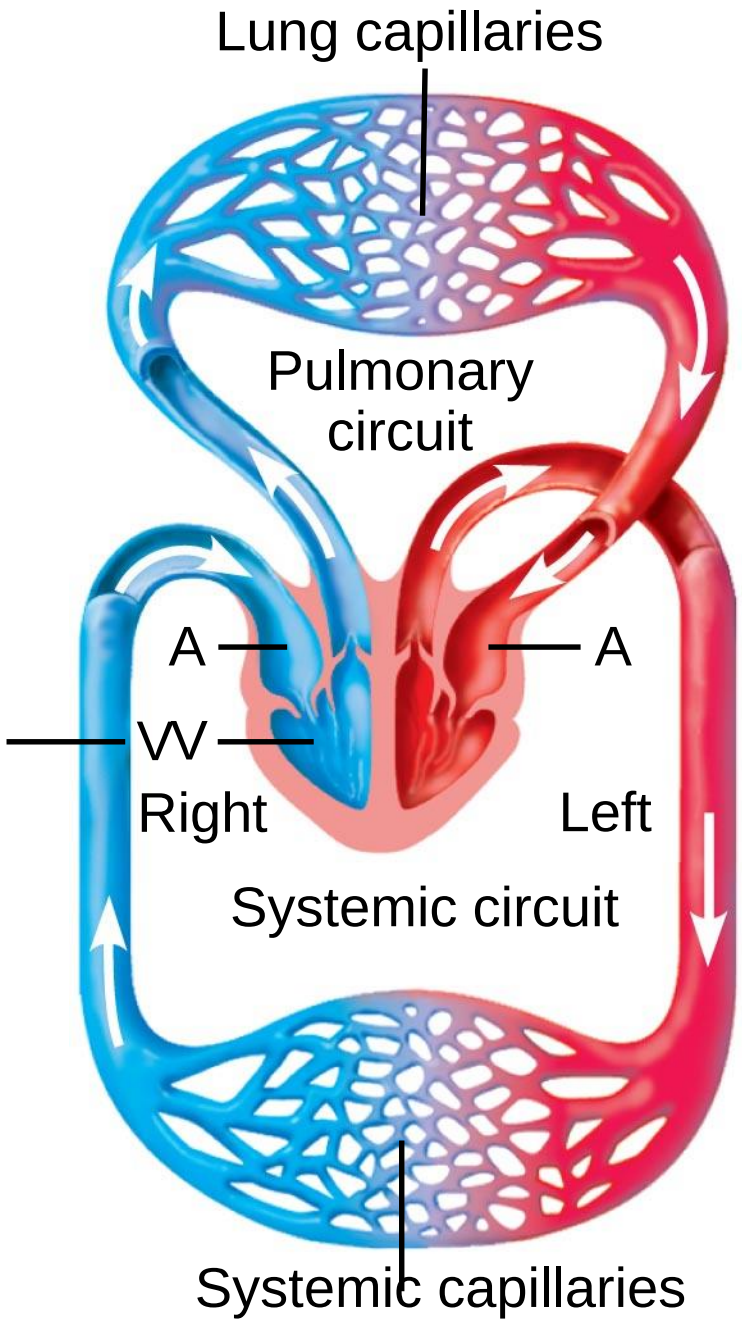
The double circulation and three-chambered heart of an amphibian

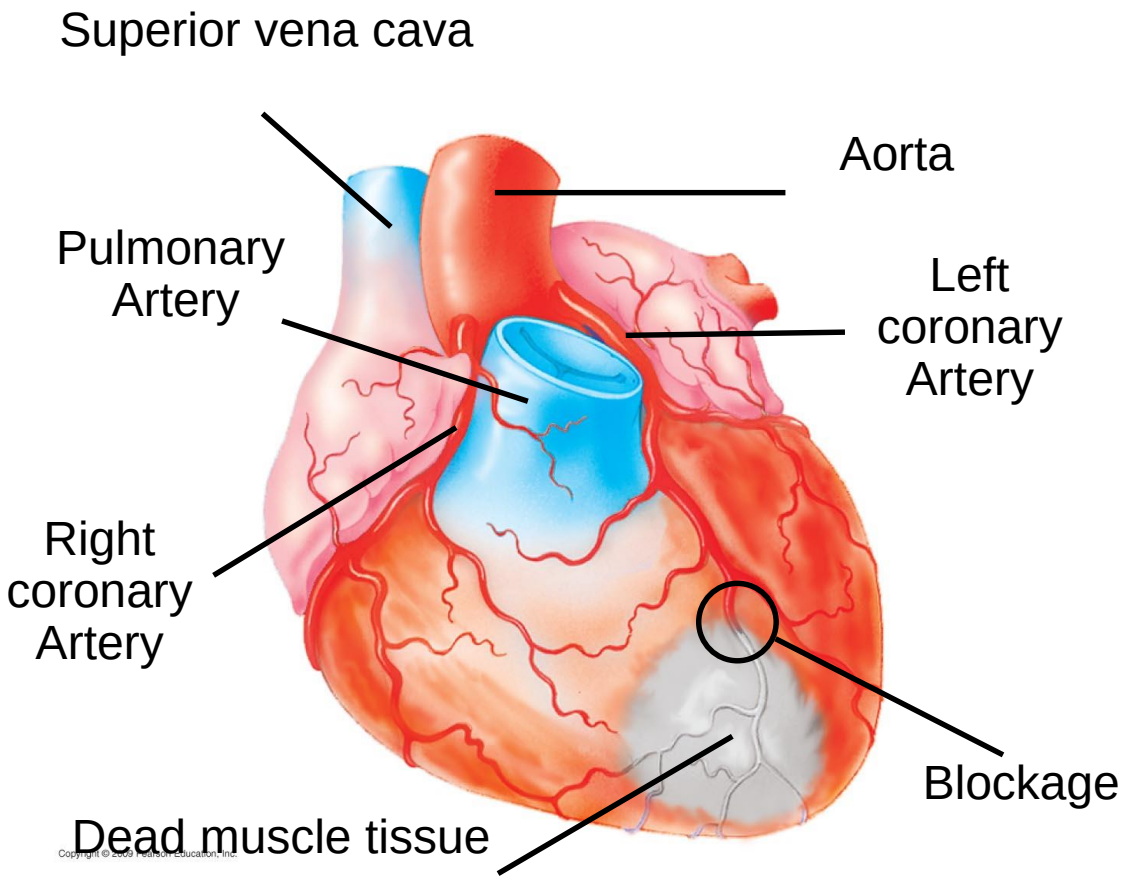


The double circulation and four-chambered heart of a bird or mammal



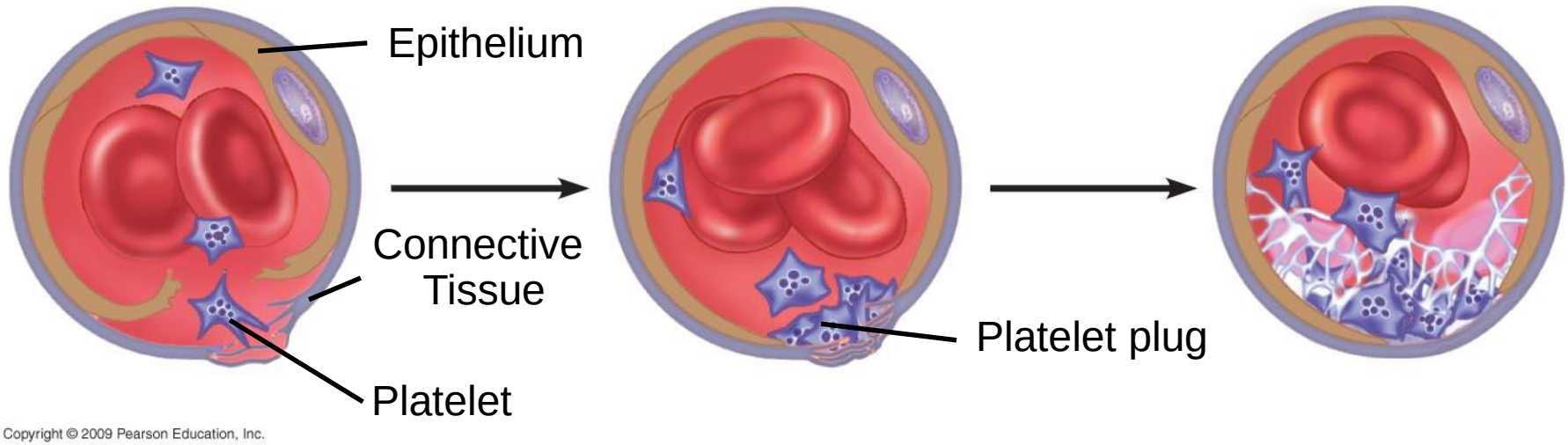
23.6 CONNECTION: What is a heart attack?

- **A heart attack is damage to cardiac muscle typically from a blocked coronary artery**
- **Stroke Death of brain tissue from blocked arteries in the head**



Blockage of a coronary artery, resulting in a heart attack

The blood-clotting process



A fibrin clot

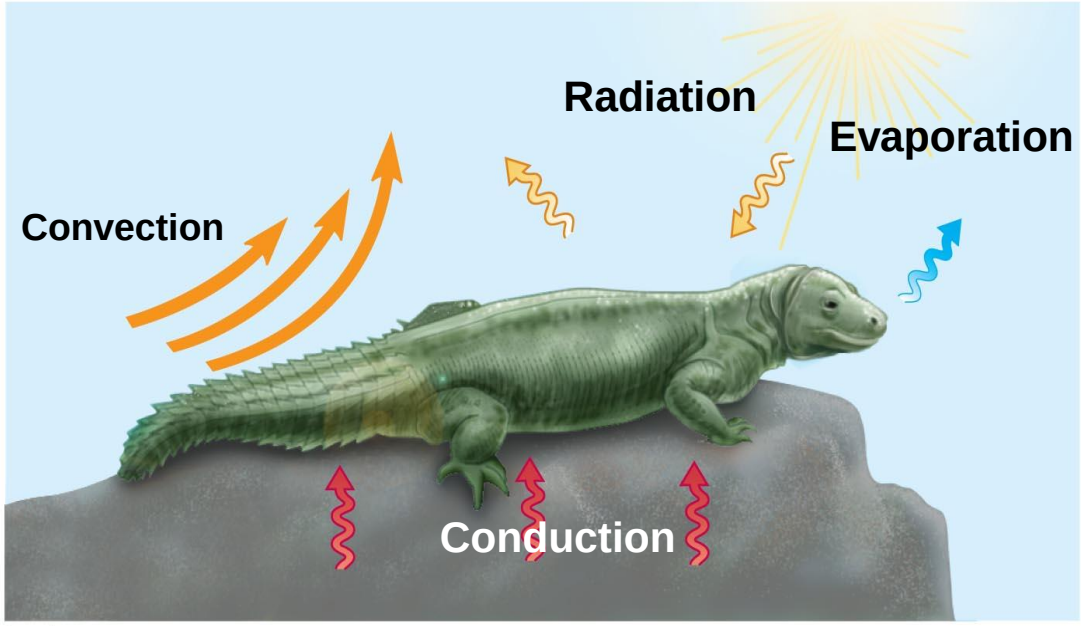
Chapter

25

25.2 Heat is gained or lost in four ways

- **Heat exchange with the environment may occur by**
  - **Conduction**
  - **Convection**
  - **Radiation**
  - **Evaporation**

Mechanisms of heat exchange



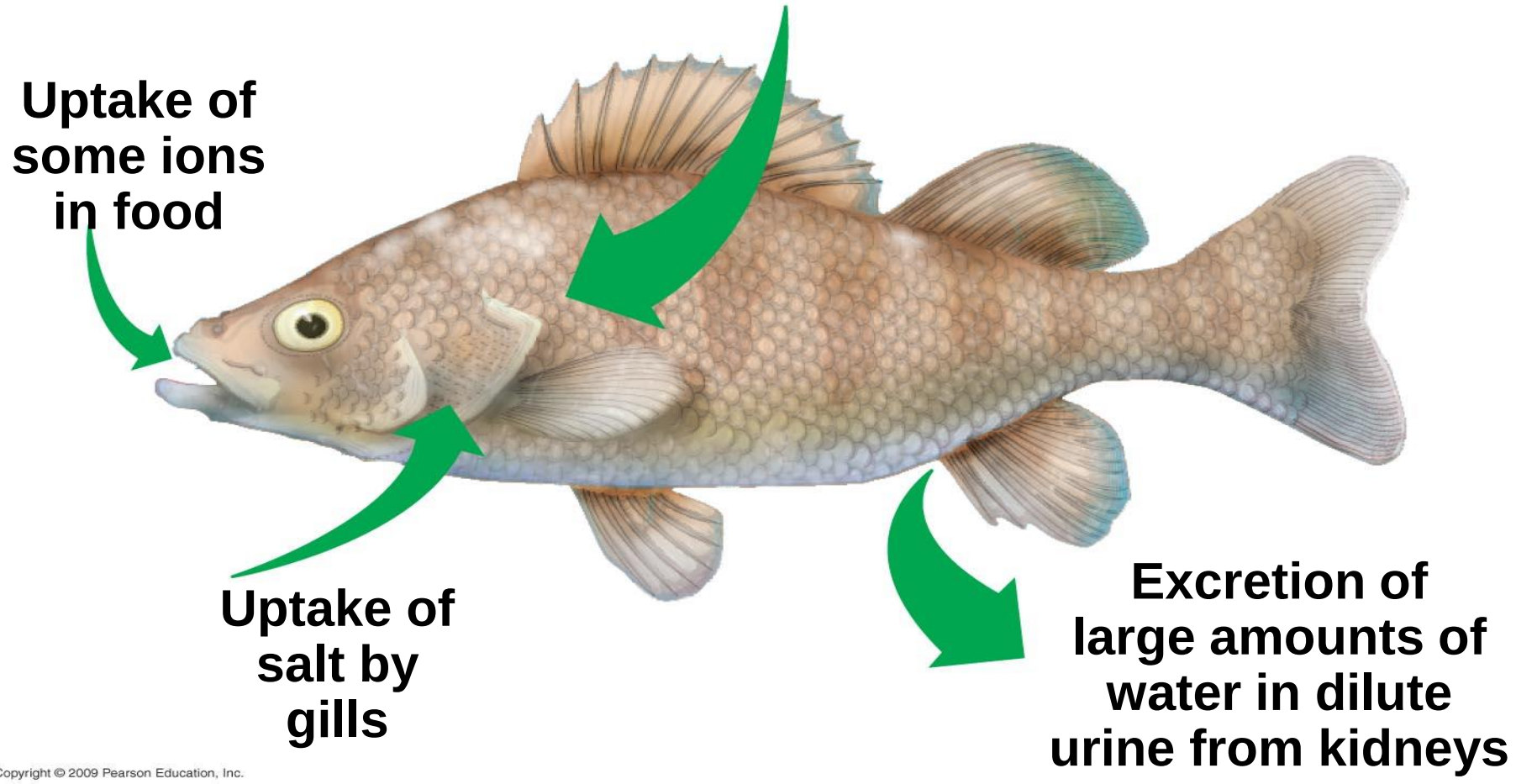
25.3 Thermoregulation involves adaptations that balance heat gain and loss

2- Insulation

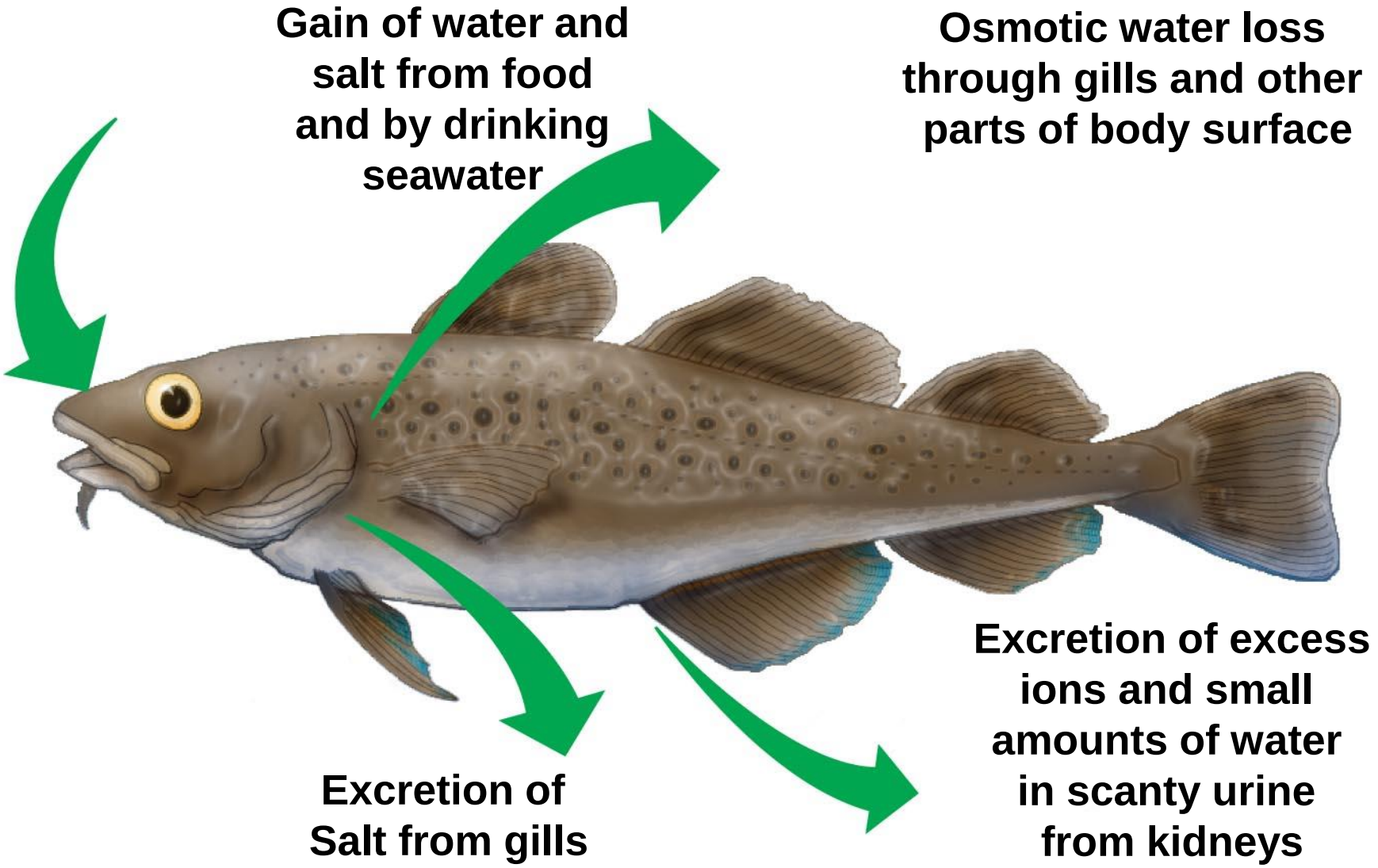
- Hair
- Feathers
- Fat layers

3- Circulatory adaptations

- Increased or decreased blood flow to skin
- Large ears in elephants
- Countercurrent heat exchange



Osmoregulation in a perch, a freshwater fish



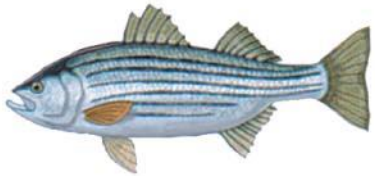
Osmoregulation in a cod, a saltwater fish

Proteins → Amino acids

Nitrogenous bases ← Nucleic acids

Amino acids → —NH_2 Amino groups ← Nitrogenous bases

Nitrogen-containing metabolic waste products

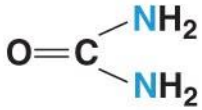


Most aquatic animals, including most fishes

NH_3

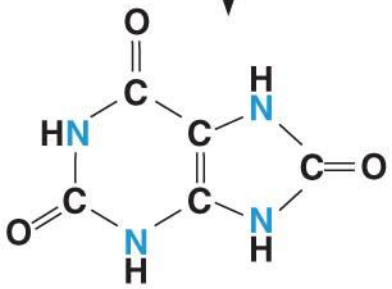
Ammonia

Mammals, amphibians, sharks, some bony fishes



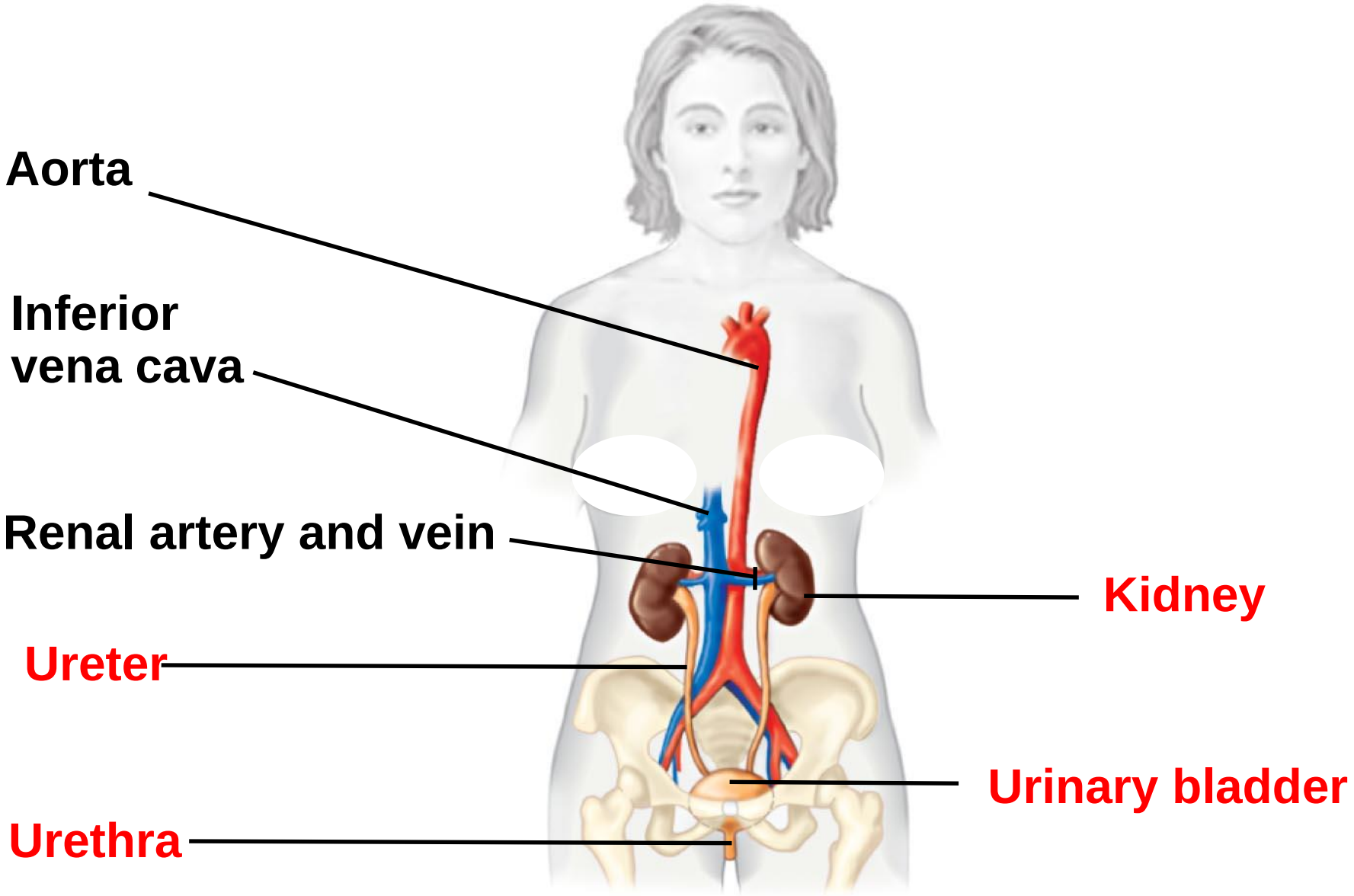
Urea

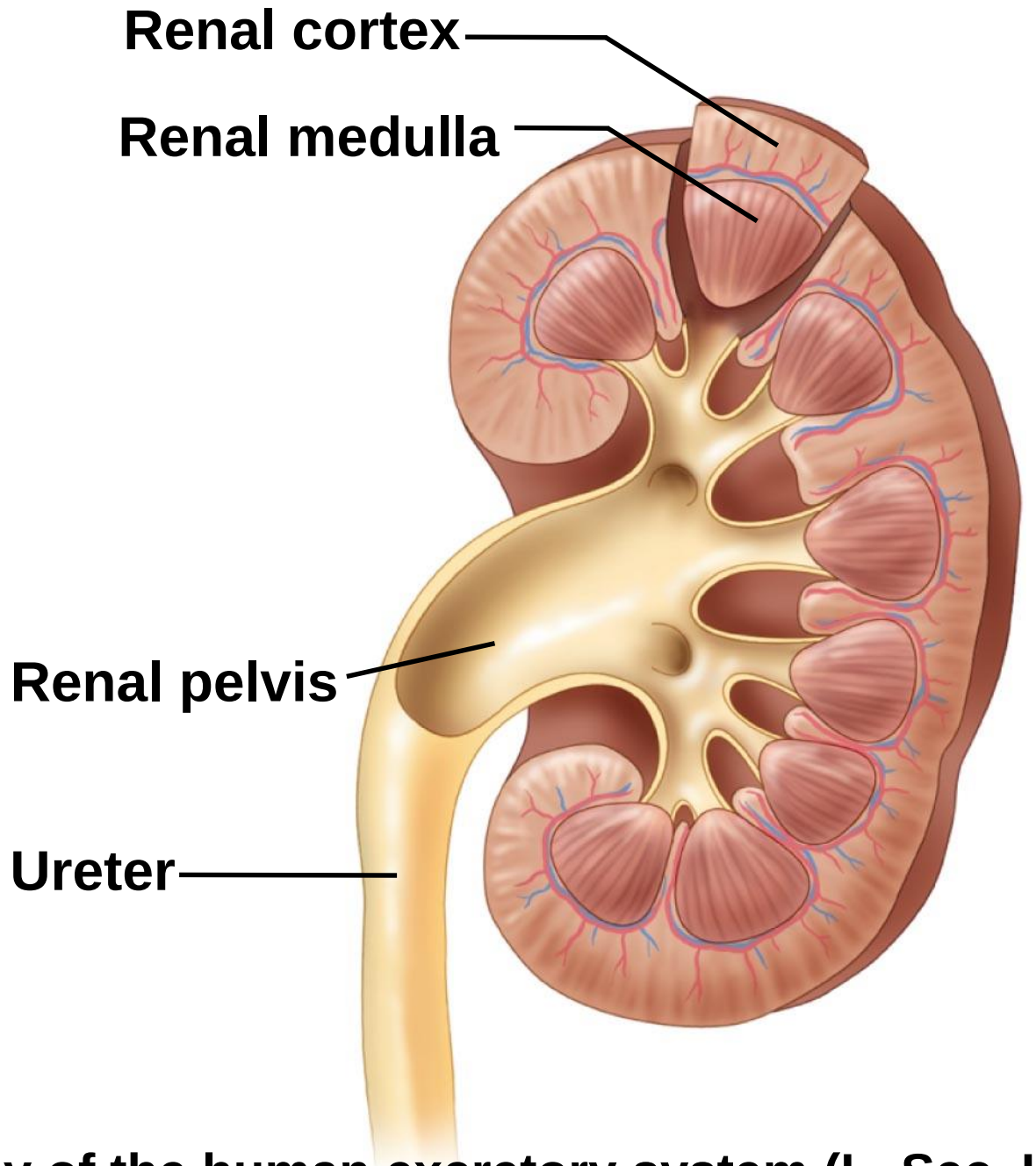
Birds and many other reptiles, insects, land snails



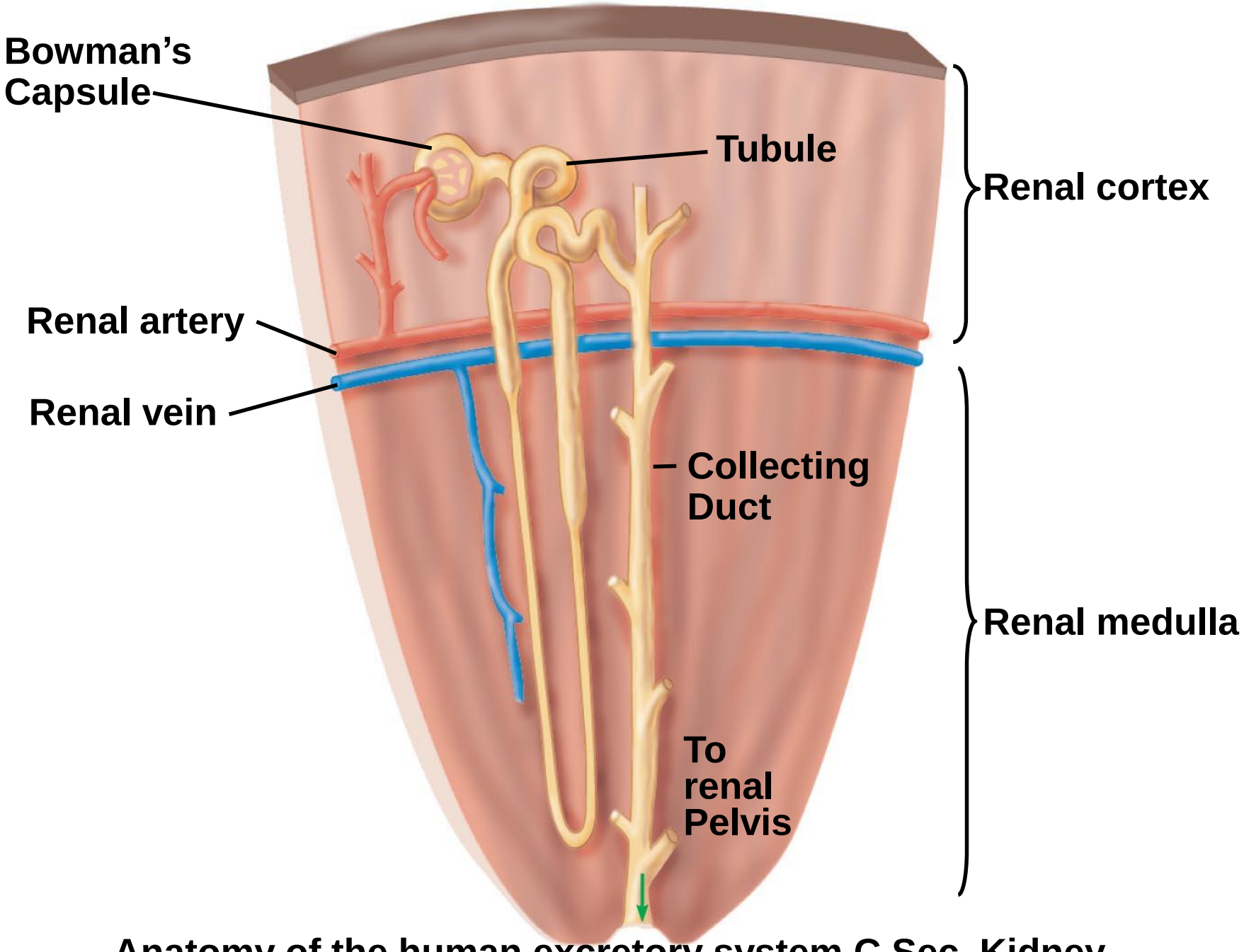
Uric acid

Anatomy of the human urinary (excretory) system





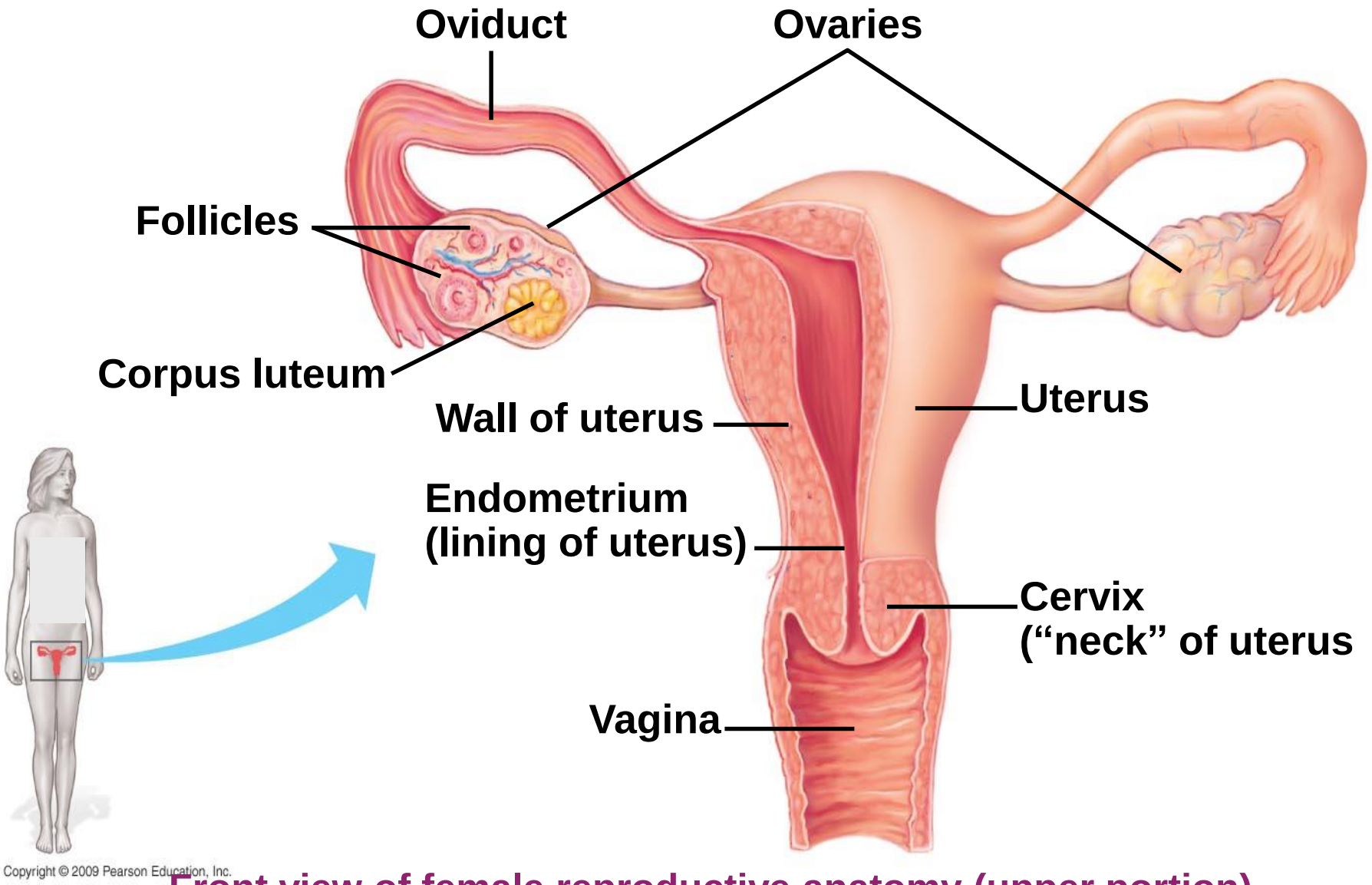
Anatomy of the human excretory system (L. Sec. Kidney)



Anatomy of the human excretory system C.Sec. Kidney

Chapter

27

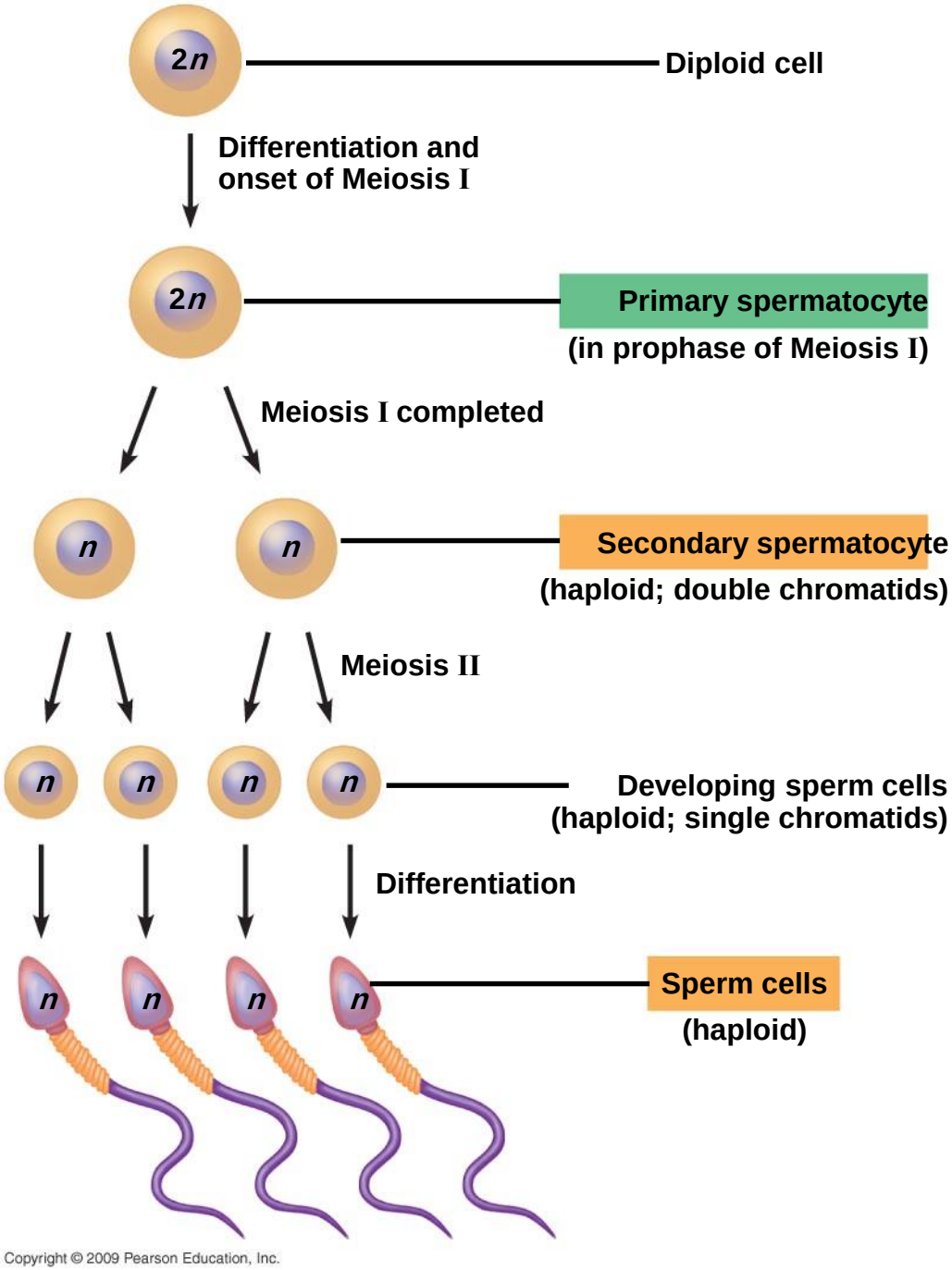


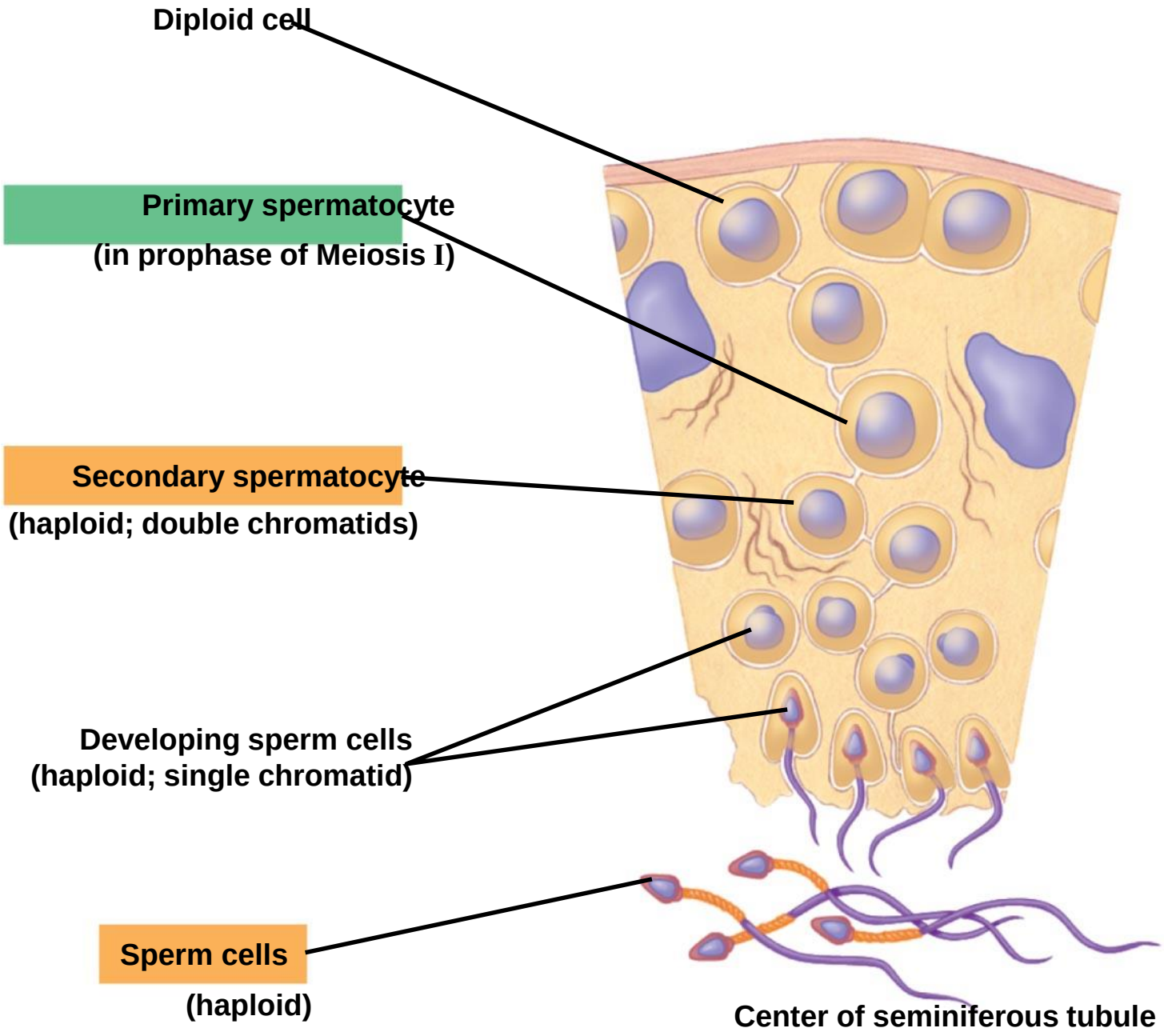
Front view of female reproductive anatomy (upper portion)

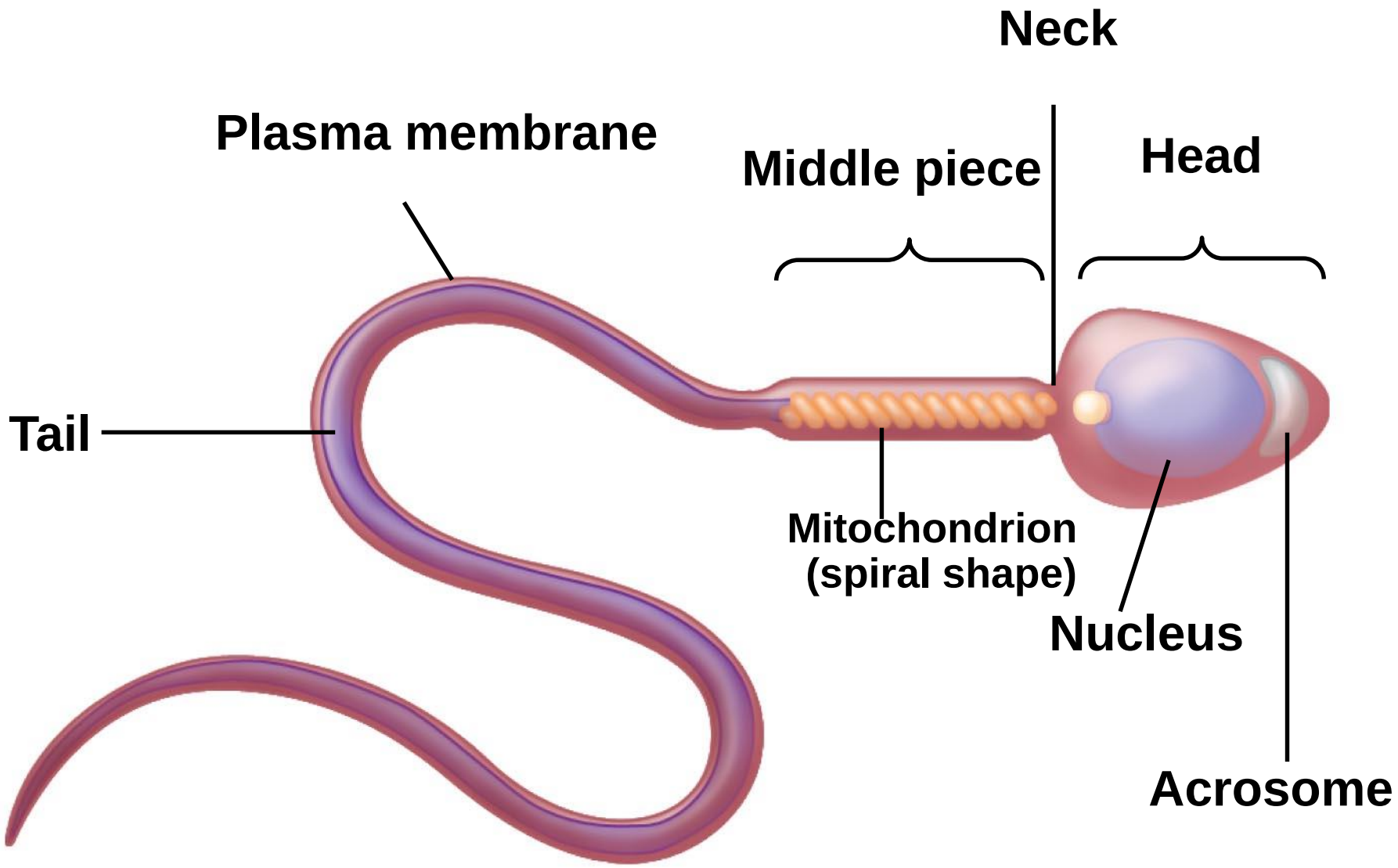
27.1 Asexual reproduction results in the generation of genetically identical offspring

- **Asexual reproduction**
  - One parent produces genetically identical offspring
  - Very rapid reproduction
  - Can proceed via
    - Budding /
    - Fission /
    - Fragmentation/regeneration

Asexual reproduction of an aggregating sea anemone (Anthopleura elegantissima) by fission







The structure of a human sperm cell

WISHING YOU ALL THE

GOOD LUCK

IN THE WORLD!