

Histology: Part III

MUSCLE AND NERVOUS TISSUE

THE 3 MUSCLE TYPES

1. Skeletal – attached to bones of skeleton.
2. Cardiac – the contractile tissue of the heart.
3. Smooth – movement of materials through passageways or ducts.

LOCATION AND DESCRIPTION

Location/Description

1. Location – throughout the body
2. Description – Specialized Structures
 - a. fibers shorten along longitudinal axis
 - b. sarcoplasm – muscle cell cytoplasm
 - c. sarcolemma – muscle cell cell membrane

SARCOMERE = Functional muscle unit.

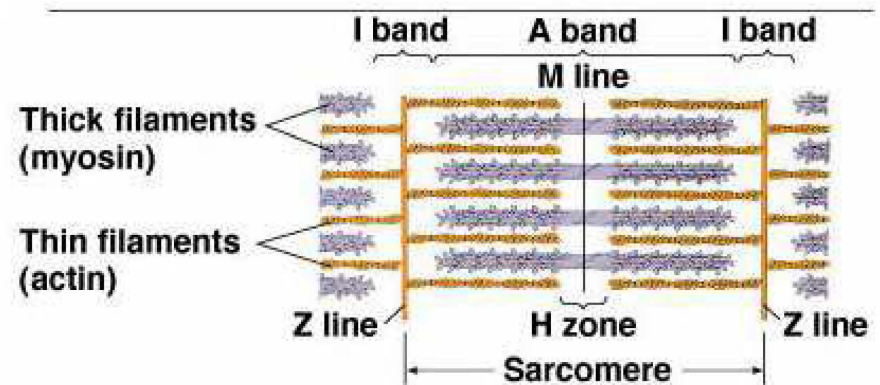
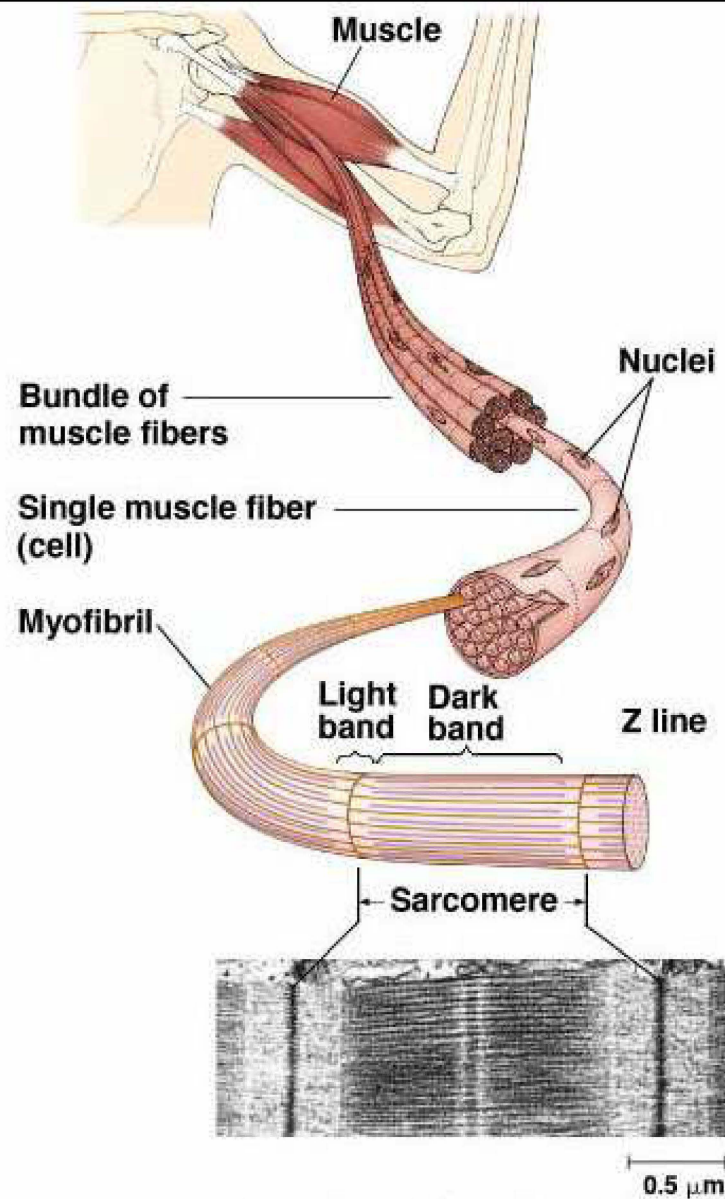
MUSCLE FUNCTION

Muscle Function – specialized cells for contraction

→ Contraction results in the shortening of the muscle which causes the body parts to do work.



THE SARCOMERE



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CLASSIFICATION: SKELETAL (STRIATED)

- Classification

- 1: Skeletal Muscle (striated, voluntary muscle)

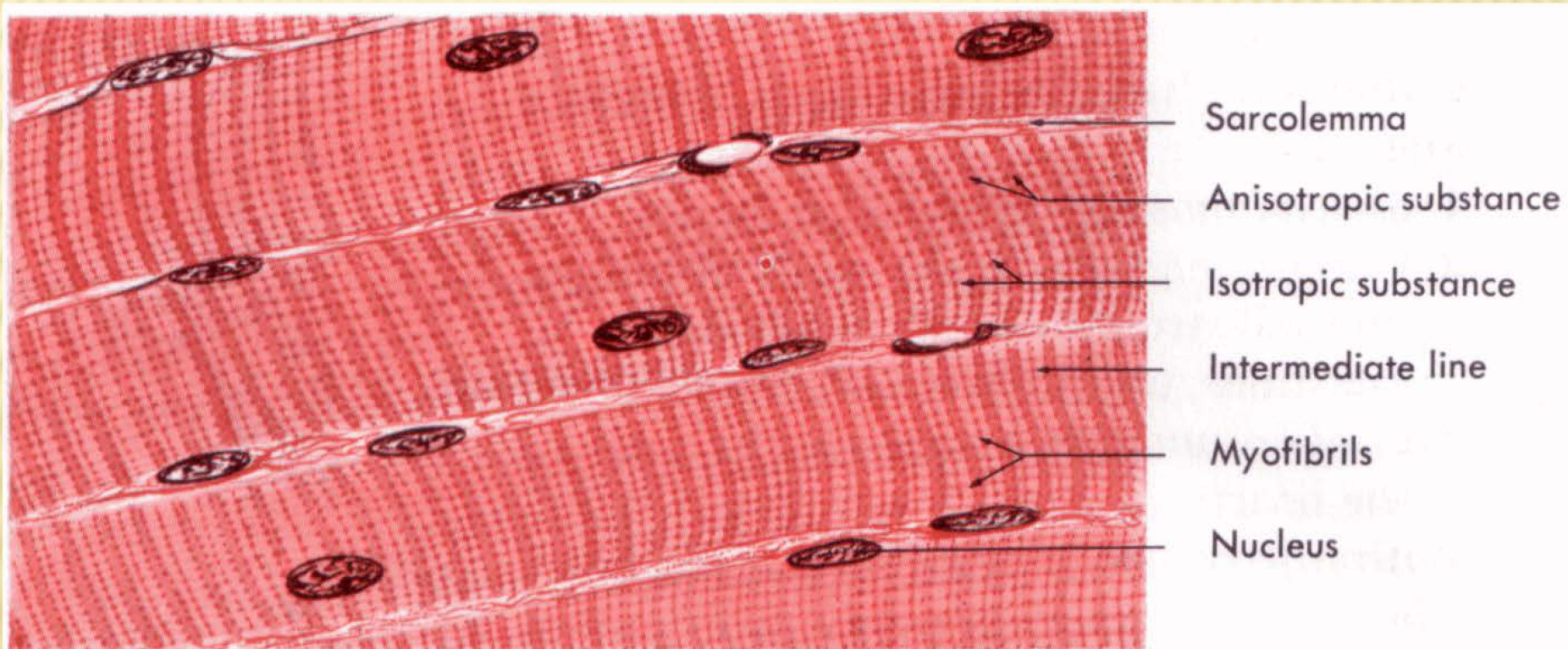
- A. Description

- very long fibers (1 ft.)
 - Multinucleated , sphincter control
 - Shows a banded appearance
 - can't divide

- B. Location – all along skeleton

- C. Function – moves skeleton; guards entrances and exits to digestive, respiratory, and urinary tracts

SKELETAL “STRIATED” MUSCLE



Skeletal or striated voluntary muscle tissue.

SKELETAL “STRIATED” MUSCLE



CLASSIFICATION: CARDIAC MUSCLE

2. Cardiac Muscle (striated involuntary muscle)

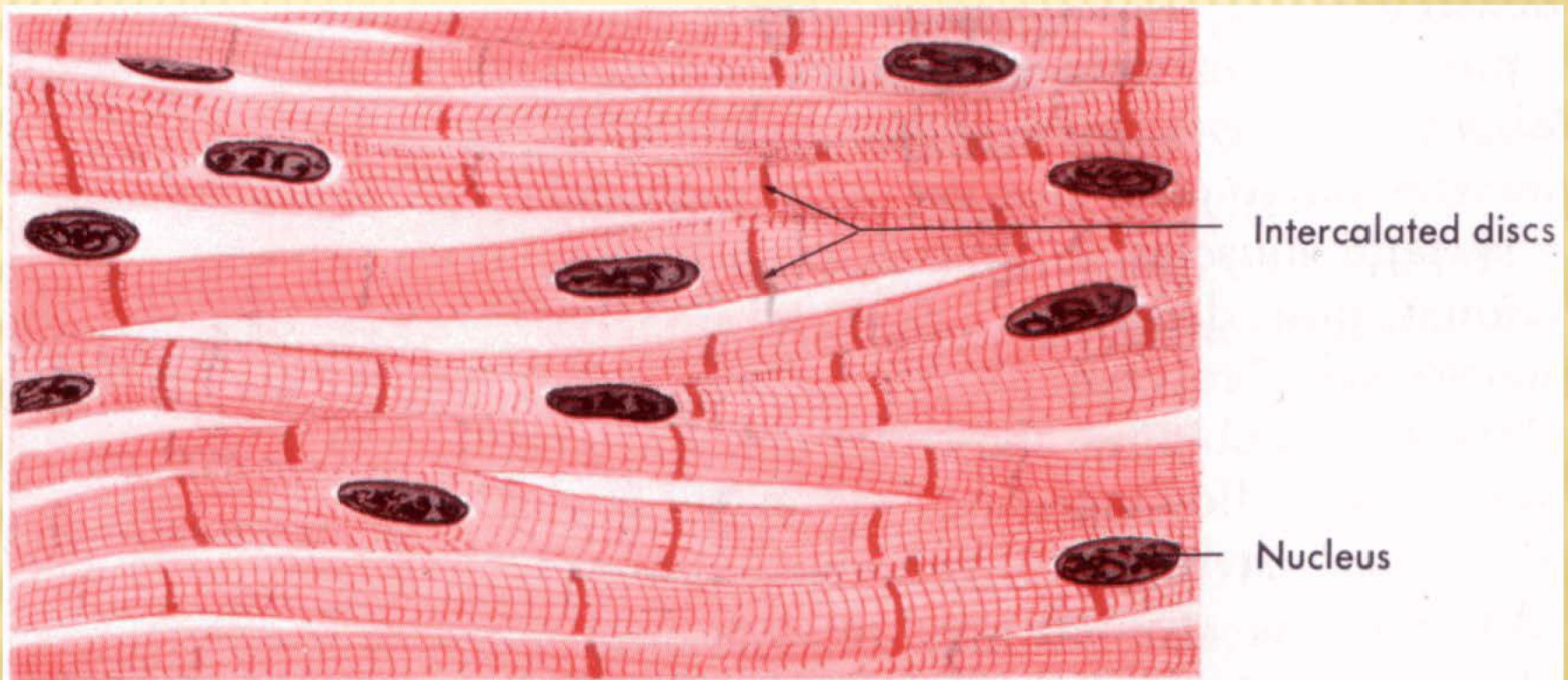
A. Description –

- Contains intercalated discs = connect muscles cells with each other
- multinucleated; banded appearance, branching
- can't divide (= amitotic)

B. Location – heart only

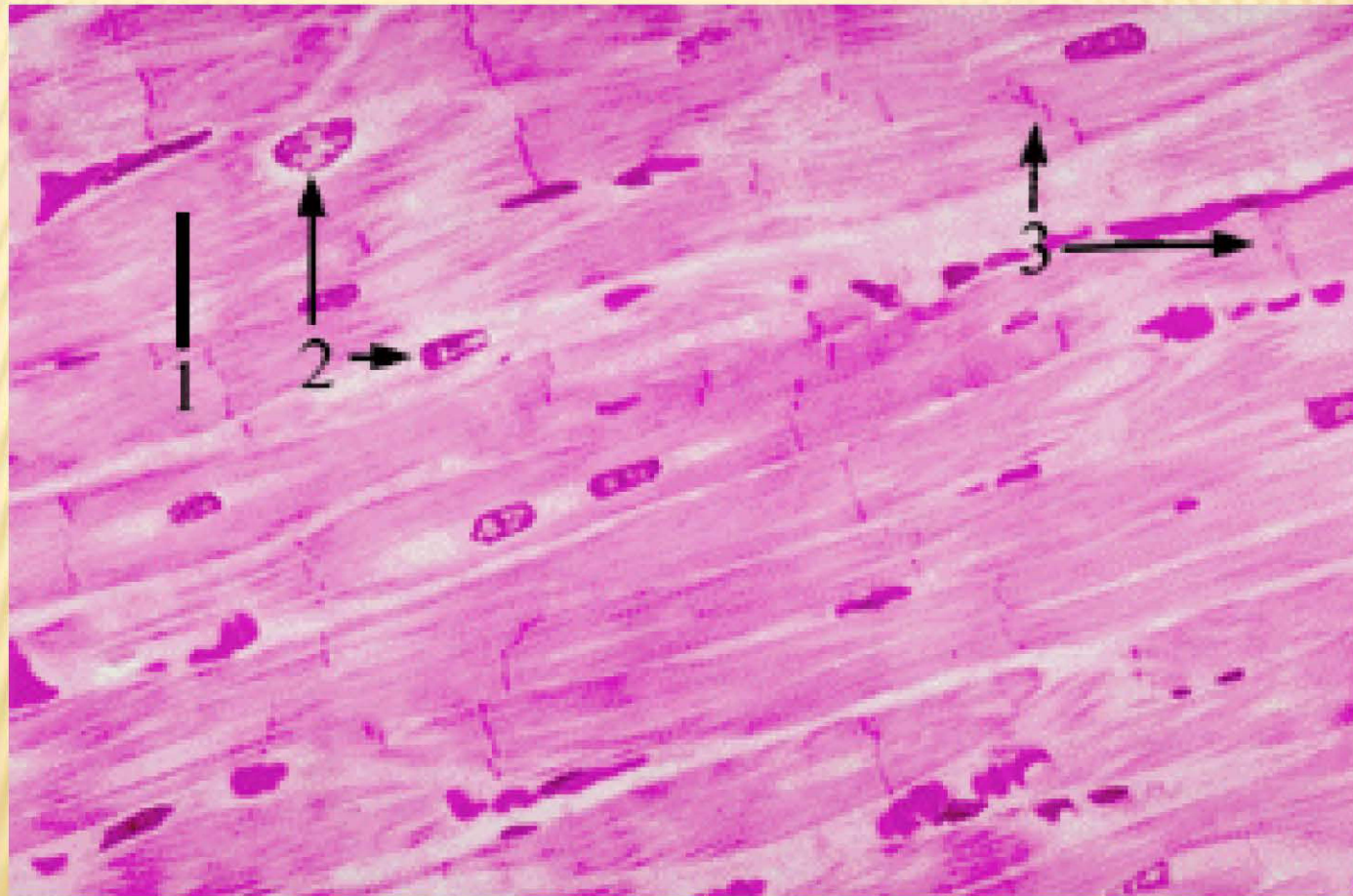
C. Function – cells work together for coordinated heart contraction

CARDIAC “STRIATED” MUSCLE

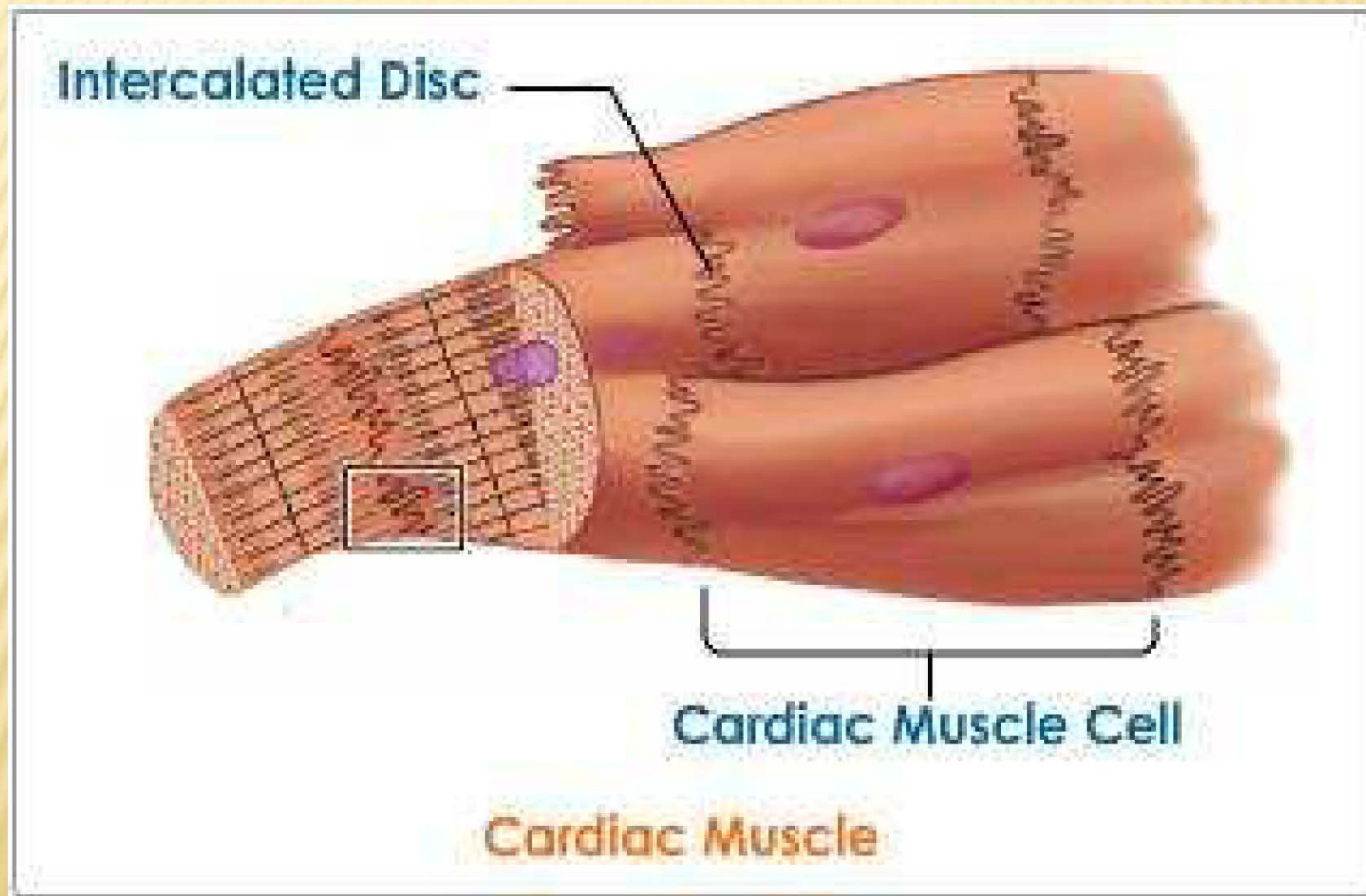


Cardiac or striated involuntary muscle tissue.

CARDIAC “STRIATED” MUSCLE



CARDIAC “STRIATED” MUSCLE



CLASSIFICATION: SMOOTH MUSCLE

3. Smooth Muscle Tissue

(non-striated involuntary muscle)

A. Description:

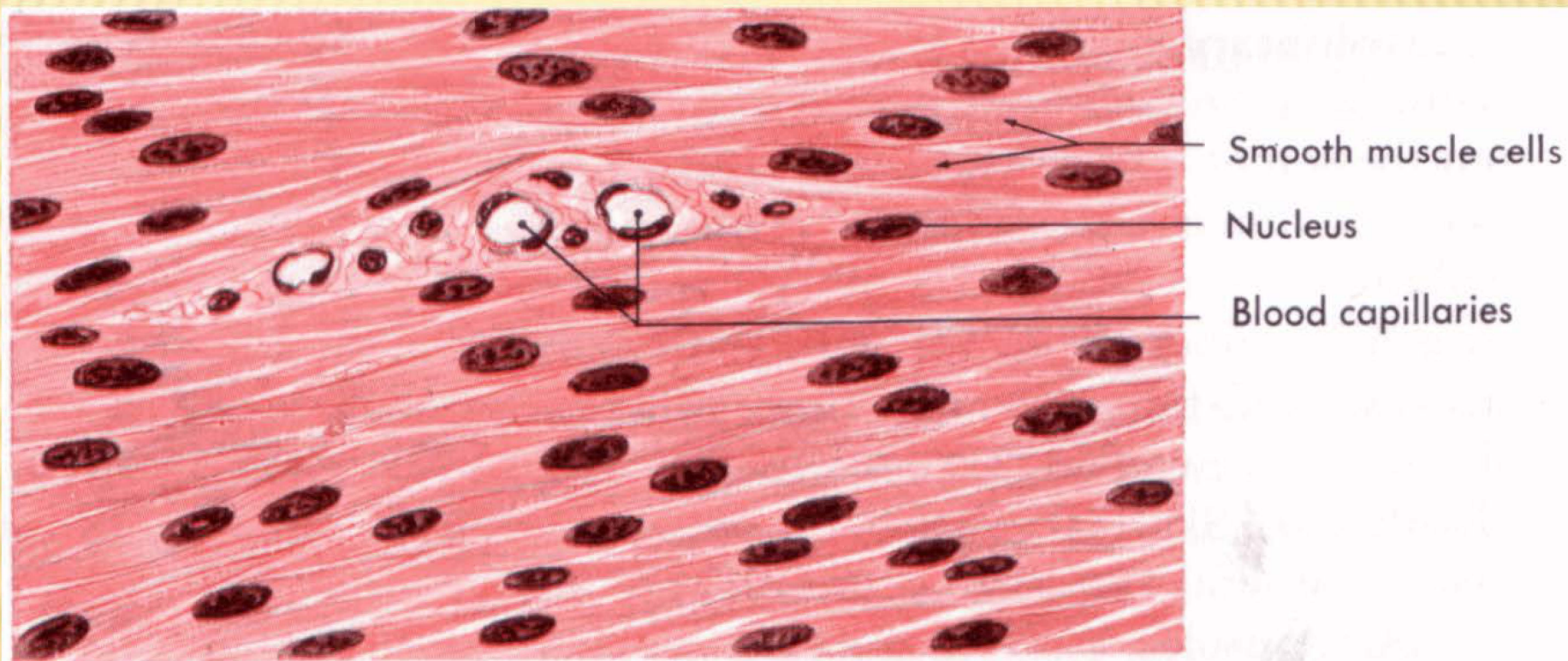
- Small, spindle shaped cells. (like little kayaks)
- Contains a single nucleus
- Can divide and repair;
- Doesn't contain bands

B. Location – blood vessels; respiratory, digestive, and circulatory tracts

C. Function

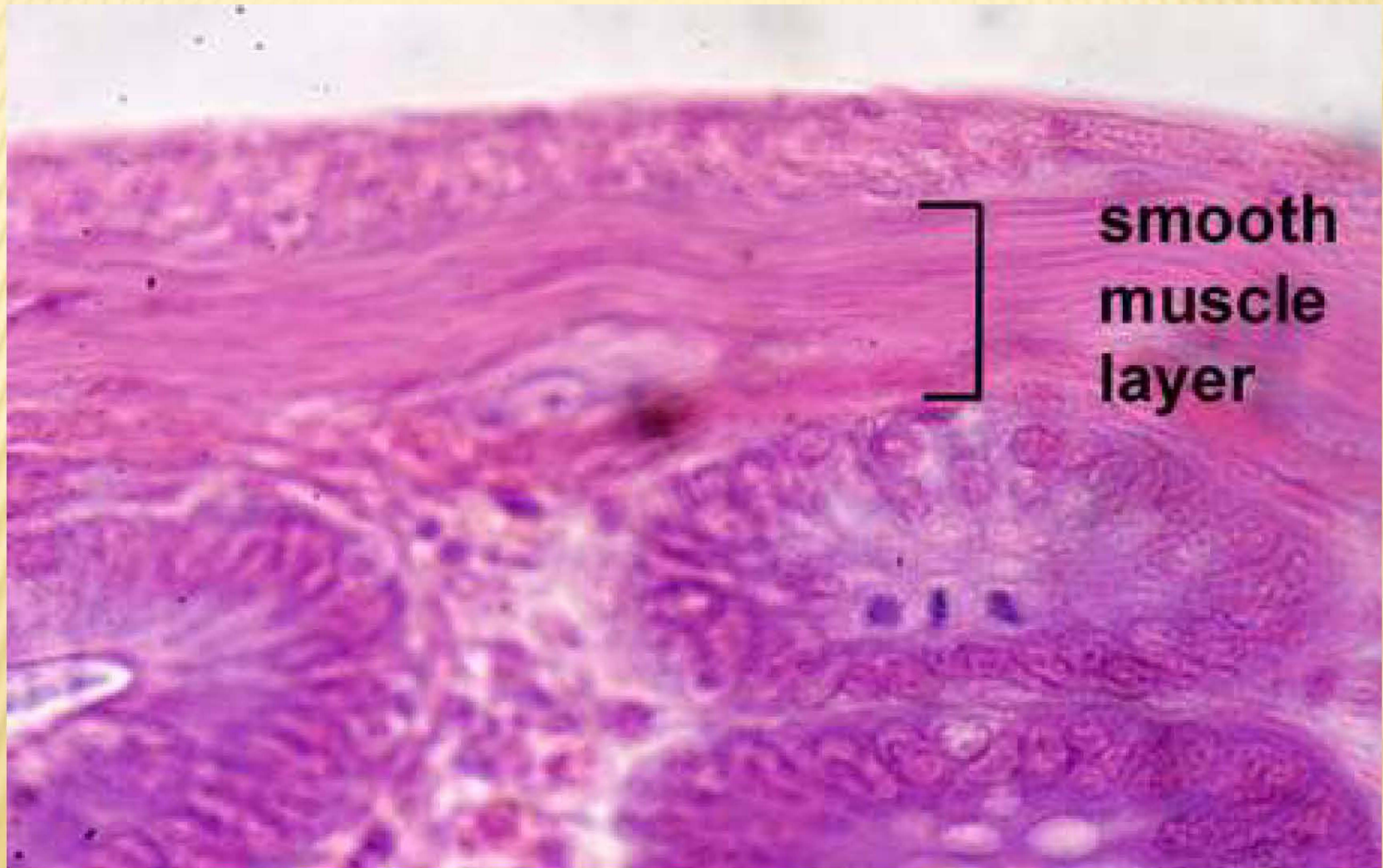
- can contract individually or as a roup
- Moves food, blood, sex cells and urine through designated tracts.

SMOOTH “NON-STRIATED” MUSCLE

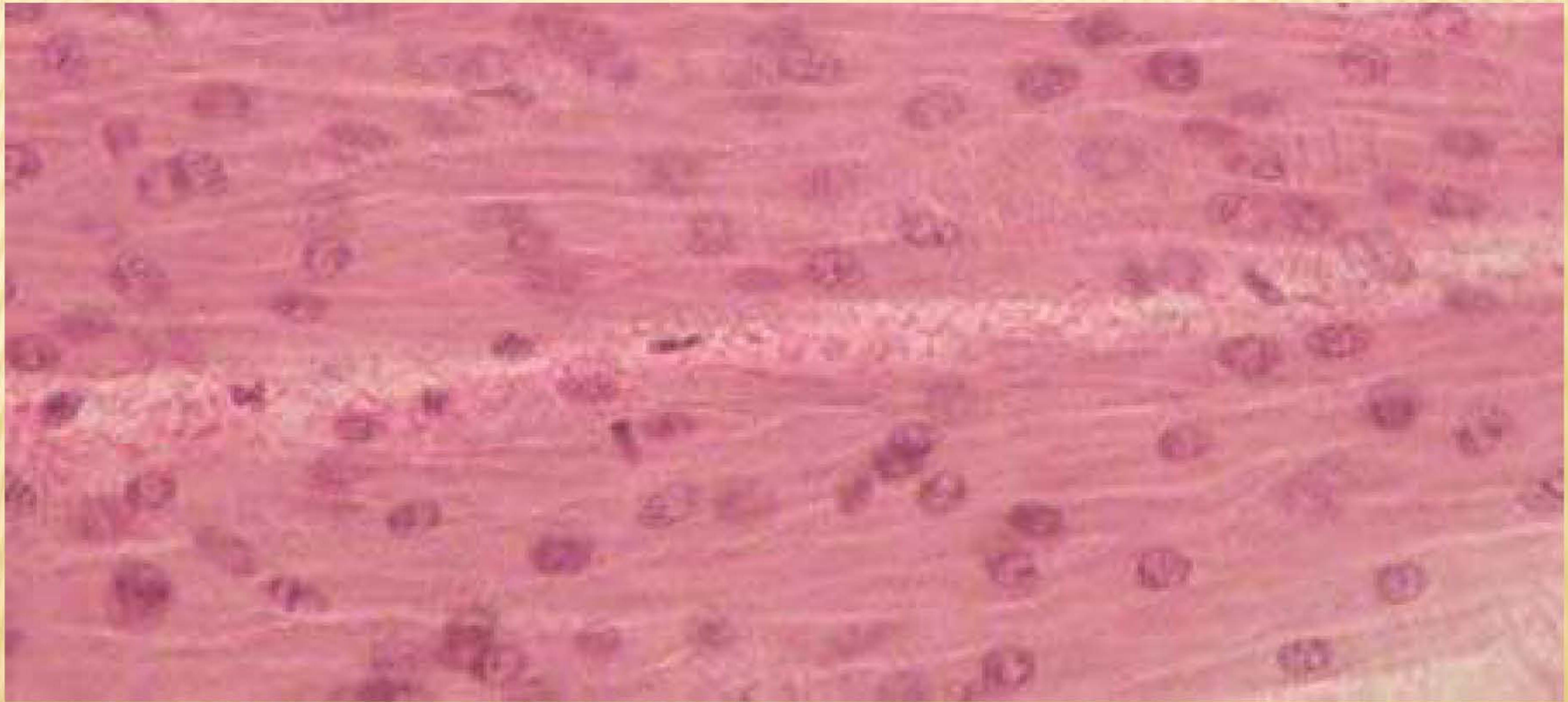


Visceral or nonstriated (smooth) involuntary muscle tissue.

SMOOTH “NON-STRIATED” MUSCLE



SMOOTH “NON-STRIATED” MUSCLE



NERVOUS TISSUE

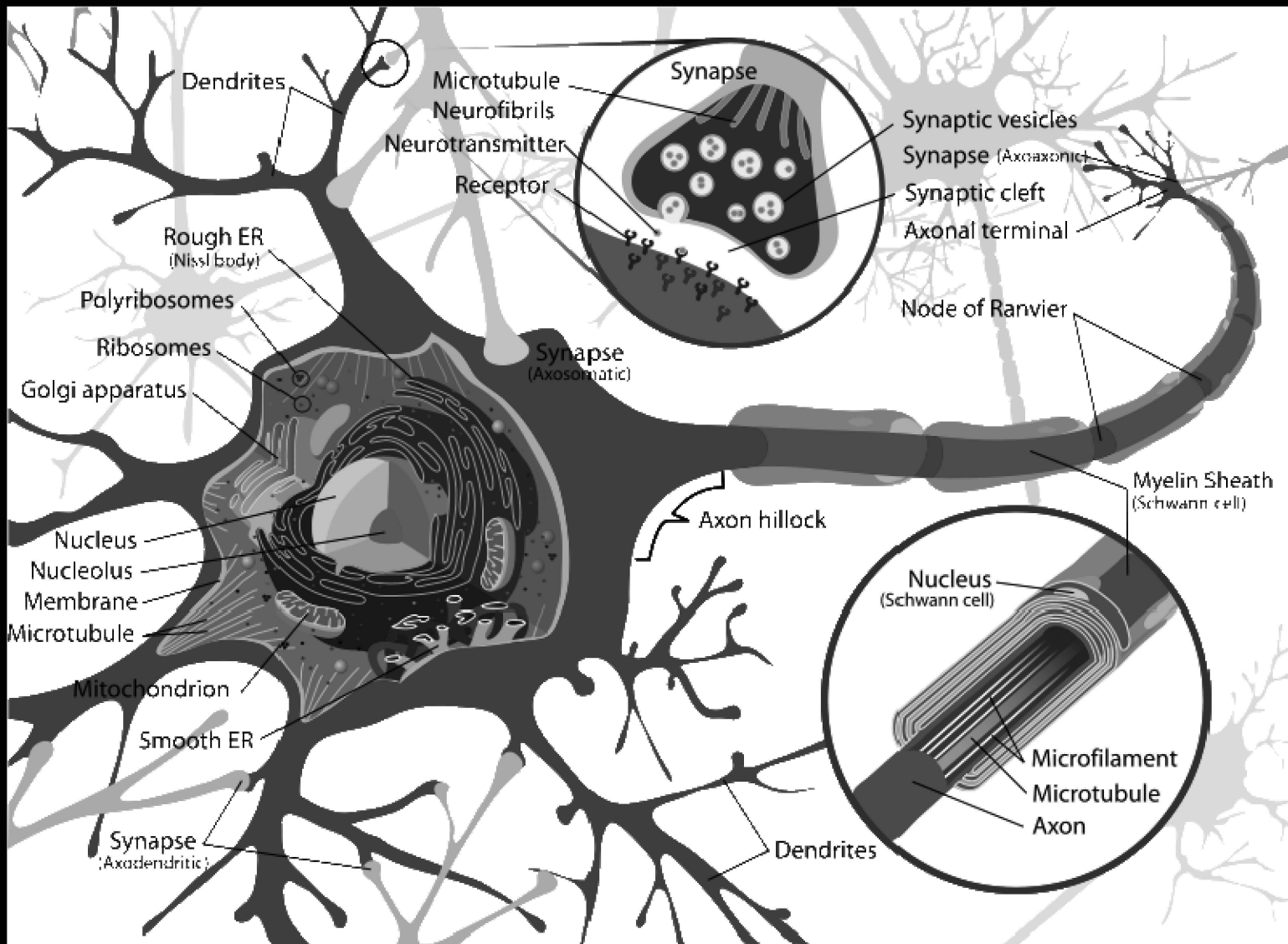
A. Location/Description

1. Location – make up 98% brain and spinal cord

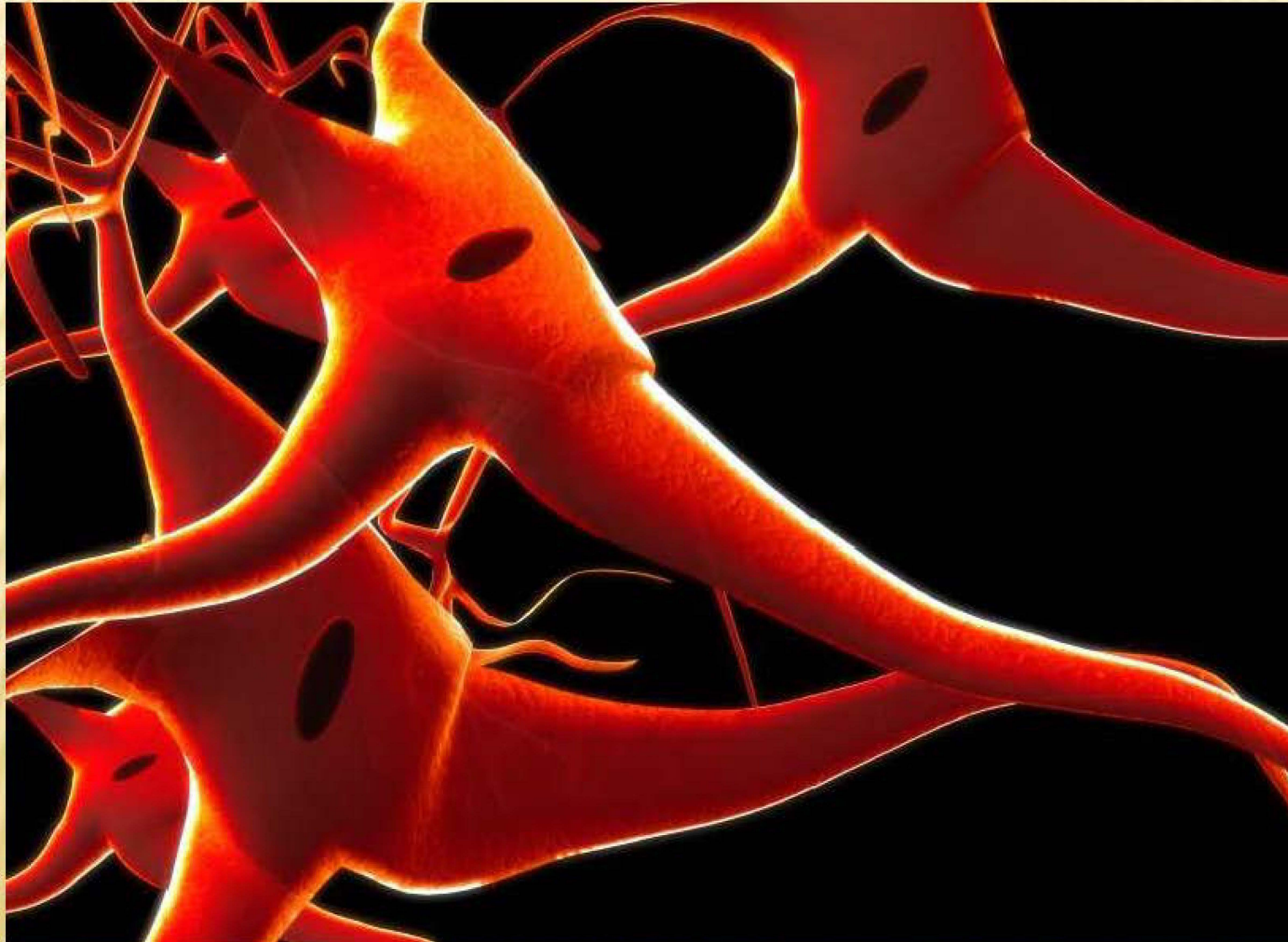
2. Description of Neurons

- Neurons – longest cells in body (39 inches)
- Incapable of dividing (=amitotic)
- Cell body contains nucleus and other essential organelles.
- Dendrites receive info from the axon terminals of the adjacent neuron.
- Axon transmits electrical impulse through cell.

THE NEURON



THE NEURON



THE NEURON

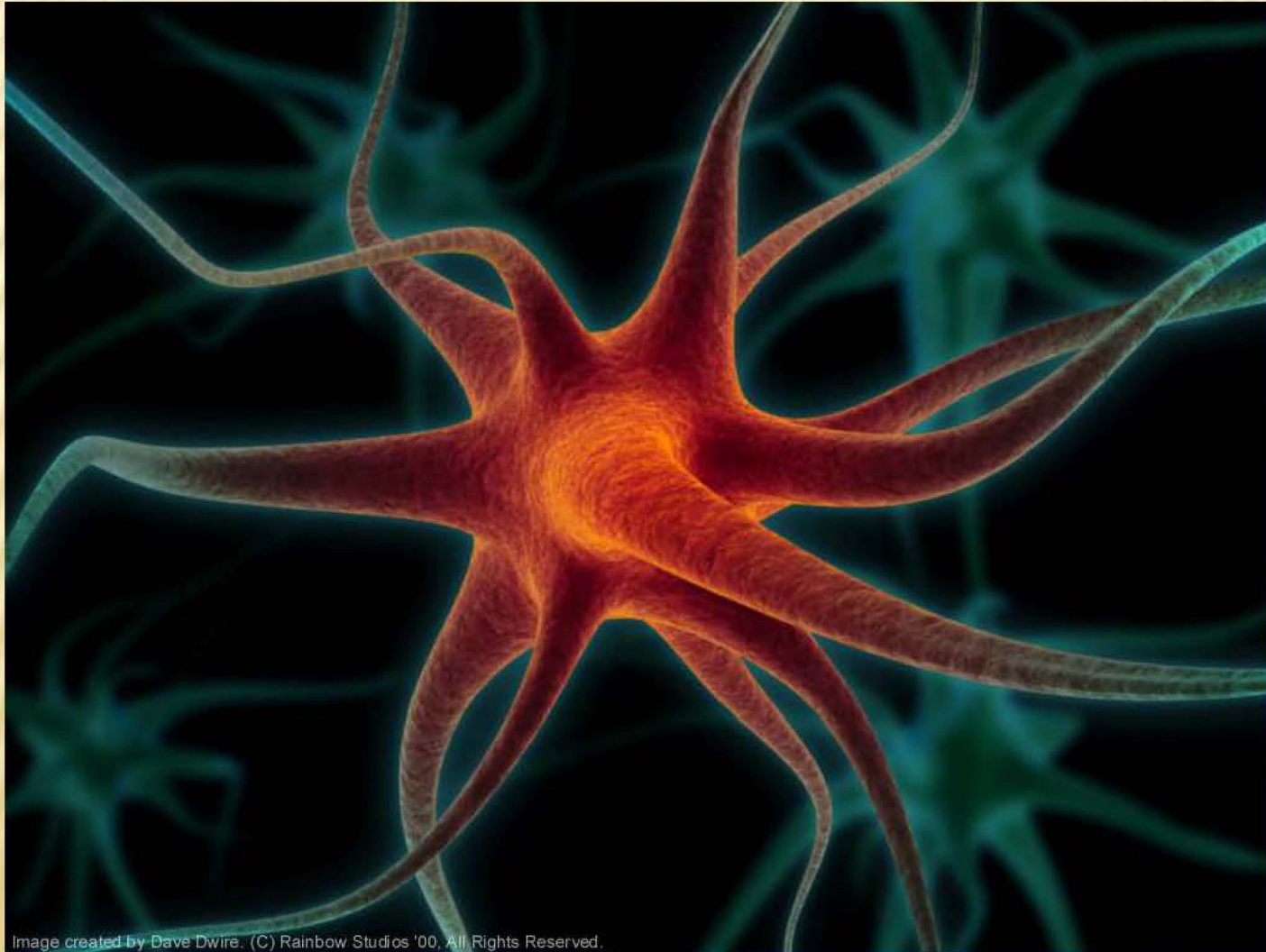


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NERVOUS TISSUE

A. Location/Description

3. Description of Neuroglial Cells = non-neuronal cells that support neurons in brain and spine.

Functions of Neuroglia:

- a. Surround and stabilize neurons.
- b. Form myelin that insulates neurons from each other.
- c. Supply nutrients and oxygen to neurons.
- d. Destroy pathogens and remove dead neurons.

NEUROGLIAL CELLS

Neuroglial Cells of the CNS

