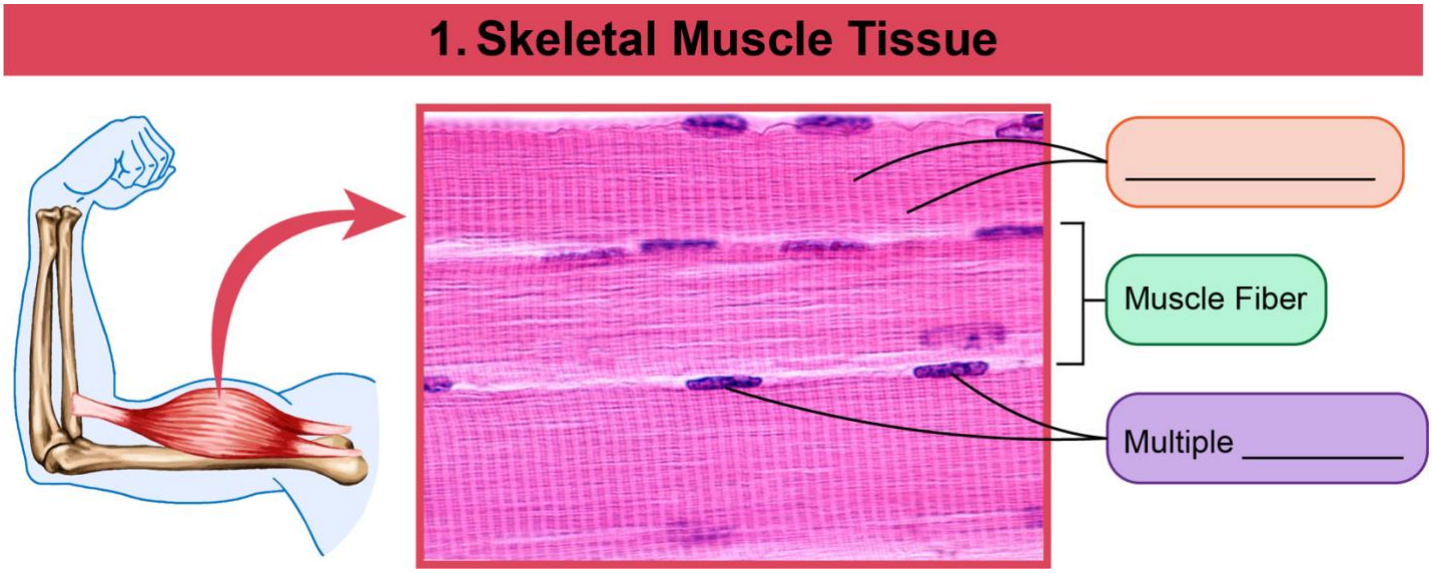
TOPIC: TYPES OF MUSCLE TISSUE

- There are _____ different types of muscle tissue: 1) *Skeletal* 2) *Cardiac* 3) *Smooth*

1) Skeletal Muscle Tissue

- **Skeletal Muscle** (_____ **Muscle**): attaches to *skeleton* & allows for *consciously* controlled movements.
  - Skeletal muscle tissue has several *key features* including:
    - **Striations:** _____ appearance due to the alignment of protein myofilaments.
    - **Long cylindrical cells:** also known as **Muscle** _____; can be over 1 foot in length
    - **Multinucleated cells:** cells with _____ nuclei; required to meet *high* protein demands.



PRACTICE: Which of the following would NOT require the use of skeletal muscle?

a) Kicking a soccer ball.

b) Your heart rate increasing after exercise.

c) Chewing and swallowing food.

d) Raising your eyebrows.

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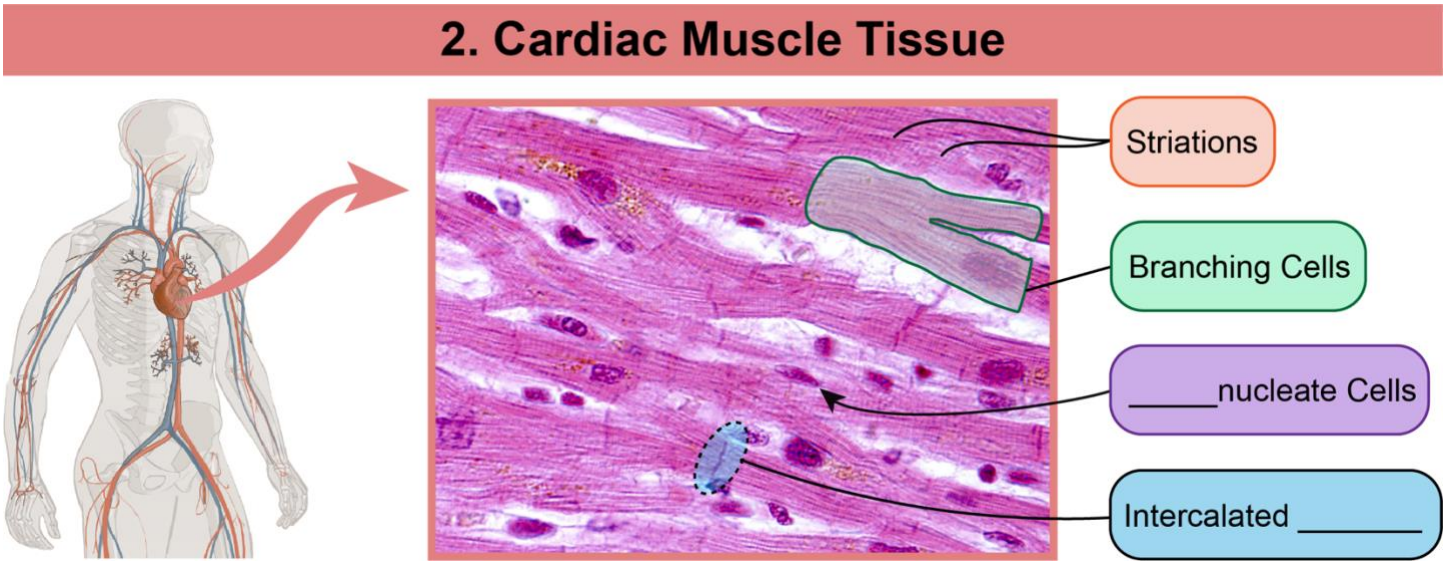
2) Cardiac Muscle Tissue

- **Cardiac Muscle**: made of cells called _____-**myocytes**, located in walls of _____ ("cardi" = heart).
  - Cardiac muscle is _____ (its contractions are NOT consciously controlled).
  - Cardiac muscle tissue has several other *key features* including:
    - **Striations:** like skeletal muscle, cardiac muscle also has a banded, or _____ appearance.
    - **Branching Cells:** cells have a branched structure.
    - **Uninucleate:** cardiac muscle cells often have _____ nucleus.
    - **Intercalated Discs:** structures that join ends of cardiomyocytes together & enable coordination.



PRACTICE: Which of the following statements about cardiac muscle and skeletal muscle is true?

a) They are both striated.

b) They are both voluntary.

c) They are both composed of long muscle fibers.

d) They both have intercalated discs.

PRACTICE: Intercalated discs allow cardiac muscle cells to coordinate. Why is this important?

a) It increases the strength of the heart.

b) It increases the endurance of the heart.

c) It allows the heart to communicate with other organs.

d) It allows the heart to contract as a unit and function as a pump.

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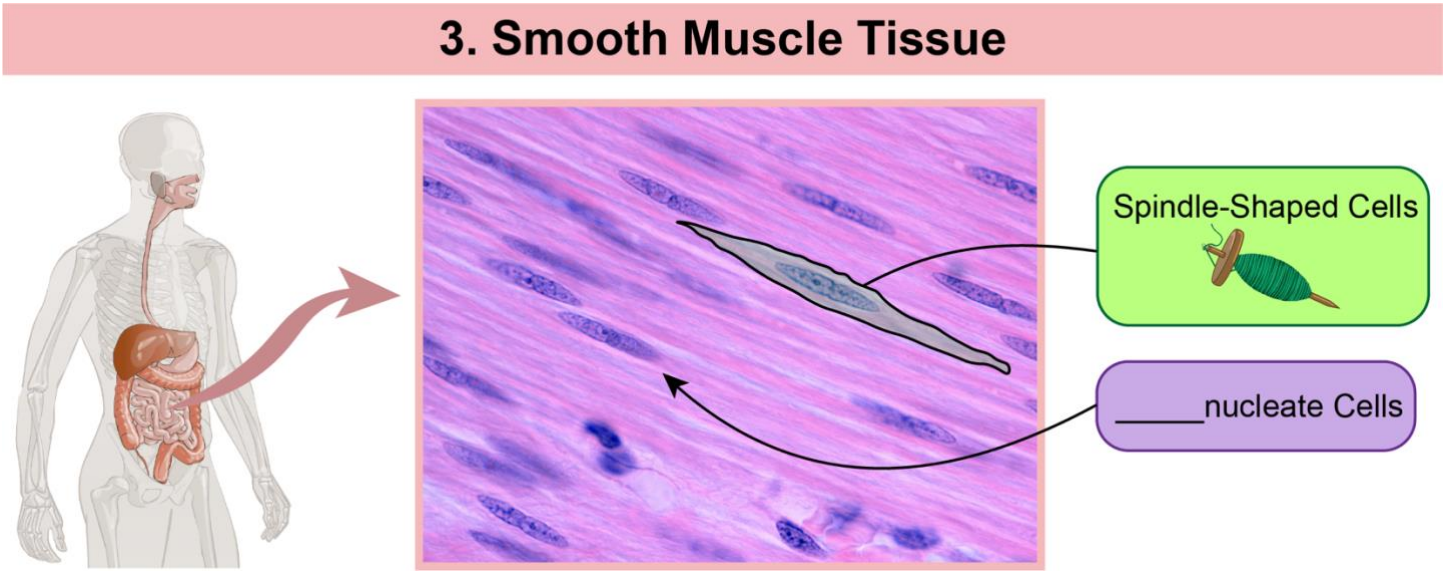
3) Smooth Muscle Tissue

- **Smooth Muscle**: named for its "smooth" appearance due to the _____ of striations.
- Location: walls of several hollow internal structures (blood vessels, digestive system, bladder, etc.).
- Function: controls _____ & propels material through organs (eg. moves food through digestive system).
  - Smooth muscle is _____ (its contractions are NOT consciously controlled).
  - **Short _____ - Shaped**: cells are thin on the ends & thick in the middle.
  - **Uninucleate:** smooth muscle cells each have _____ nucleus.



PRACTICE: Which of the following movements requires smooth muscle contraction?

a) Eyeballs rotating to look to the left.

b) Heart pumping blood through blood vessels.

c) Arm moving to lift a weight.

d) Blood vessels constricting to restrict blood flow.

PRACTICE: Arrector pilli are small muscles located in the connective tissue beneath the skin and are connected to the base of each hair. They are responsible for creating goosebumps when you get cold, an involuntary response to temperature. Based on this information, what type of muscle would you expect the arrector pili to be?

a) Skeletal muscle, as one function of skeletal muscle is to generate heat.

b) Smooth muscle, as getting goosebumps is an involuntary reaction.

c) Cardiac muscle, as blood flow helps control temperature.

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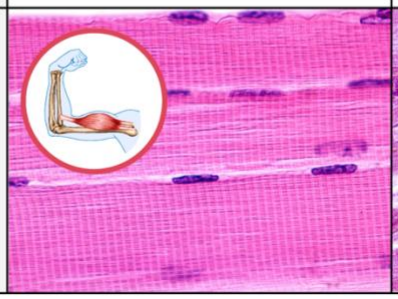
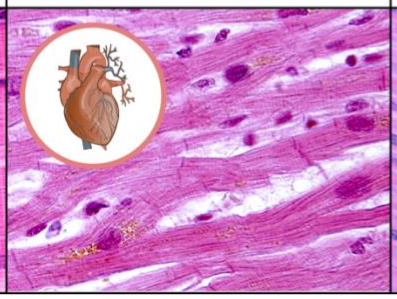
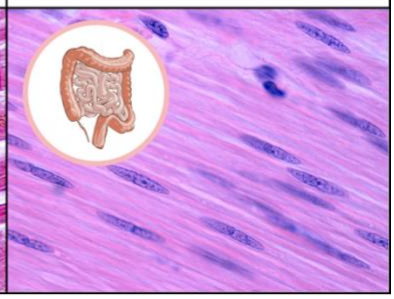
Review: Types of Muscle Tissue

Muscle Type	1 Skeletal Muscle	2 Cardiac Muscle	3 Smooth Muscle
Location?			
Voluntary or Involuntary?			
Striated?			
Number of Nuclei per Cell?			
			

PRACTICE: During an intense running session, you pull a leg muscle. Which type of muscle did you injure?

a) Skeletal.

b) Cardiac.

c) Smooth.

PRACTICE: Striations are a feature shared by skeletal and cardiac muscle, but they are not present in smooth muscle. Based on what you know about the functions of these three types of muscle, what do you think the presence of striations indicates about the muscle it is found in?

a) It's a flexible muscle.

b) It's a voluntary muscle.

c) It can generate significant force when it contracts.

d) It has a branched structure.