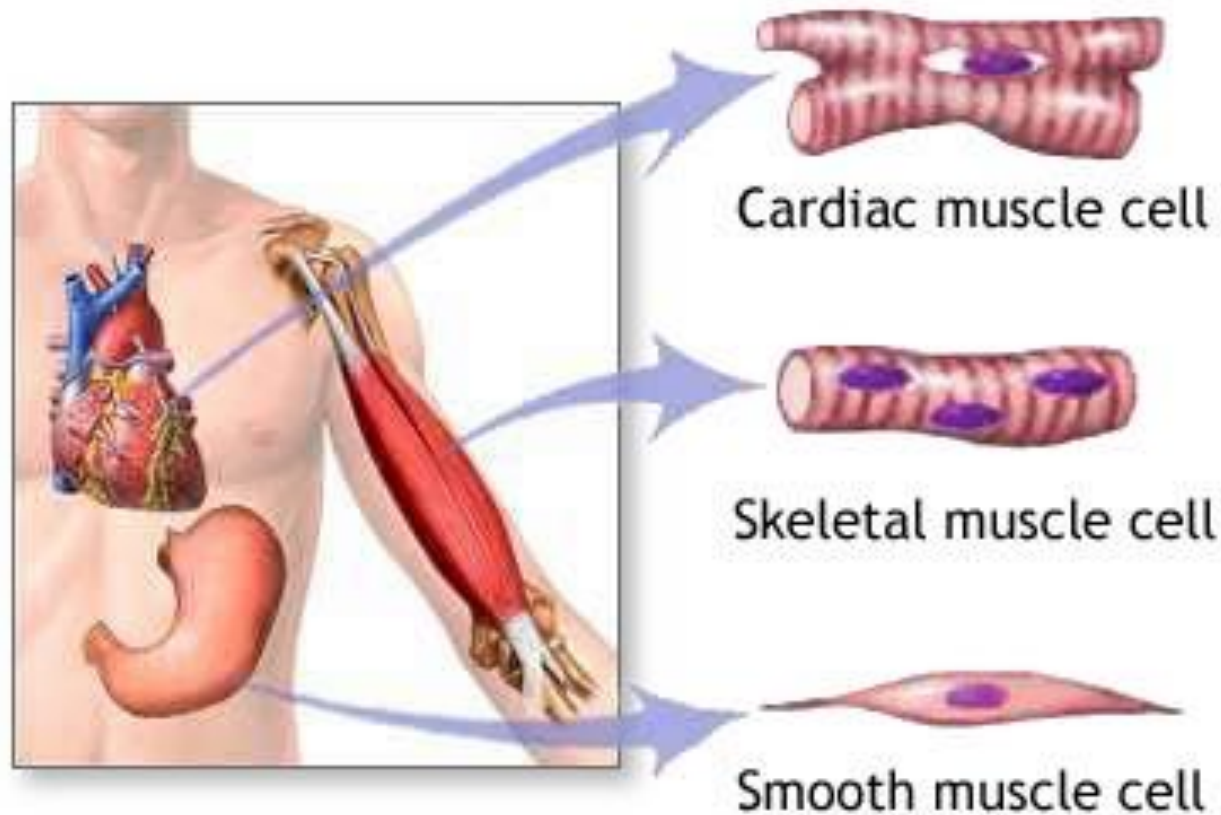
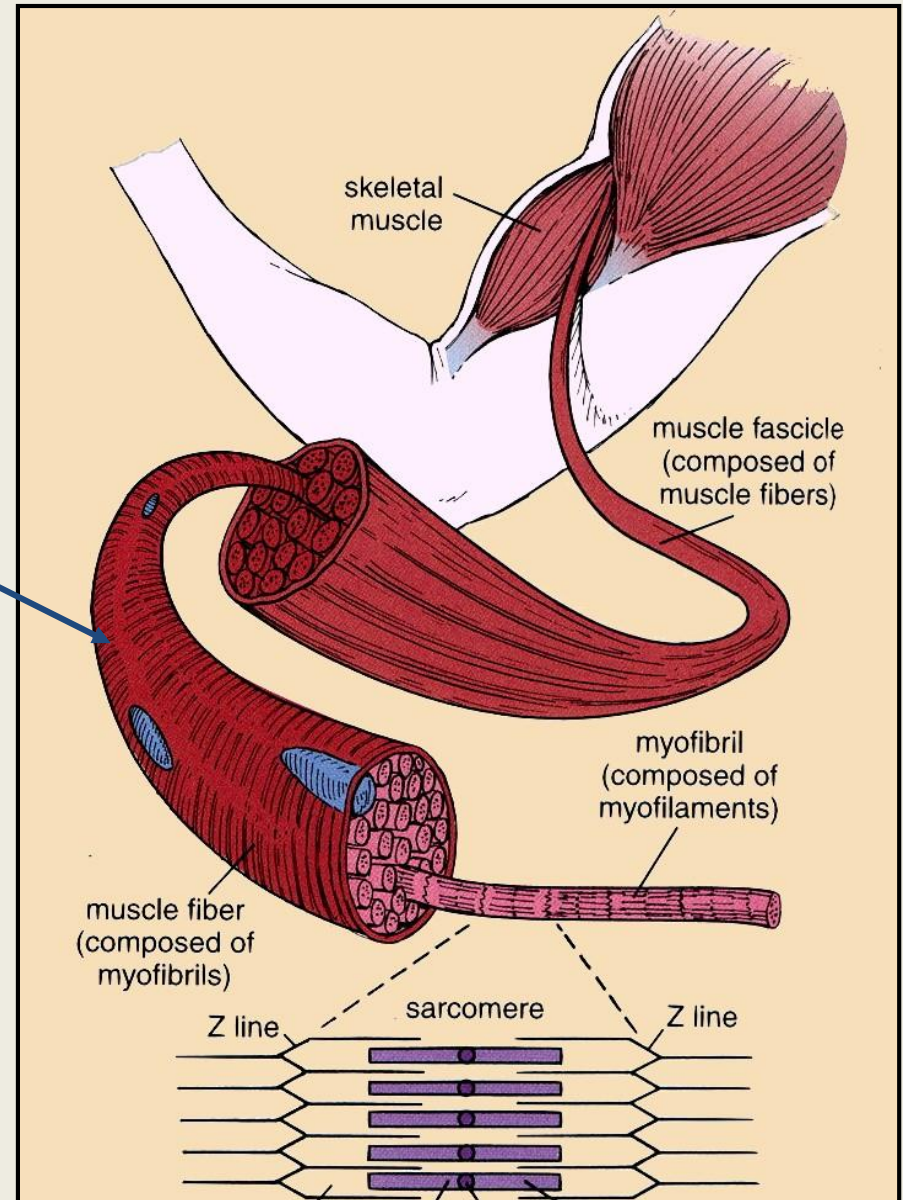


# Svalová tkáň



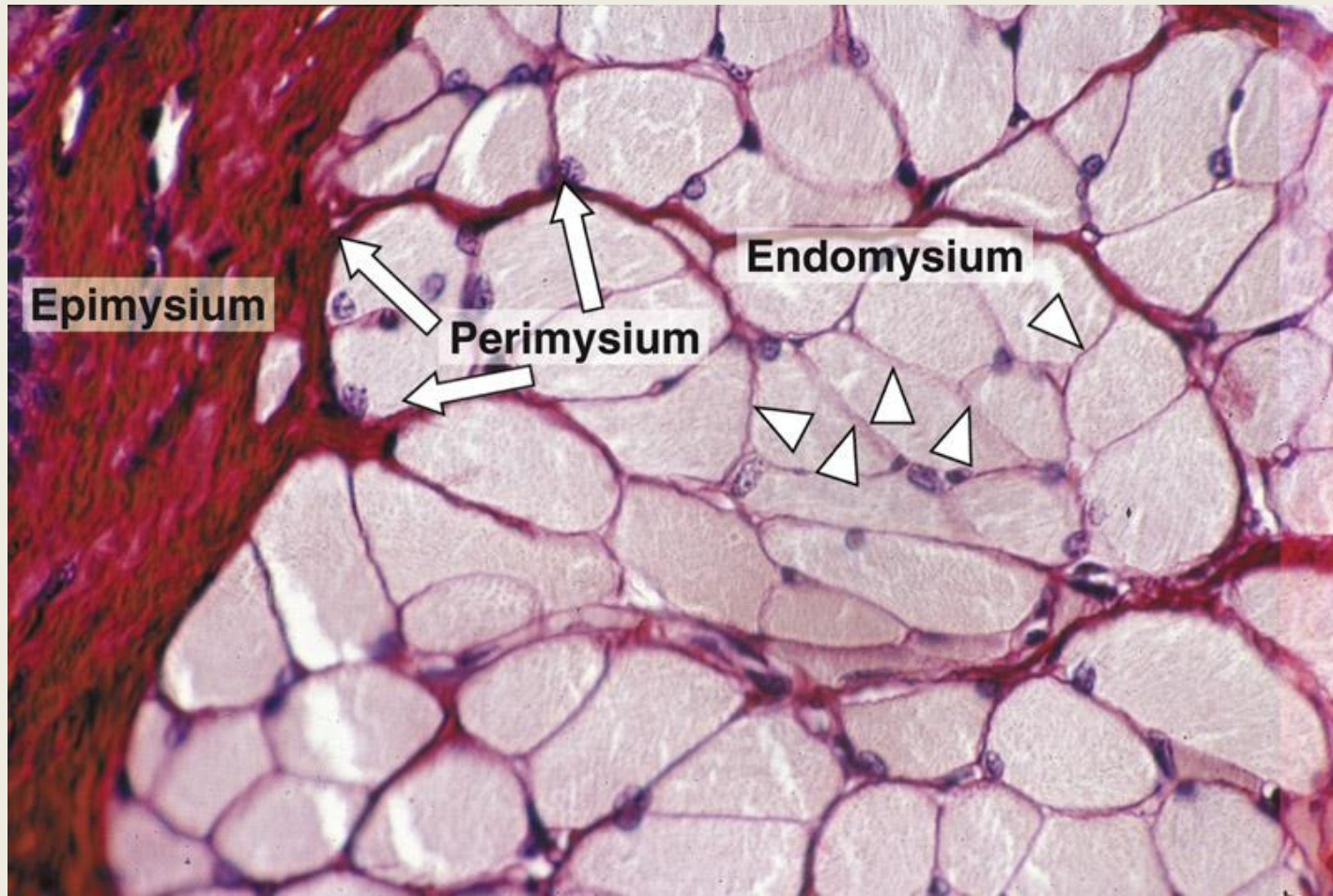
# Kosterní svalová tkáň

- sval
- fasciculus – svalový snopec – svazek vláken
- **svalové vlákno = rhabdomyocyt**
  - l:1-30cm,tl:10-100  $\mu\text{m}$
  - obrovská mnohojaderná buňka – syncytium
  - obsahuje **myofibrily**



# Kosterní svalová tkáň

- vazivo
  - epimysium – husté kolagenní vazivo, obaluje sval
  - perimysium – řídké kolagenní kolem sval. fasciculů
  - endomysium – jemná retikulární síť kolem rhabdomyocytů

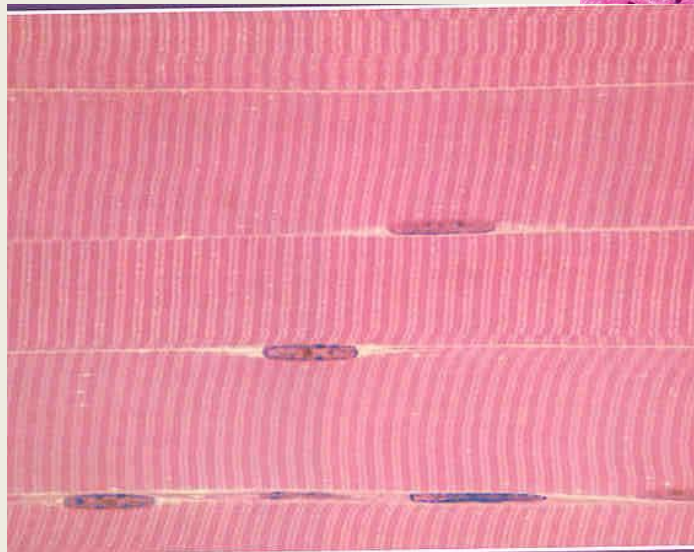
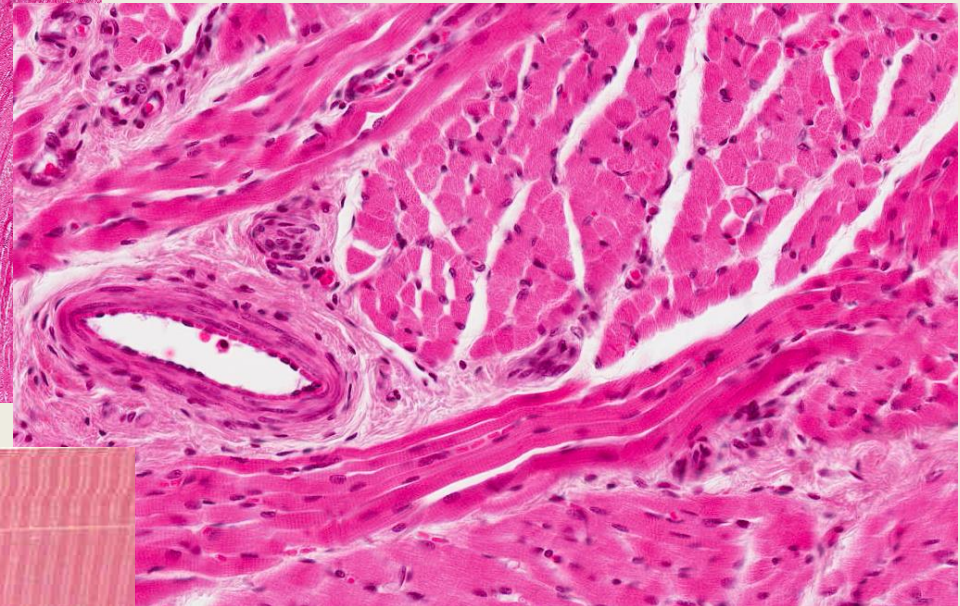


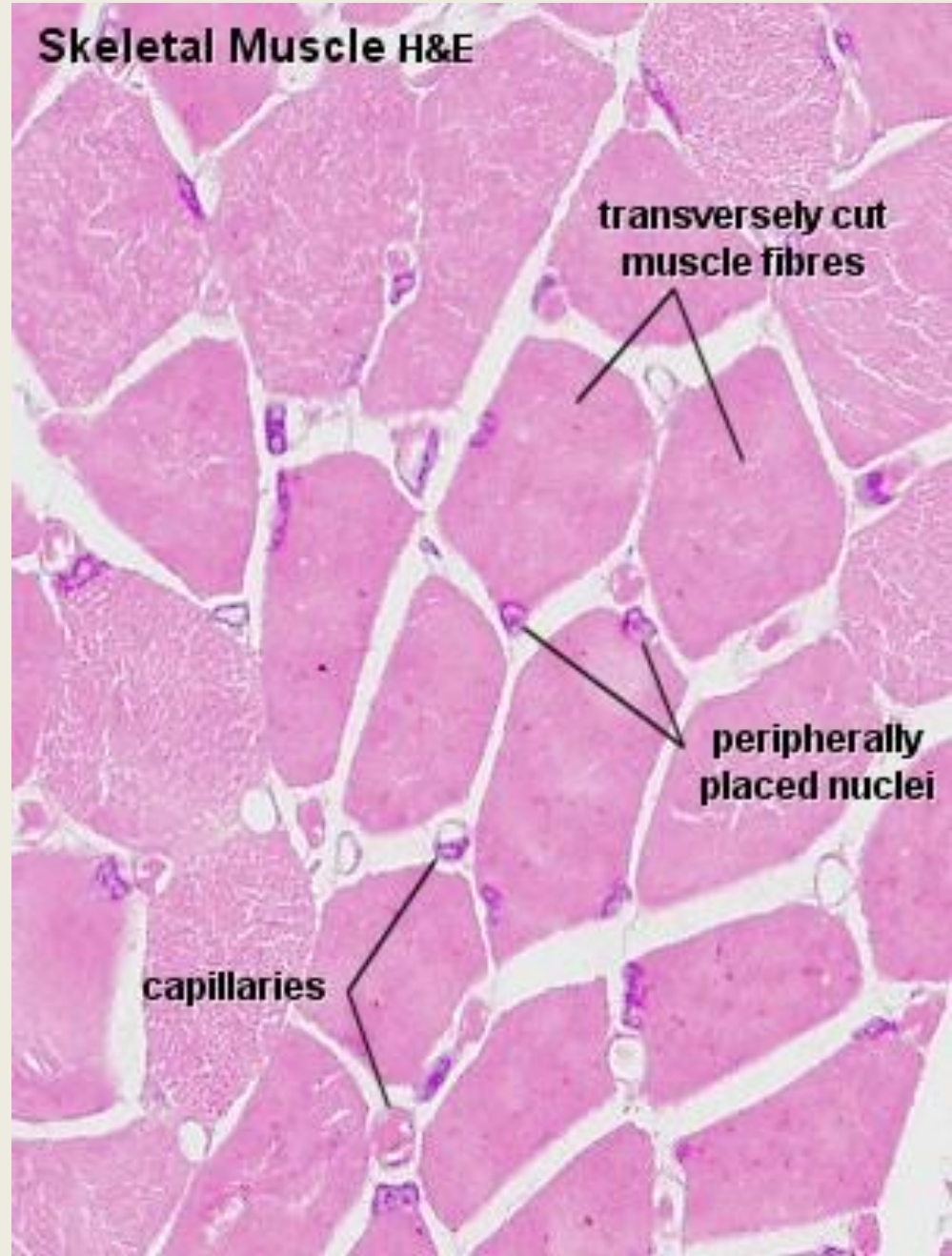
# Kosterní svalová tkáň



svalová  
tkáň

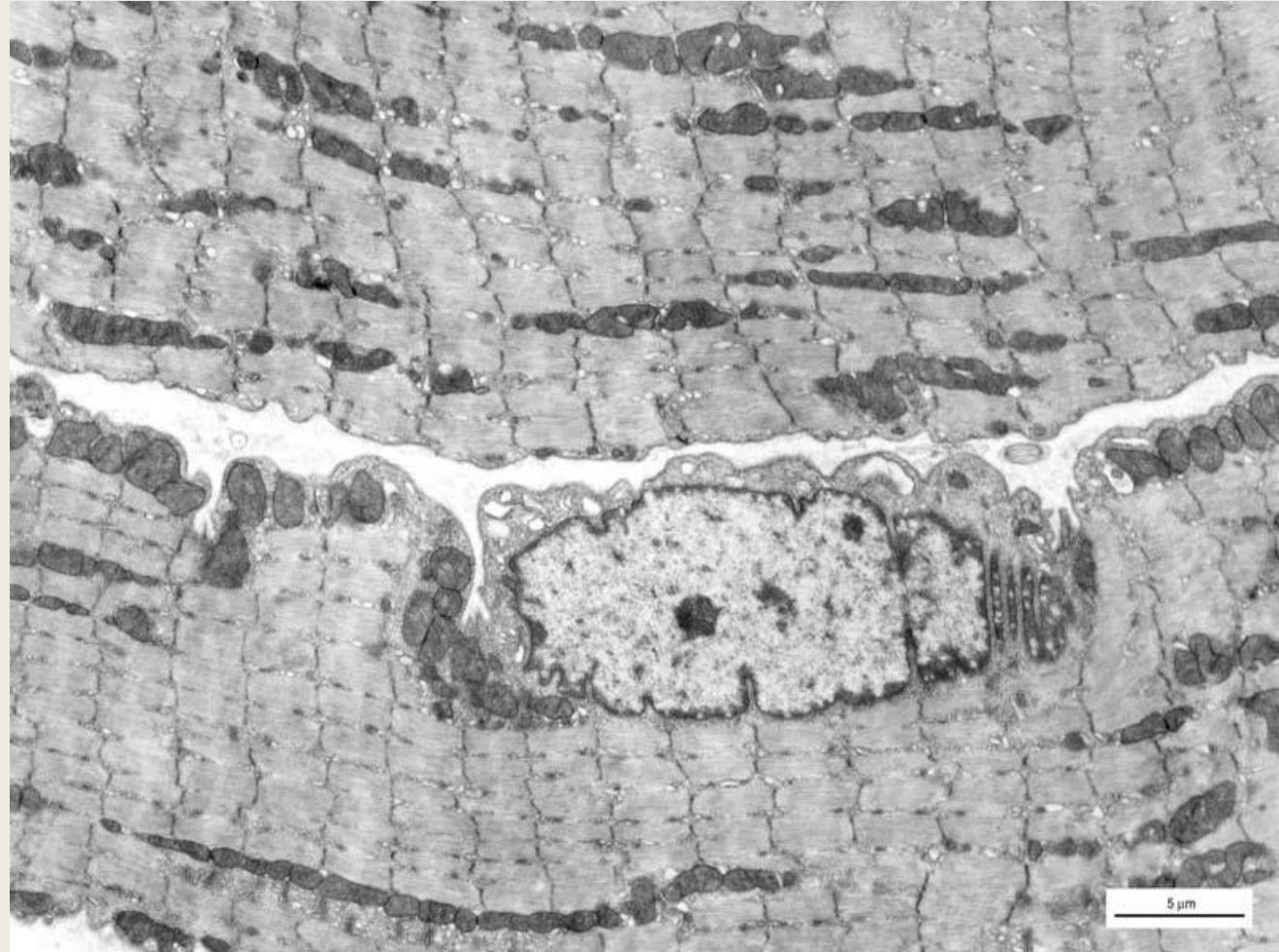
apex  
linguae



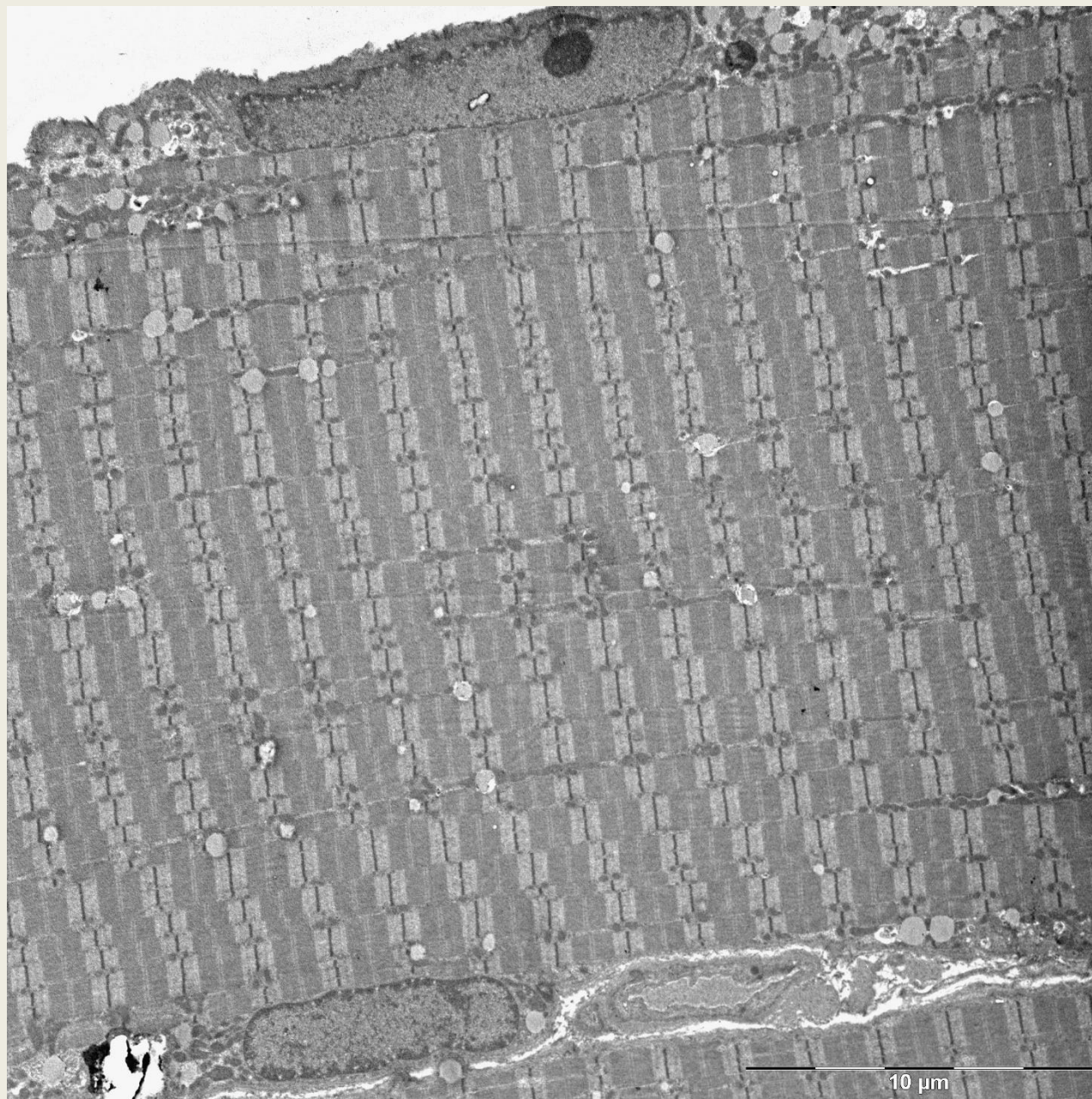


# Stavba svalového vlákna

- Sarkolema, T-tubuly
- Sarkoplazma
- **Jádra**
  - hned pod sarkolemou, na 1mm vlákna: 20-45 jader
- SR – AER
- **Myofibrily**
  - vlákna tlustá 1-2  $\mu\text{m}$
- Mitochondrie, GA, glykogen, lipidové kapky, myoglobin



# Stavba svalového vlákna

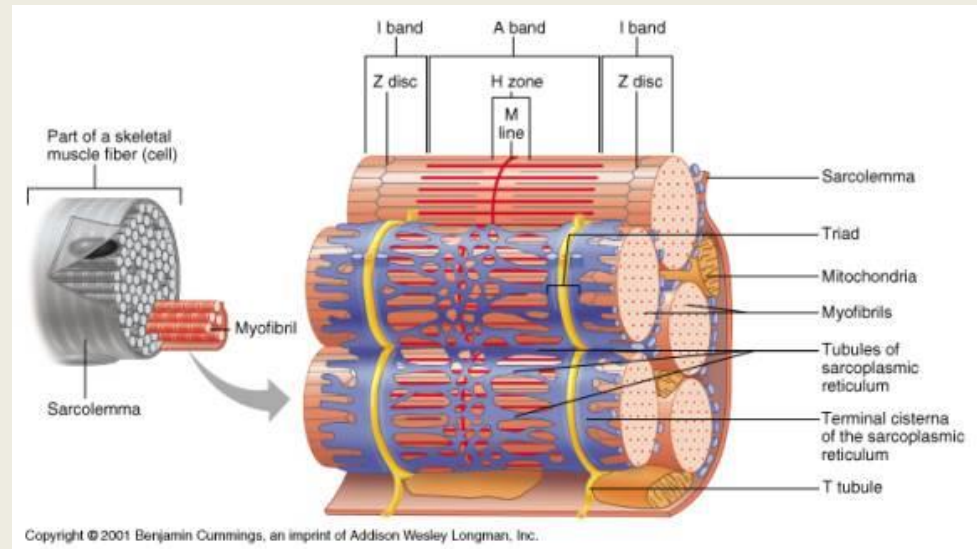


# Stavba svalového vlákna



triáda

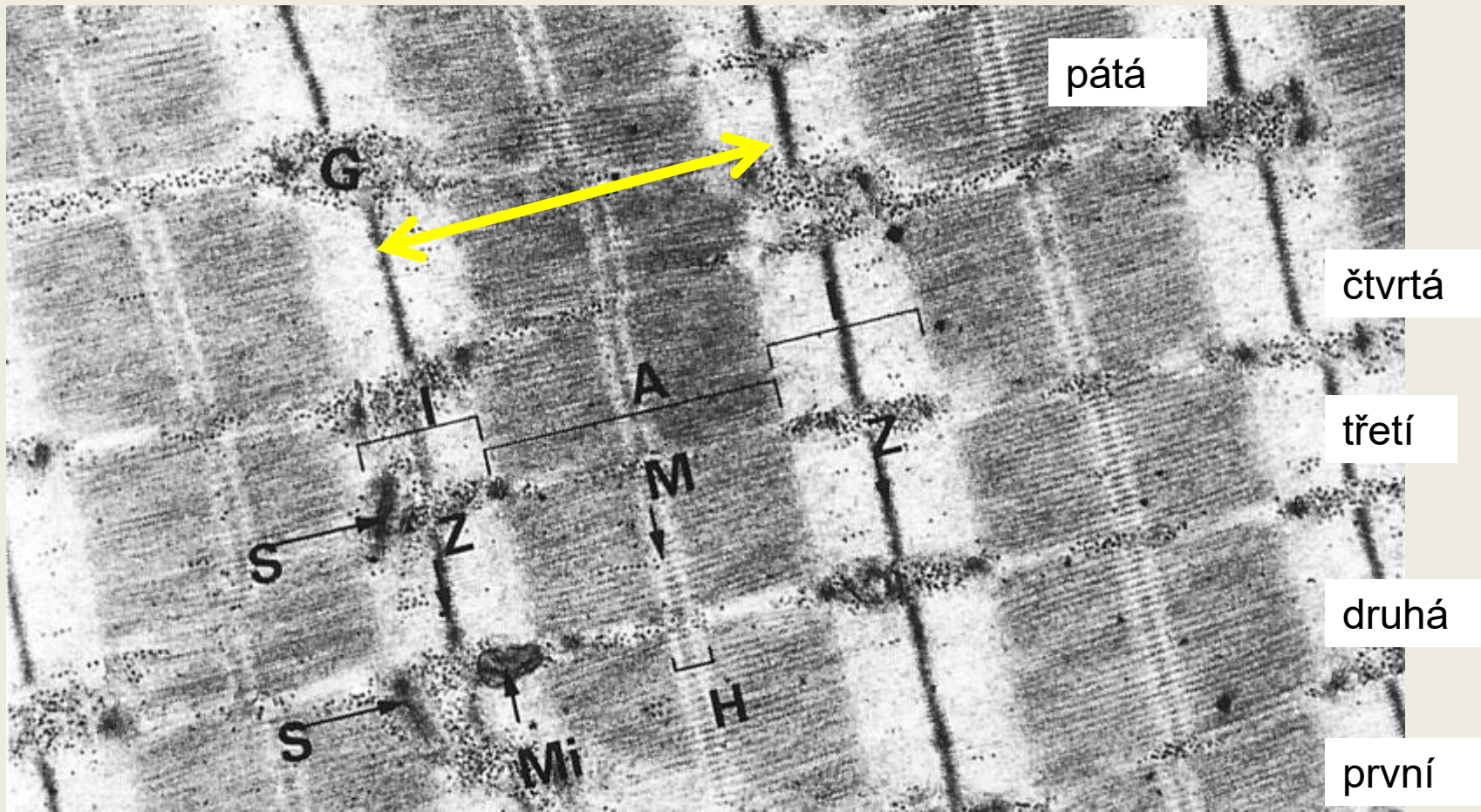
Myofibrily  
Sarkoplazmatické  
retikulum  
Triády  
T-tubuly



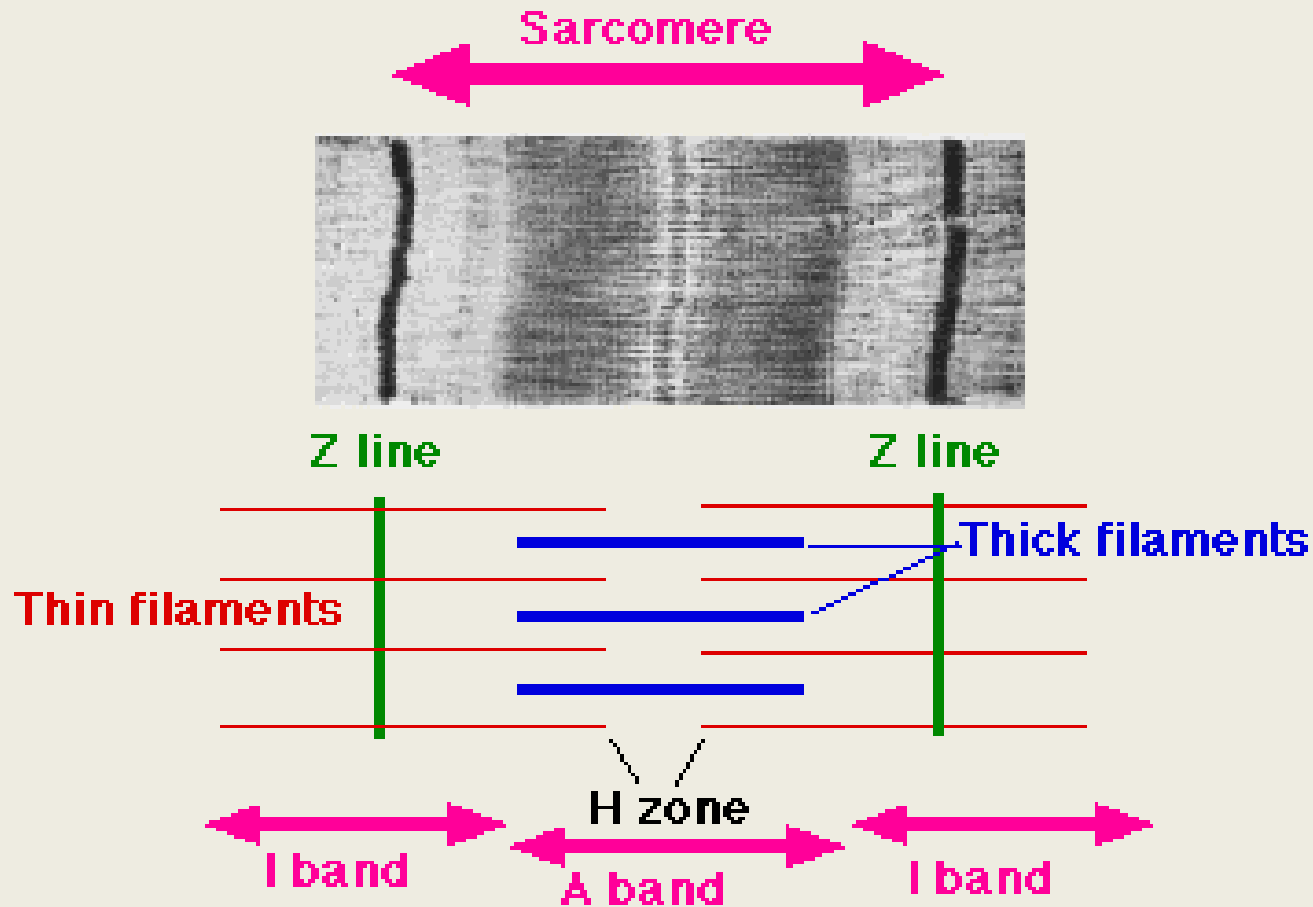


# Myofibrila, sarkomera

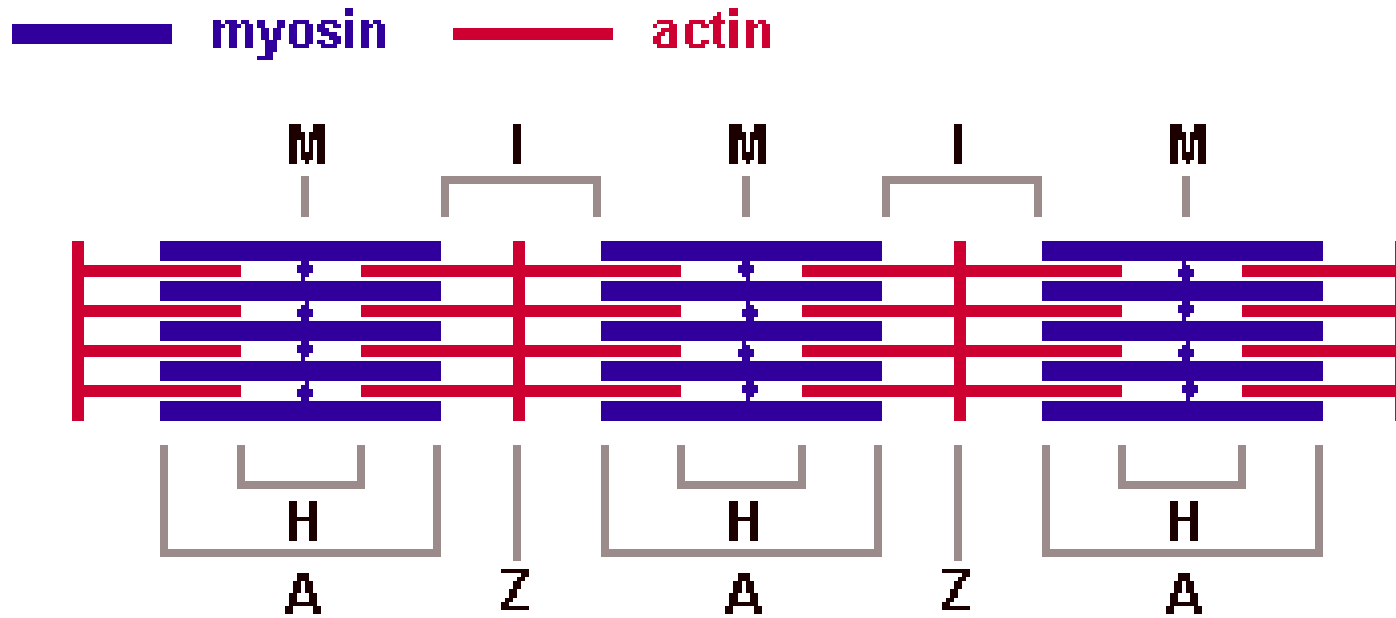
- Každá **myofibrila** se skládá z pravidelně se střídajících světlejších a tmavších úseků, které se odlišují barvitelností a lomem.



# Myofibrila, sarkomera

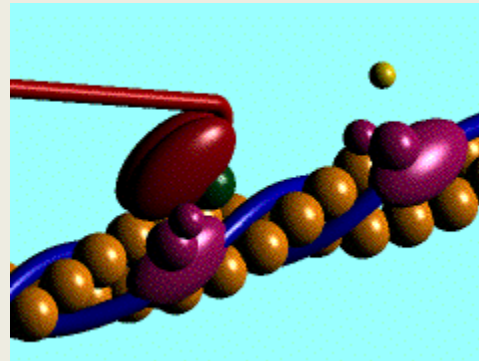
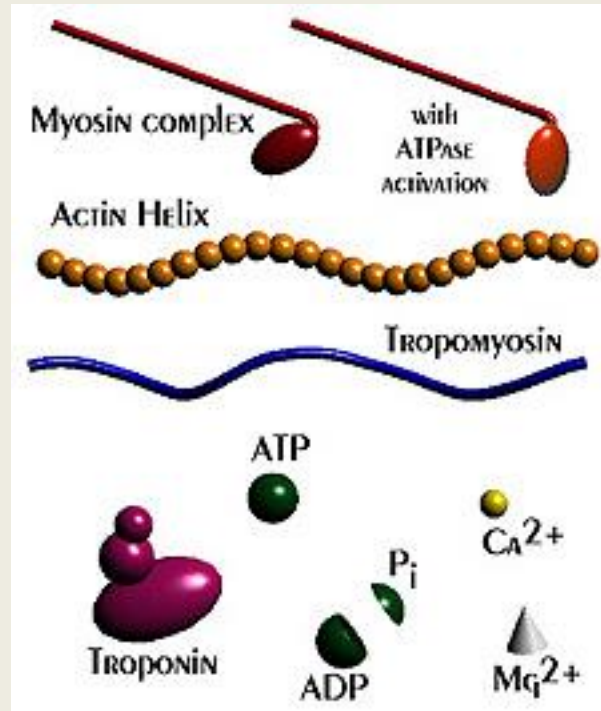


# Mechanismus svalové kontrakce

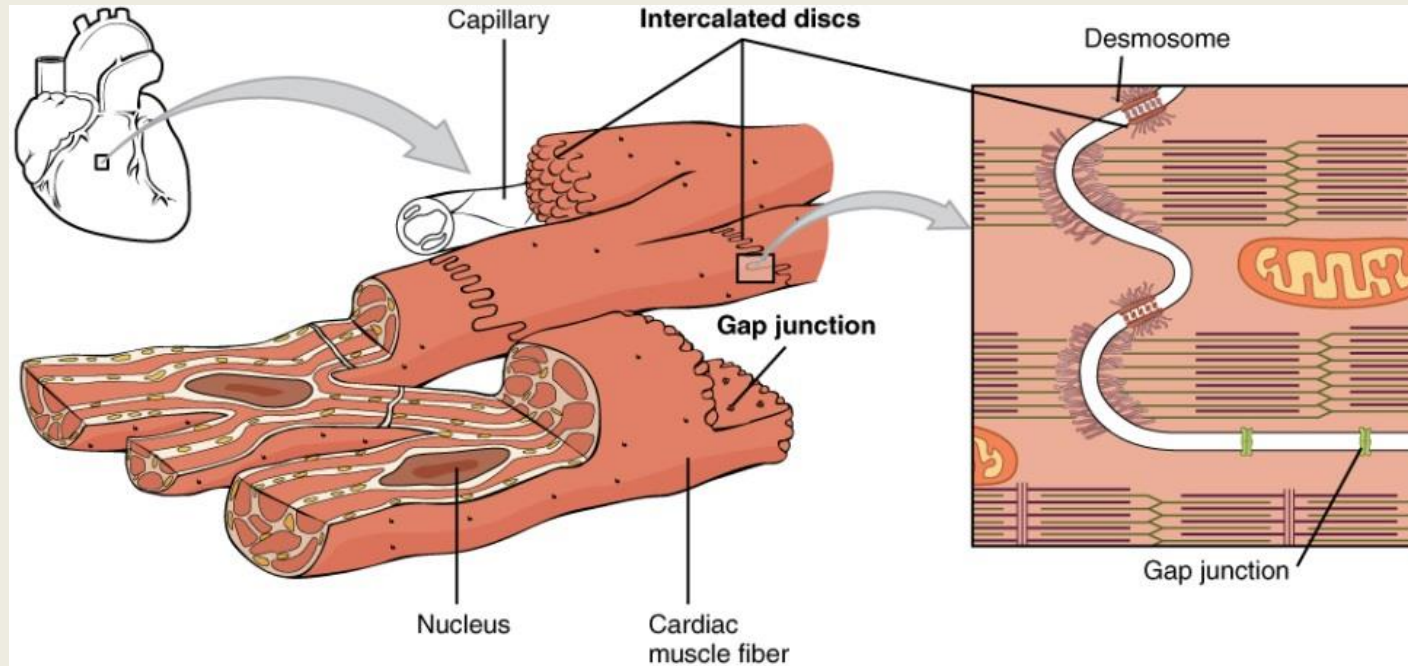


Bands and lines in the contractile apparatus of skeletal muscle

# Mechanismus svalové kontrakce

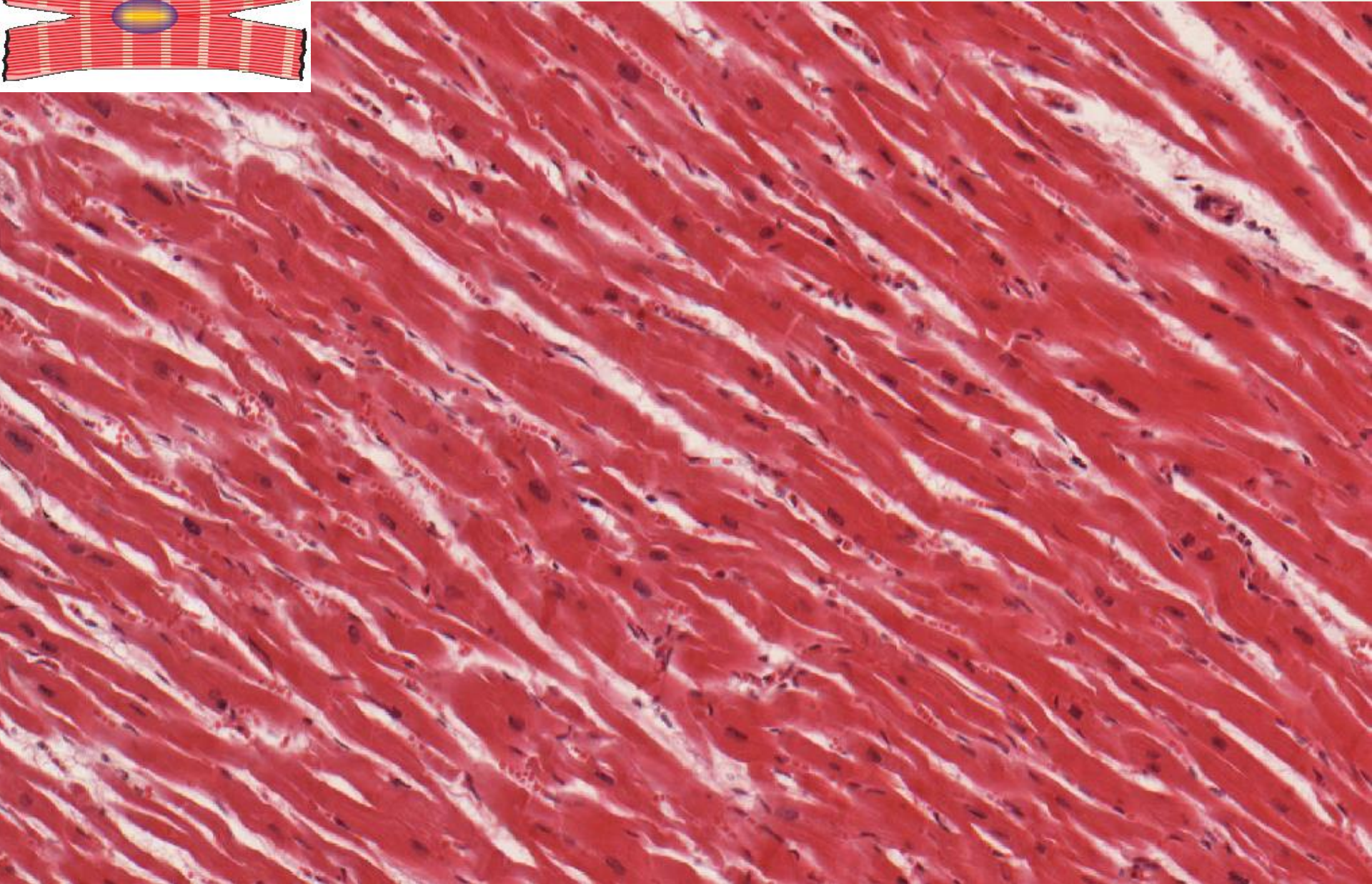
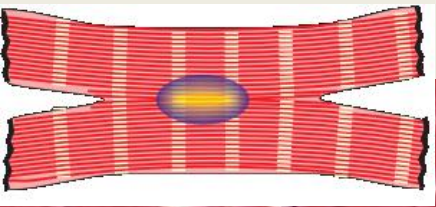


# Srdeční svalová tkáň

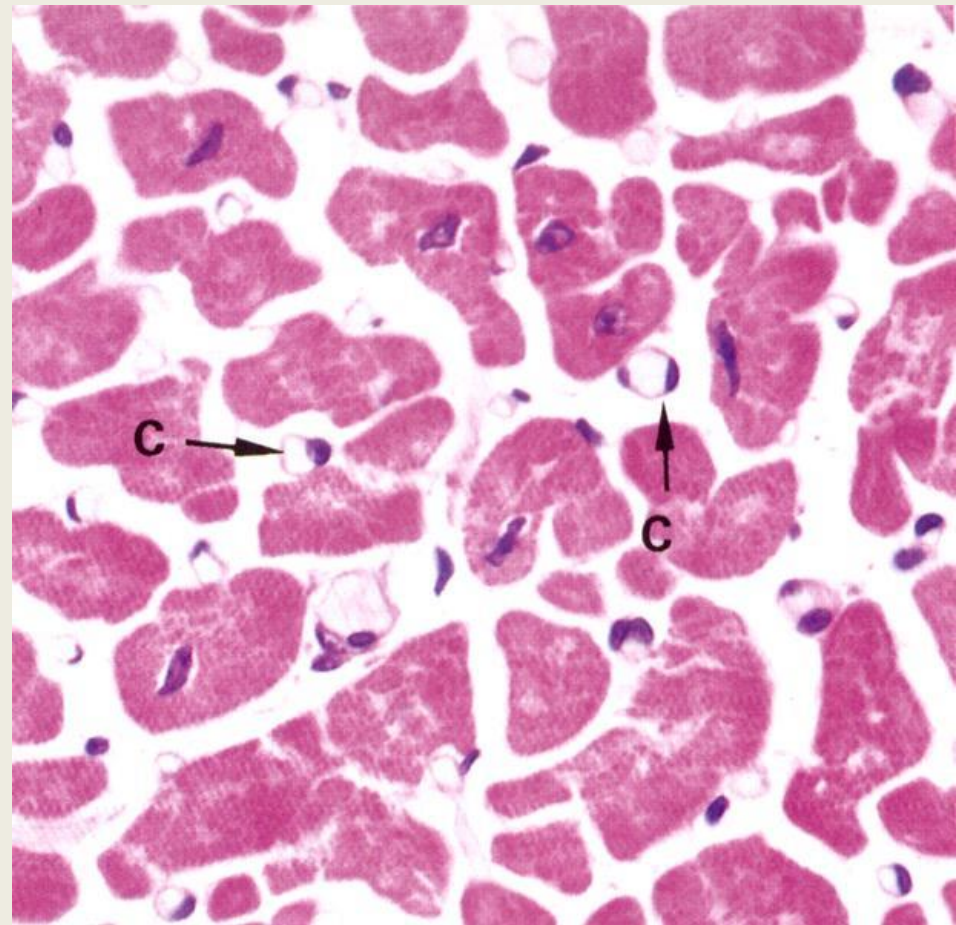
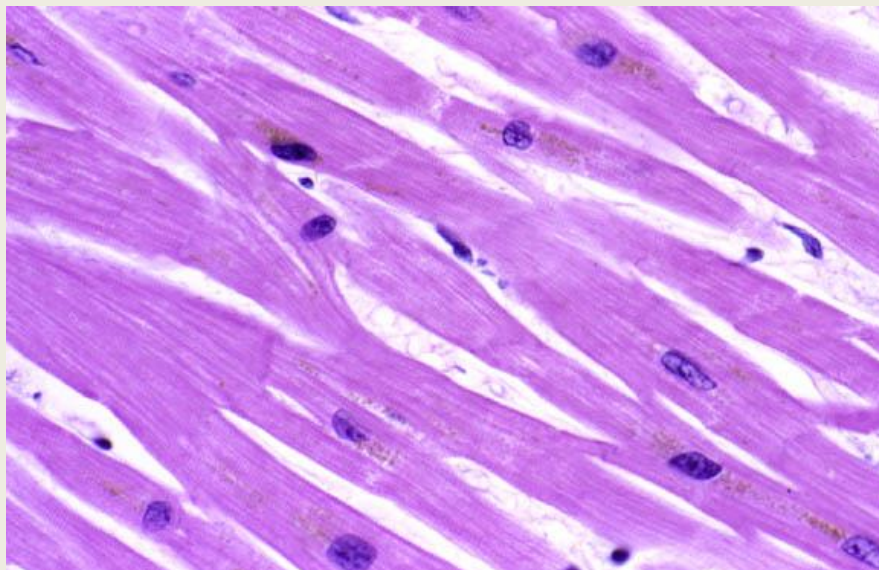
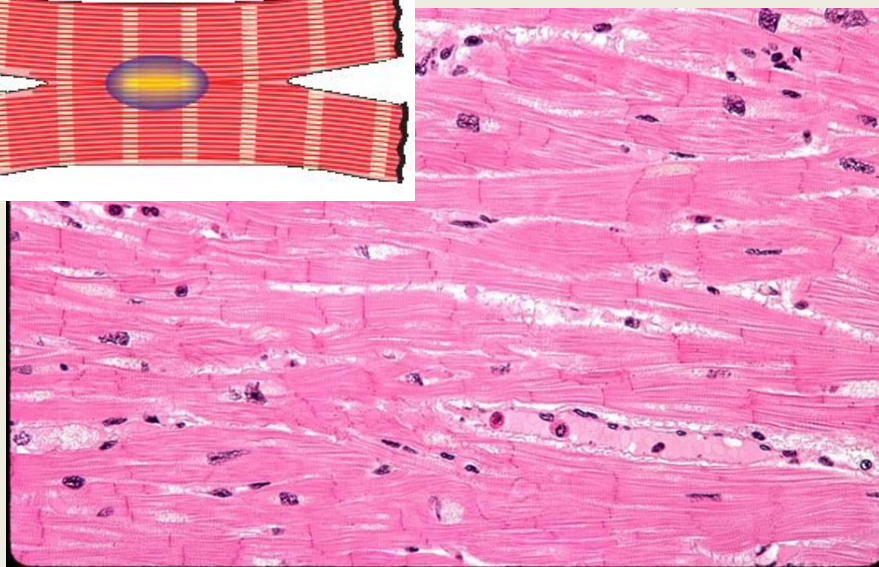
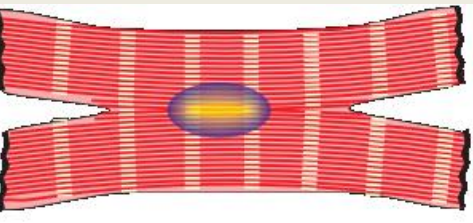


- **kardiomyocyty pracovní** - tl:10-15  $\mu\text{m}$  , l:85-100  $\mu\text{m}$  a **vzrušivé**
- válcovitý nebo s výběžky /Y/
- 1 oválné jádro uprostřed s 1 nebo 2 jadérky
- sarkolema + lamina basalis
- **myofibrily** – žíhané /kratší sarkomery, sousední myofibrily sdílejí myofilamenta/
- hojné **mitochondrie**
- GA, glykogen, lipofuscin, lipidy
- kardiomyocyty síní – aurikulín /ANF/
- SR - diády

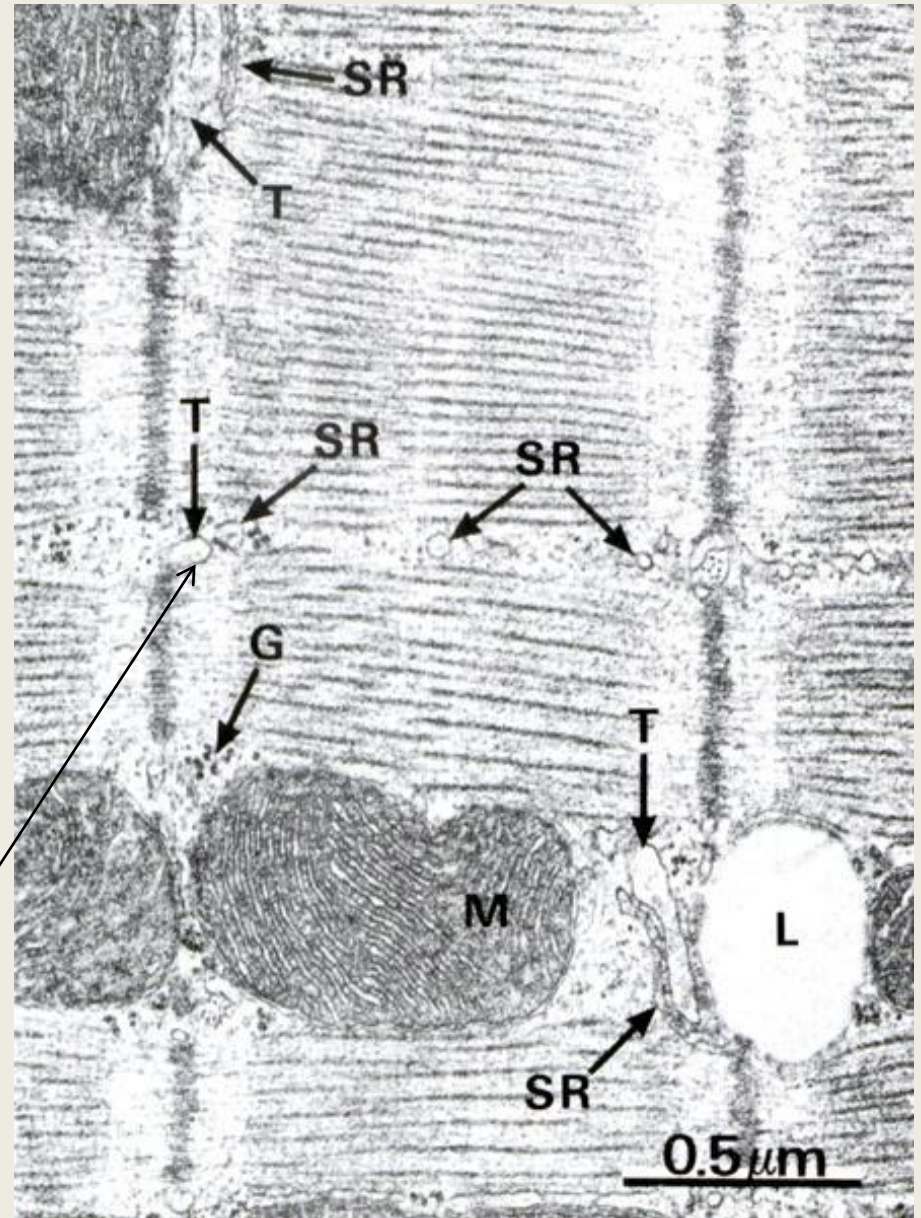
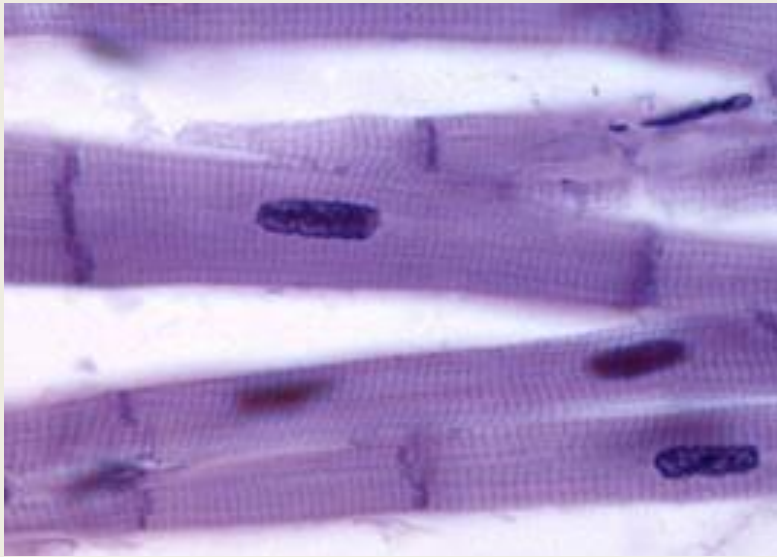
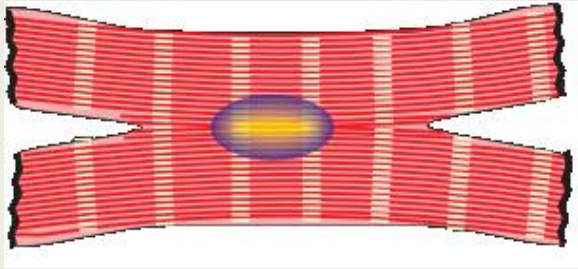
# Srdeční svalová tkáň



# Srdeční svalová tkáň



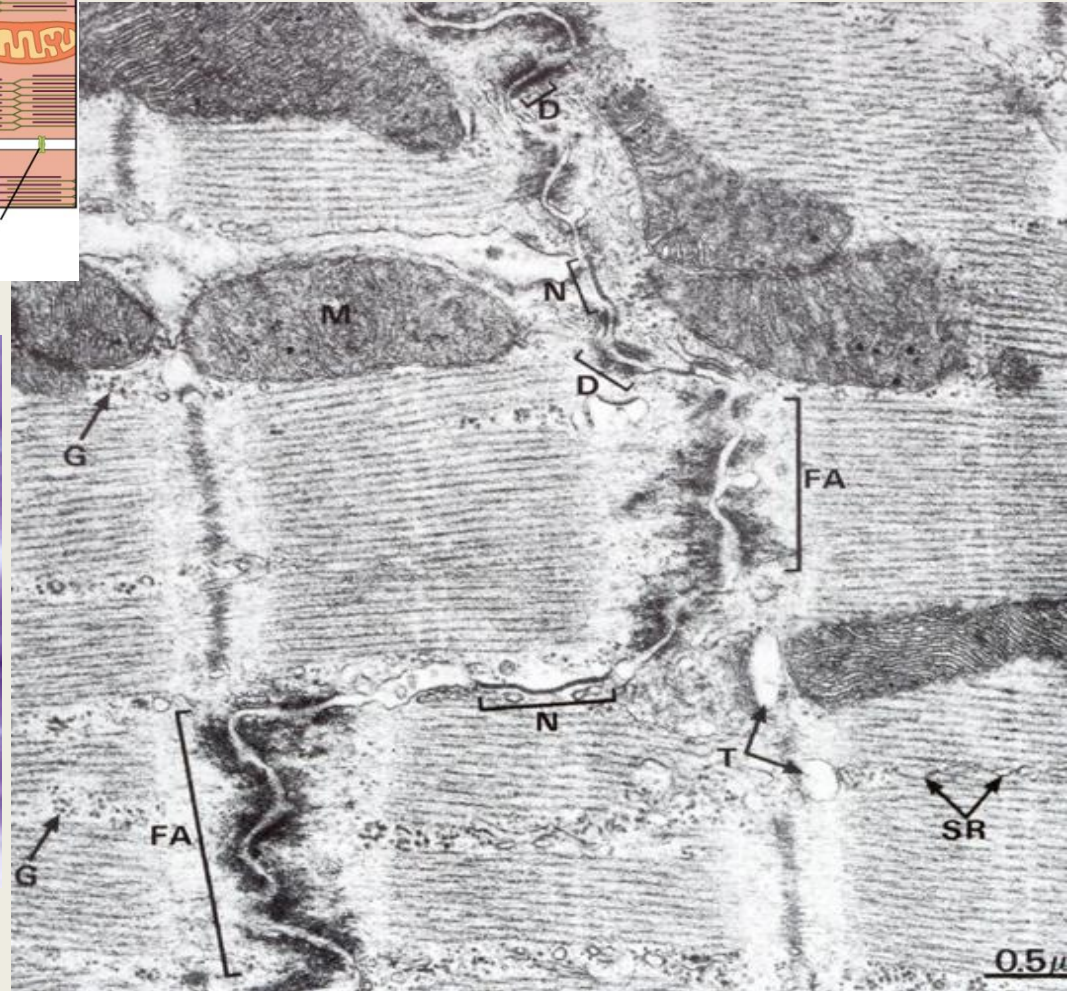
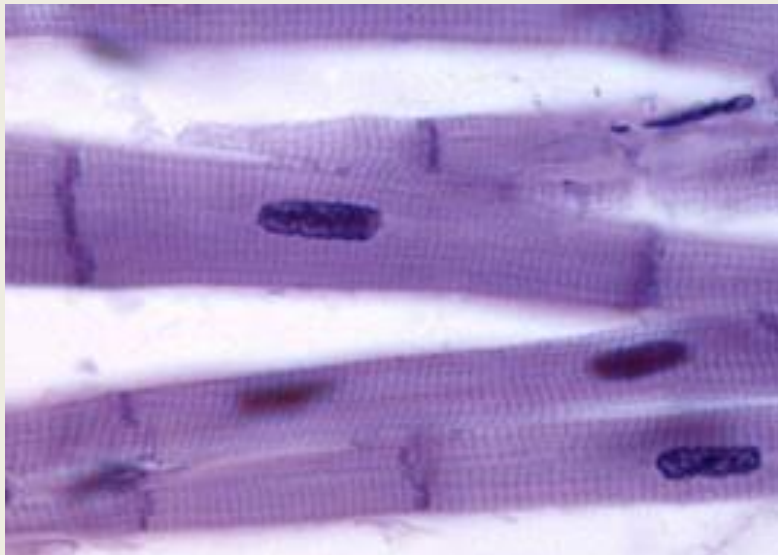
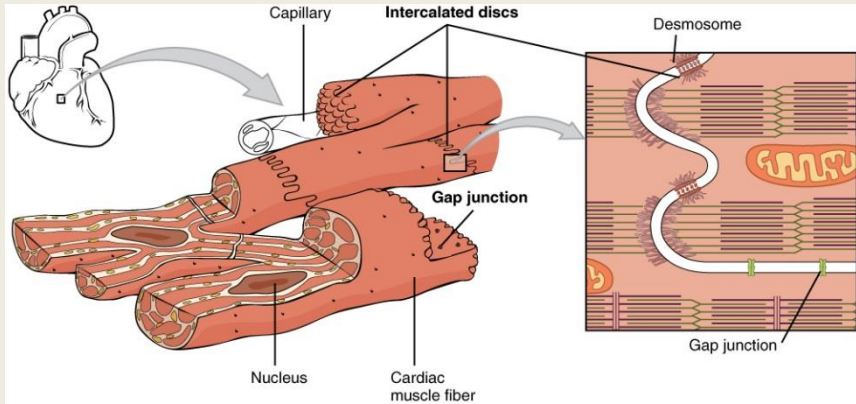
# Kardiomyocyt



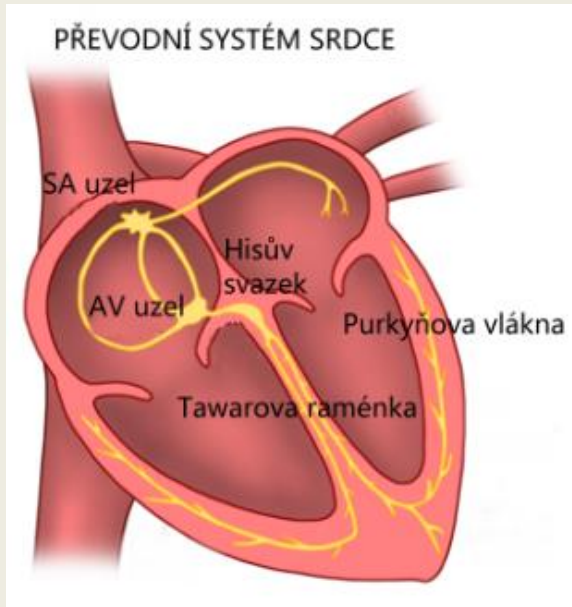
diády



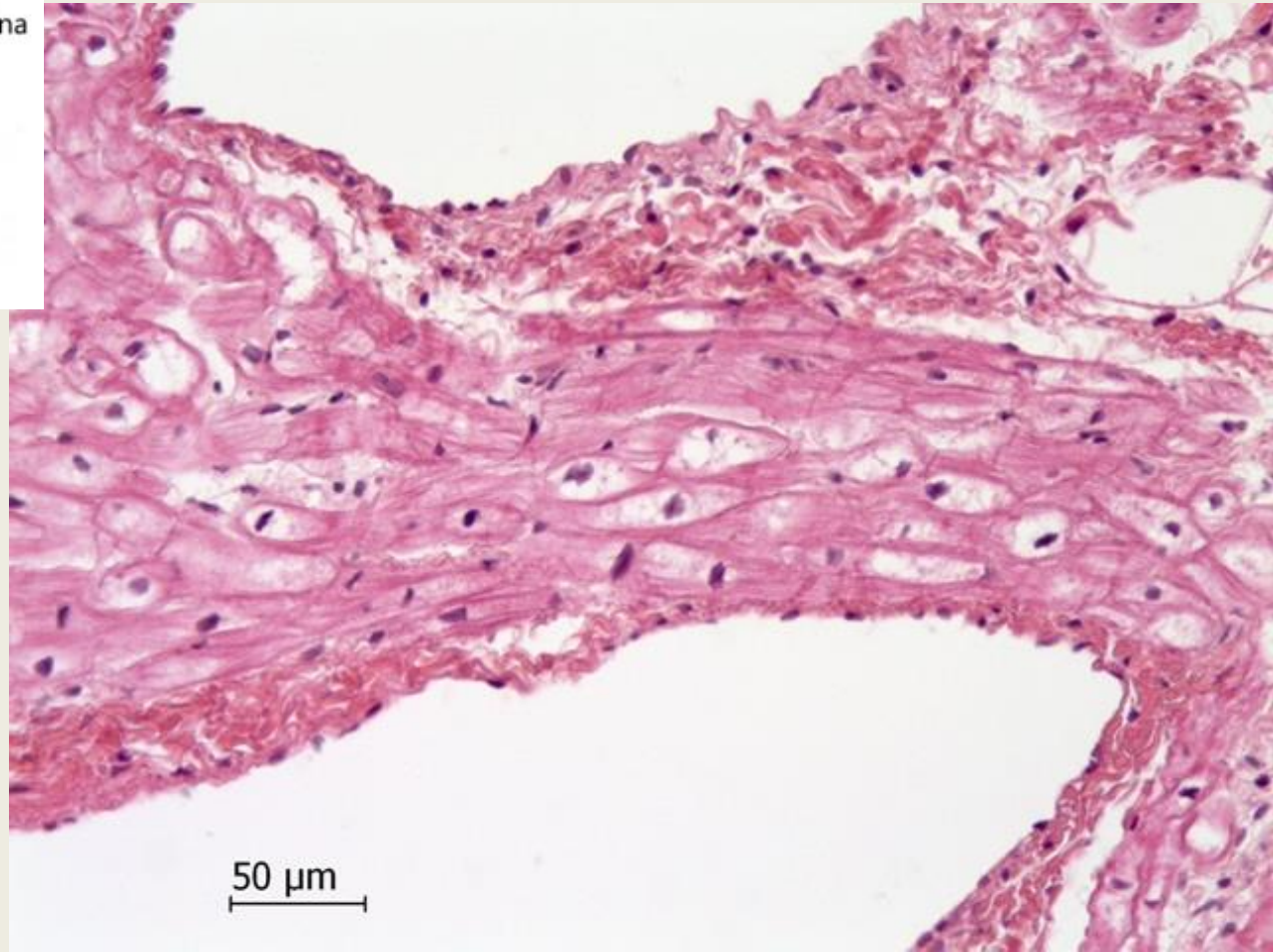
# Kardiomyocyty - interkalární disky



# Kardiomyocyty – vzrušivé



SA-uzel 60 – 80/min  
AV-uzel 30 – 40/min  
Hisův svazek  
Tawarova raménka  
Purkyňova vlákna

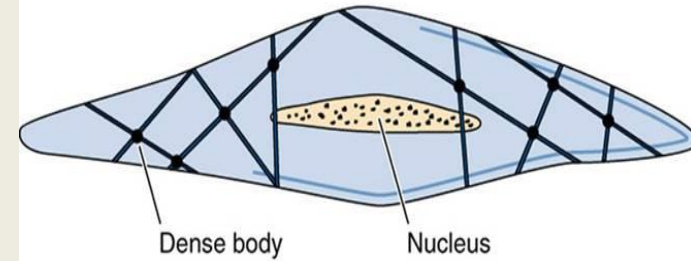


# Hladká svalová tkáň

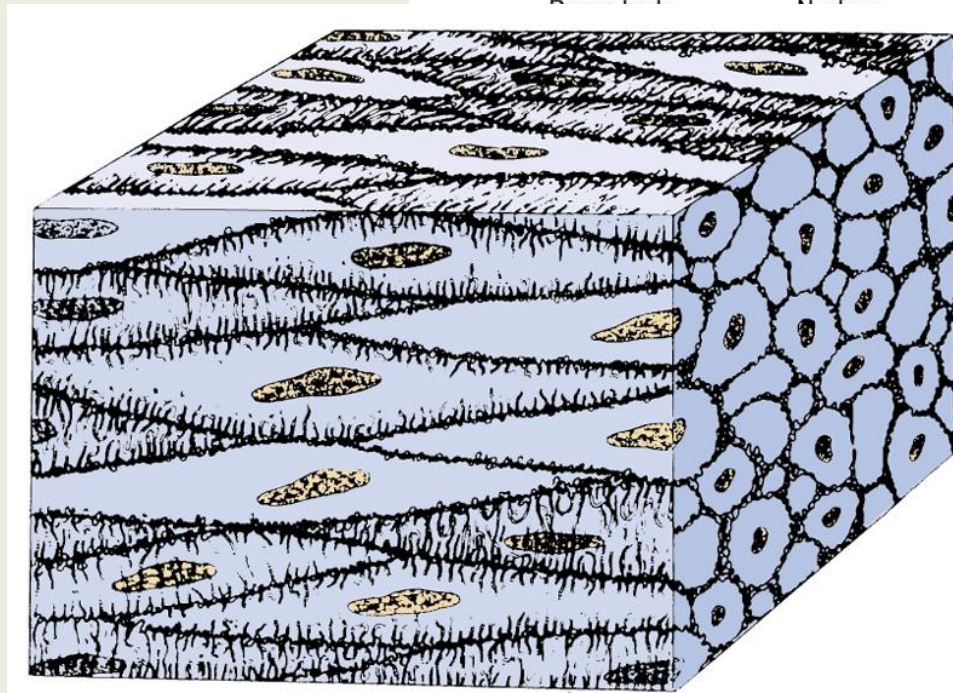
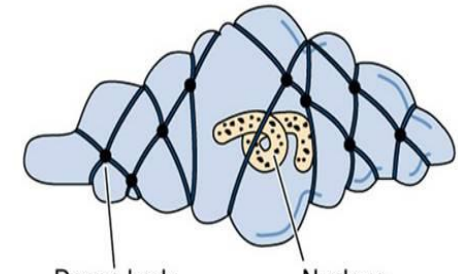
- **leiomyocyt** – buňka vřetenovitého tvaru s 1 tyčinkovitým jádrem /a několika jadérky/
- l:20-500  $\mu\text{m}$ , tl.:3-10  $\mu\text{m}$
- cytoplazma bez žíhání
- typické organely, jen málo SR
- kaveoly – vesikulární invaginace sarkolemy
- **myofilamenta** – A+M /více aktinu/, tvoří prostorovou síť, místo troponinu kalmodulin
- **denzní tělíska** – slouží k úponu filament
- spoje typu nexusů

Mezi buňkami - jemná retikulární vlákna.

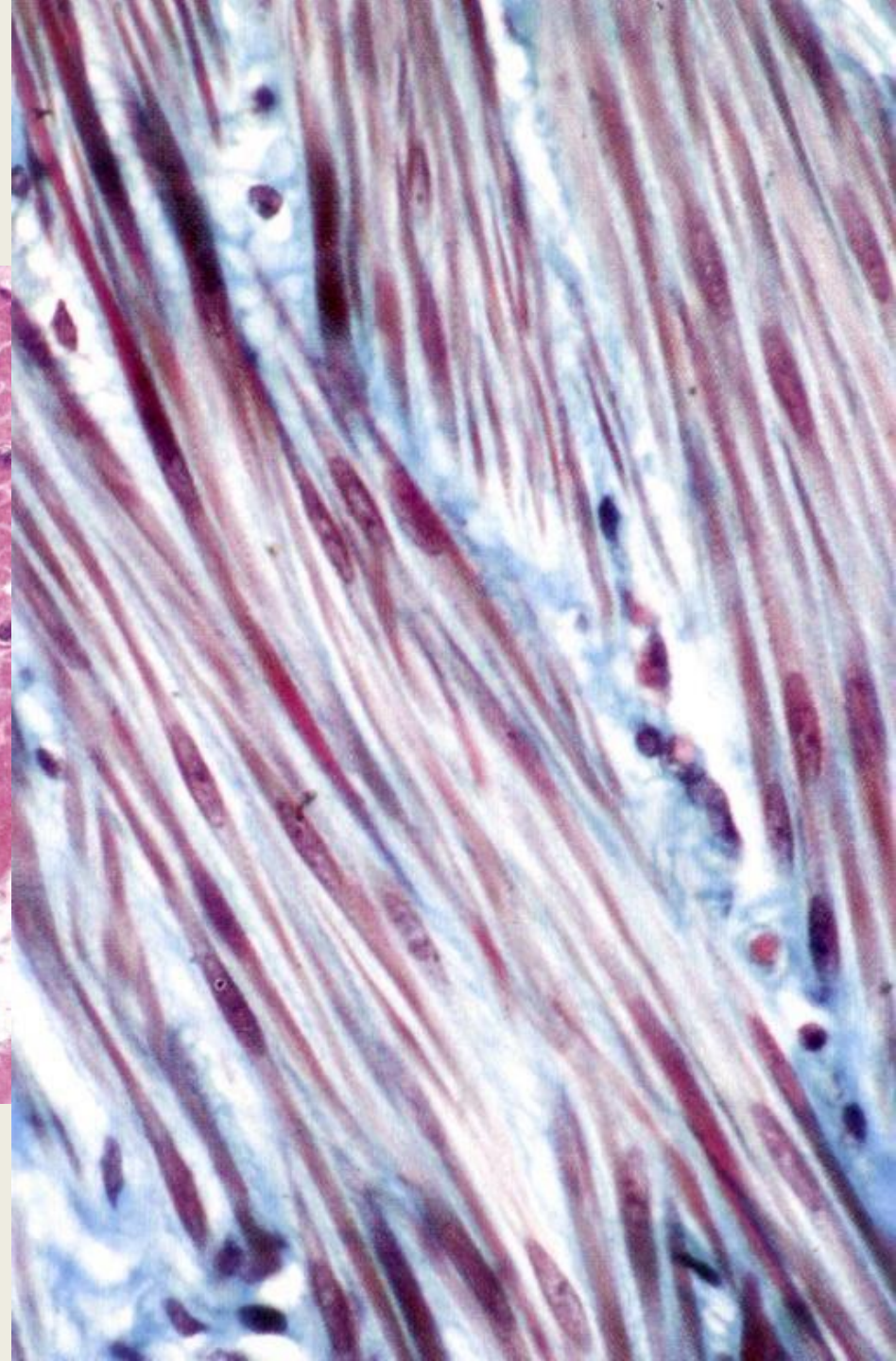
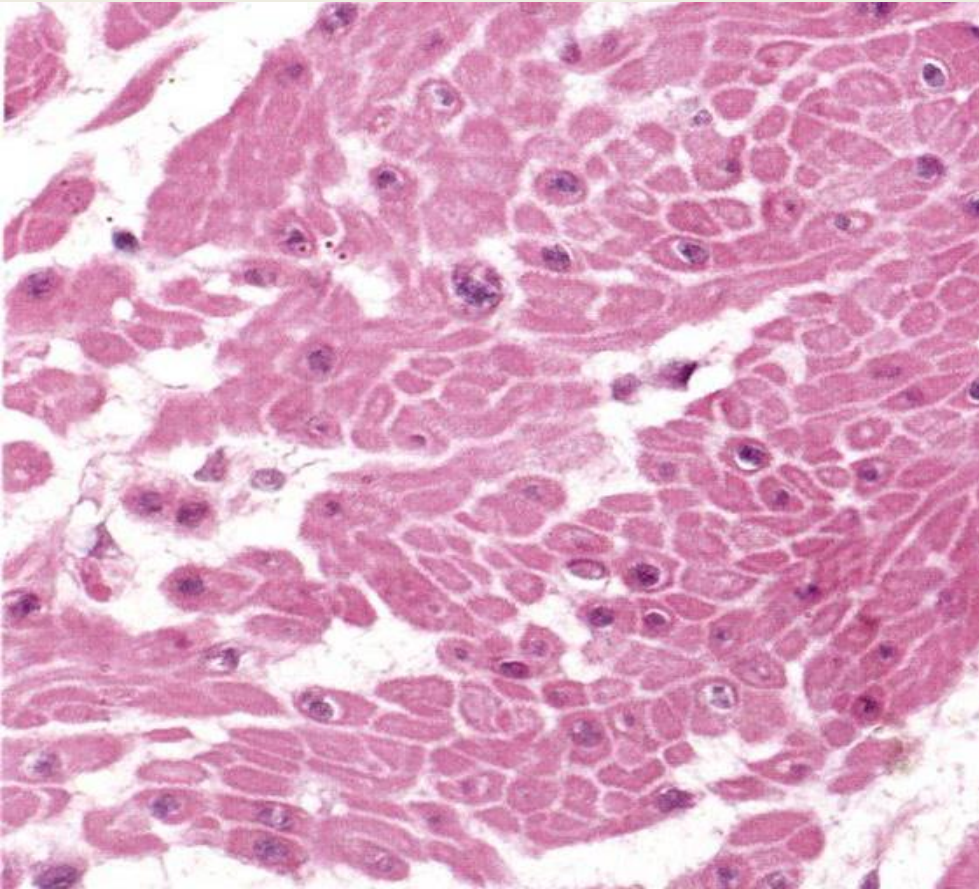
Relaxed smooth muscle cell



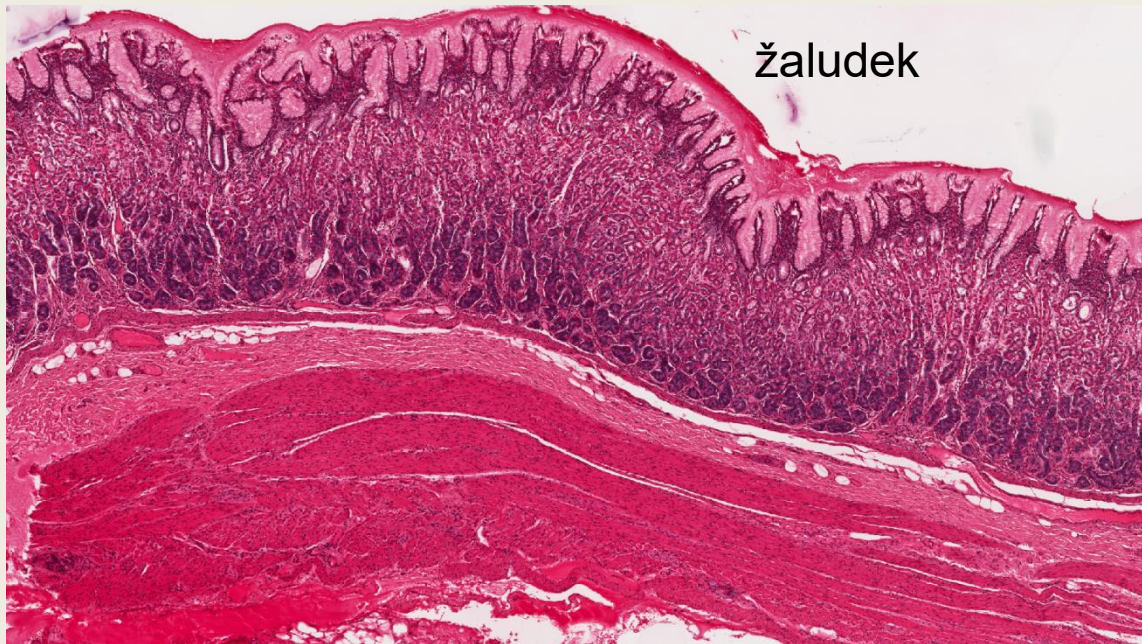
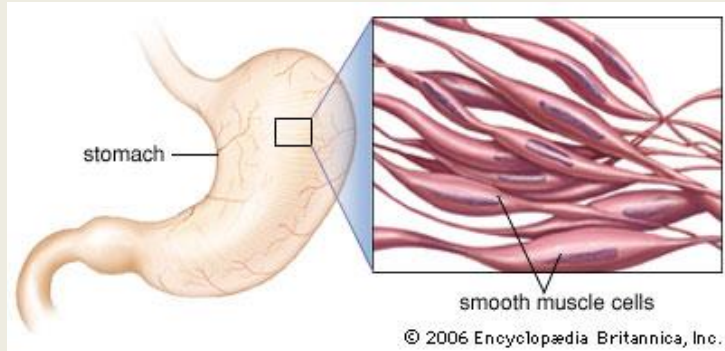
Contracted smooth muscle cell



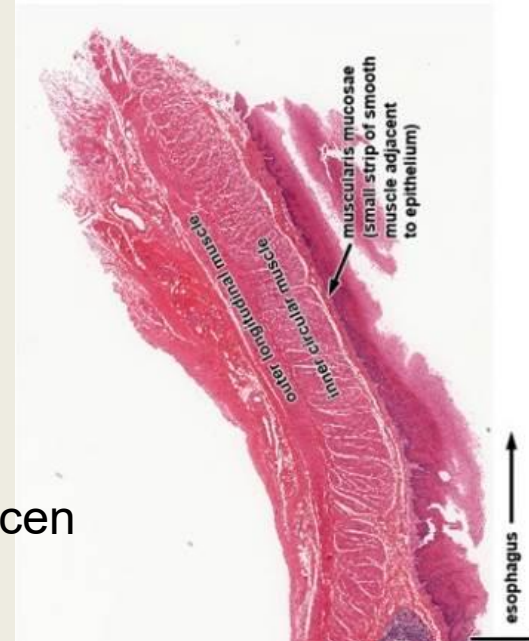
# Hladká svalová tkáň



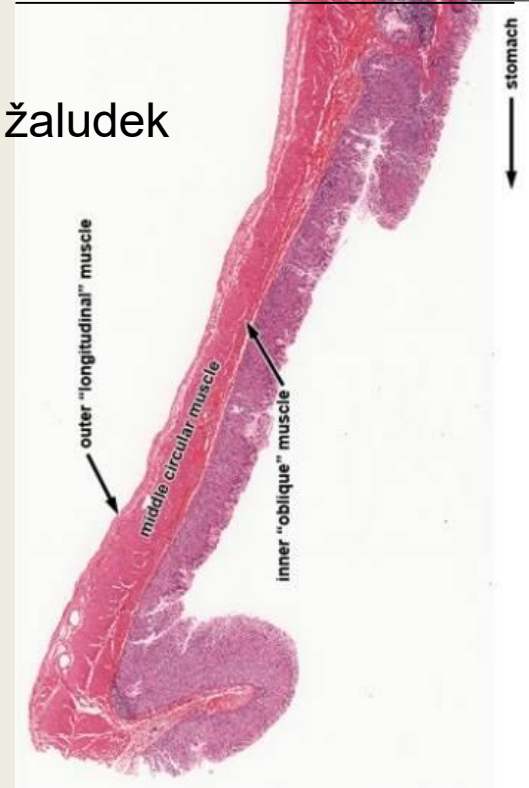
# Hladká svalová tkáň



jícen



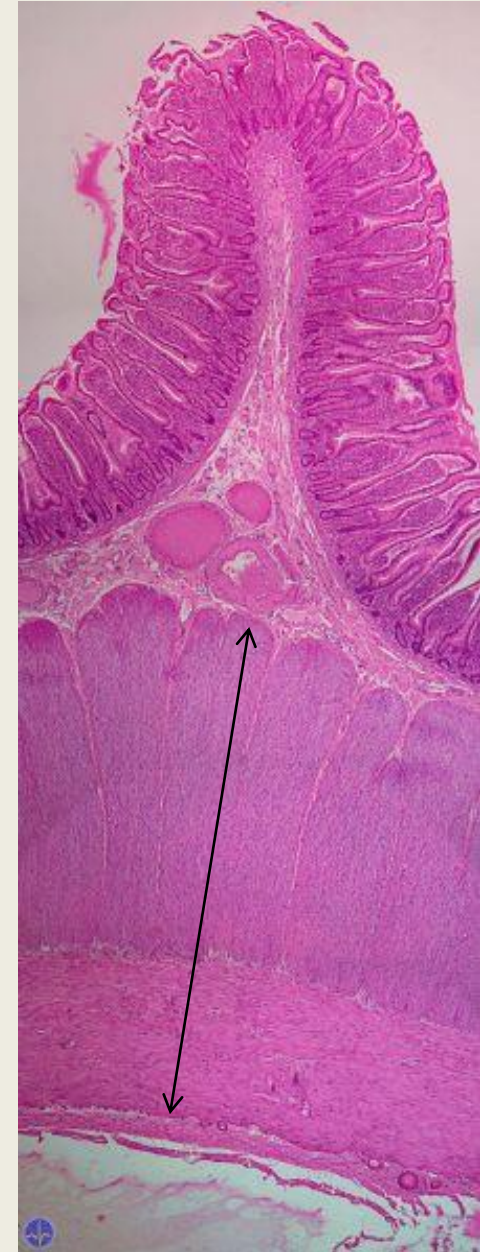
žaludek



# Hladká svalová tkáň



tenké střevo



# Základní typy svalové tkáně

- **Kontrakce**

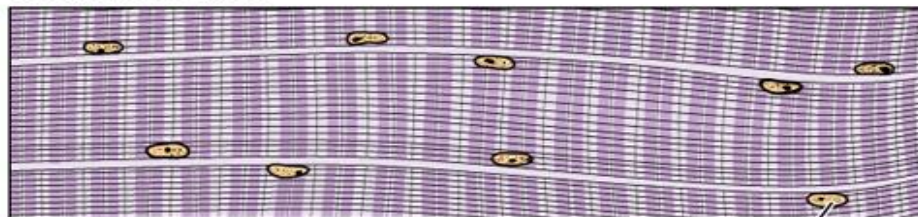
- Rychlá, ovládaná vůlí
- Rychlá autonomní
- Pomalá autonomní

- **Původ**

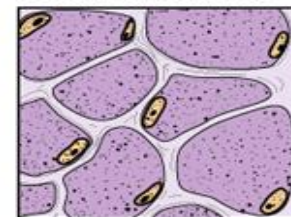
- Mesoderm /myotomy/
- Mesoderm /kardiogenní ploténka/
- Mezenchym

## Muscle types

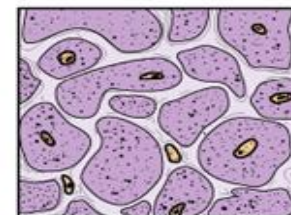
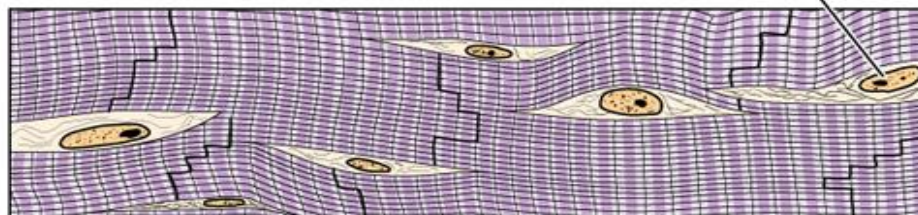
Skeletal muscle



Cross sections



Cardiac muscle



Smooth muscle

