

Frog Lab: Anatomy and Contraction

Bioengineering/Physiology 3202



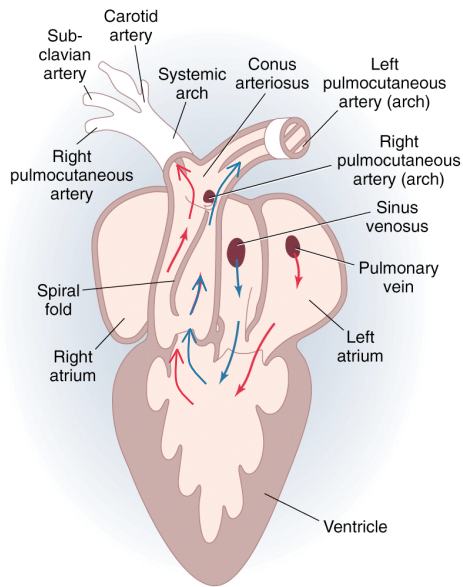
Frog Lab I

Slide 1

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Frog Heart Anatomy/Function

- Shared ventricle but blood separated
 - Spiral fold
 - Initial flow through pulmonary because of reduced pressure
 - Resistance to flow varies with breathing (inhale reduces resistance)



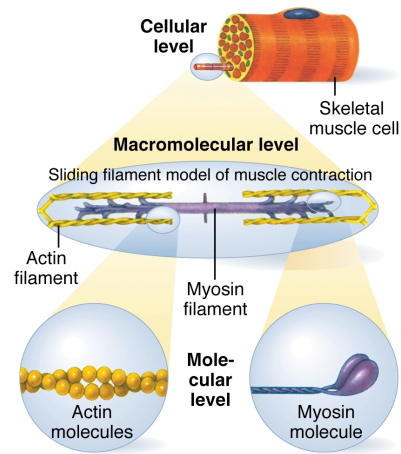
Frog Lab I

Slide 2

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EC Coupling

- Action potential causes influx of Ca^{2+}
- In mammals and birds, this causes release of more Ca^{2+}
- Ca^{2+} interacts with actin/myosin to cause contraction
- Pumps gather up Ca^{2+} or remove it from cell



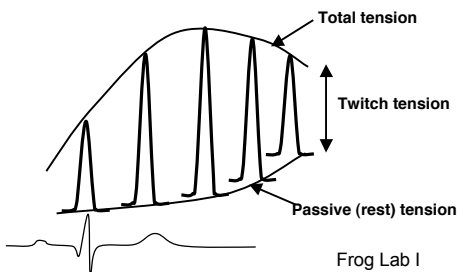
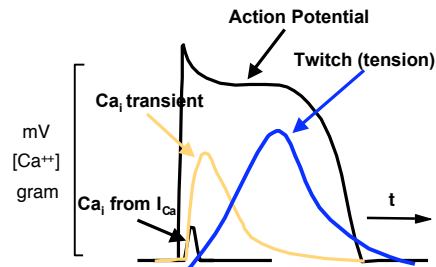
Frog Lab I

Slide 3

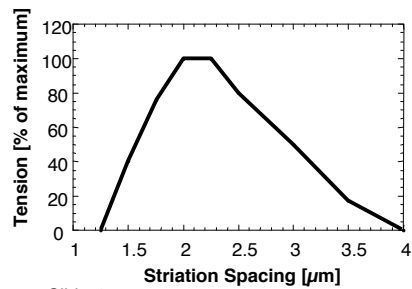
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Regulation of Cellular Contraction

- Adjust pretension to improve spacing in contractile elements
 - Optimal spacing
- Works at tissue and whole heart levels



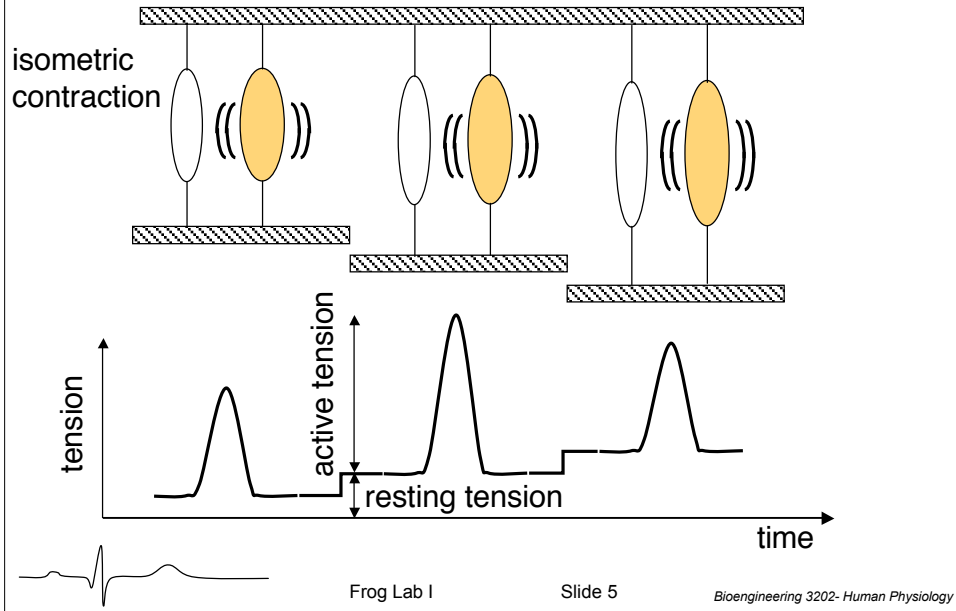
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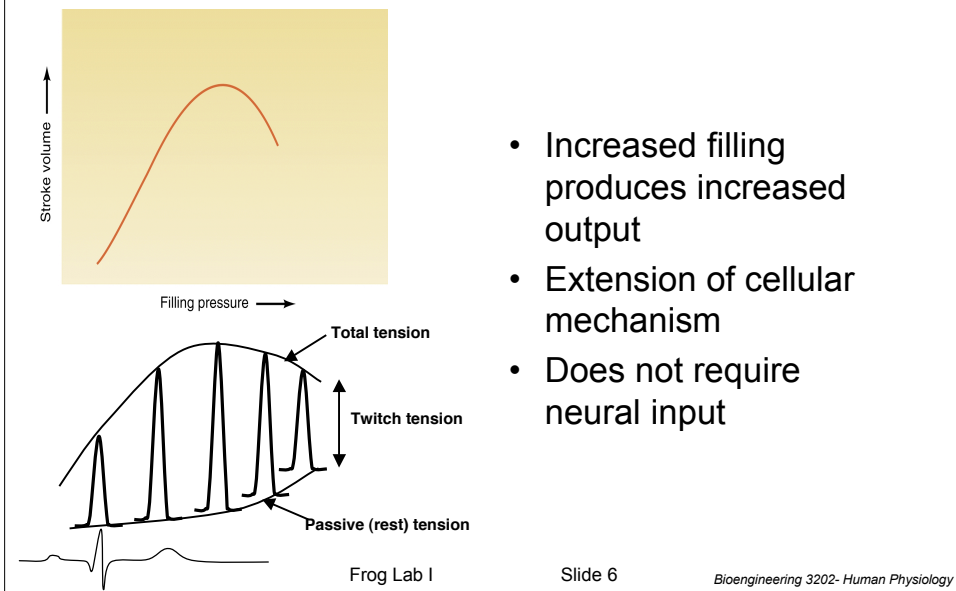
Slide 4

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Effect of Pretension



Frank Starling Mechanism



Lab Goals/Tasks

- Dissection of heart
 - Prepare according to web site
 - Bring digital camera to make photos
- Measure contraction
 - Attach force transducer
 - Calibrate transducer
 - Measure contraction as function of pre-tension

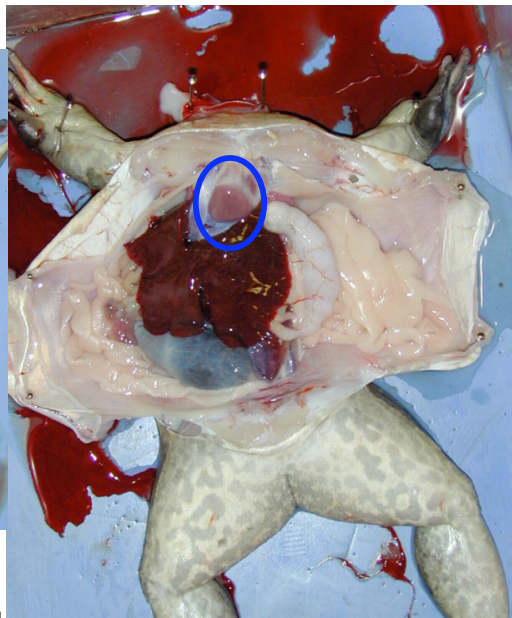
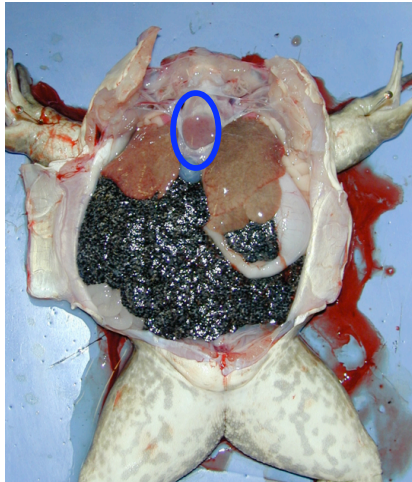


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In Situ Views

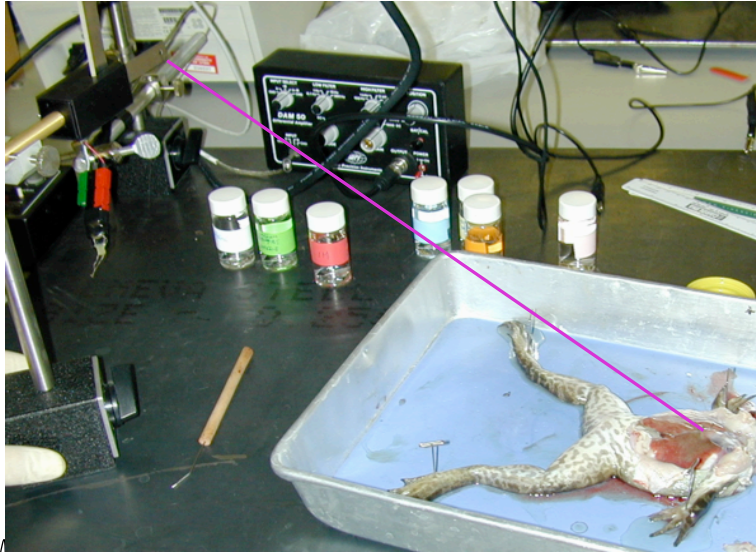


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Lab Preparation



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