Talking Science

Designing and Delivering Successful Oral Presentations

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Objectives of a science talk

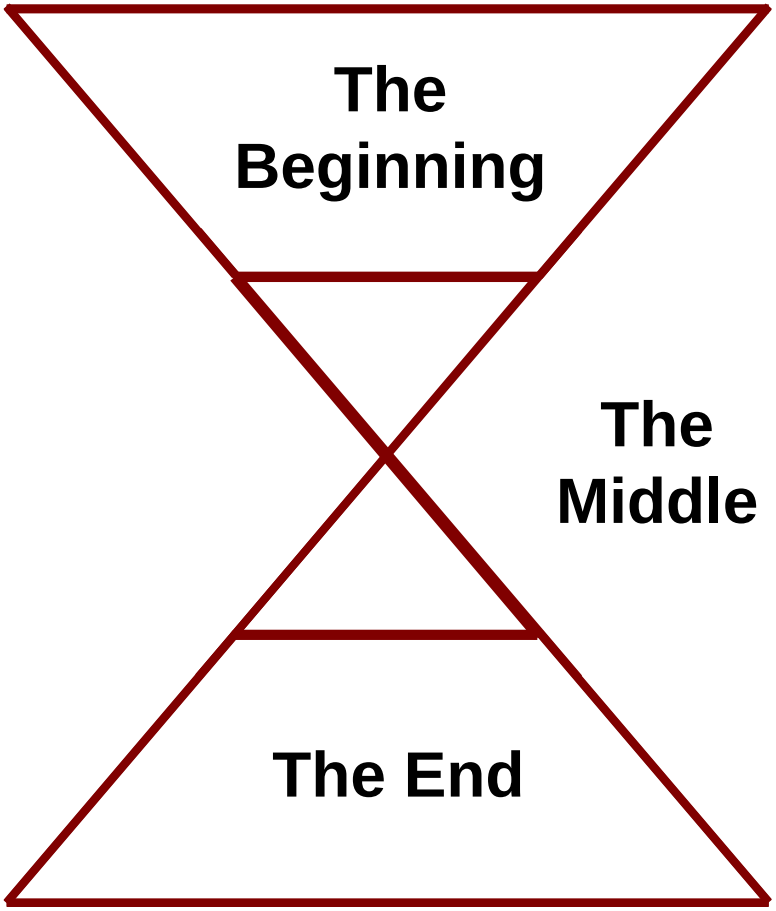
- Effectively communicate your science to <u>any</u> audience
- Demonstrate your expertise in your scientific area
- Generate interest in your research
- Create networking/collaborative possibilities
- Establish your reputation as an effective communicator

Elements of a good science talk

- Knowing your audience
- Knowing the rules
- Creating an interesting story
- Presenting crisp, clean slides
- Having an engaging and confident delivery
- Mastering the Question and Answer period

Knowing your audience and the rules

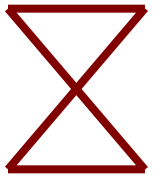
- Who will you be giving this talk to?
  - Something for everyone
- What is the format:
  - How long is the talk and how long for questions?
- What do you bring with you?
- Technology Issues
  - PC vs Mac, slide advancers, laser pointers
- Who will be introducing you?
- What is the venue like?
  - Room layout, lighting, etc
  - Lighting


The Beginning
The Middle
The End

The Beginning

- Contains “The Hook”
- Introduction
  - Big picture relevance
  - Background
- Defines the question/problem you are seeking to answer/solve
- Establishes the format and style of the talk

The Middle



- Defines your hypothesis
- Describes your methodology
- Contains key findings or results
  - Clearly explained
  - Easily identifiable
  - logically linked to point you are trying to make
- Summary/recap with regards to the objectives of each of the assays or projects

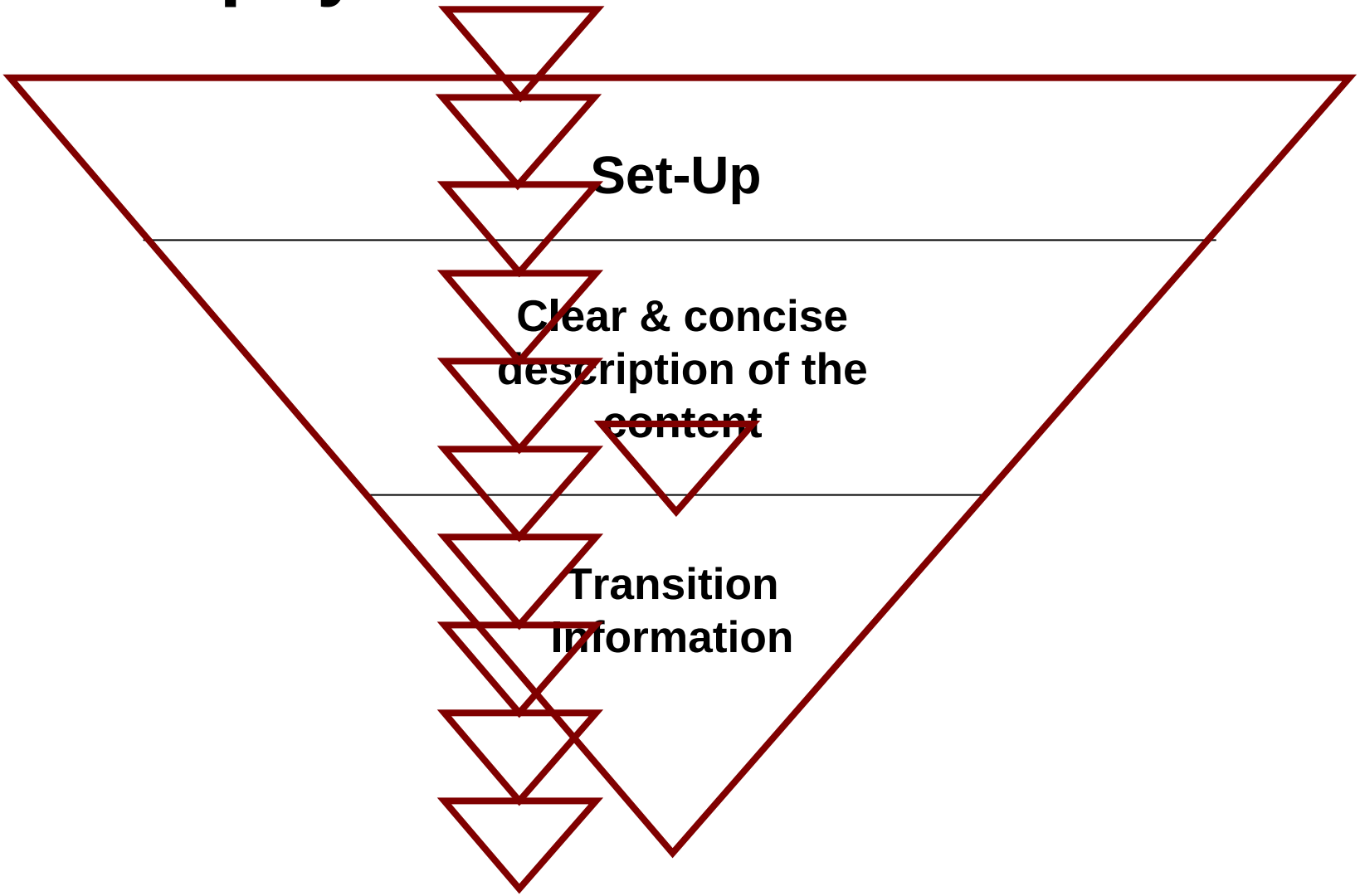
The End

- Discussion of the results
  - How do the results relate to each other?
  - How the key findings support your hypothesis?
  - How does it address the question you were looking to answer?
- Addressing the bigger picture
  - How does it impact the field?
  - How does it impact “me”?
- Where does it go from here?
- Acknowledgements

Creating the story

- Where do you start?
  - Start in the middle with the data
    - Choose the best - Less is more
- What's next?
  - Work your way outward
    - Data summary, methods, hypothesis
- Closing up the ends
  - Now Tackle the hard stuff
    - Conclusions, "Your Question", background, hook

Philosophy of a slide Flow



Characteristics of a *any* good slide

- A title that is a declarative statement
  - Key finding, a result, a statement of importance
  - Is the piece of information that listeners remember
  - It can be used as a sign post
- Figures that are large, clean, and crisp
- Labels and text that are clearly readable
- Added arrows or indicators that point to difficult things to see
- Sufficient white space
- Helps, not hinders, the person “telling the story”

Slide basics

- Backgrounds
  - White, black, or dark blue
  - Artsy or picturesque backgrounds are highly distracting
- High picture/text ratio
- Bulleted information
  - Succinct
  - Key “pieces” of information
- Consistent formatting appearance
- Custom animation
  - Avoid unless absolutely necessary
  - Aid to making a point

Other slide basics

- Fonts
  - Type
    - Arial, Times New Roman
  - Avoid using all capitals
  - Size
    - Titles – 36 to 40 pt
    - Subtitles – 28 to 36 pt
    - Rule of Thumb – can it be seen on the screen easily
  - Color
    - Contrast with background for easy readability
    - Primary colors, avoid pastels

The Delivery

- The talk is not a spoken paper
- Good slide language
- Pace
- Position
- Transitions
  - Topic to topic and slide to slide
- Be engaging and personable
- Eye contact with the audience
- Be excited about the material

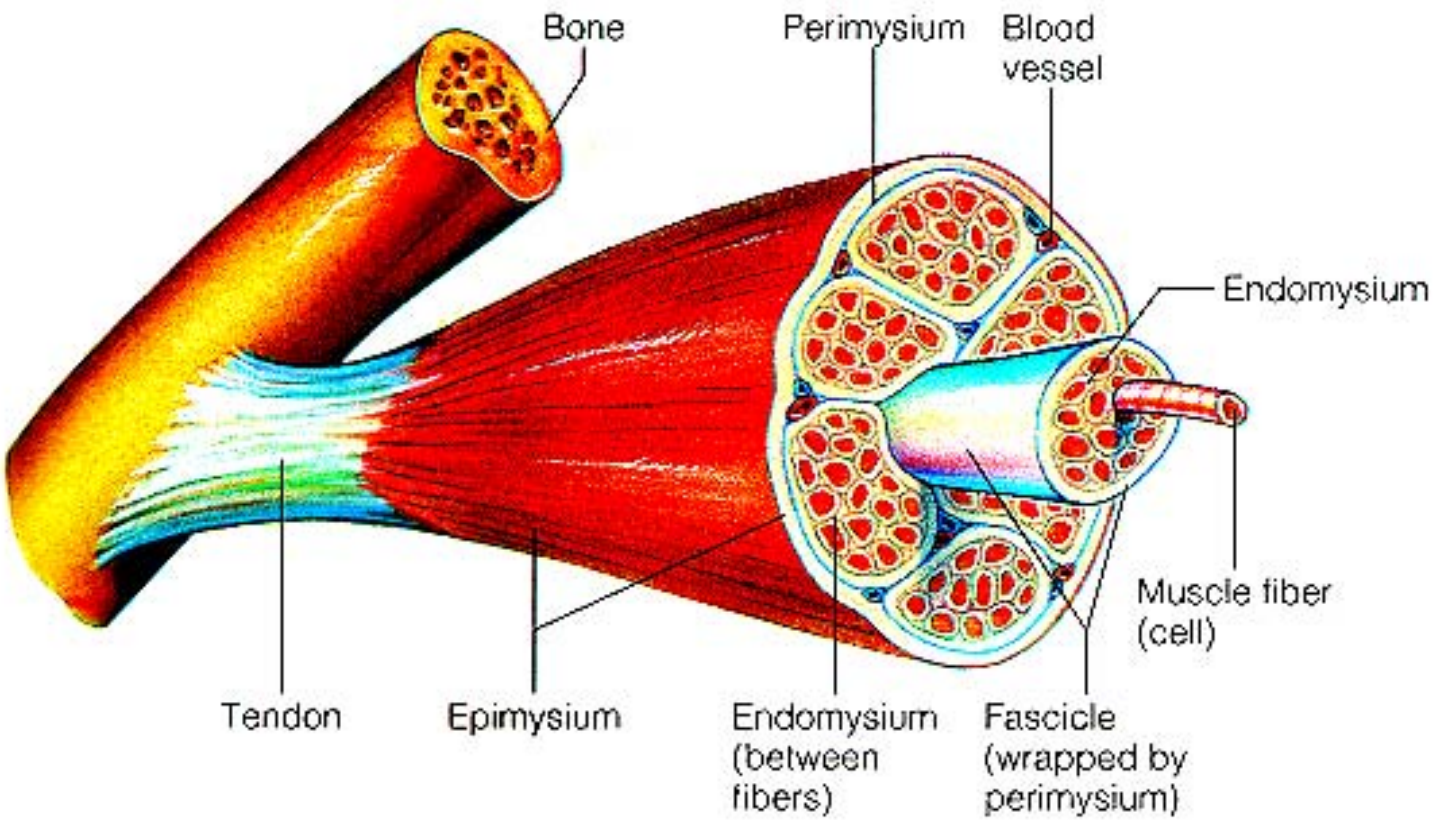
Muscle Contraction

- Muscle fiber is made up of bundles of myofibrils surrounded by the sarcolemma.
- Invaginations (tranverse tubules) within the muslce fiber form a network extension of the sarcolemma.
- Each myofibril contains regularly arranged myofilaments of actin and myosin so that the ends are all lined up. Each repeating arrangement is called a sarcomere.
- A specialized endplasmic reticulum called the sarcoplasmic reticulum surrounds each myofibril, following the sarcomeric pattern while maintaining an association with the the t-tubules.

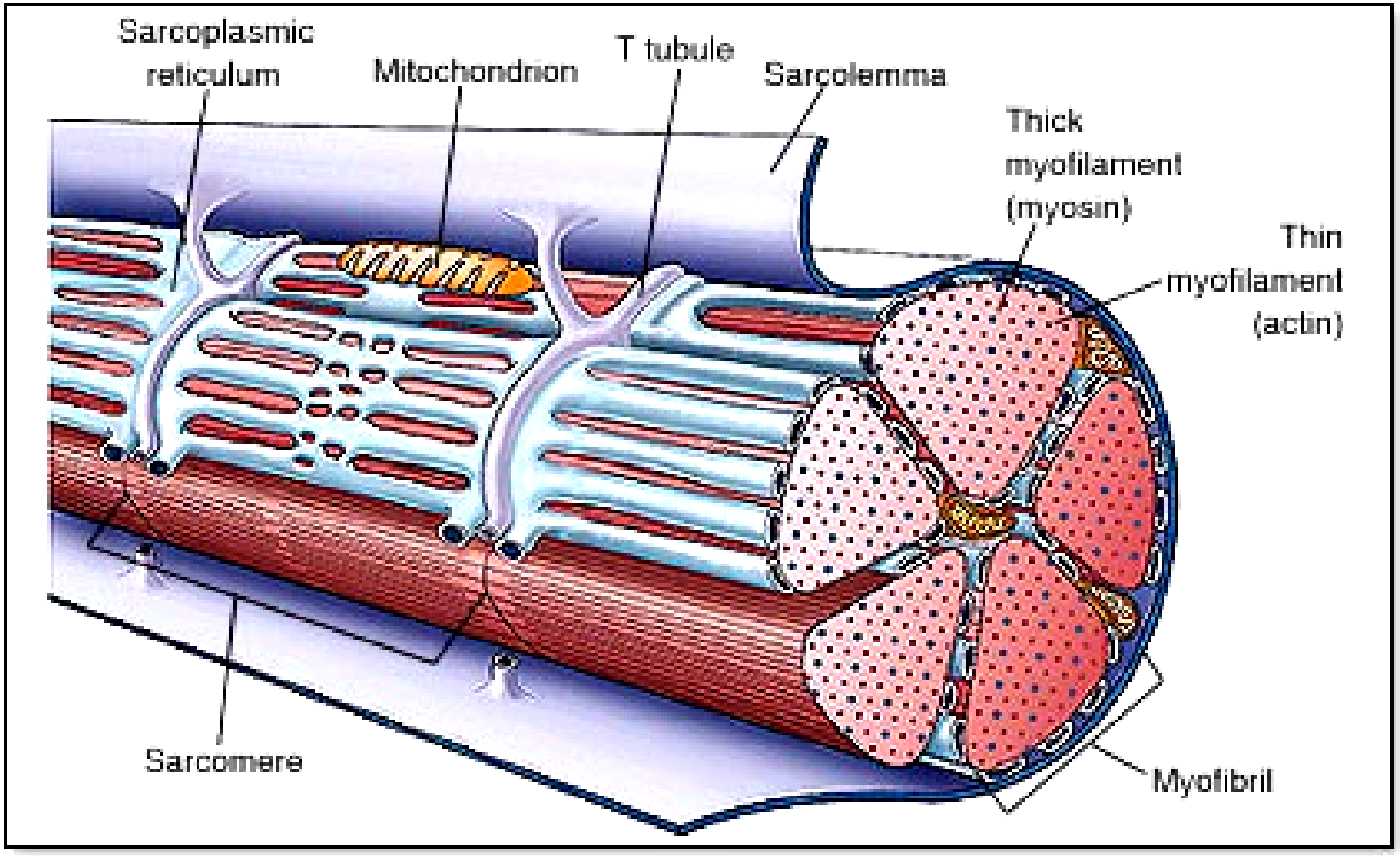
Muscle Contraction Cont'd

- The SR acts as a calcium storage reservoir for the facilitation of muscle contraction through the release of calcium through the calcium release channel.
- The brain sends an electrical signal along the muscle sheath and down the T-Tubule. This signal initiates calcium release.
- The binding of calcium within the myofilament arrangement allows for binding between the myofilaments resulting in the sliding of the filaments which is known as contraction.
- For relaxation, calcium is removed via the sarcoplasmic reticulum's calcium pump causing the myofilaments to move to their original positions resulting in the relaxation of the muscle

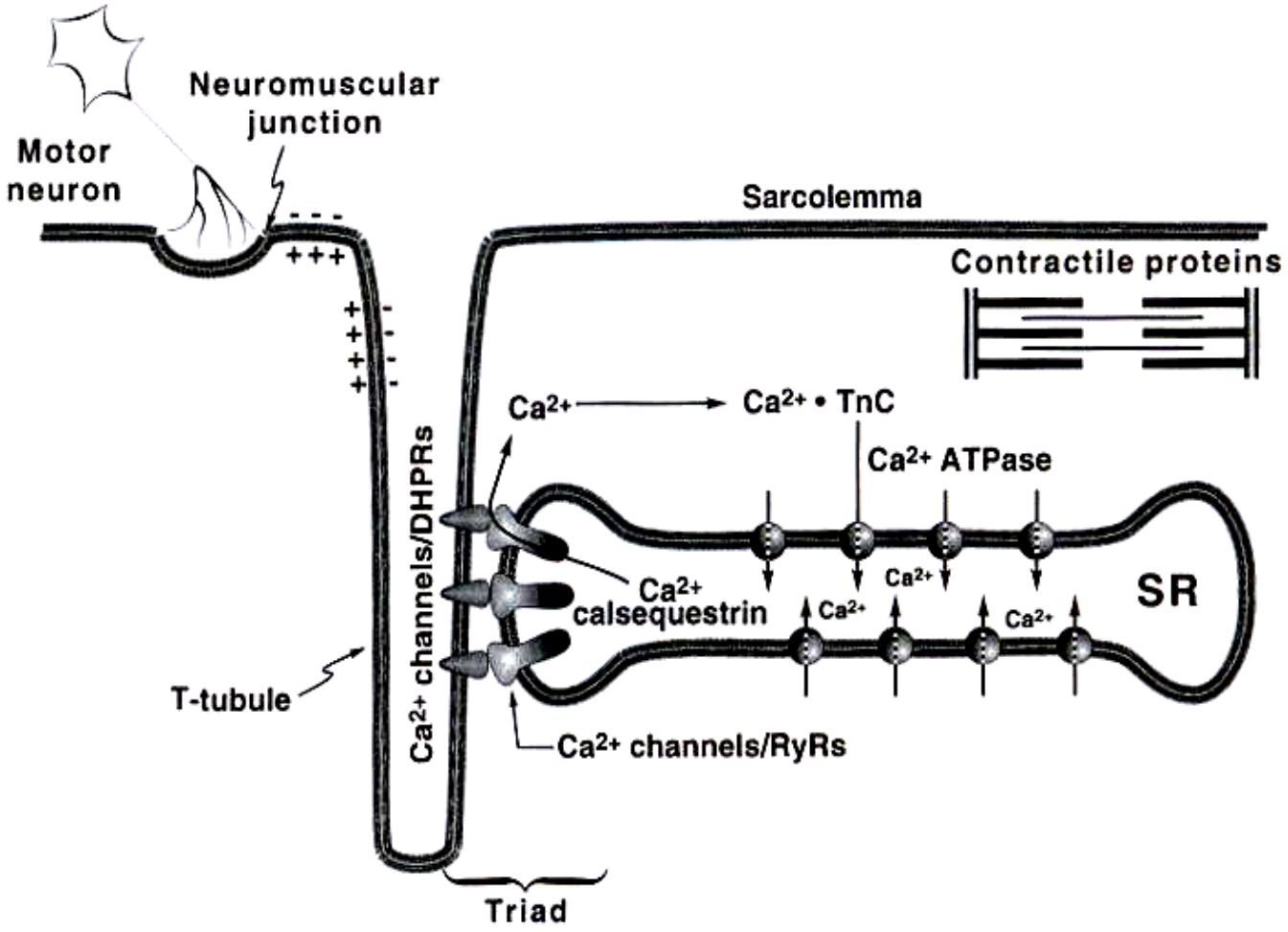
General skeletal muscle anatomy



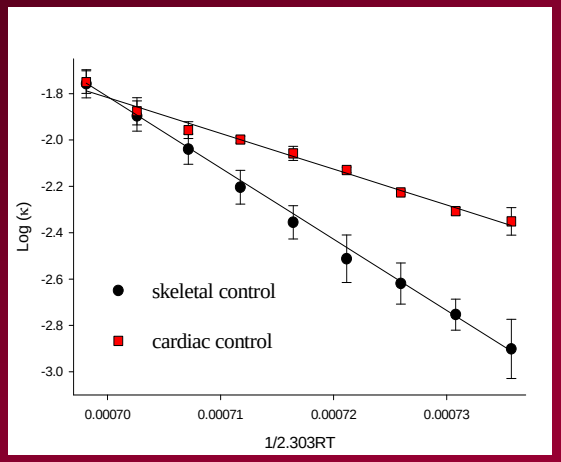
Muscle contraction is facilitated by Ca^{2+}

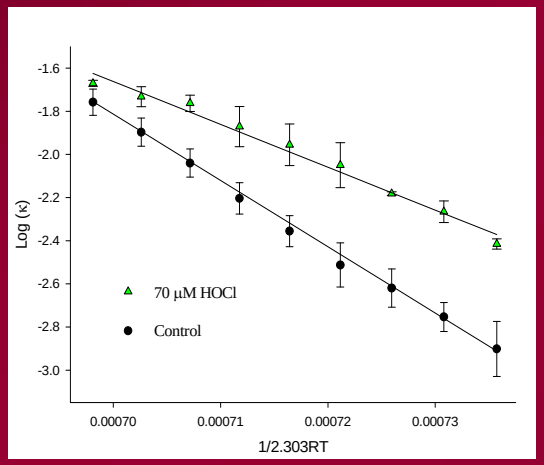


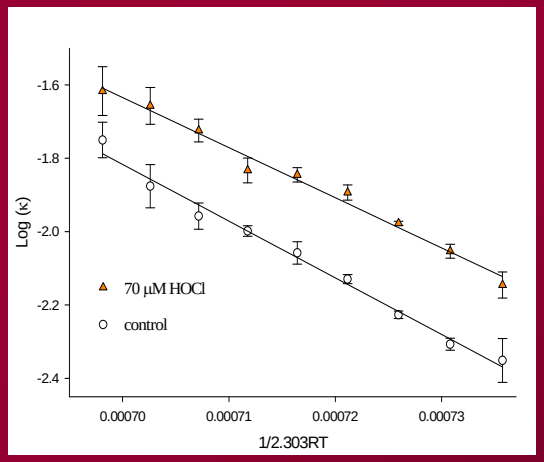
Excitation-Contraction Coupling



Skeletal/Cardiac Comparison







- Skeletal control

E_a = 30.7 +/- 2.1 kcal/mol

- Skeletal - 70 μM HOCL

E_a = 19.9 +/- 0.9 kcal/mol

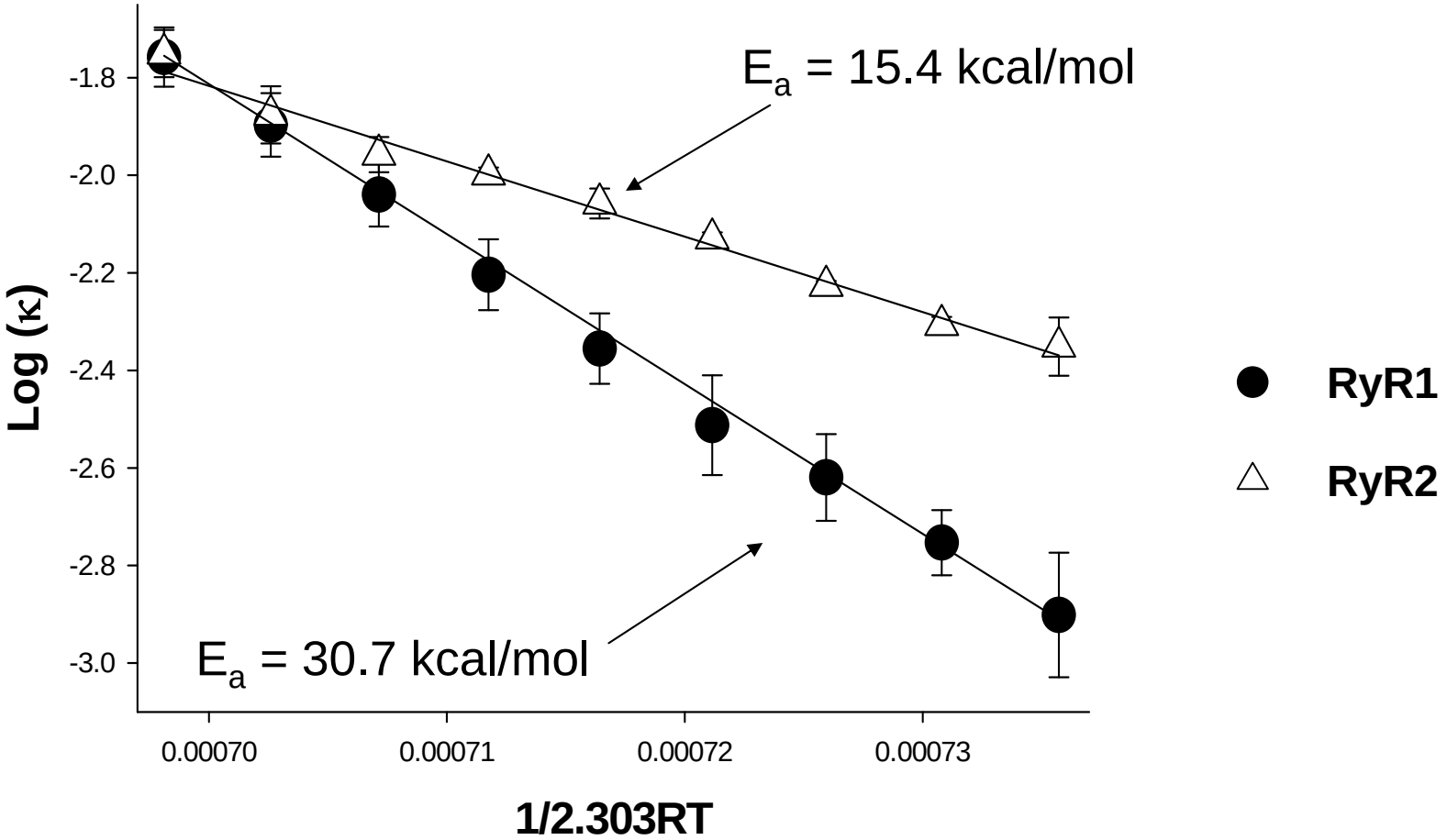
- Cardiac control

E_a = 15.4 +/- 0.5 kcal/mol

- Cardiac - 70 μM HOCL

E_a = 13.7 +/- 1.0 kcal/mol

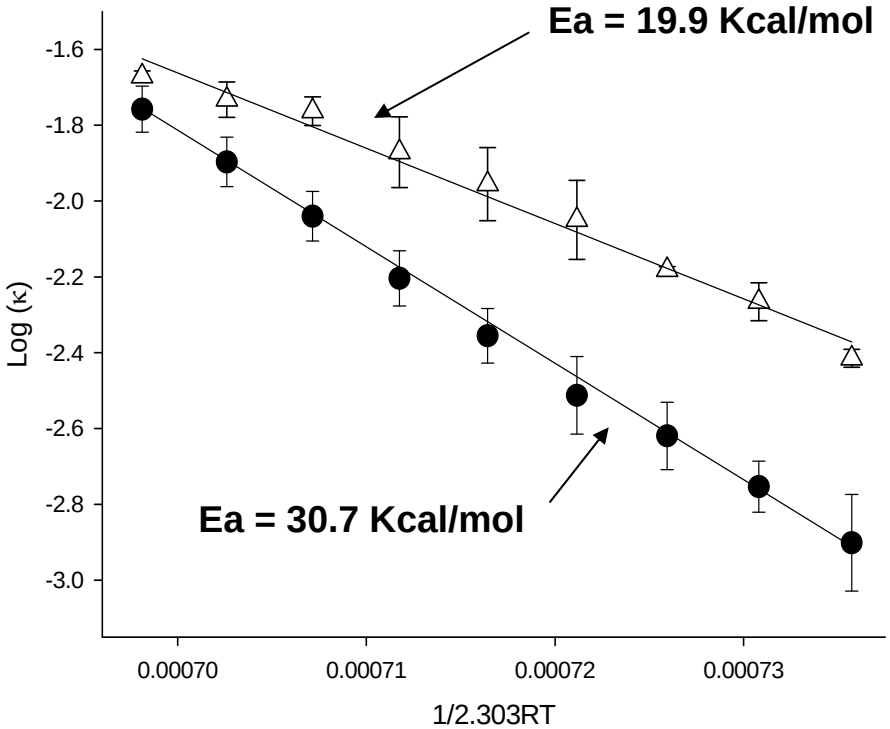
The E_a of RyR1 is twice that of RyR2



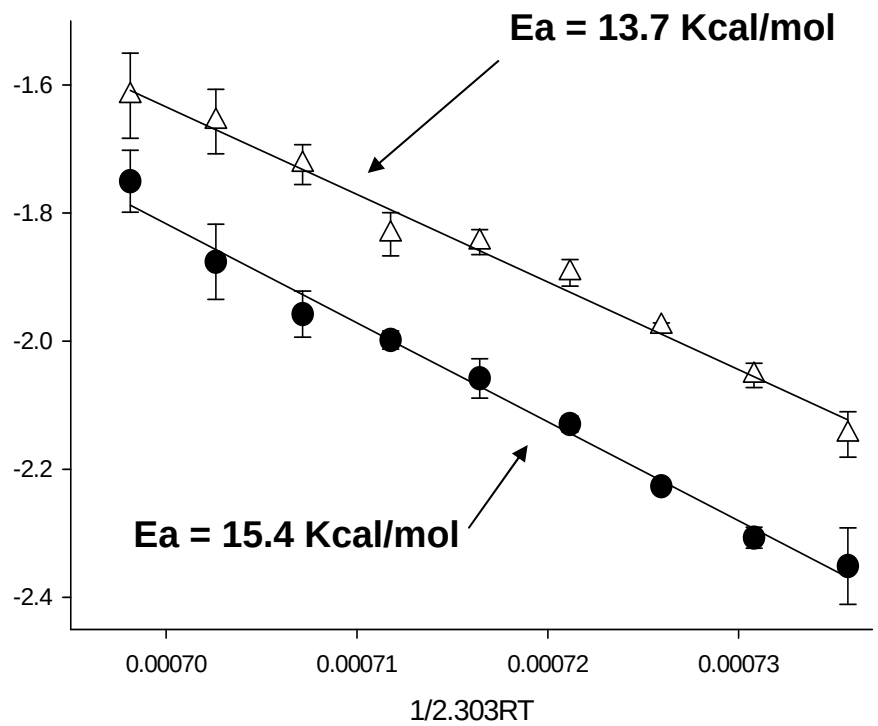
Arrhenius Eqn: $E_a = -RT \ln\left(\frac{k}{A}\right)$

Log(k) = E_a(1/2.303RT) + Log(A)

HOCL Significantly decreases the E_a of RyR1



Skeletal



Cardiac

△ **70 μM HOCl**

● **Control**

Question and Answers

- Make sure you understand what is being asked
- Repeat the question
- Avoid long digressions
- Don’t take the “bait”
- Not all questions are “great”
- OK to say “I don’t know”

Best advice

- The best talk is one you could do without slides
- Any talk is a professional networking opportunity
- Start early
  - Developing the story
  - Creating the slides
  - Practice followed by modification if needed
  - Practice followed by modification if needed
  - Practice
- Put yourself in the audience's shoes

“First Thursdays”

- Talking Science Feedback Sessions
  - Opportunity to get feedback on a sample of a presentation
    - Lunch time small group sessions
    - 10 minute sample followed by questions and feedback
    - OITE staff and peers provide the feedback
    - Targeted towards the type of talk that you intend to eventually give
    - First Thursday of every month
- Look for the full description and information on registering coming soon on the OITE website

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