



# Oral Presentations:

How to translate data into an oral presentation

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6.021J: Quantitative Physiology

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Massachusetts Institute of Technology

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# Technical Presentations

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- Primary goal is to **explain** a technical finding (the message is primarily oral).
- Slides provide visual reinforcement of the spoken message.
- Bad slides can distract the audience by being irrelevant, confusing, or inconsistent.



# Step 1: Complete your project

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- Organize your data
- Locate trends in your data and isolate specific results
- Distill information to key points

Very similar to preparing a written report!



## Step 2: Plan the presentation

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- Who is the audience?
- How much time do you have?
  - Budget under time
- Equipment or room constraints?



## Step 3: Draft the presentation

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- Sketch candidate slides
- Combine slides to create story-board
- Develop 2-3 bullet points for each slide
- Add slides to fill in gaps, remove slides to eliminate redundancy



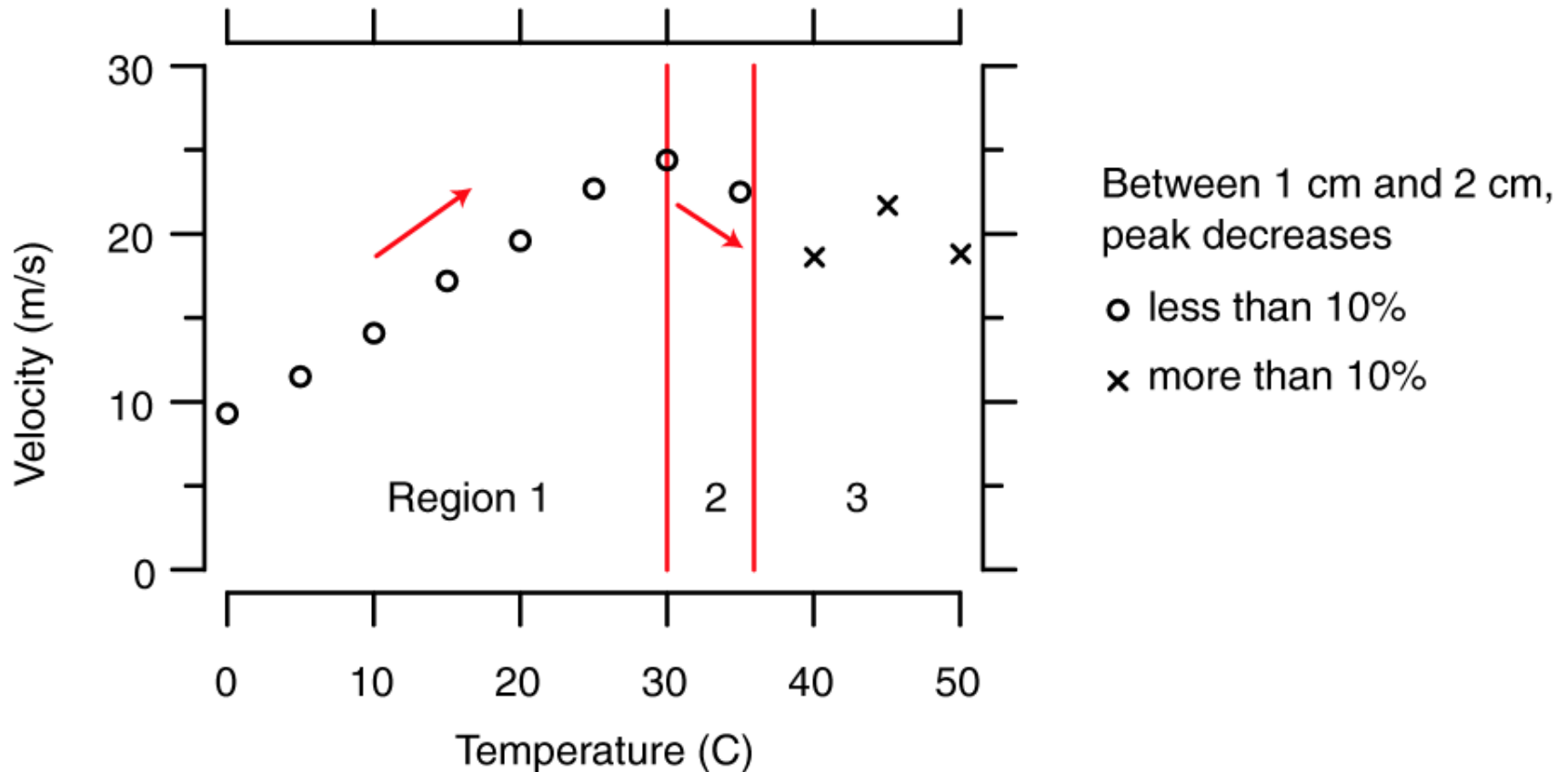
# Results

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- Develop 2-3 relevant figures
- Distill information about each figure into 2-3 bullet points
- Include key words in figures to remind yourself (and audience) of each bullet point
- Figure should allow listener to fill in gaps due to lapses in attention

T (C)	$t_{p1}$ (ms)	$t_{p2}$ (ms)	velocity (m/s)
0	1.52	2.60	9.25
5	1.15	2.02	11.49
10	0.89	1.60	14.08
15	0.71	1.29	17.24
20	0.56	1.07	19.60
25	0.47	0.91	22.72
30	0.40	0.81	24.39
35	0.37	0.81	22.72
40	0.31	0.85	18.51
45	0.56	1.01	22.22
50	0.58	1.11	18.86

# Three Effects of Temperature on Propagated Action Potentials



Temperature  $\uparrow$  then

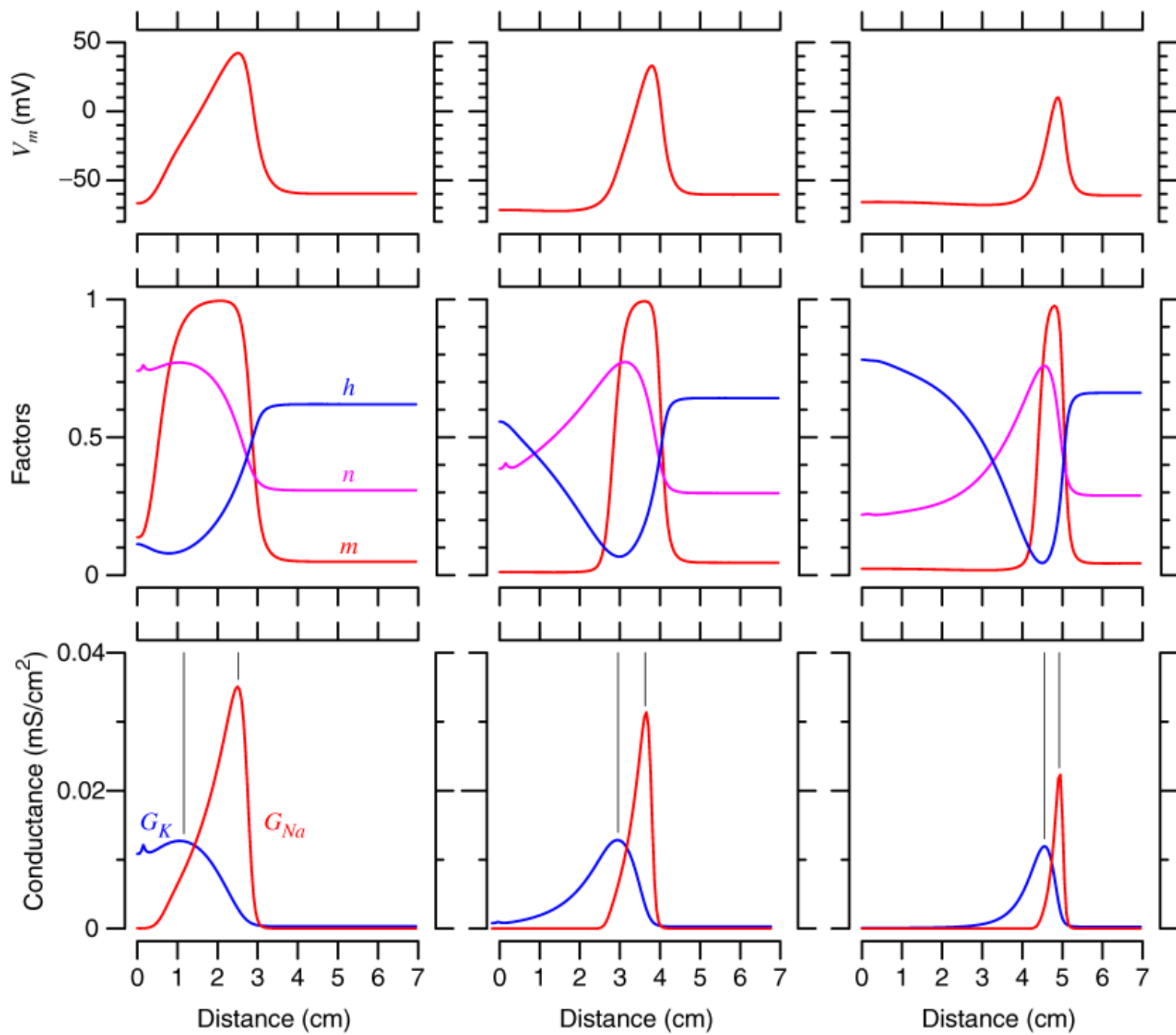
{	Velocity $\uparrow$	in Region 1
	Velocity $\downarrow$	in Region 2
	Propagation Fails	in Region 3



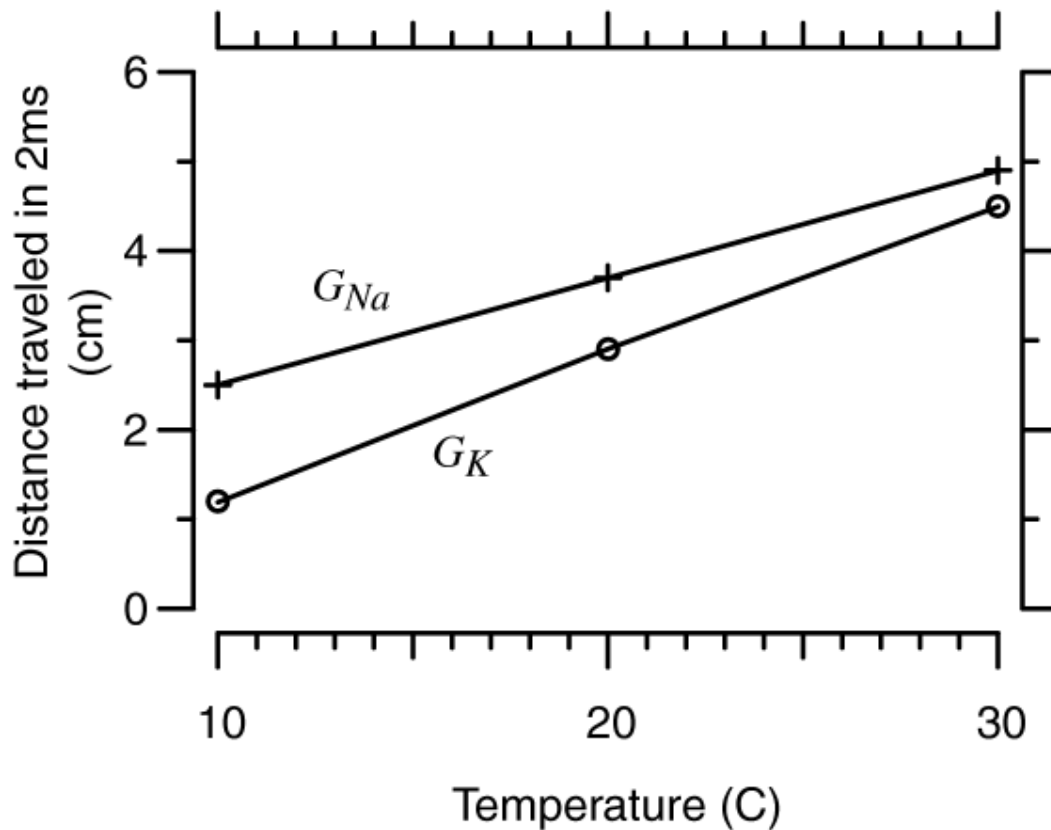
10° C

20° C

30° C



# Increasing Temperature Speeds Sodium and Potassium Conductances



... but rate of increase greater for potassium!

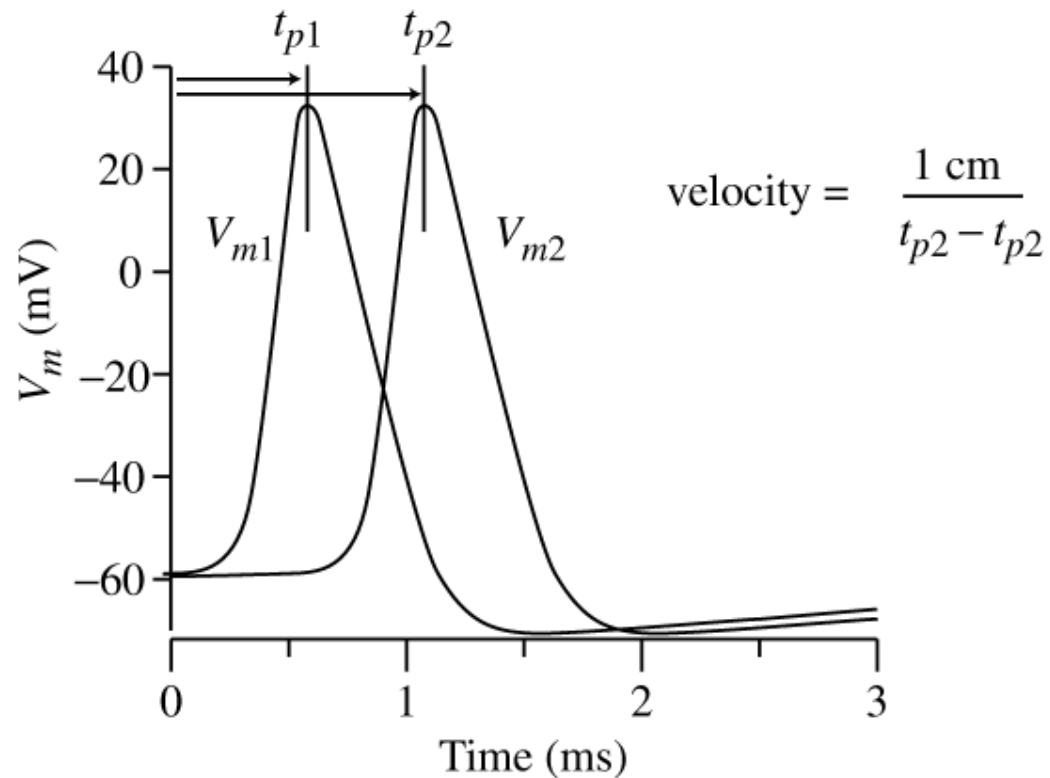
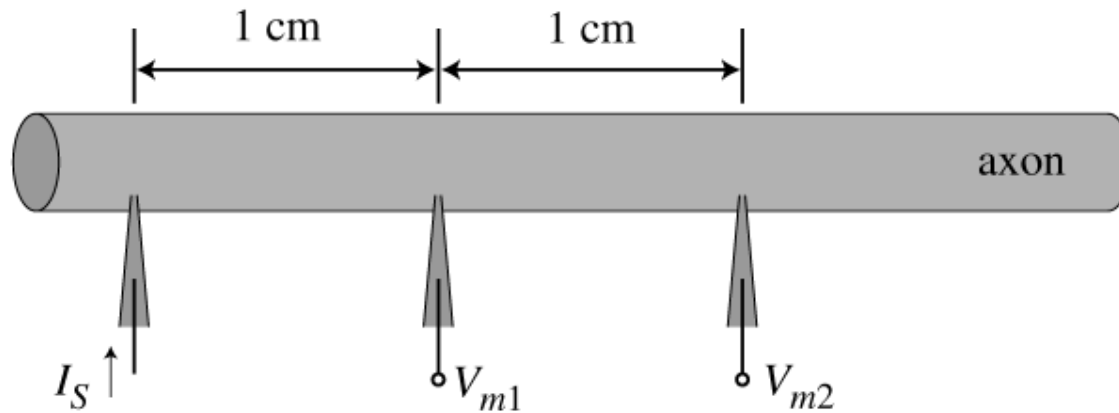


# Methods

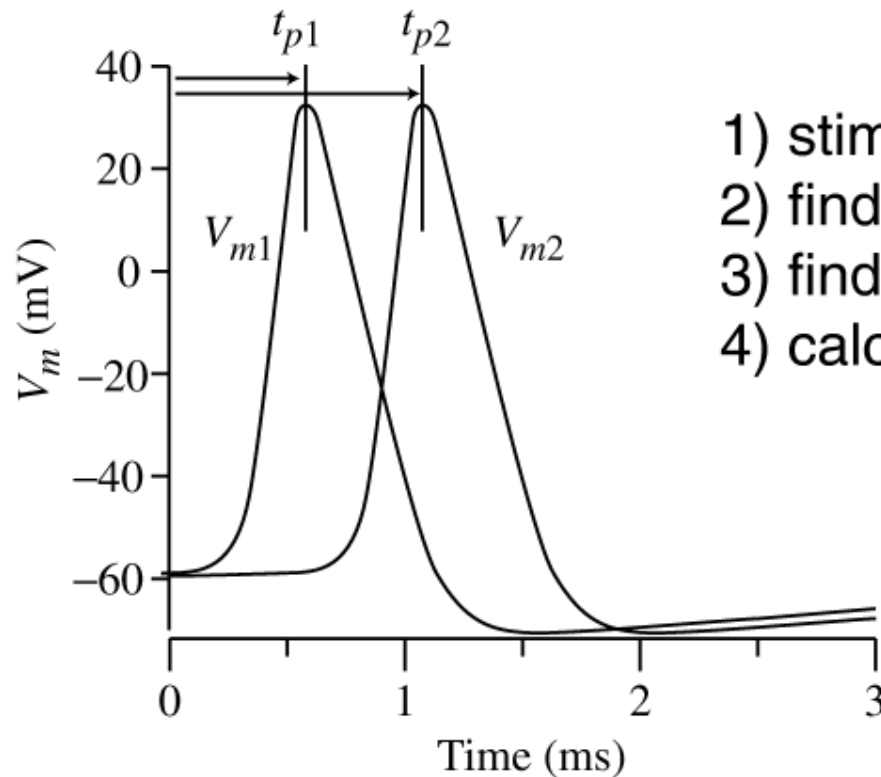
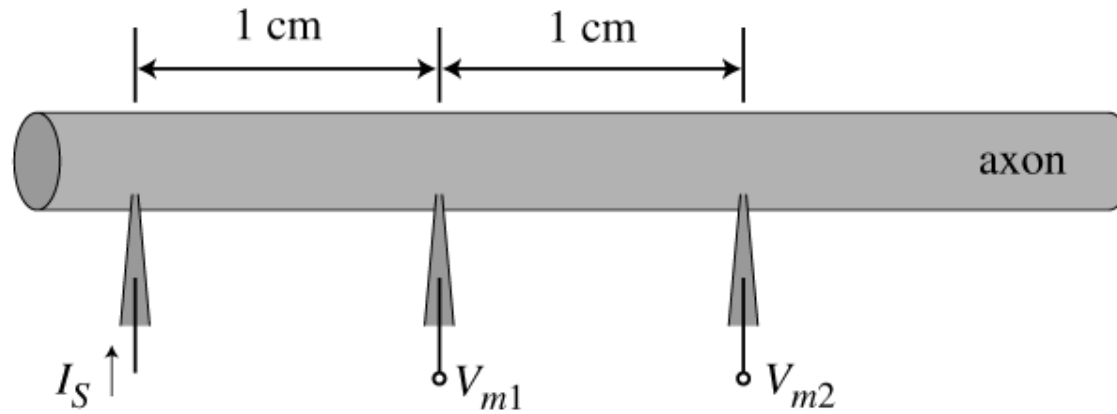
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- Distill Methods to key procedures
  - HH will use theoretical methods
- Numbered list is fine
- Do not show equations (unless they are extremely simple and friendly)

# Methods: Calculating Velocity of Propagation



# Methods: Calculating Velocity of Propagation



- 1) stimulate with current  $I_S$
- 2) find  $t_{p1}$ , time to peak at 1cm point
- 3) find  $t_{p2}$ , time to peak at 2cm point
- 4) calculate

$$\text{velocity} = \frac{1 \text{ cm}}{t_{p2} - t_{p1}}$$



# Discussion

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- Limit discussion points to most important details (related to Results)

## Summary

- Increasing temperature increases velocity of propagation ... but only for a range of low temperatures.
- Increasing temperature above a critical temperature **blocks** the propagation of action potentials.
- Thermal block results because inactivation processes increase faster with temperature than do activation processes.



# Introduction

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- Explains the goals and purpose of the project
- Ideally, these goals and purpose relate to the Discussion points



## Introduction

Question: Will action potentials propagate faster at higher temperatures?

Pro: Rates of many chemical reactions increase with increasing temperature. Therefore it seems reasonable that the electro-chemical reactions underlying neural conduction would occur more rapidly at higher temperatures.

Con: However, excessive heat leads to stroke, which represents profound neurological failure.

Goal: Develop a mathematical model for effects of temperature based on the Hodgkin-Huxley model of neural excitation.



# Title Slide

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- Titles
  - Informative
  - Specific
  - Understandable at a glance
- Your name and partner's name
- Date



## Step 4: Edit the Slide Show

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- Edit slides for coherence
- Check for balance and coherency in story-board
- Spell-check and proofread



## Step 5: Prepare for Q&A

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- Anticipate questions not covered in the presentation
- Brainstorm, considering:
  - Audience
  - Scope
- OK to acknowledge gaps in knowledge



## Step 6: PRACTICE

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- Make sure that you meet the time limit
- Practice speaking slowly
- Know your quirks
- Use visuals as cues, not note cards
- Know how to use the equipment



# Step 7: The Big Day

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- Arrive early
- Check equipment
- Check voice projection
  - How loudly do you need to speak?
- Have a printed copy of your presentation + backup
- If you get lost, stop and regroup.



# Presentation Priority Given to:

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- Sophomores (CIM)
- Must be available on 12/6 to present
- Both partners agree to present
- Successfully-written frog lab
- Undergrads over grad students



# Presentation Details

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- Presentations given on 12/6
  - Between 9am and 11am
  - 15 minute talk + 5 min Q&A
- All slides loaded on course computer prior to 9am
- Rough draft = all slides completed, including bullet points & transitions
- Writing clinic = mock presentation





# Presentation Tips

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- Length:
  - 7-8 slides for 15 minute presentation
- Font Size:
  - Title                      44 pt
  - Subtitles                  28 pt
  - Other text                20 pt



# Tips, cont'd

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- **Visual Elements:**

- Should not interfere with text
- Use animation sparingly
- Understandable at a glance

- **Color Scheme**

- Use a light background with dark text if the lighting is dim
- Keep colors consistent

# ■ HH Grade Sheet: Presentations

## ⌘ First draft (10%). Critique (5%).

### **Presentation Structure (15%).**

A: all information is well organized in proper sections with smooth transitions between sections. Visual elements were effective.

B: overall organization is understandable but could be improved in one section of the presentation or in minor instances throughout the presentation.

C: repeated organizational problems that interfere with presentation coherence. Poor presentation of visual information.

### **Delivery of Presentation (10%).**

A: delivery was clear with appropriate use of non-verbal gestures. Verbal articulation and timing were appropriate.

B: several awkward moments or slips in verbal clarity.

C: repeated awkwardness in presentation, and/or repeated problems with verbal clarity. Presentation too long.

## ⌘ Clarity and Conciseness of Technical Information (10%)

A: technical flow is clear: introduction motivates a topic, results focus on that topic, conclusions follow from results, relevant methods are described.

B: no more than one major lapse in technical clarity.

C: more than one major lapse in technical clarity.

### **Conceptual Correctness (20%).**

A: interpretations of results are technically correct.

B: interpretations are not well supported.

C: major errors.

### **Insightfulness (30%).**

A: Recognized an interesting issue and developed at least one way to understand it.

B: Thorough description of WHAT happened without a clear understanding of WHY it happened.

C: Confusion about what happened