

*Giving an effective presentation:  
Using Powerpoint and structuring a scientific talk*

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based on a presentation at the  
2005 Pew Foundation meeting by

**Susan McConnell**

Department of Biological Sciences  
Stanford University

We may not be experts at public speaking,  
but we are all experts at listening to talks

What do you want from a talk?

Before planning your talk think about its purpose, the audience you will be talking to, and the setting.

Don't assume the audience will all be experts.

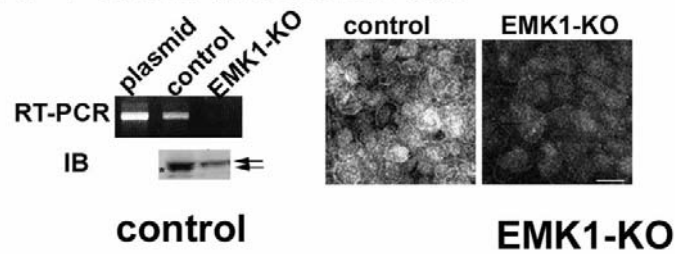
Never underestimate your audience!

Check on the time that has been allotted to you.

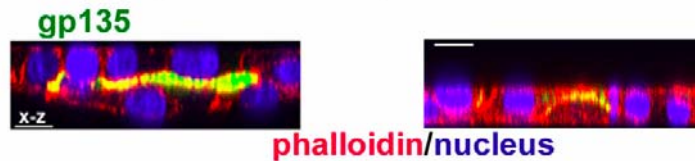
How big is the room?

What do you think of the following slide?

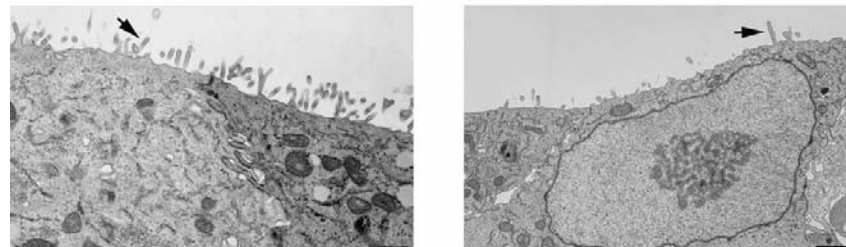
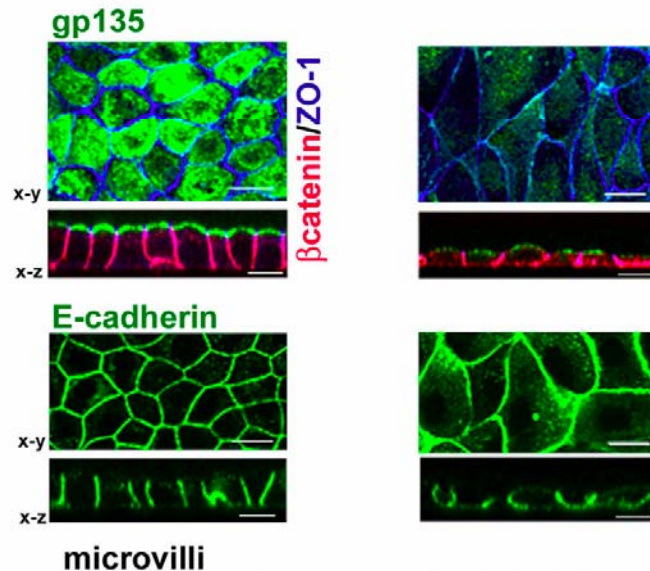
## A EMK1-knockdown



## B collagen overlay



## C Ca-switch



Emk1 knockdown inhibits lumen formation in MDCK cells:

-RT-PCR: EMK1 is effectively knocked down in MDCK cells 24 hours after transfection with P-SUPER (control) or P-SUPER-siEMK1 plasmid; knockdown confirmed on the right with antibodies to EMK1.

- Collagen overlay assay: cells cultured 24 h on collagen I before being overlaid with additional collagen on the apical surface, analyzed 24 h later. Note the lack of lumen in EMK1-KO cultures.

- Ca switch: control or EMK1-KO cells were plated in low Ca medium 24 h upon transfection with pSUPER or pSUPER-KO. After 12 h, cultures were switched to normal medium for 24 h. Transmission EM of cells sectioned perpendicular to the substratum shows lack of microvilli in EMK1-KO cells.

Of course, it is far too confusing and a clear take-home message does not come across !

This presentation will take you through a strategy for presenting the data in a clear and logical way.

# Powerpoint basics:

## 1. What font to use

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Use a Sans Serif font:

This font is Arial.

This font is Comic Sans.

**This font is Papyrus.**

Serif fonts take longer to read...

This font is Times New Roman.

This font is Courier.

This font is Didot.



# Powerpoint basics:

## 1. What font to use

---

Some fonts look really good in **boldface**:

Arial vs. **Arial bold**

Comic Sans vs. **Comic Sans bold**

Papyrus vs. **Papryus bold**

# Powerpoint basics:

## 1. What font to use

---

Type size should be 18 points or larger:

18 point

20 point

24 point

28 point

36 point

\* References can be in 14 point font

## Powerpoint basics:

1. What font to use

---

AVOID USING ALL CAPITAL LETTERS  
BECAUSE IT'S REALLY HARD TO READ!

# Powerpoint basics:

## 2. Color

---

Dark letters against a light background work.

# Powerpoint basics:

## 2. Color

---

Light letters against a dark background also work.

# Powerpoint basics:

## 2. Color

---

Many experts feel that a dark blue or black background works best for talks in a large room.

## Powerpoint basics: 2. Color

---

Dark letters against a light background are best for smaller rooms and for teaching.

## Powerpoint basics: 2. Color

---

Avoid red-green combinations because a significant fraction of the human population is red-green colorblind.



## Powerpoint basics: 2. Color

---

Avoid red-green combinations because a large fraction of the human population is red-green colorblind.

Lots of people can't read this -  
and even if they could, it makes your eyes hurt.

# Powerpoint basics:

## 2. Color

---

Other color combinations can be equally bad:

Other color combinations can be equally bad!

# Powerpoint basics:

## 2. Color

---

View your slides in grayscale to ensure that there is adequate color contrast in each slide.

Other color combinations can be equally bad!

# Powerpoint basics:

## 3. Layout

---

Keep the layout and style as consistent as possible

Every slide should have a heading.

Sentences are preferred if it's possible to make a statement.

# Powerpoint basics:

## 3. Layout

---

Limit text blocks to no more than two lines each.

# Powerpoint basics:

## 3. Layout

---

The reason for limiting text blocks to two lines is that when the text block goes on and on forever, people in the audience are going to have to make a huge effort to read the text, which will preclude them from paying attention to what you are saying. Every time you lose their focus, your presentation suffers!

# Powerpoint basics:

## 3. Layout

---

Lists should contain no more than 3 items:

- Item 1
- Item 2
- Item 3

# Powerpoint basics:

## 3. Layout

---

It is often effective to “unveil” your list one by one:

You can do this using the “Slide show” - “animations” - “custom” - option

- Point 1
- Point 2
- Point 3



# Powerpoint basics:

## 3. Layout

---

Avoid sublists!

- Item 1
  - Item 1a
  - Item 1b
  - Item 1c
- Item 2
  - Item 2a
  - Item 2b
- Item 3

# Powerpoint basics:

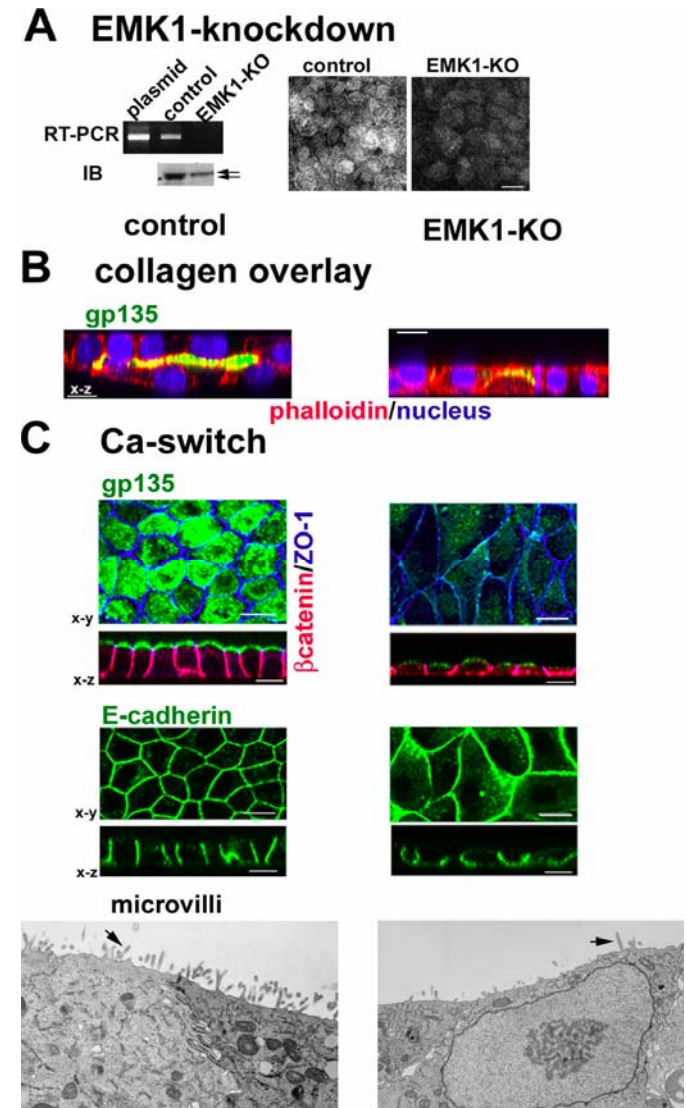
## 3. Layout

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Be generous with empty space.

# Powerpoint basics: 3. Layout

If you try to cram too much into a slide, and place things too close to the sides, they can get cut off if you're using a poor projector. In any case, the slide looks all cluttered and junky.



# Powerpoint basics:

## 4. Style

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Try your best to include a simple image on every slide.

# Powerpoint basics:

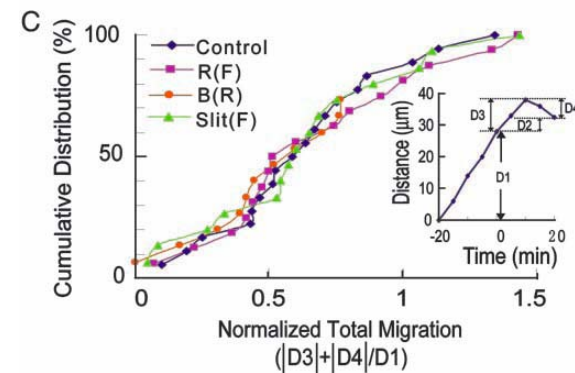
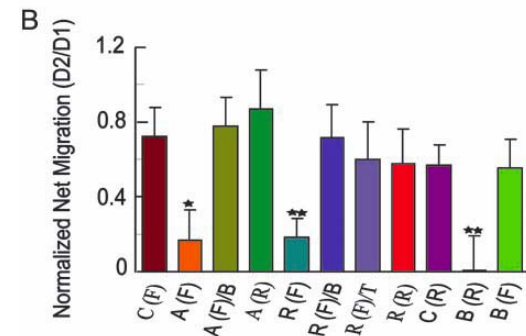
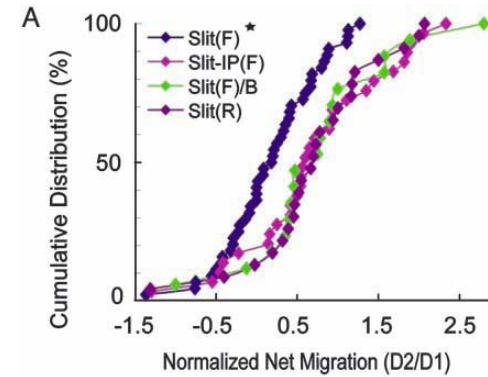
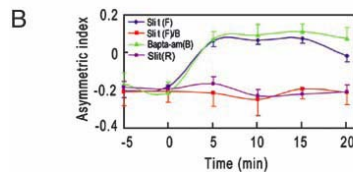
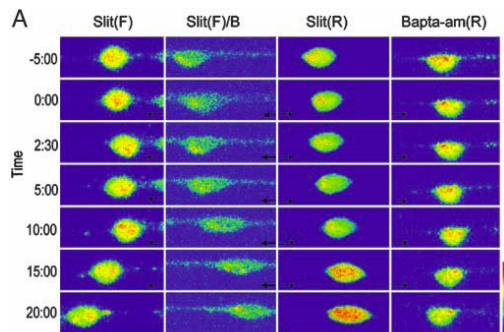
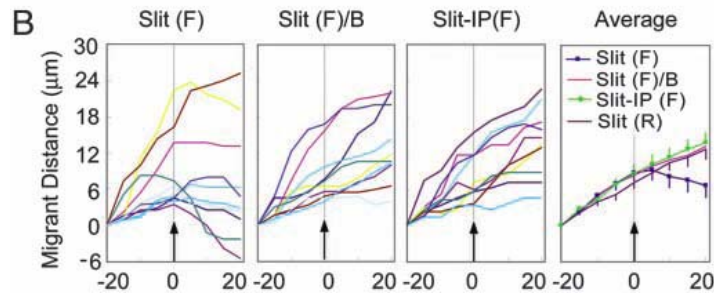
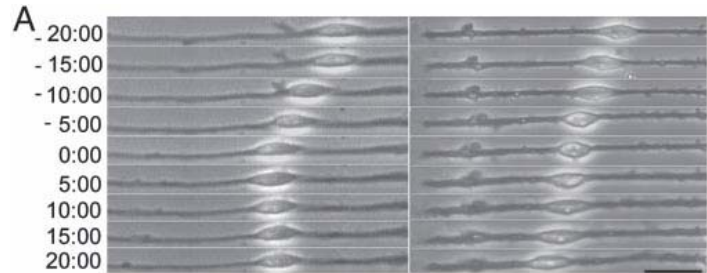
## 4. Style

---

Limit the number of items on each slide.

Each slide should make just one or two points!

# Powerpoint basics: 4. Style



Arrrgh!

# Powerpoint basics:

## 4. Style

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Don't try to show too many slides.

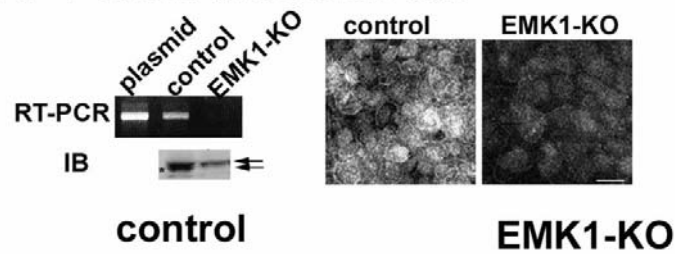
Often, less is more.

It's very easy to use Powerpoint really badly

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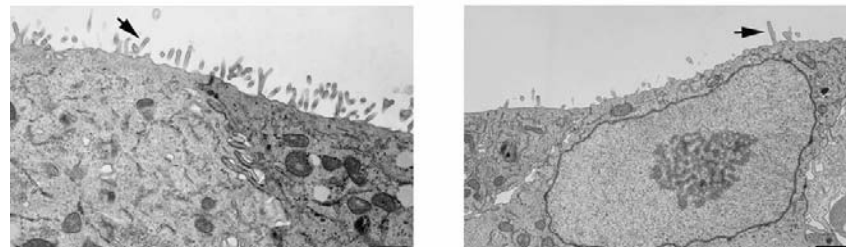
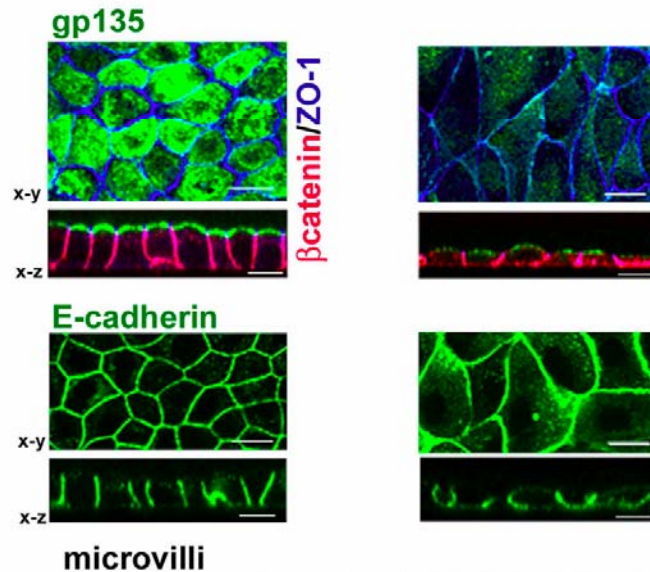
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Emk1 knockdown inhibits lumen formation in MDCK cells:

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It takes some work and forethought  
to use Powerpoint well

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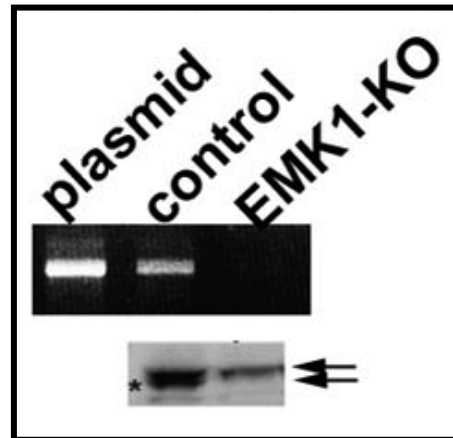
Let's break down the previous slide  
into its minimum essential components

# EMK1 / Par1 can be knocked down in MDCK (kidney) cells using siRNA methods

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RT-PCR

Western

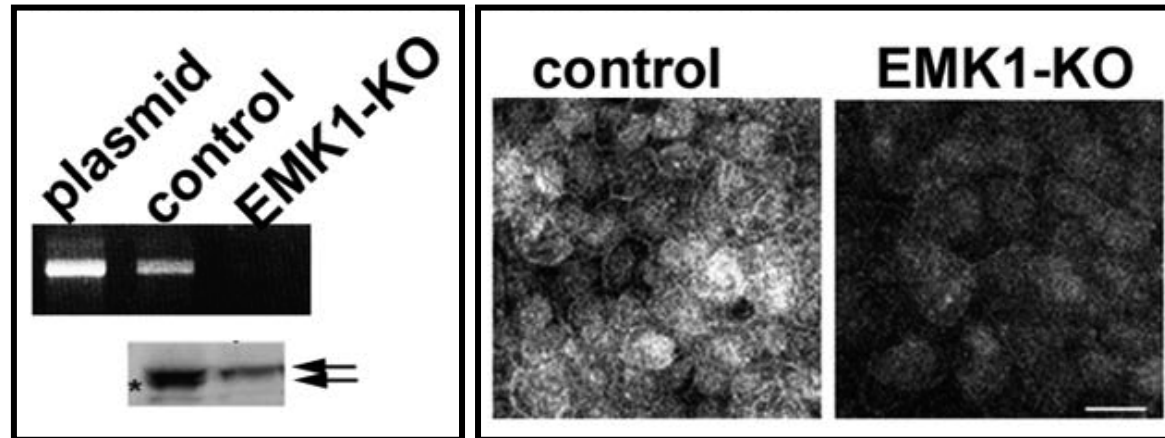


# EMK1 / Par1 can be knocked down in MDCK (kidney) cells using siRNA methods

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RT-PCR

Western

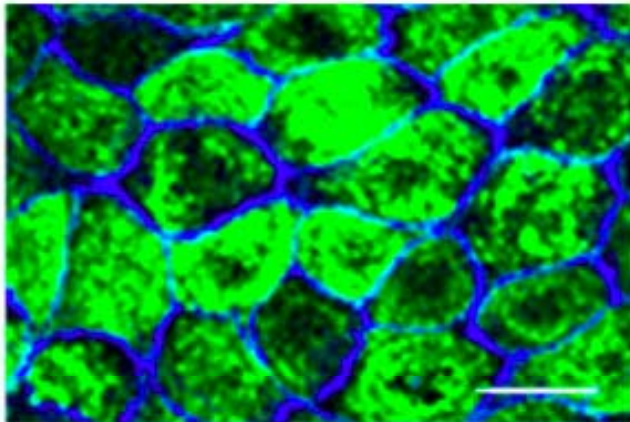


MDCK cells

# MDCK cells form a lumen following a change in extracellular $[Ca^{++}]$

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MDCK cells



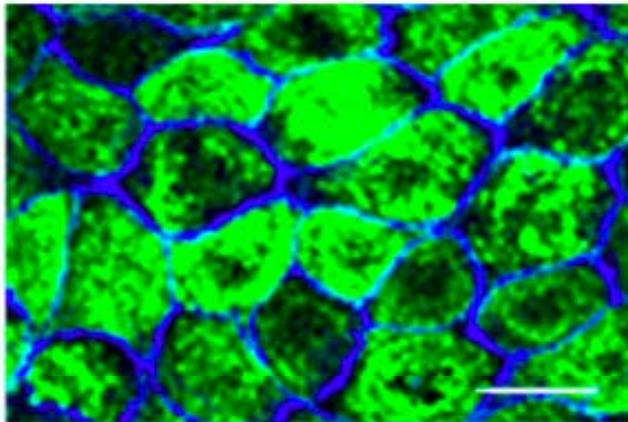
← Surface view from lumen

gp135     $\beta$ -catenin    ZO-1

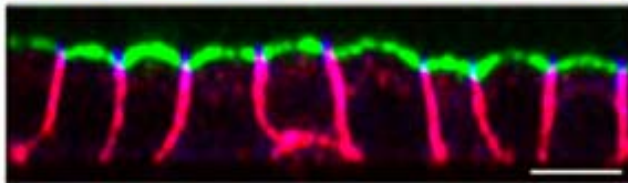
# MDCK cells form a lumen following a change in extracellular $[Ca^{++}]$

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MDCK cells



← Surface view from lumen



← Side view of lumen

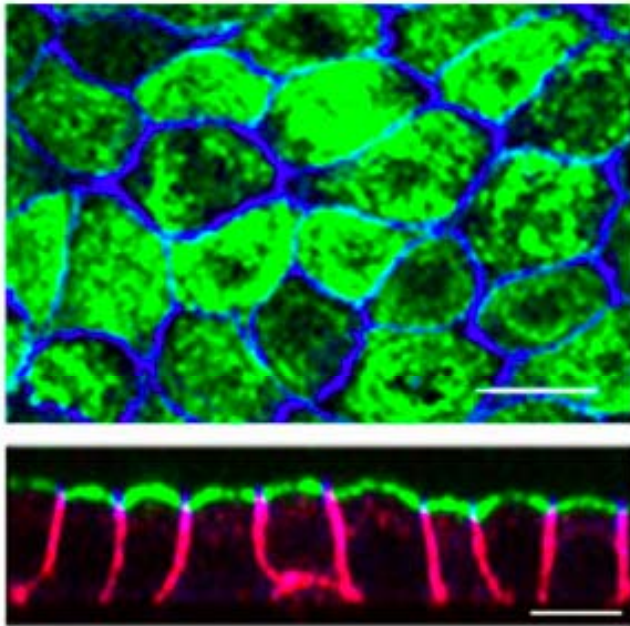
gp135     $\beta$ -catenin    ZO-1



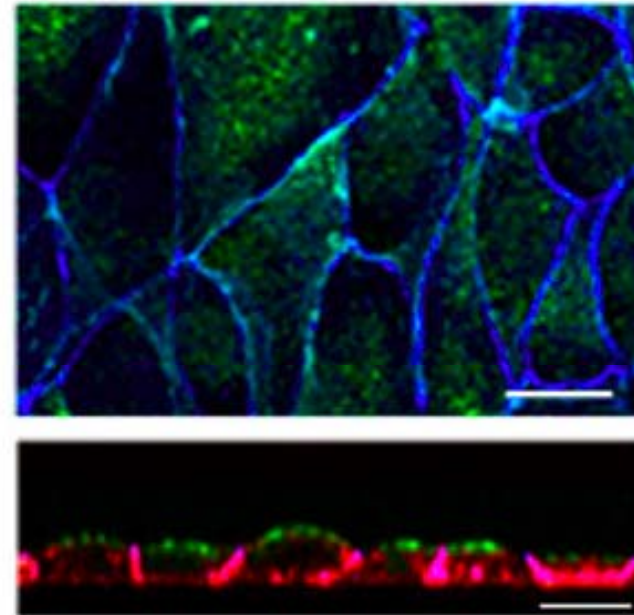
# Lumen formation is blocked in EMK1 knockdown cells

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MDCK cells



EMK1 knockdown



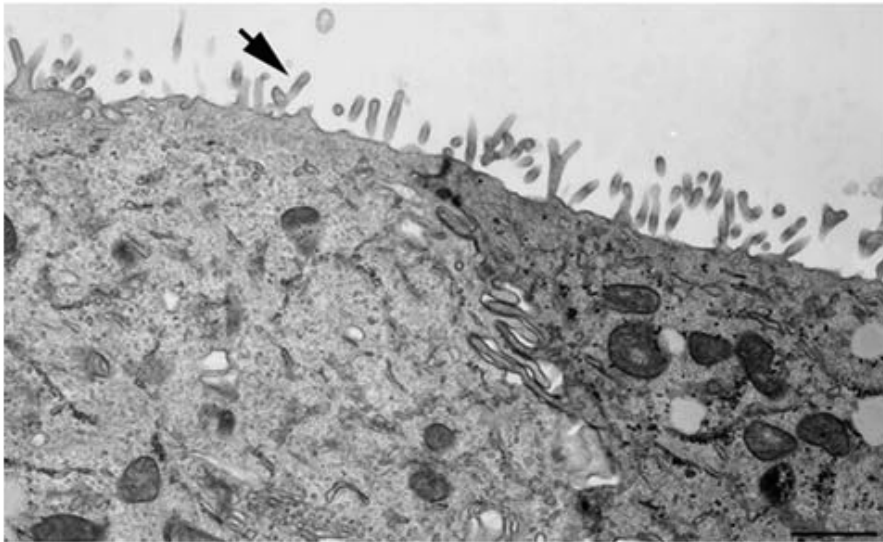
gp135     $\beta$ -catenin    ZO-1



# EMK1 knockdown cells also fail to form microvilli

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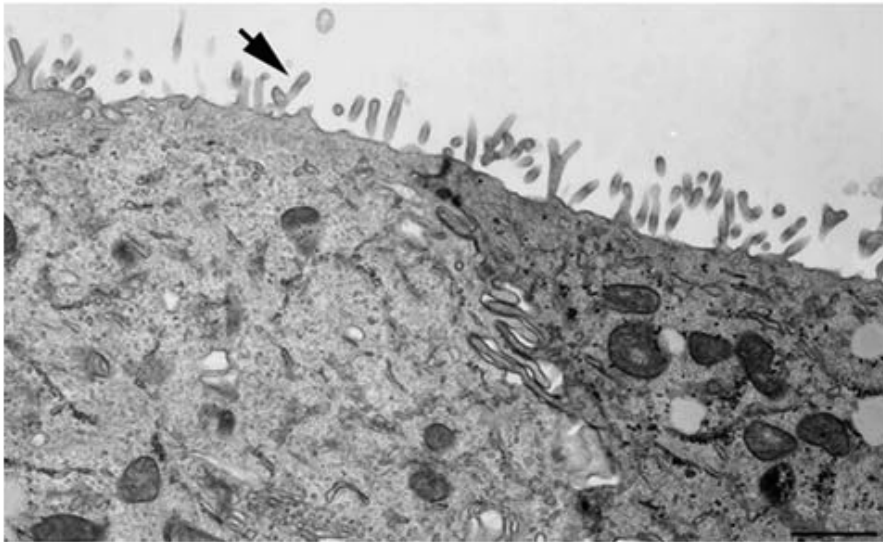
MDCK cells



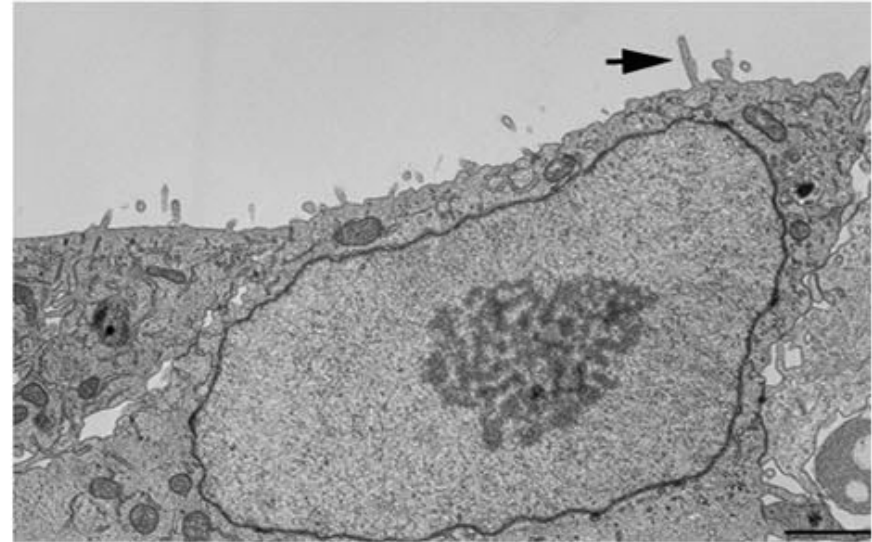
# EMK1 knockdown cells also fail to form microvilli

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MDCK cells



EMK1 knockdown

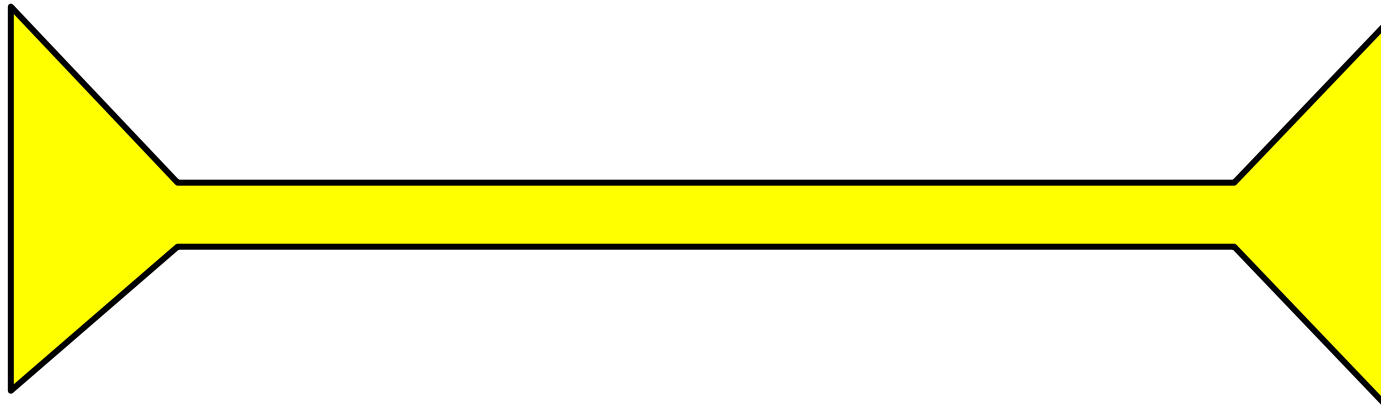


The structure of a good talk: start broad,  
get specific, and end broad

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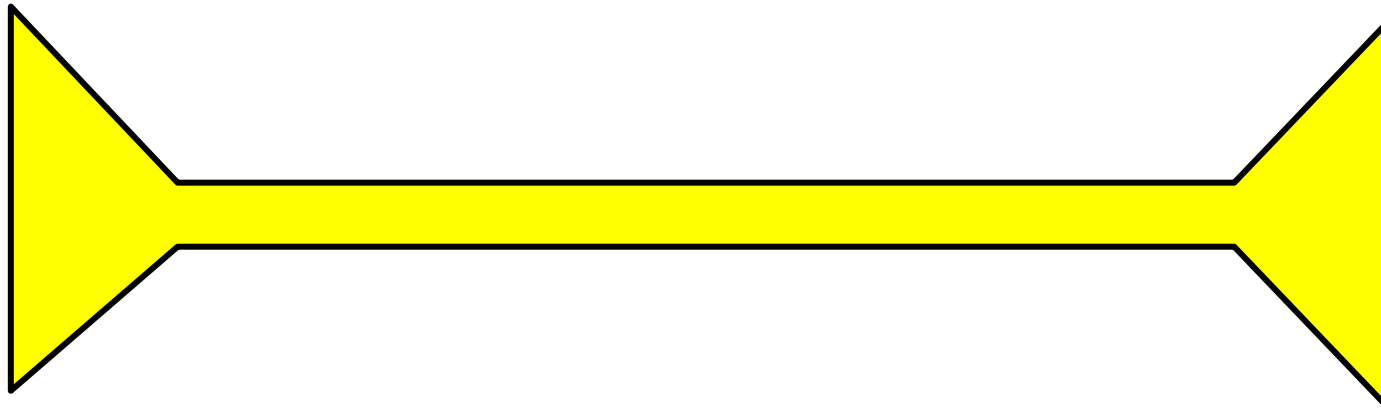
The structure of a good talk: start broad,  
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---



The structure of a good talk: start broad,  
get specific, and end broad

---



Start with the biggest questions  
and get progressively more specific

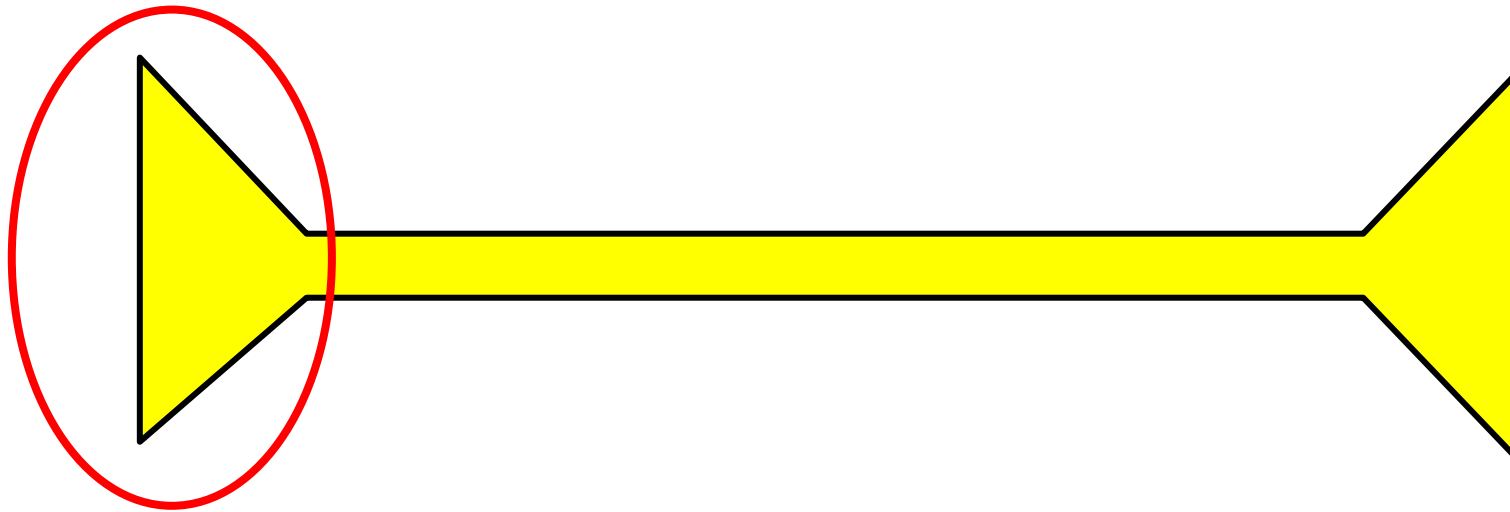
A powerful tool in a talk is a "home slide"

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Design and introduce a "home slide" that you'll come back to at each major transition in your talk.

A powerful tool in a talk is a "home slide"

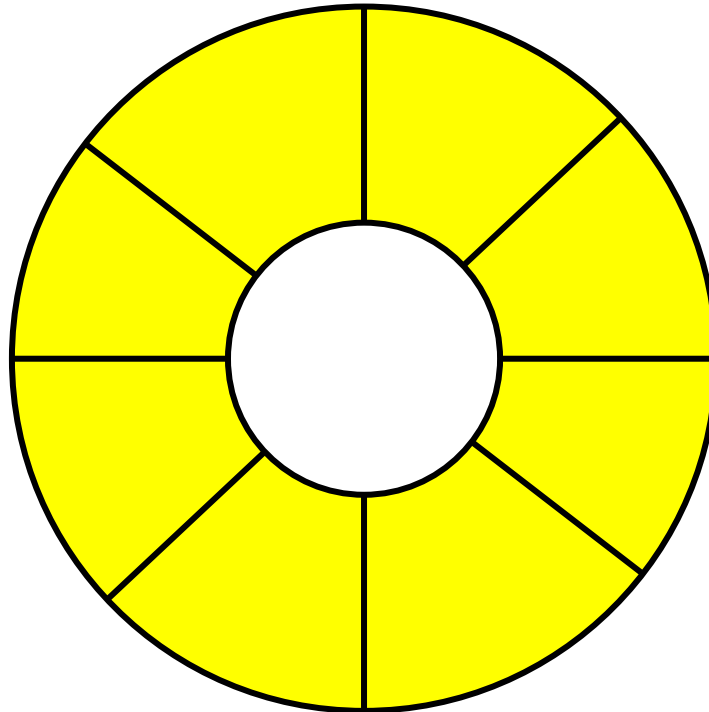
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Now we'll build an introduction and a home slide that puts the previous data into context.

Our bodies are full of tubes

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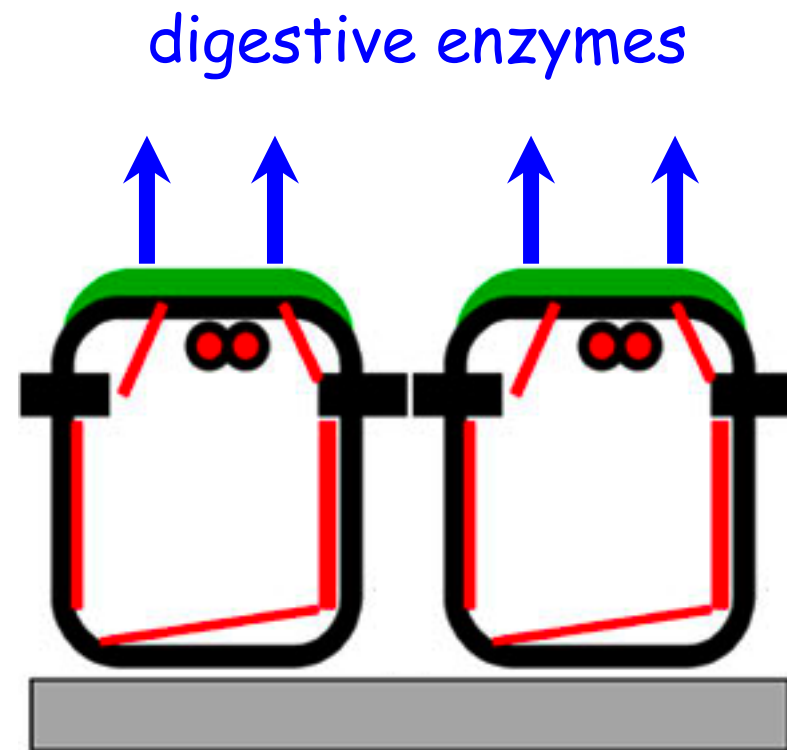




# Our bodies are full of tubes

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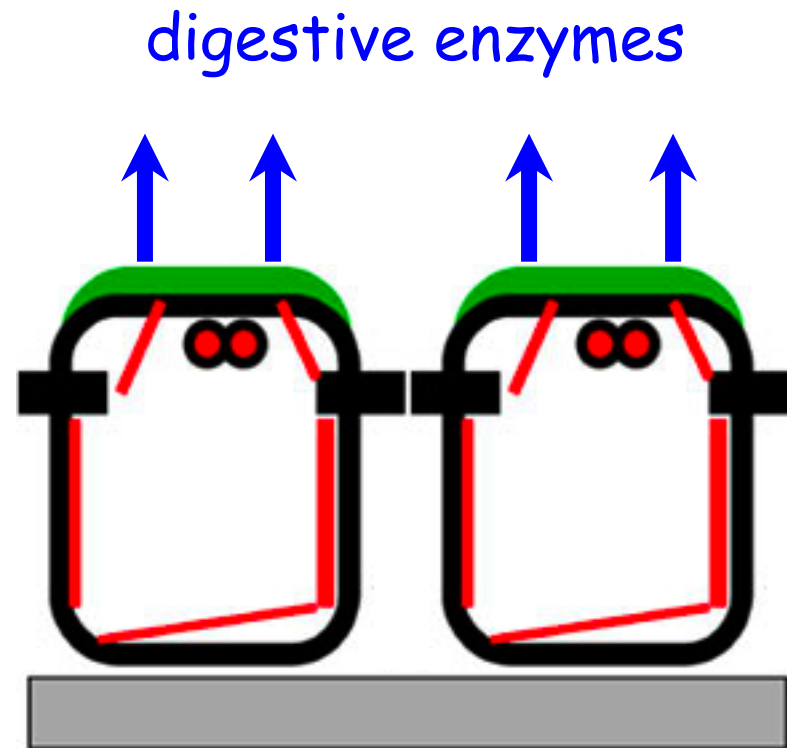
Intestine:



# How do cells become polarized and form a lumen?

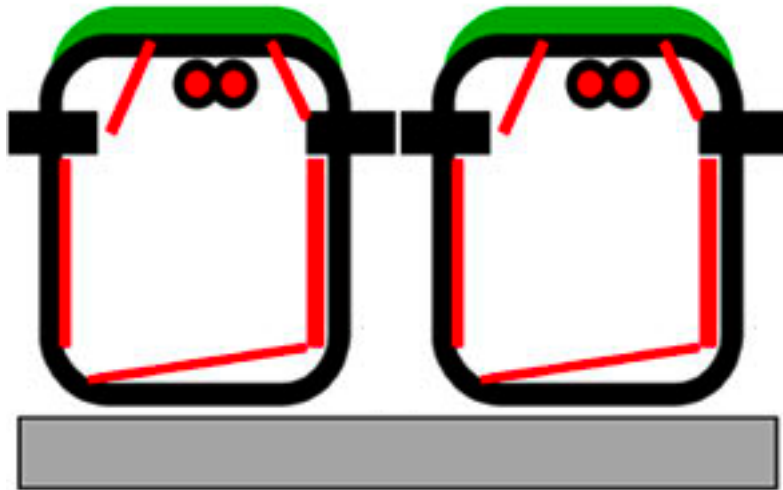
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Intestine:



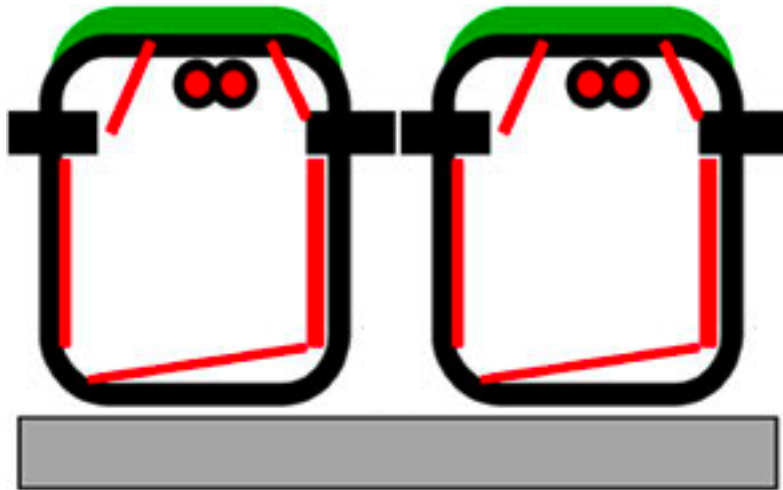
MDCK cells are a model system for a polarized cell type (from the kidney)

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MDCK cells are highly polarized

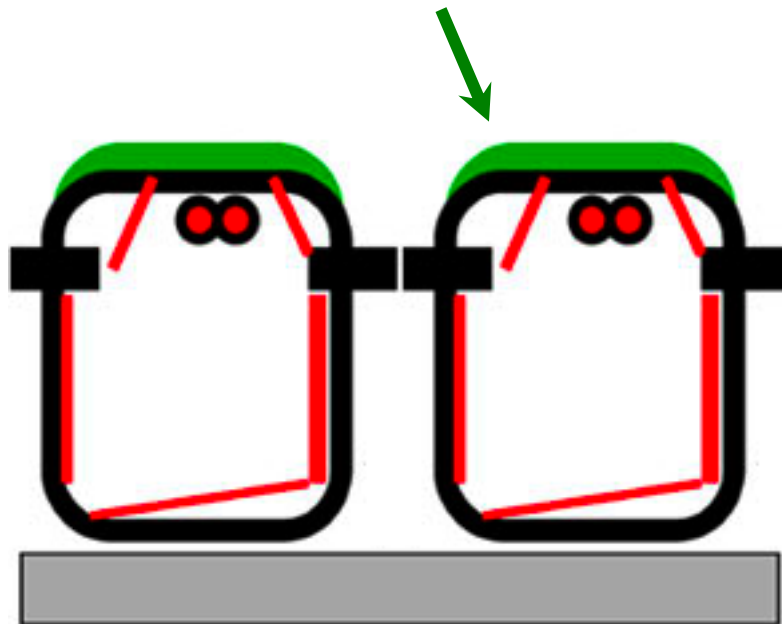
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# MDCK cells are highly polarized

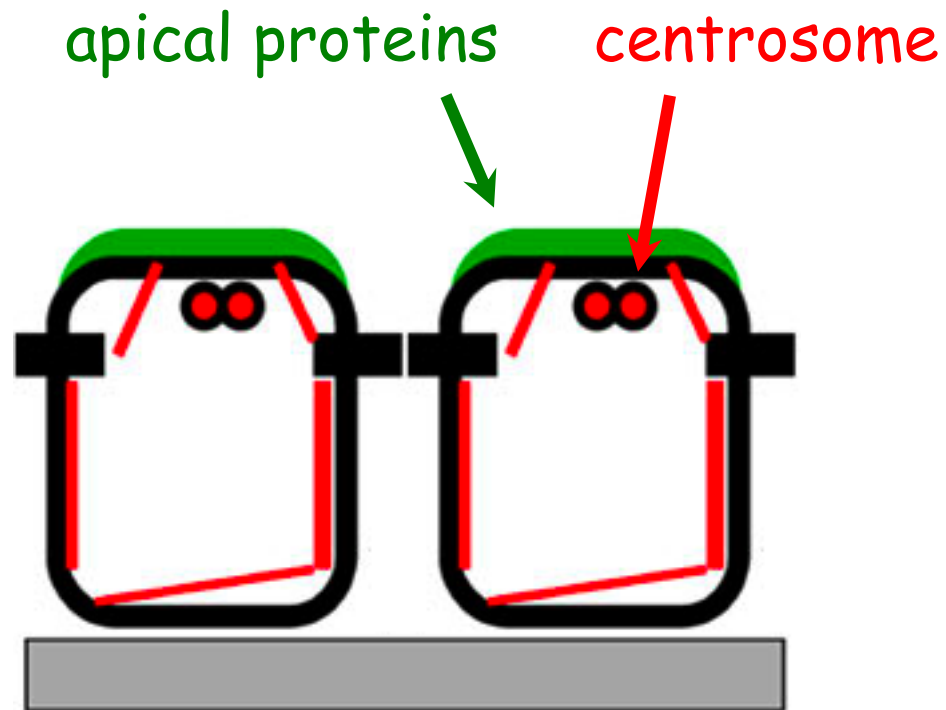
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apical proteins



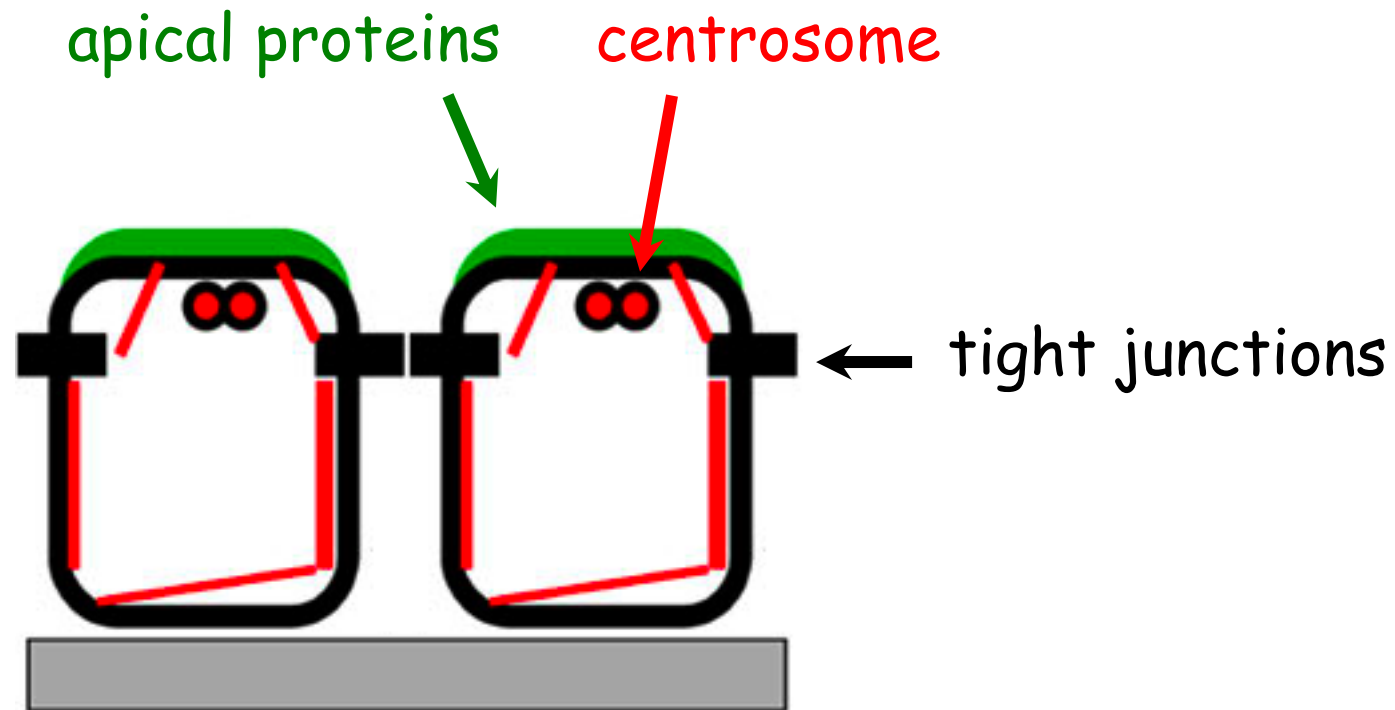
# MDCK cells are highly polarized

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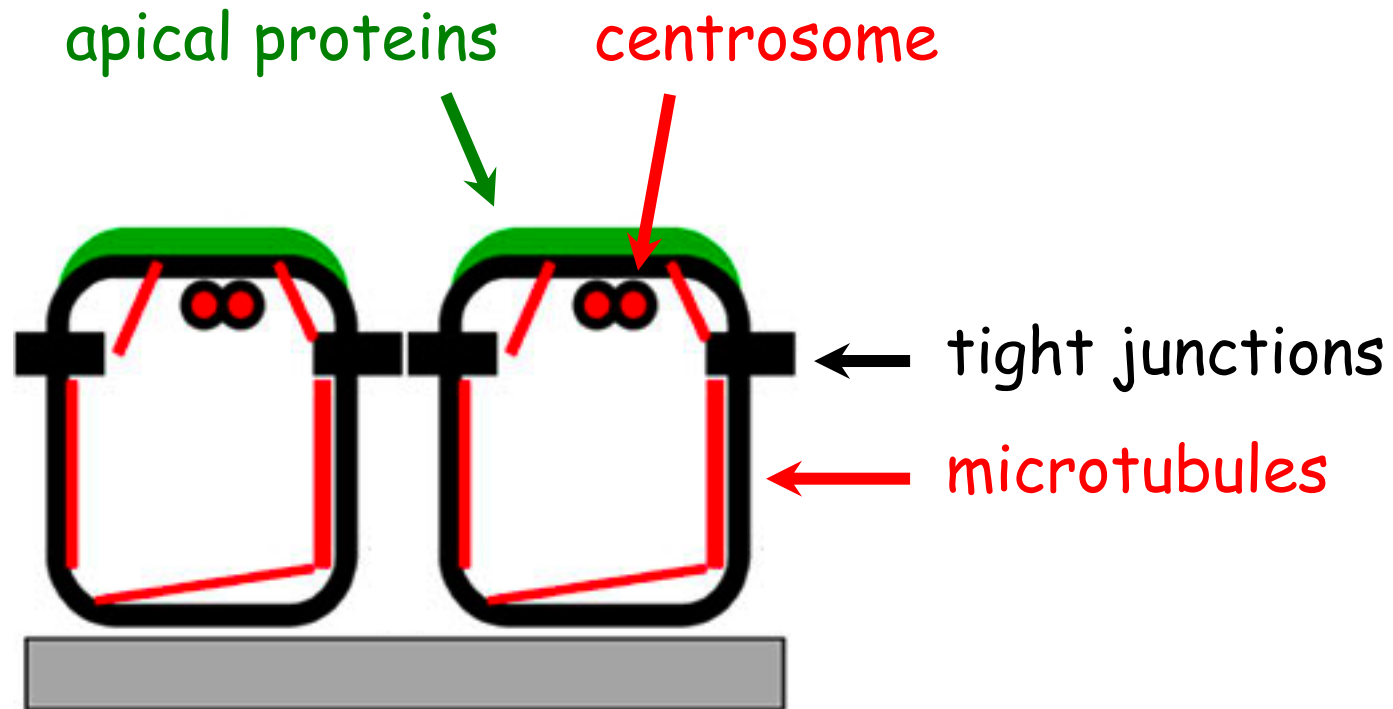
# MDCK cells are highly polarized

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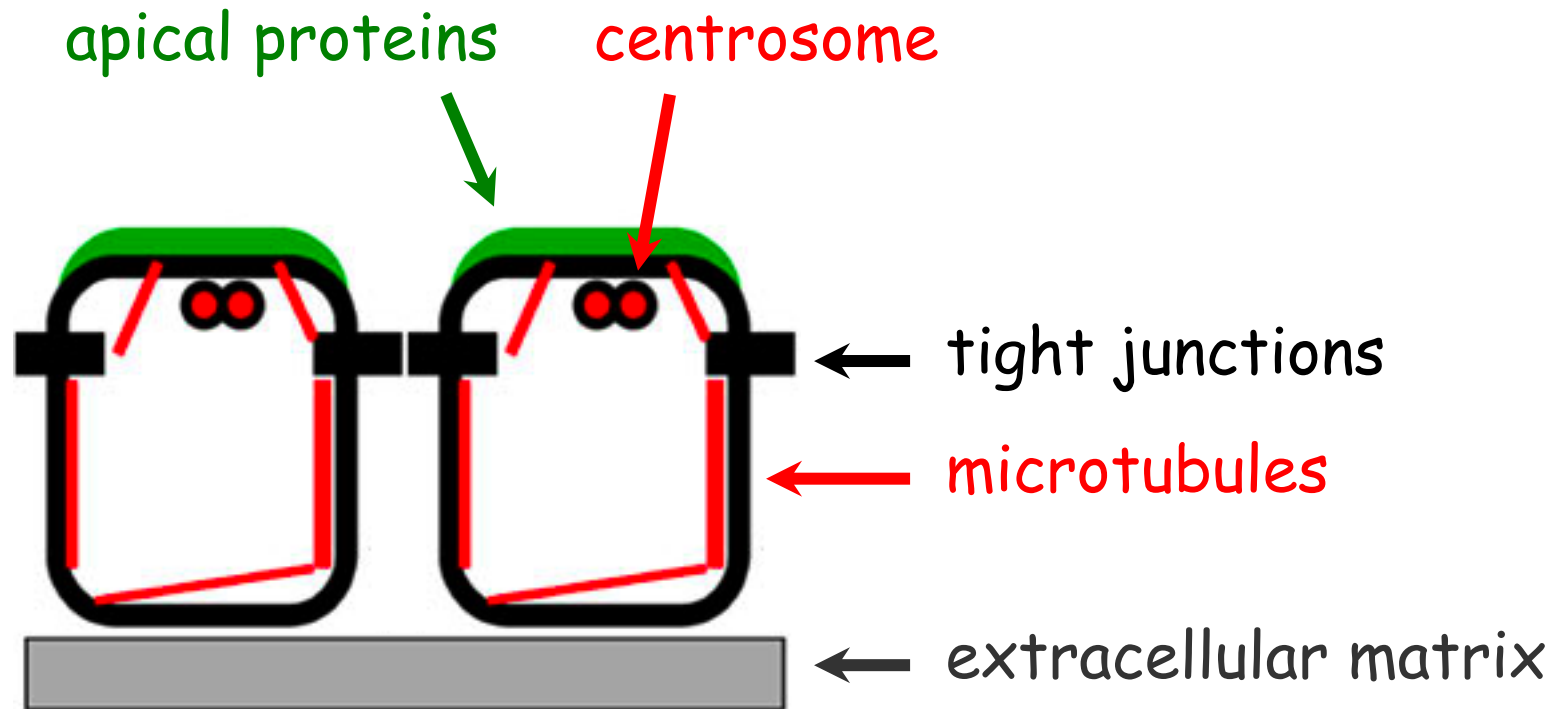
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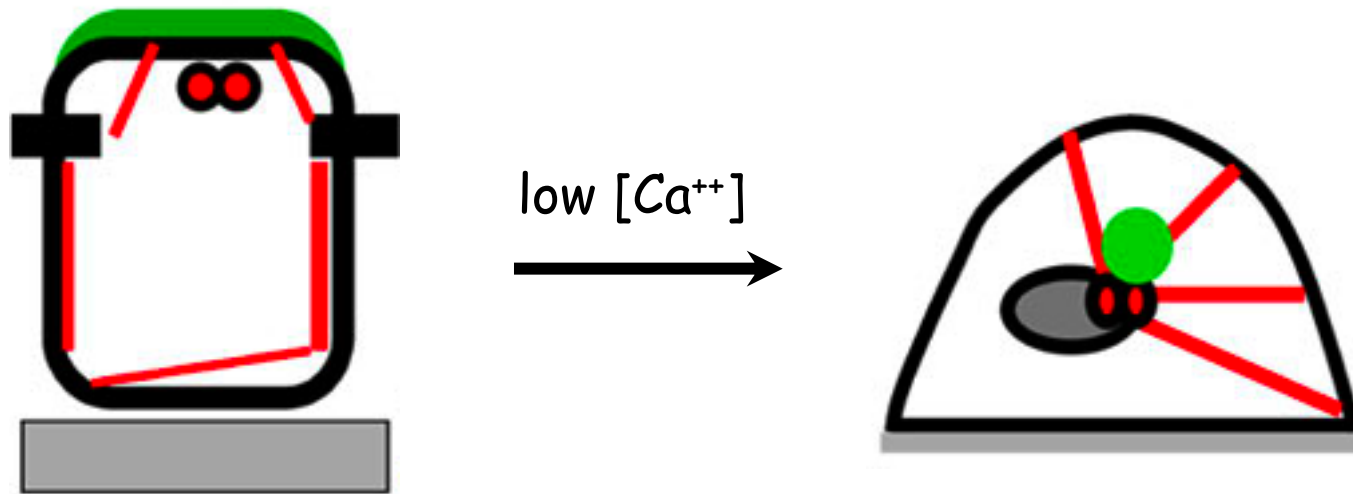
# MDCK cells are highly polarized

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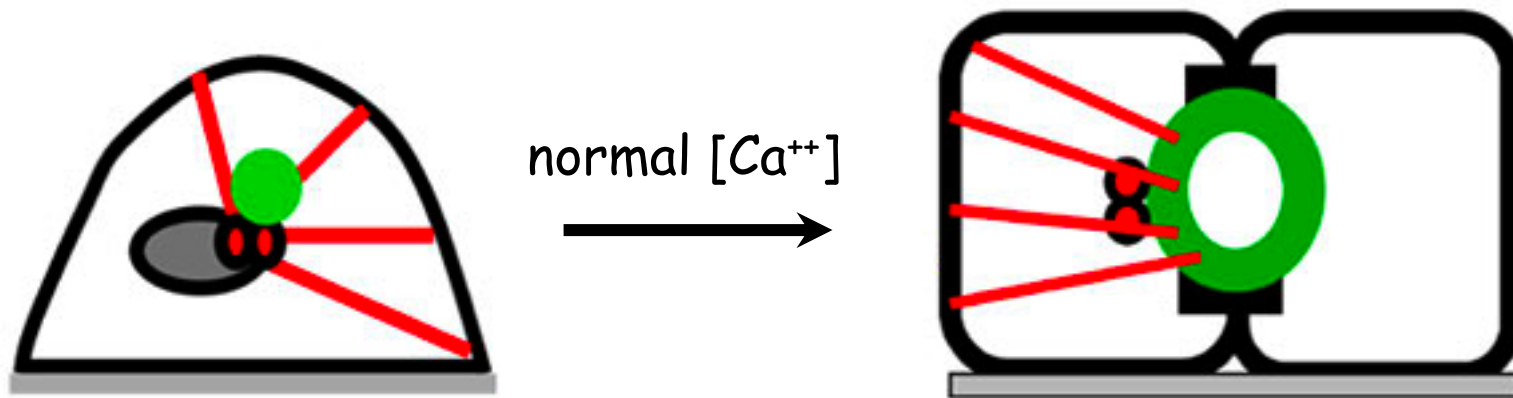
# MDCK cells lose their polarity in low $[Ca^{++}]$

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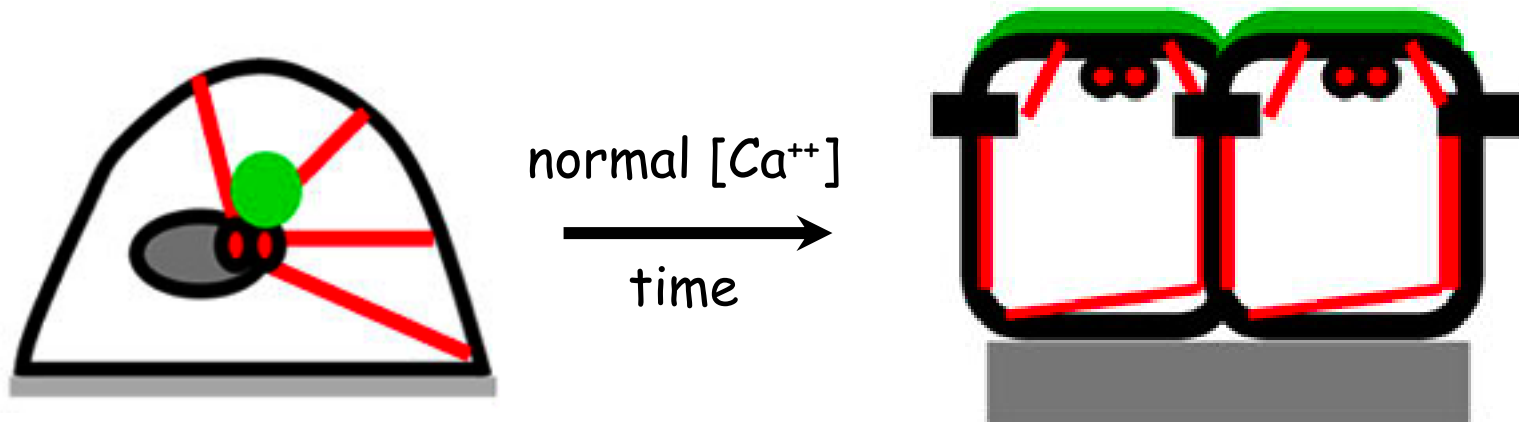
# MDCK cells regain their polarity in normal $[Ca^{++}]$ and reform a lumen

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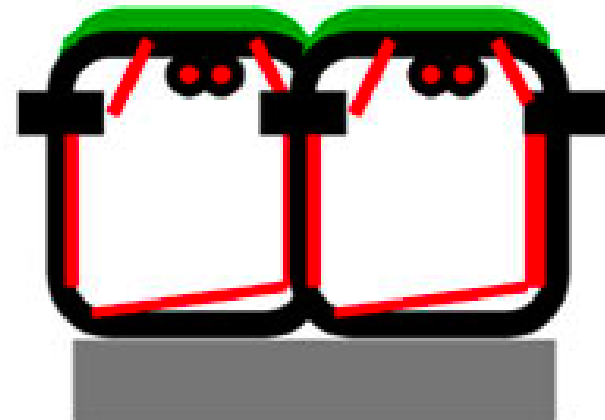
# MDCK cells regain their polarity in normal $[Ca^{++}]$ and reform a lumen

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Questions addressed today:

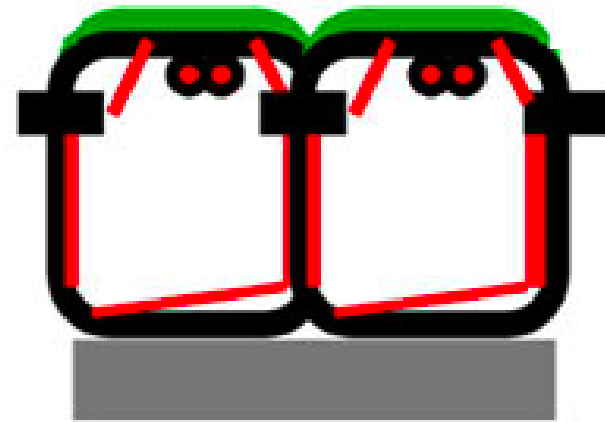
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## Questions addressed today:

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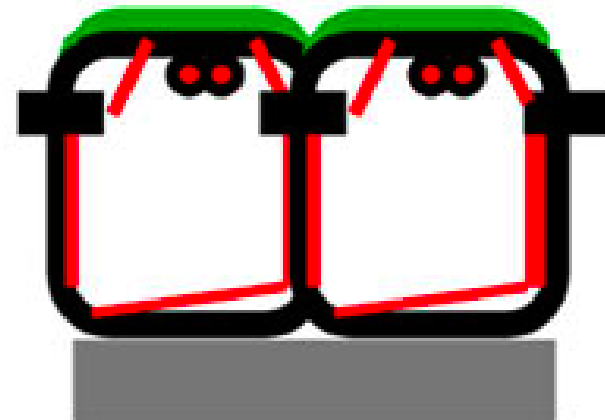
- What molecular mechanisms regulate cell polarization?



## Questions addressed today:

---

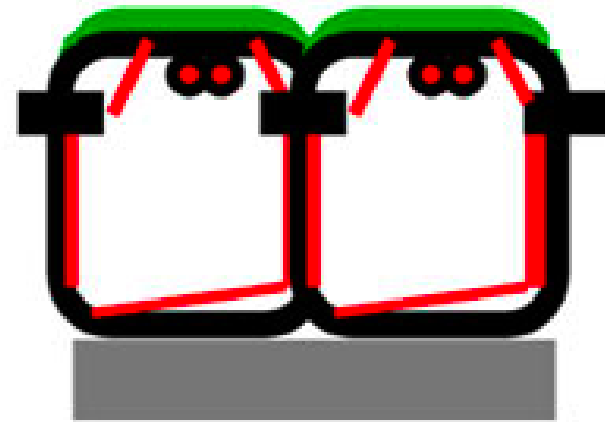
- What molecular mechanisms regulate cell polarization?
- What molecular mechanisms regulate lumen formation?



## Questions addressed today:

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- What molecular mechanisms regulate cell polarization?
- What molecular mechanisms regulate lumen formation?
- How do different tissues form different types of tubes?

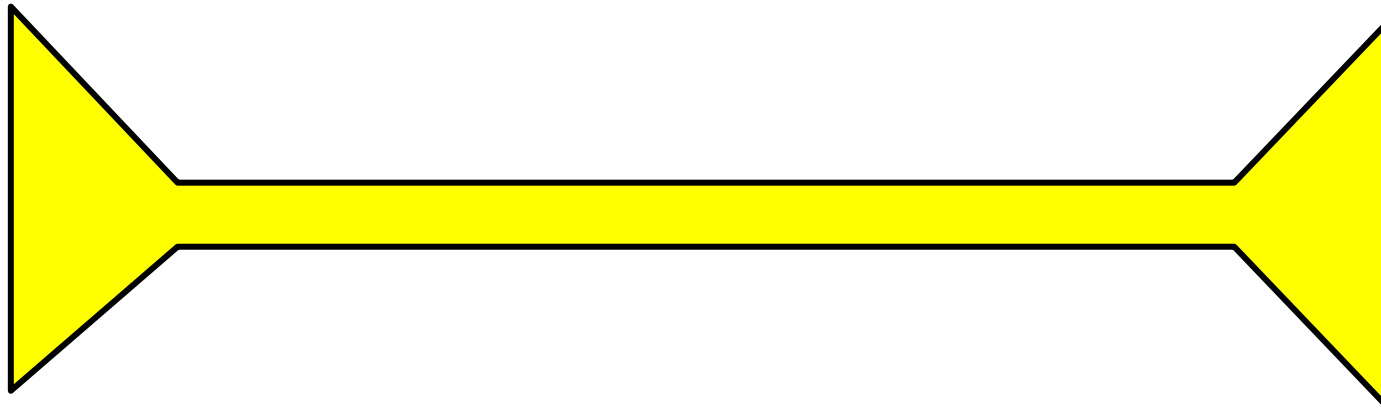




The structure of a good talk: start broad,  
get specific, and end broad

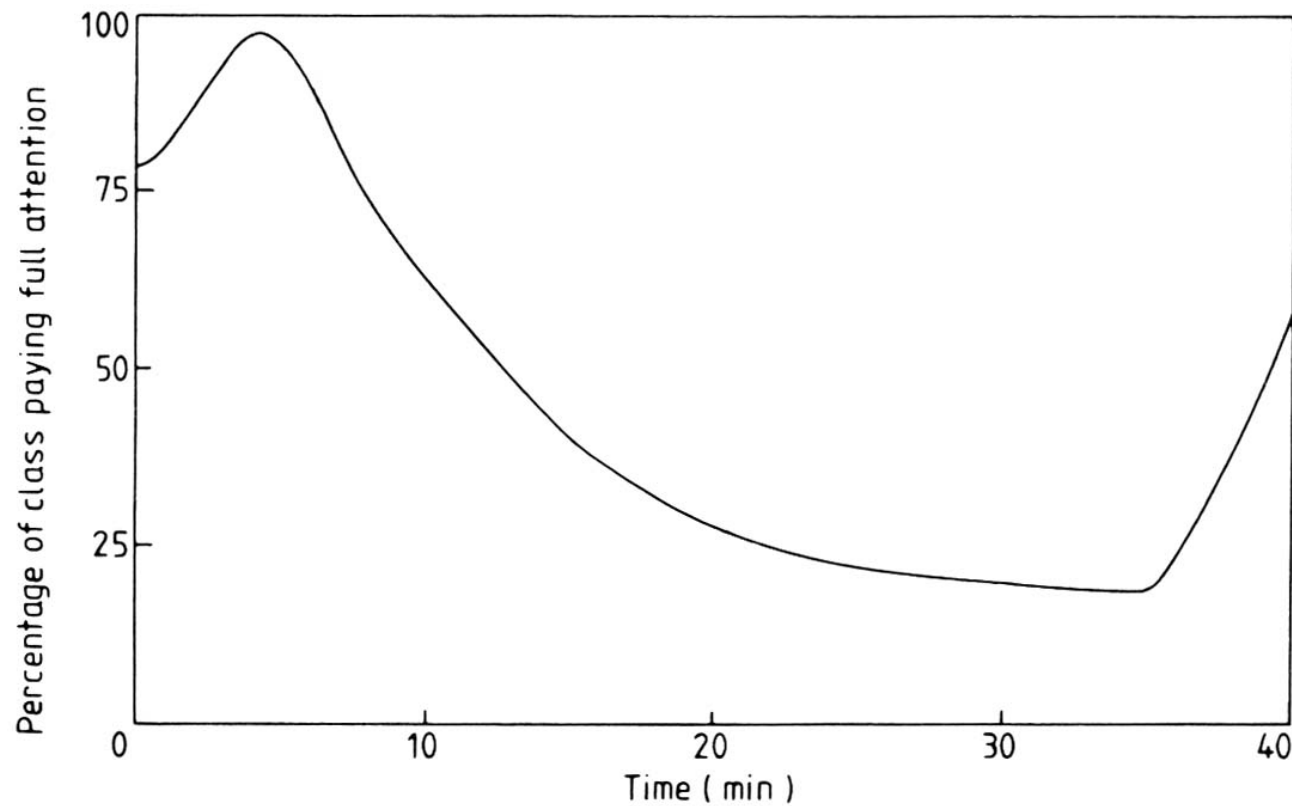
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The middle is the meat of the talk...



...but talks are delivered to audiences  
with limited attention spans

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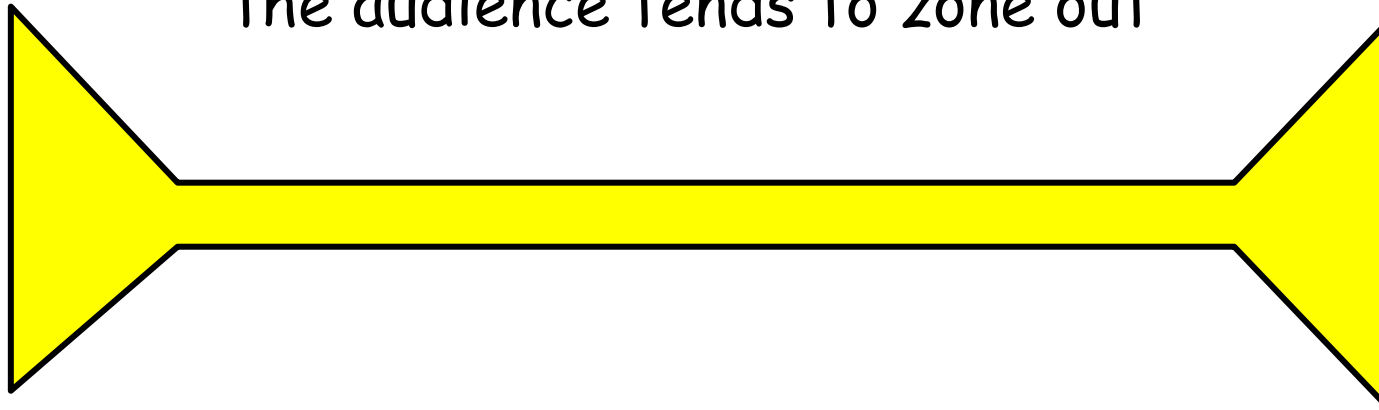


Audience attention curve

The structure of a good talk: start broad,  
get specific, and end broad

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The middle is also the time at which  
the audience tends to zone out



The structure of a good talk: start broad,  
get specific, and end broad

---

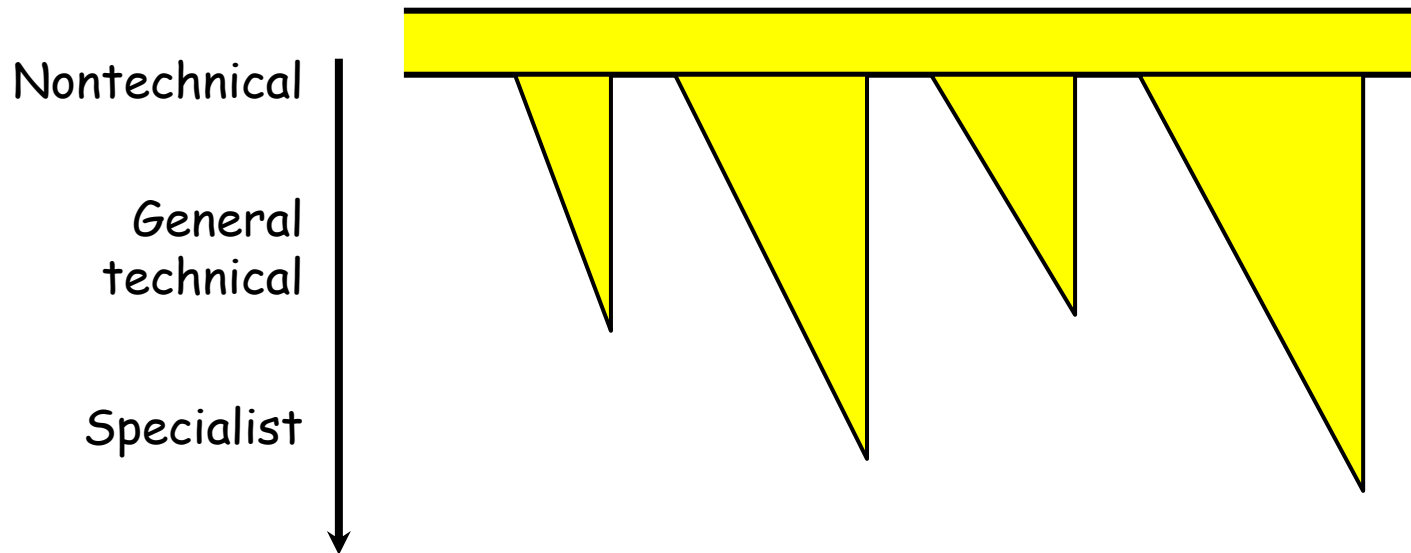
After going into depth, come back to  
your home slide to make transitions

---

# The structure of a good talk: start broad, get specific, and end broad

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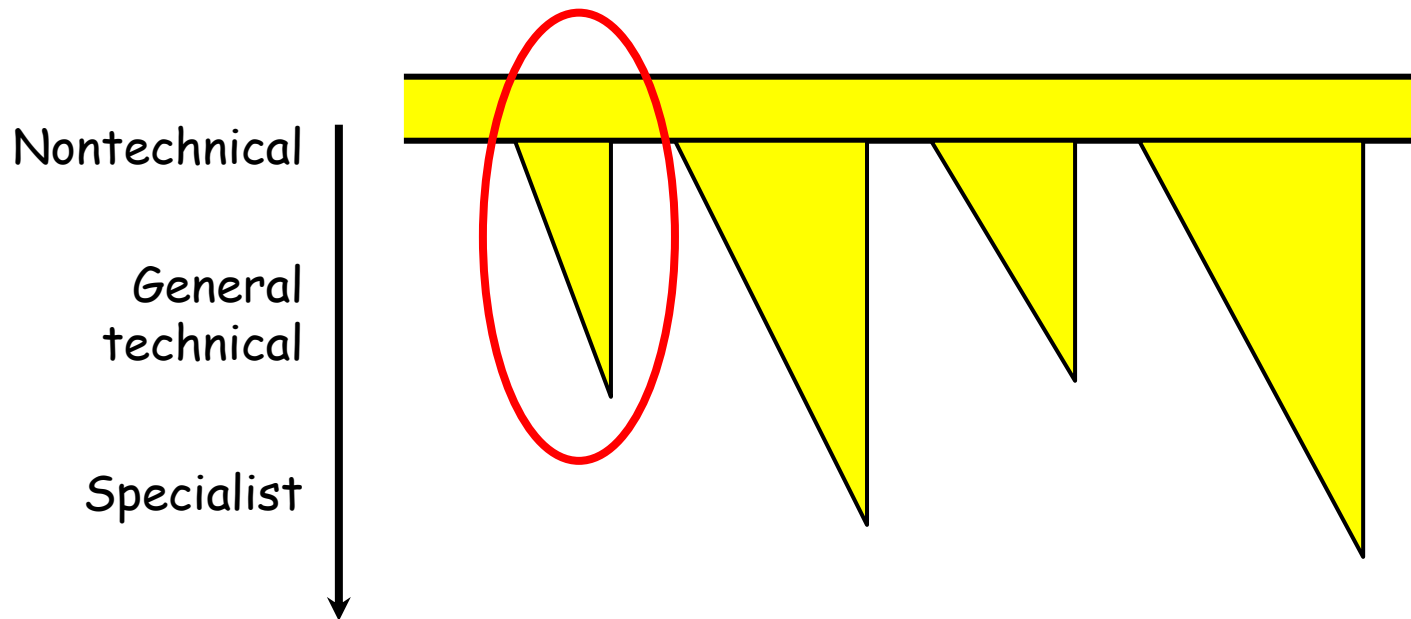
After going into depth, come back to your home slide to make transitions



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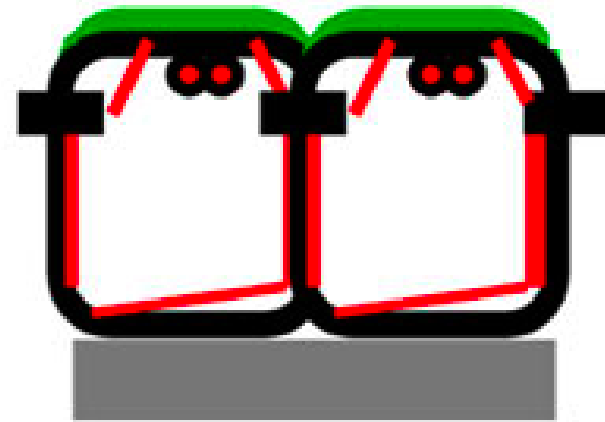
Let's review "episode 1" (which we've already designed) and add a home slide



## Questions addressed today:

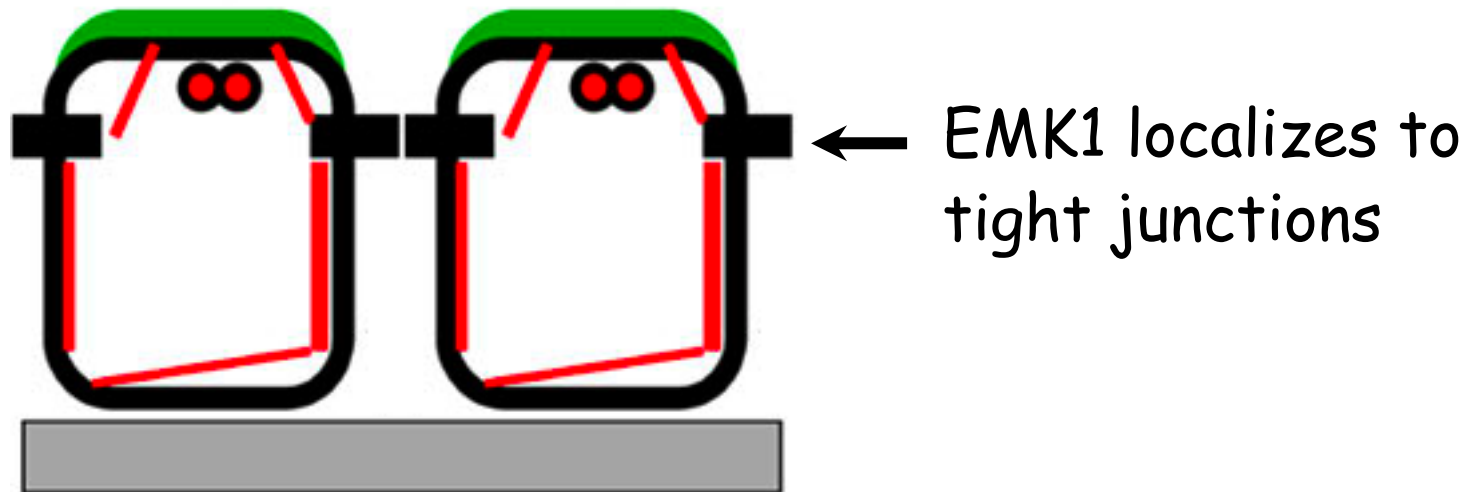
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- What molecular mechanisms regulate cell polarization?
- What molecular mechanisms regulate lumen formation?
- How do different tissues form different types of tubes?



EMK1 (also known as Par1) is a serine-threonine kinase that is essential for cell polarity

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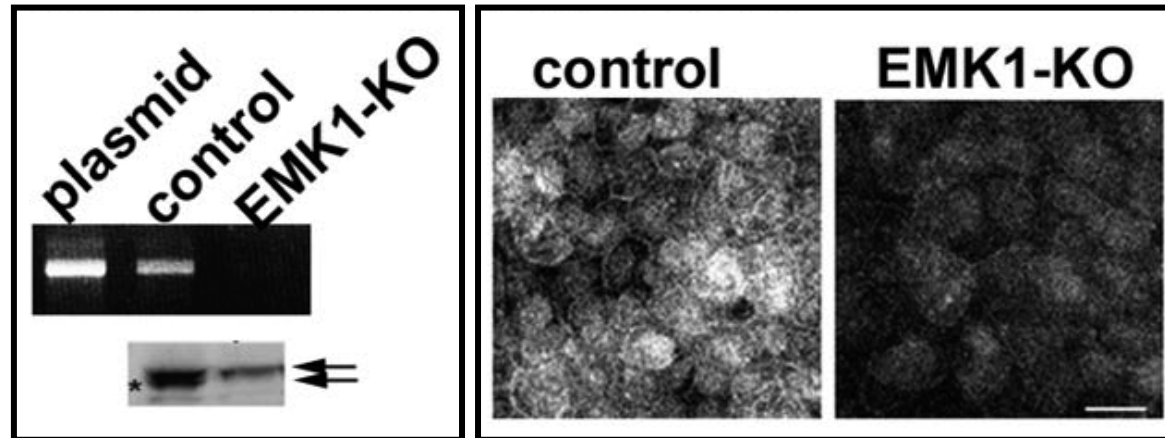


# EMK1 / Par1 can be knocked down in MDCK (kidney) cells using siRNA methods

---

RT-PCR

Western

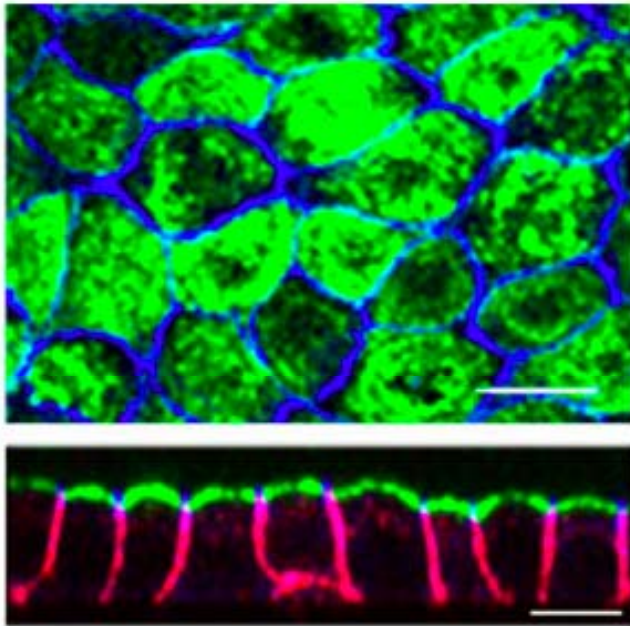


MDCK cells

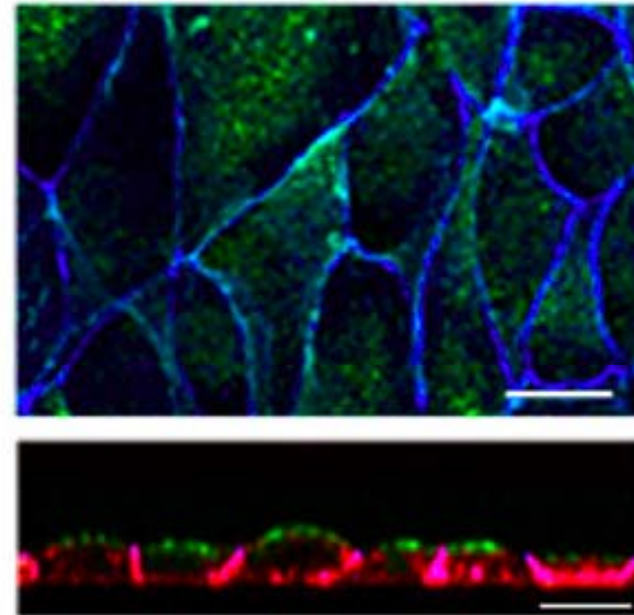
# Lumen formation is blocked in EMK1 knockdown cells

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MDCK cells



EMK1 knockdown

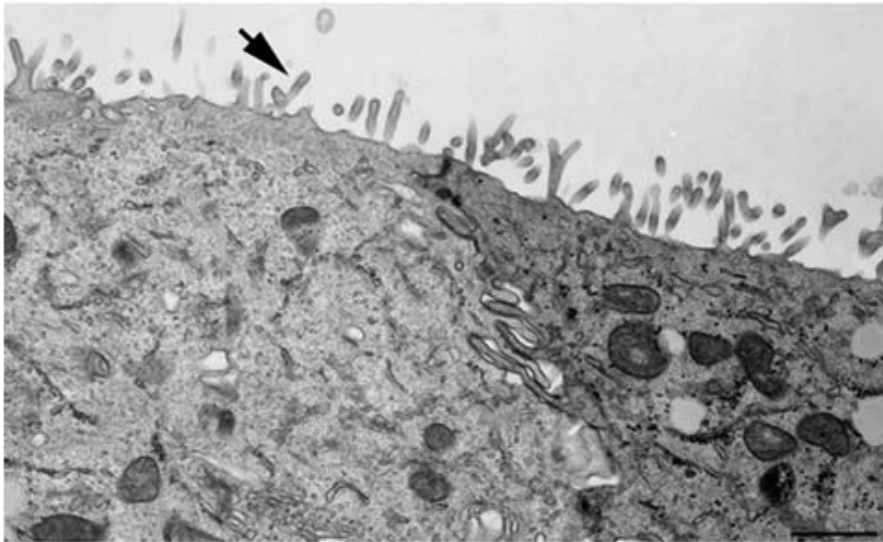


gp135    β-catenin    ZO-1

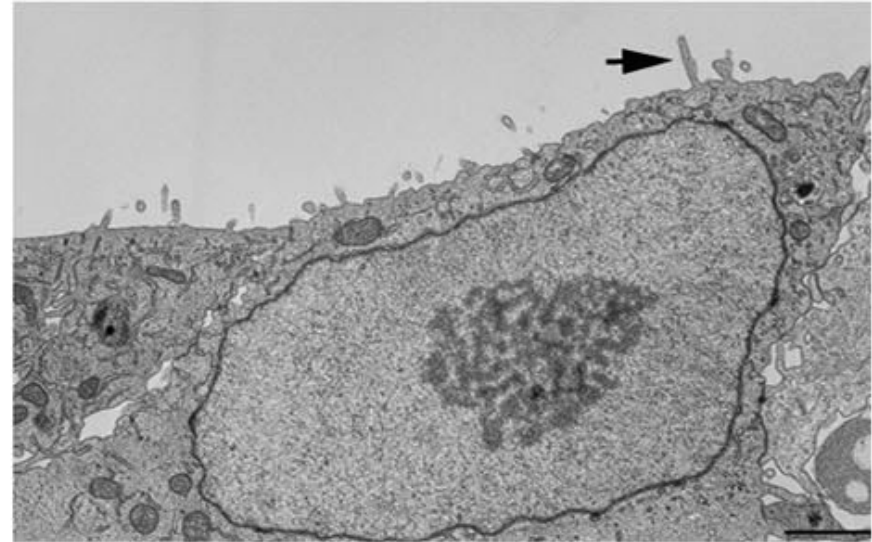
# EMK1 knockdown cells also fail to form microvilli

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MDCK cells



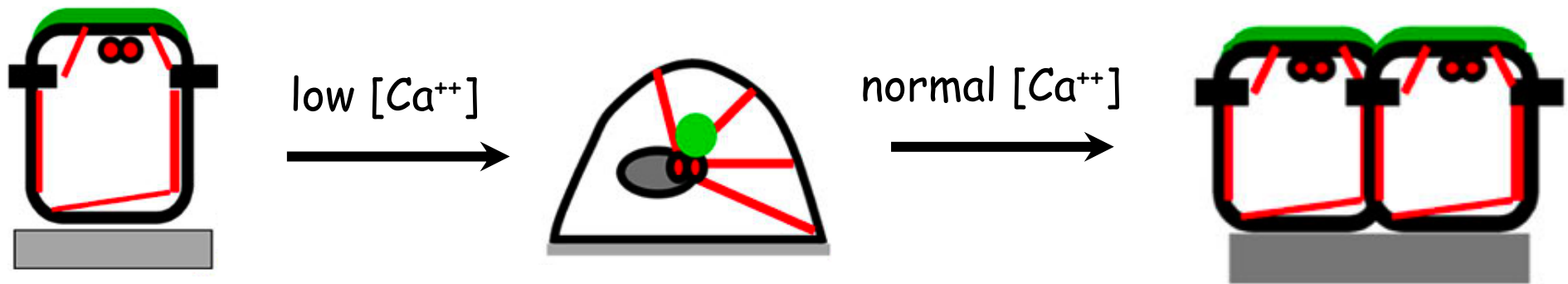
EMK1 knockdown



# EMK1 is required for cell polarization

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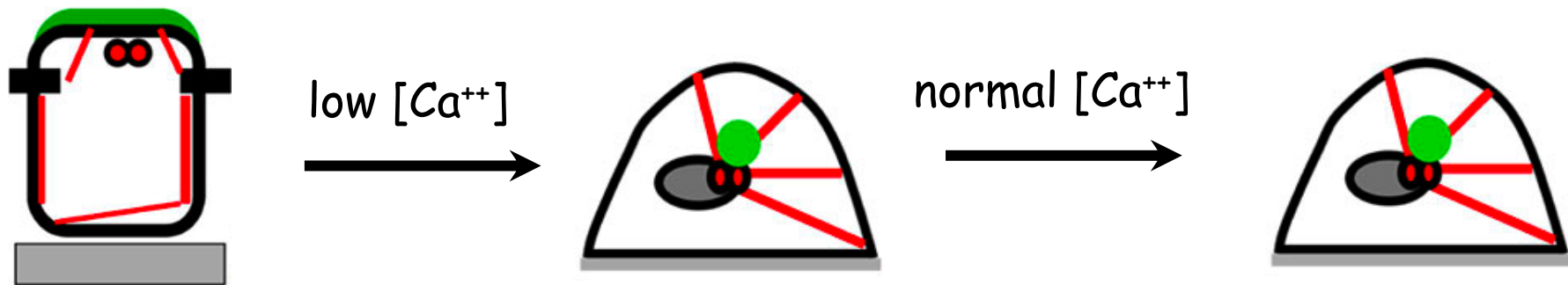
Normal MDCK cells:



# EMK1 is required for cell polarization

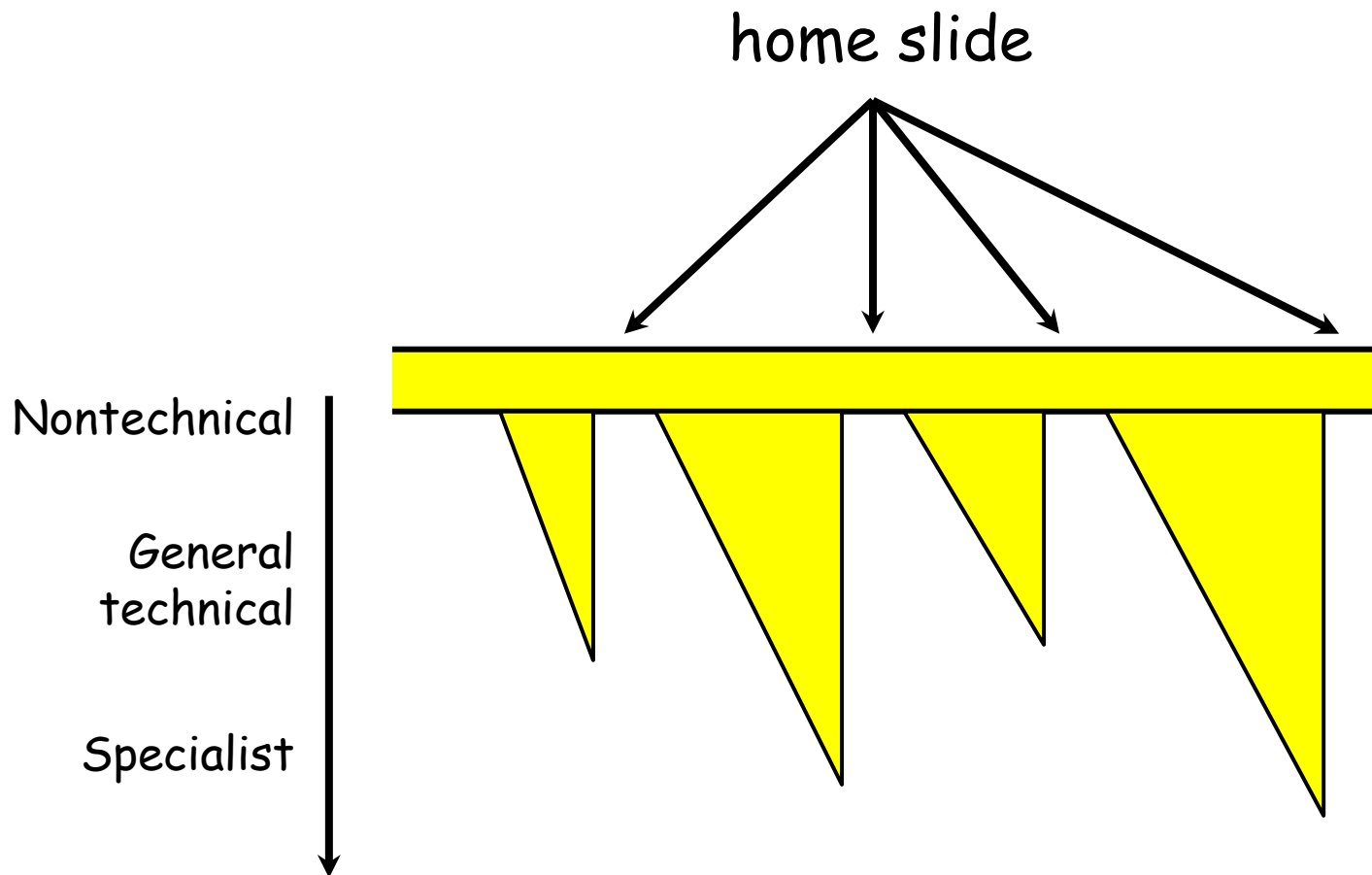
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EMK1 knockdown cells:



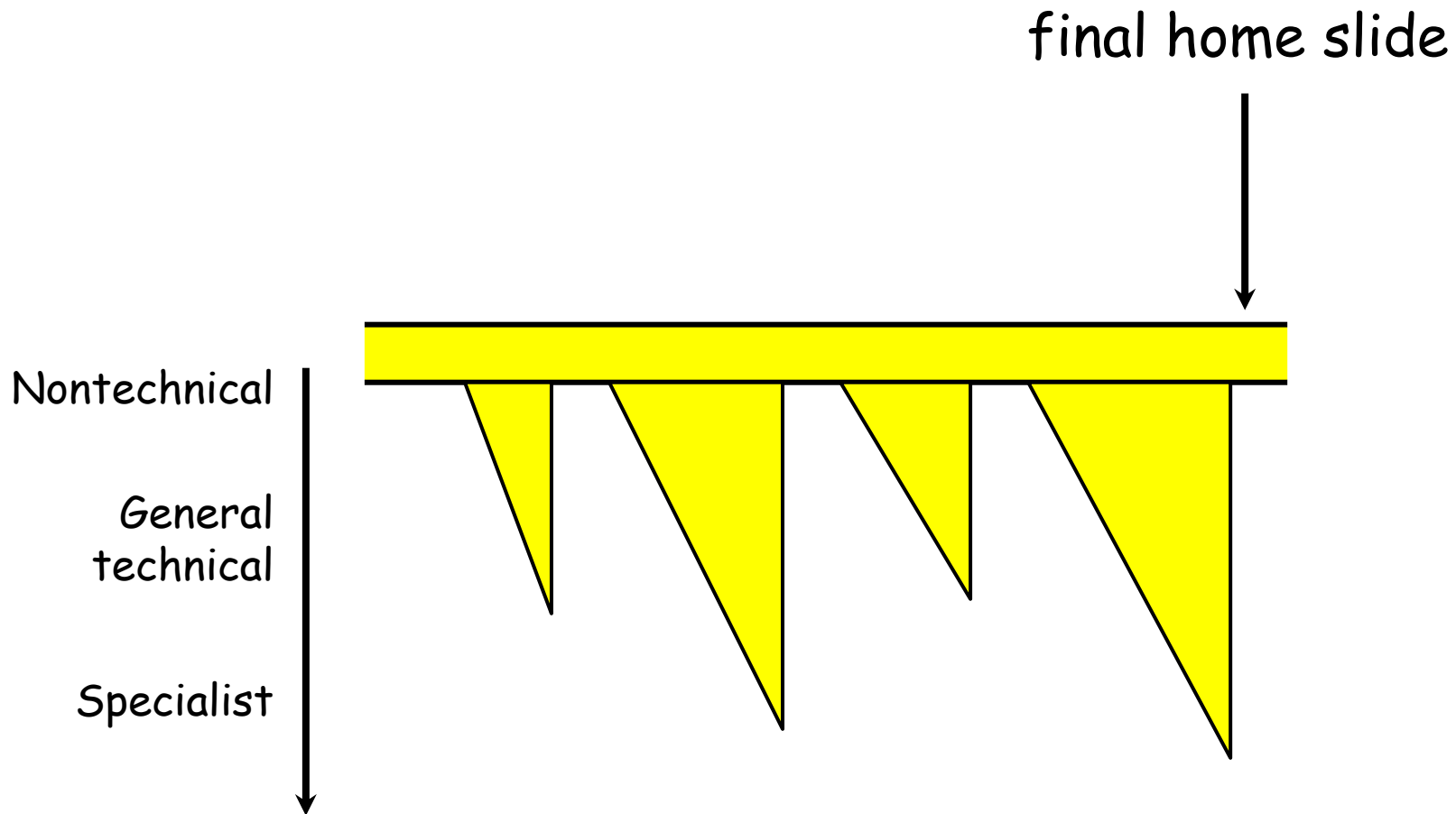
Use your home slide repeatedly to build a theme over time and enable the audience to catch up

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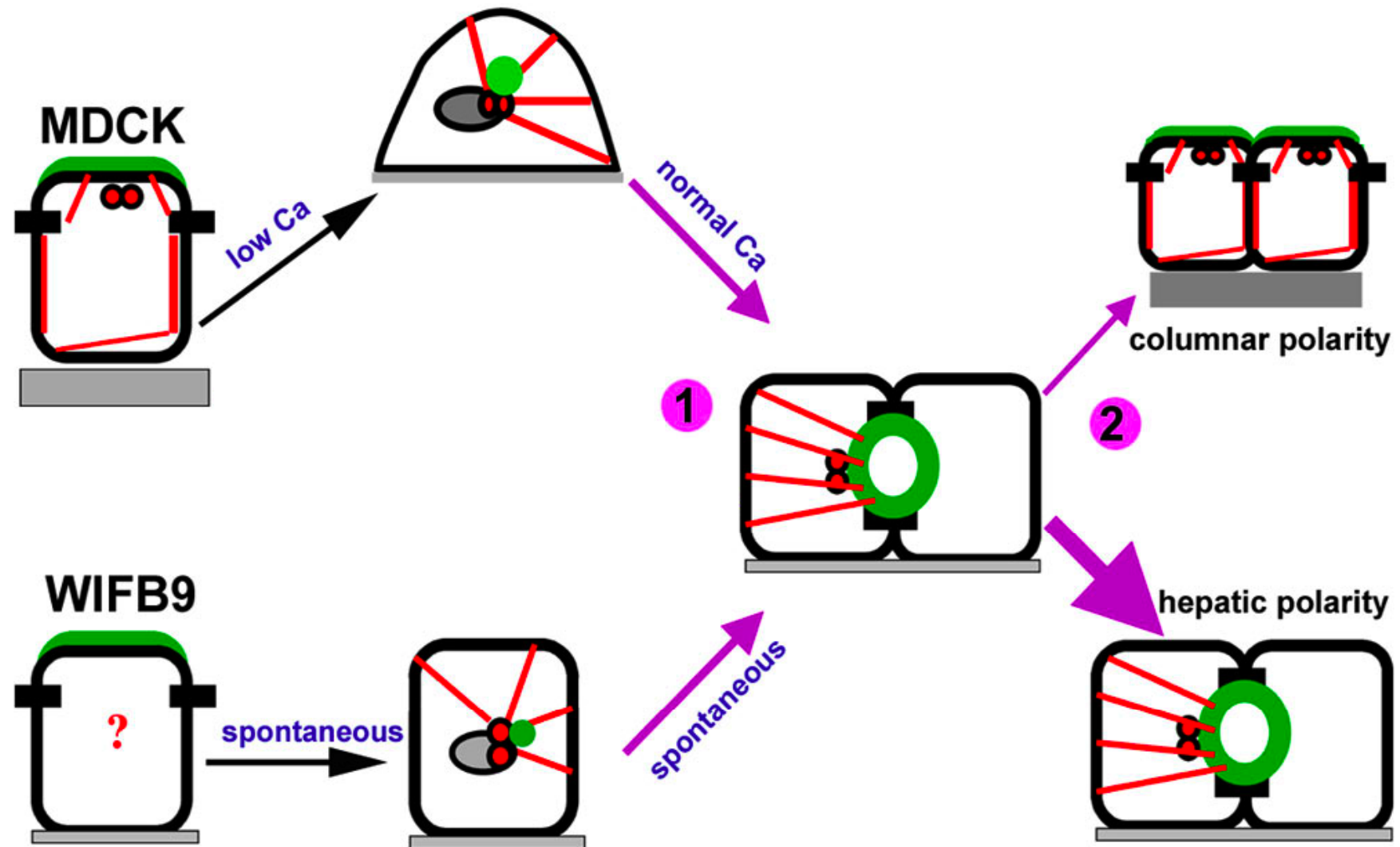


Over the course of the talk, you can progressively build a fairly complex model

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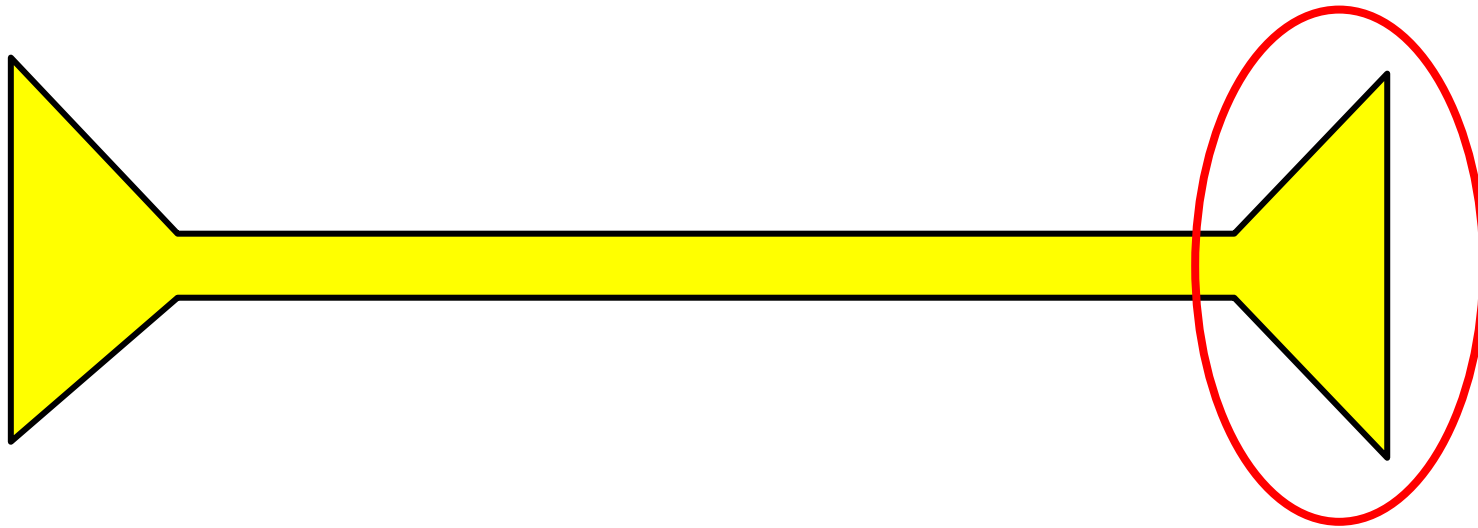
# EMK1 regulates microtubules and cell polarity in two steps





The structure of a good talk: start broad,  
get specific, and end broad

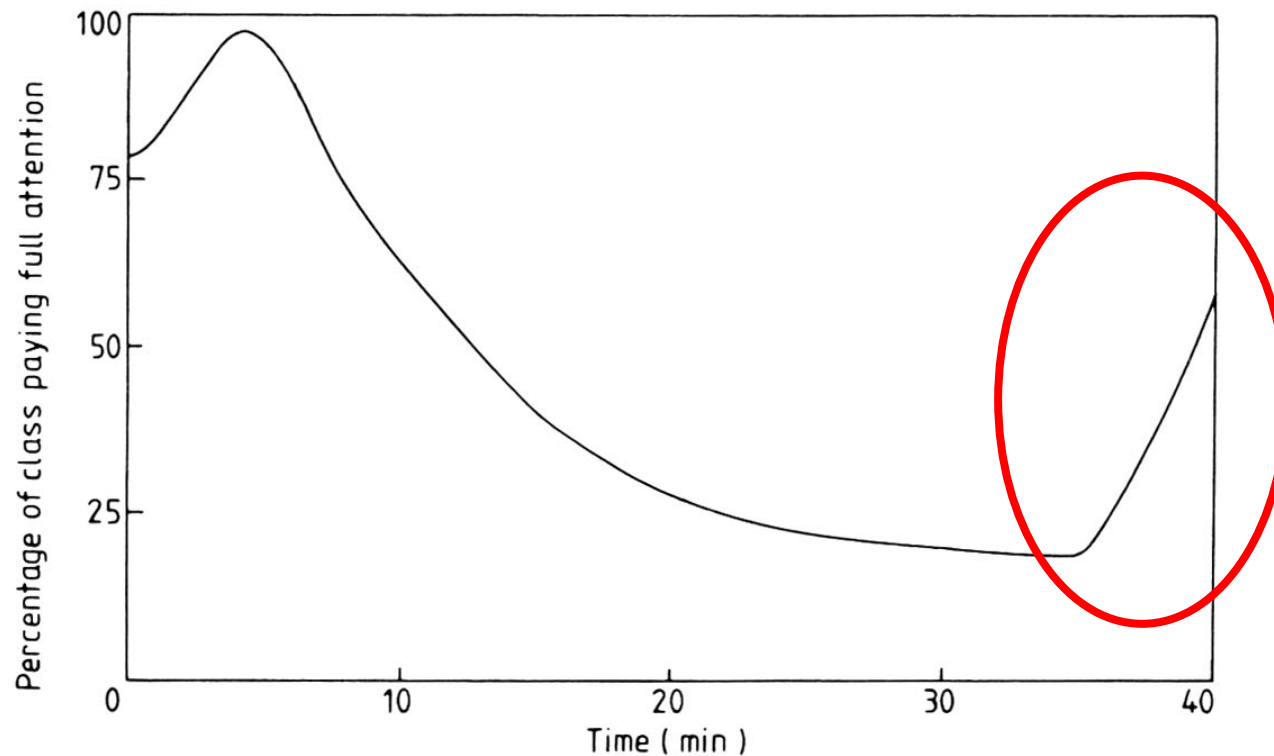
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Focus now on conclusions

Audience attention increases as you signal the end of the talk - so avoid false endings!

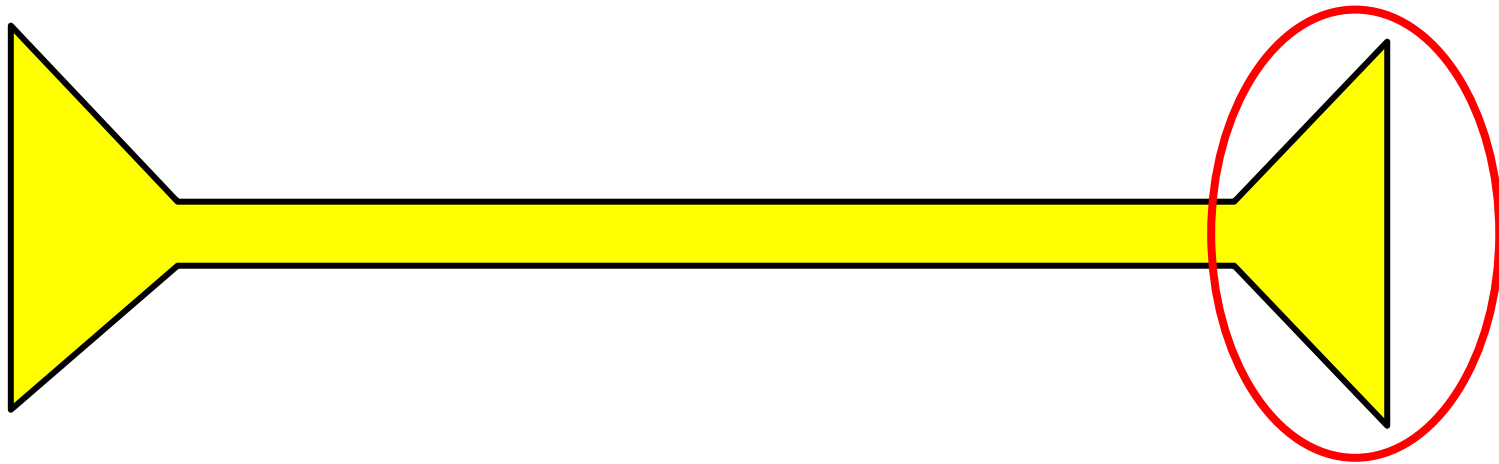
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Audience attention curve

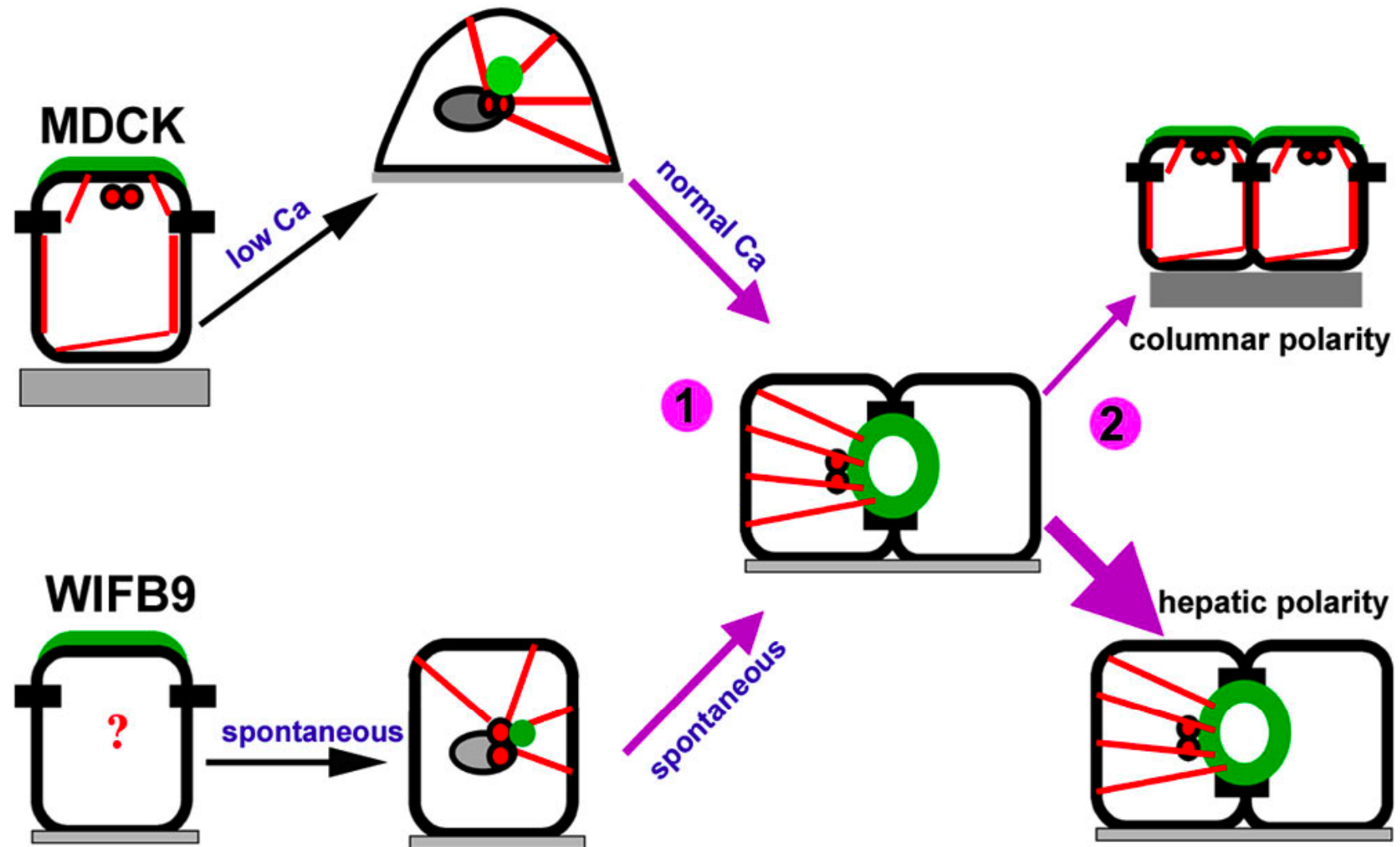
The structure of a good talk: start broad,  
get specific, and end broad

---



End with the most specific conclusions  
then build back out to the "big picture"

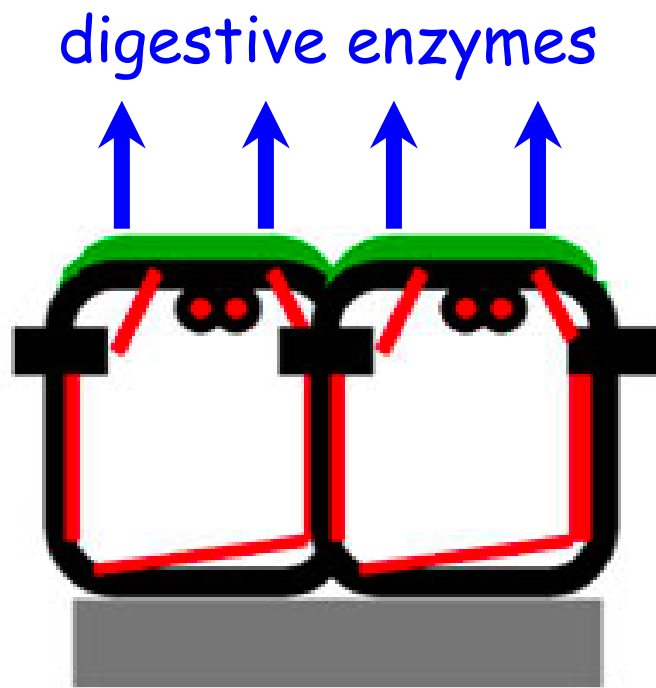
# EMK1 regulates microtubules and cell polarity in two steps



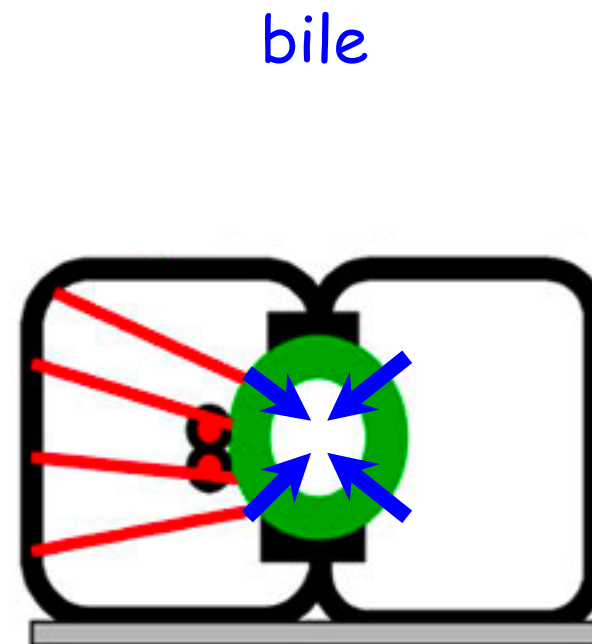
# EMK1 can regulate the type of lumen formed by epithelial cells

---

Intestine:



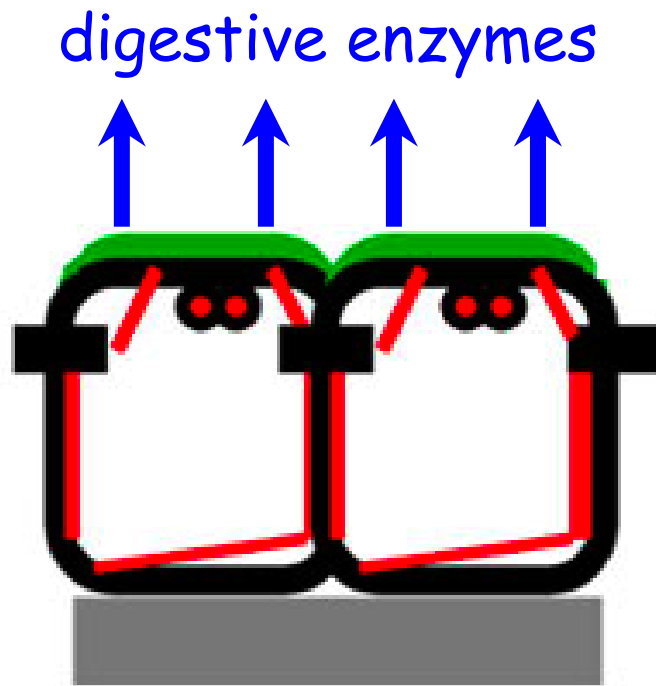
Liver:



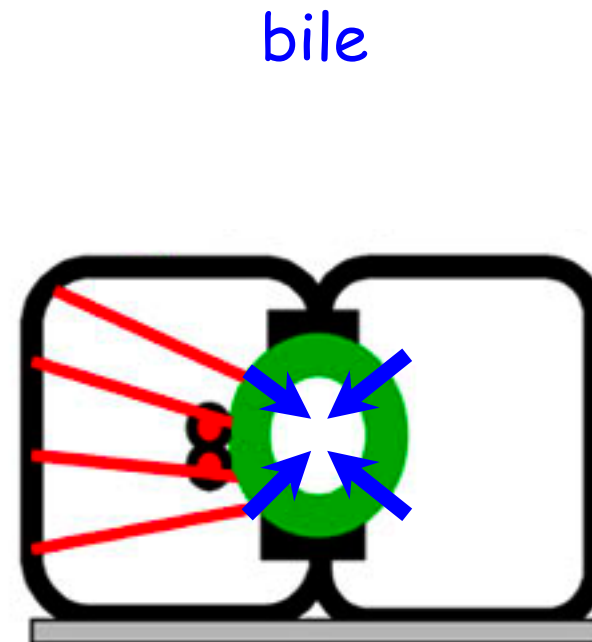
This enables the body to make many different types of tubes in different organs

---

Intestine:



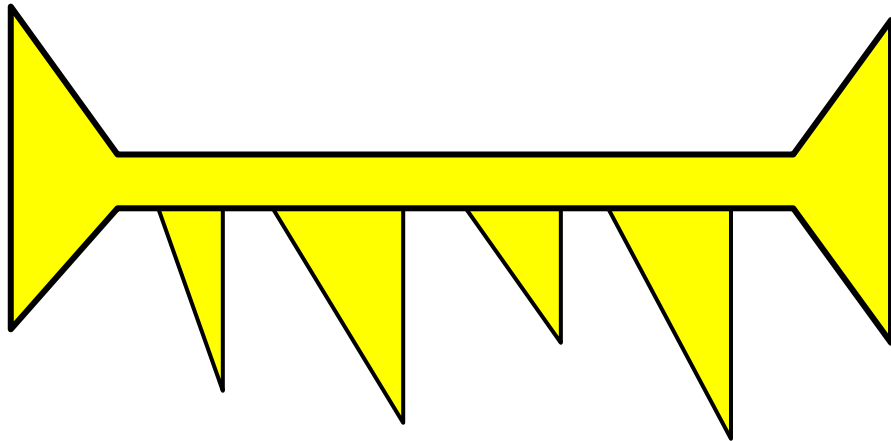
Liver:



# Organizing a great talk

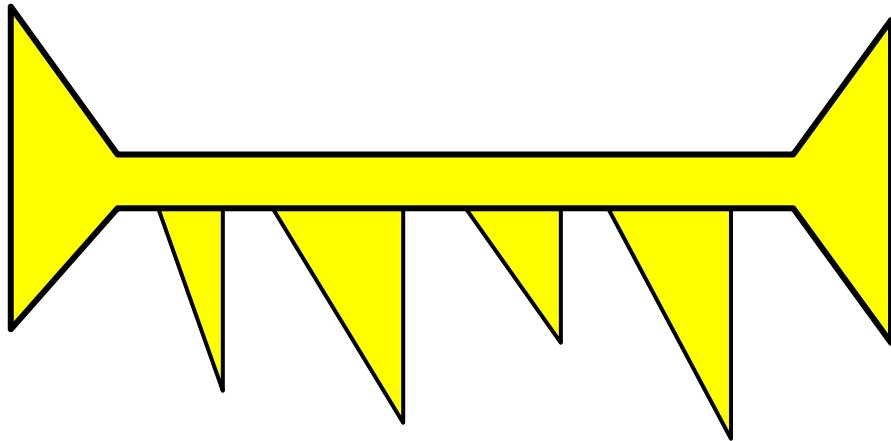
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- Be smart about Powerpoint



# Organizing a great talk

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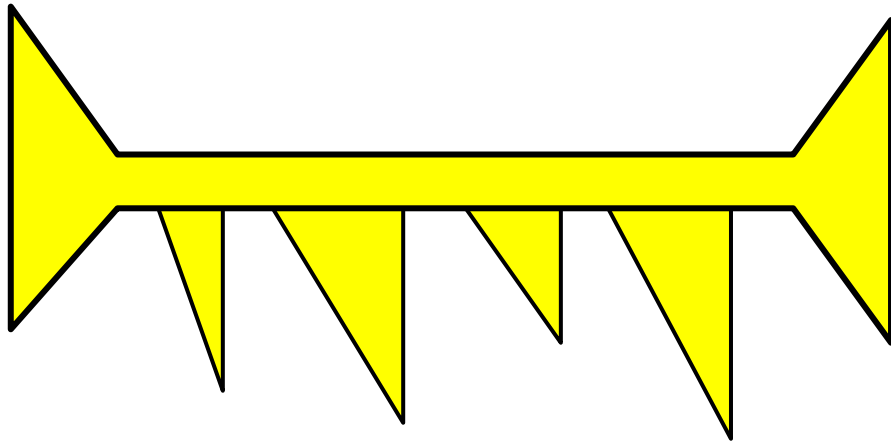


- Be smart about Powerpoint
- Your introduction should start broad then get specific



# Organizing a great talk

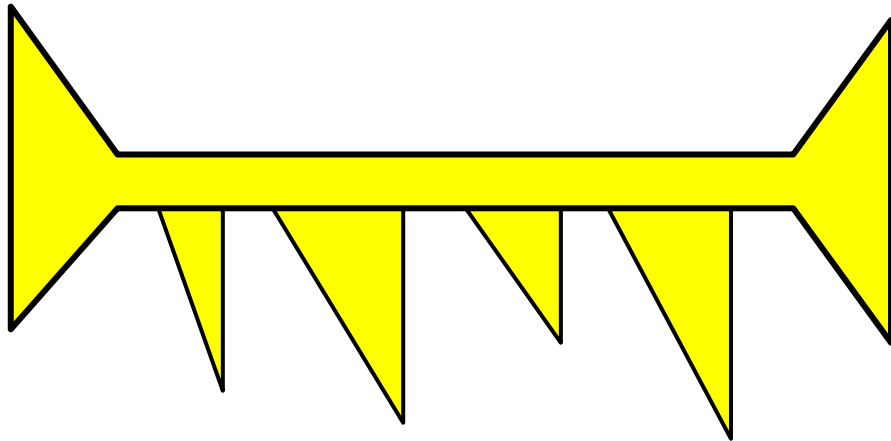
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- Be smart about Powerpoint
- Your introduction should start broad then get specific
- Think of your talk as consisting of episodes

# Organizing a great talk

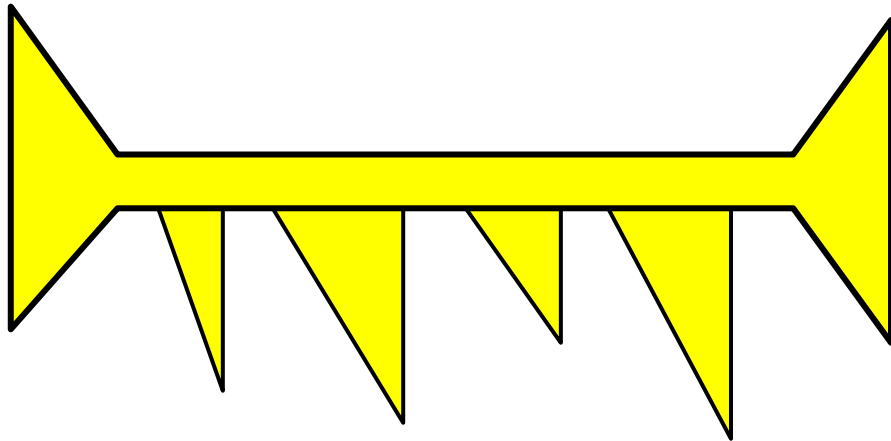
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- Be smart about Powerpoint
- Your introduction should start broad then get specific
- Think of your talk as consisting of episodes
- Use a home slide to make transitions effectively

# Organizing a great talk

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- Be smart about Powerpoint
- Your introduction should start broad then get specific
- Think of your talk as consisting of episodes
- Use a home slide to make transitions effectively
- Your conclusion should start specific but end broadly

There is more to giving a good talk than  
showing good slides

---

Do face the audience and make eye contact  
Do be enthusiastic and vary the tone of your  
voice,

Don't pace up and down but also don't stand  
rigid!

Don't wave your pointer all over the slide  
Don't take lots of drinks- it is distracting and  
unprofessional

There is more to giving a good talk than  
showing good slides

---

Do practice beforehand, preferably using a  
video camera and timer

Do ask your friends (and family) for feedback

Don't use too many gimmicks

# Here are some of the things many listeners want from a talk:

## **CONTENT**

- Conveys new information
- Poses an interesting question
- Conveys how people in other fields think
- Describes important ideas
- Novel discovery

## **CLARITY AND ORGANIZATION**

- Understandable
- Avoids jargon
- Uses clear and simple visual aids
- Well organized
- Enables me to catch up if I space out
- Doesn't run over time

## **STYLE AND DELIVERY**

- Keeps me awake
- Varies voice
- Conveys enthusiasm
- Doesn't stay in one place
- Friendly and approachable

## **EXPERTISE**

- Credible
- Inspires trust and confidence
- Answers questions clearly

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A great resource is

The Craft of Scientific  
Presentations

by Michael Alley