How to give a (scientific) talk

Michael Schatz

Oct 2, 2019

Lecture 10: Computational Biomedical Research

Project Pitch
Due Wed Oct 9

Project Pitch

Assignment Date: Wednesday, Oct 2, 2019
Due Date: Wednesday, Oct. 9, 2019 @ 11:59pm

Assignment Overview

In this assignment, you'll start to define your research proposal for the semester. As a reminder, any questions about the assignment should be posted to Piazza

Team assignment

Please mark your preference for the following topics:

Team Ancestry Analysis

- Given an unknown sample, determine which country/countries they come from
- Given an unknown sample, find any close relatives within a larger collection of samples
- Identify regions of Neanderthal introgression in an unknown sample
- Develop a tool/webapp to generate PCA plots of how people are related
- Your own idea! Please describe in 5-10 sentences, plus a figure if needed

Team Disease Risk

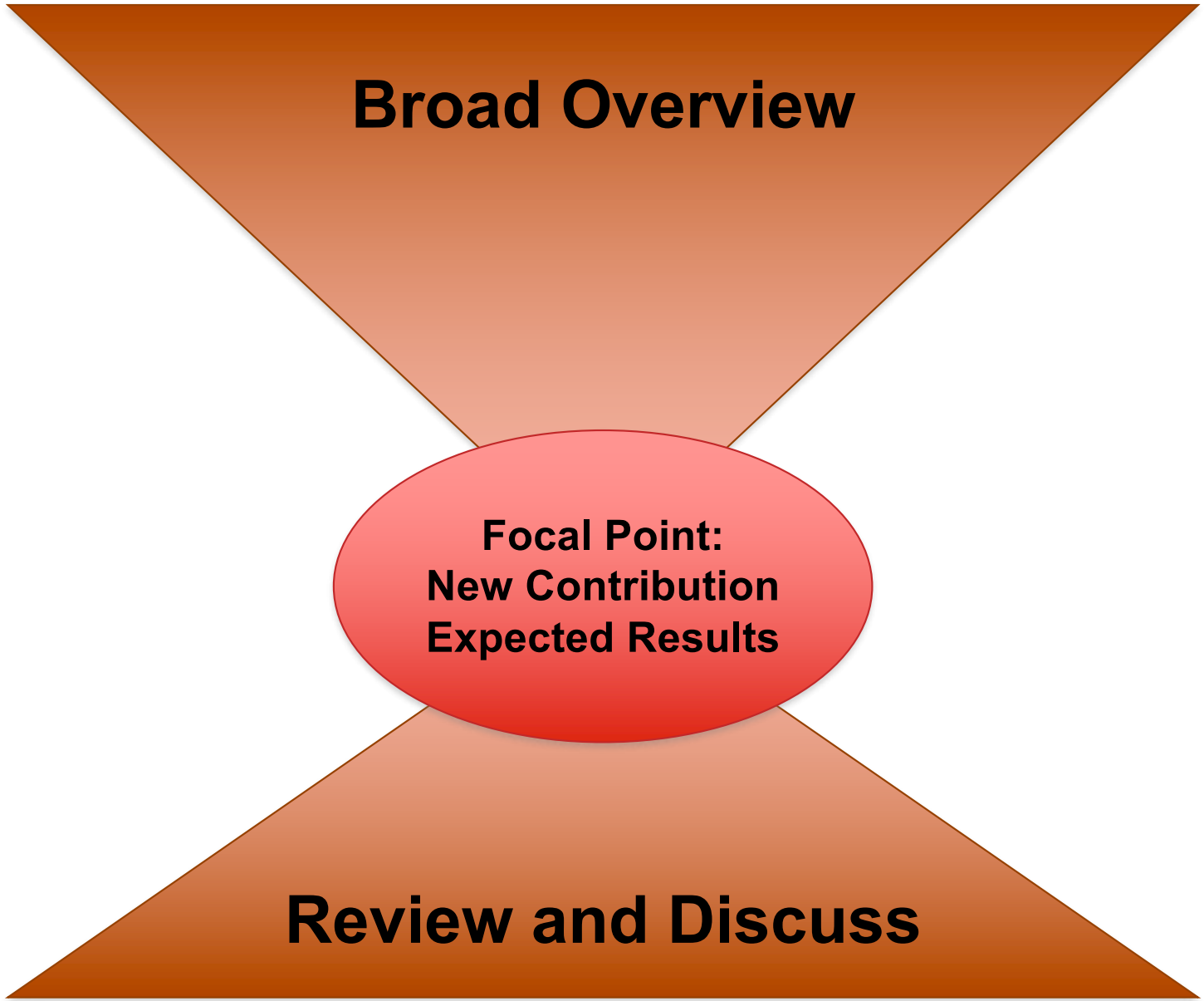
- Develop a pipeline to Evaluate an unknown sample for disease risk using OMIM, Clinvar, and other approaches
- Compare variant calls in GIAB HG002 using Illumina sequencing and PacBio CCS reads for additional disease related variants in OMIM
- Most disease genetics approaches focus exclusively on single nucleotide variations. Develop a pipeline to evaluate impact of structural variations on coding sequence (insertion/deletion of exons, flanking regulatory sequences). Look for common variants in the 1000 genomes project.
- Use OMIM variants to train a classifier (CNN, Random Forest, etc) to recognize clinically relevant variants and test through cross validation
- Your own idea! Please describe in 5-10 sentences, plus a figure if needed

Hollywood versus Science

Suspenseful, never sure what is going to happen

Transparent, clear path from start to finish

Follow the Scientific Hourglass



Follow the Scientific Hourglass

Title Slide (Who)

What?
Why?
How?

What is your contribution?

Summary
Future Work
Acknowledgements

Common Mistakes

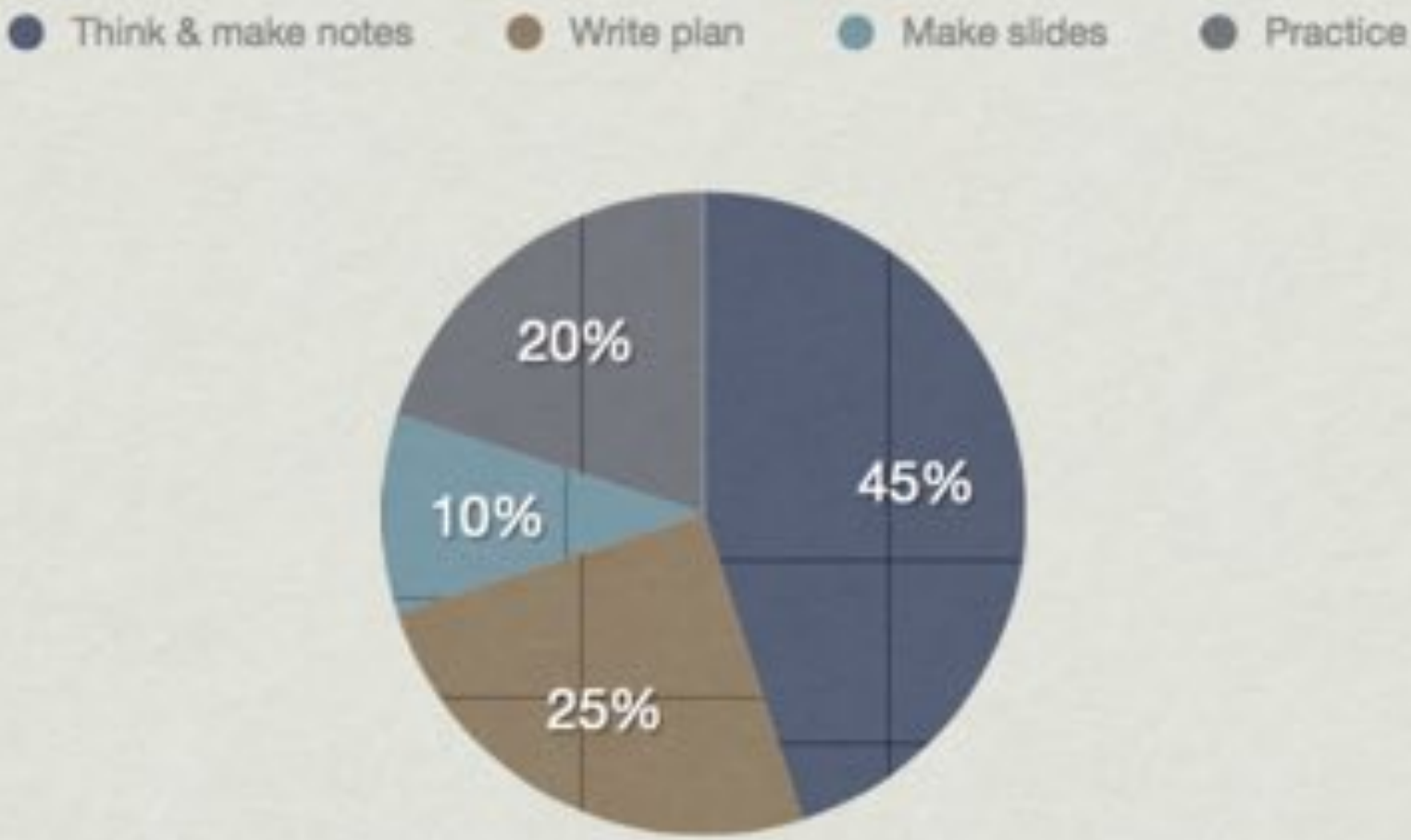
1. **Forgetting your audience**
   - They don't know what you are talking about
2. **Forgetting the story**
   - Start with the outline, then develop the details
3. **Forgetting the design**
   - Figures, fonts, layout needs to be clear
4. **Forgetting yourself**
   - It is stressful to be on stage
   - Rehearse the first minute 15 times
   - We are all friends here ☺

Thanks Keith!

http://www.slideshare.net/kbradnam/10-tips-for-adding-polish-to-presentations

Some things to consider before you present

Things to do *before* your talk



Who is your audience?

Venue	Preparation time (expected)	Preparation time (observed)
Lab talk	3–7 days	2–24 hours
Department meeting	2–4 weeks	1–2 days
Conference presentation	1–2 months	1–2 weeks

10 tips for a better presentation

1) Be prepared

Things to do before your talk

Before your talk...

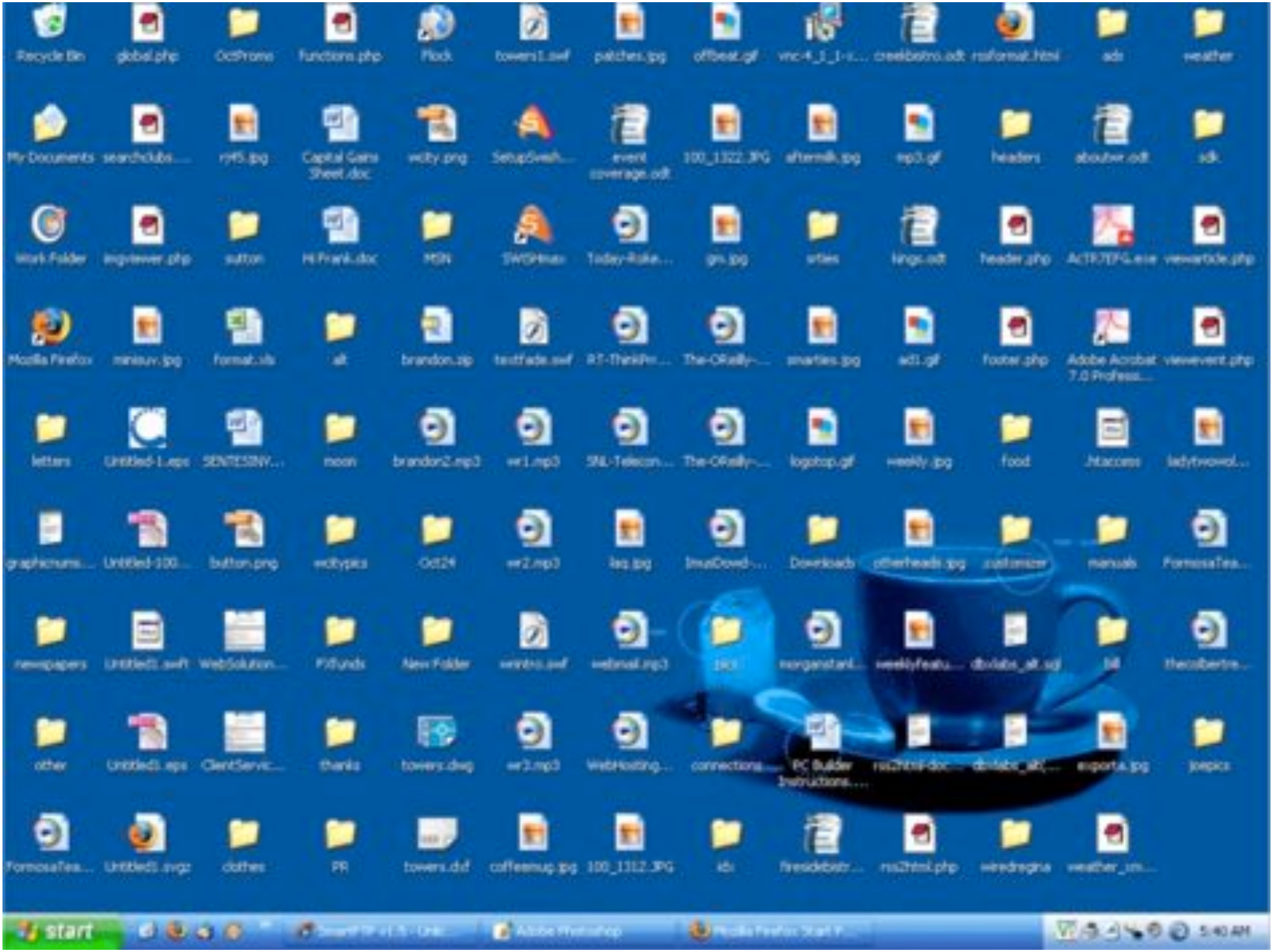
- Research your presentation environment:
  - projector
  - computer
  - version of Powerpoint/Keynote
  - pointer?
  - microphone?

Before your talk...

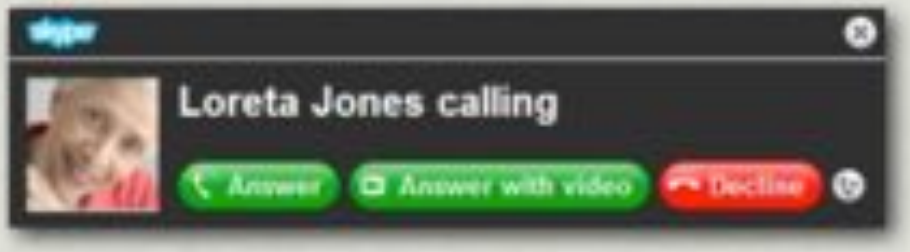
- Silence your cell phone
- Have a plan B!
  - Save a PDF copy of talk
  - Put backup copy on flash drive and/or online
  - Could you do your talk without slides?

2) Eliminate distractions

What *don't* you want your audience to see?


Recycle Bin
global.php
functions.php
Flock
patches.jpg
offbeat.gif
ads
weather
My Documents
Capital Gains Sheet.doc
headers
Work Folder
Hi Frank.doc
MSN
header.php
Mozilla Firefox
format.xls
alt
brandon.zip
footer.php
Adobe Acrobat 7.0 Profess...
letters
moon
brandon2.mp3
logotop.gif
weekly.jpg
food
button.png
Oct24
faq.jpg
Downloads
manuals
newspapers
New Folder
webmail.mp3
other
thanks
towers.dwg
connections...
PC Builder Instructions....
clothes
PR
towers.dxf
coffeemug.jpg
rss2html.php
start

Distractions



ON A MAC, USE A GUEST ACCOUNT!

3) Don’t mix styles

Choose one style and stick to it

Ugly slides

- If you *needlessly* change your fonts between slides...
- ...or even within slides
- And if you use lots of different colors
- OR FONT SIZES...

IT LOOKS UGLY!

Templates

- Avoid out-of-date templates

A little more advice on style

- **Only use a few font sizes**
- Be consistent with text alignment
- It's okay to change the font size to improve word wrapping

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4) Use images

We are visual creatures

Data

- I studied conserved genes in:
  - *Arabidopsis thaliana*
  - *Mus musculus*
  - *Xenopus tropicalis*
  - *Gallus gallus*

Data

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  - *Arabidopsis thaliana*

  - *Mus musculus*

  - *Xenopus tropicalis*

  - *Gallus gallus*

Data

5) Reduce bullet points

And reduce chance of people falling asleep

Death by bullet point

- Some talks contain
- so many bullet points
- that it makes you
- want to get out and
- shoot something

Too short?

- Download data
- Process
- Check

Too long?

- Need to obtain sequence data from suitable database in order to find set of intron sequences
- A script was written to process sequences into suitable data format (process_data.pl)
- All species that were investigated had data sets that did not produce any errors

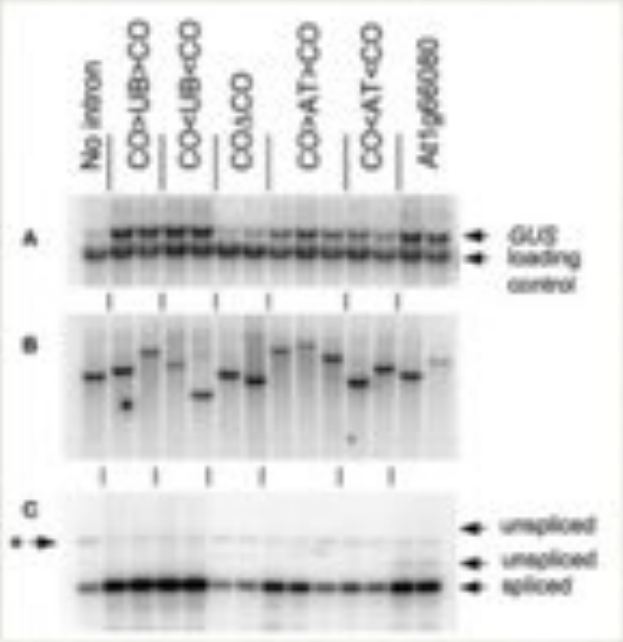
A happy compromise

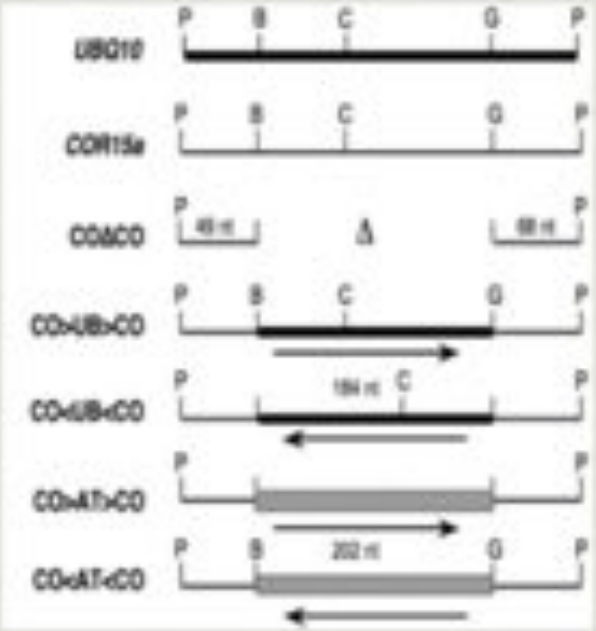
- Download intron data from GenBank
- Process into new format
- No species contained errors

6) Avoid data overload

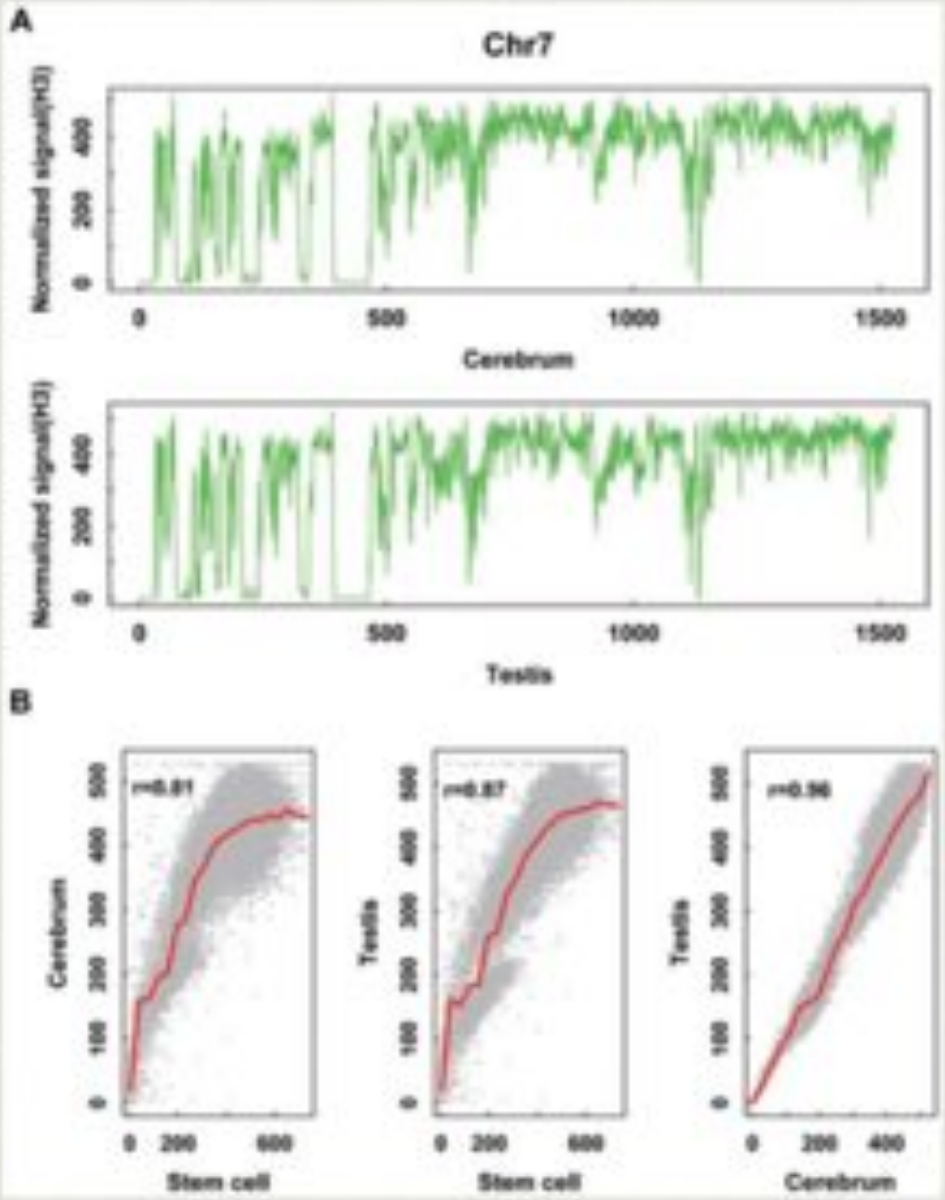
Only show what needs to be shown

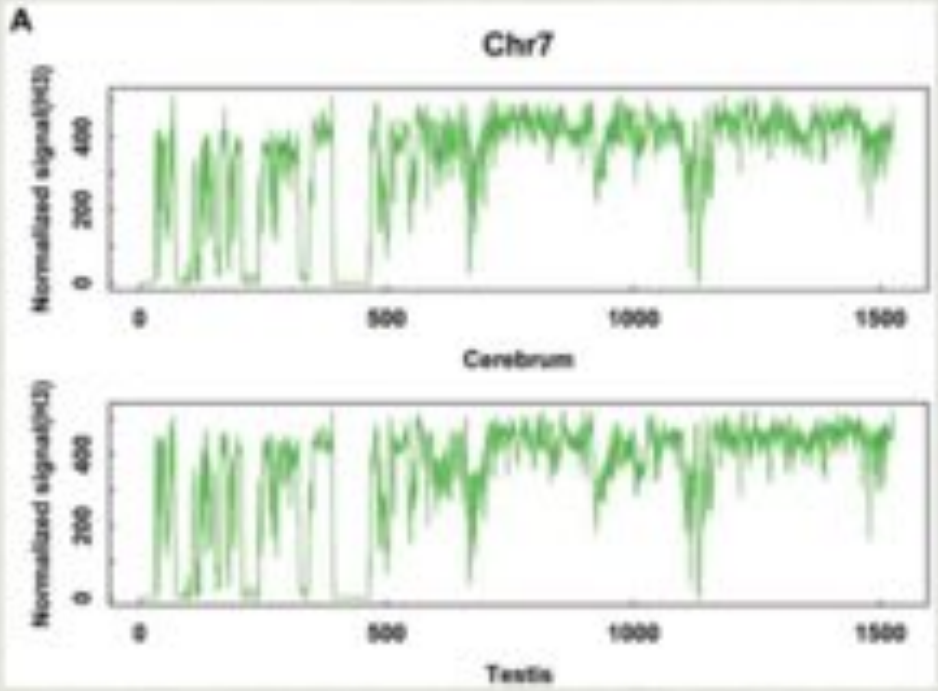
Don’t look at the cheese



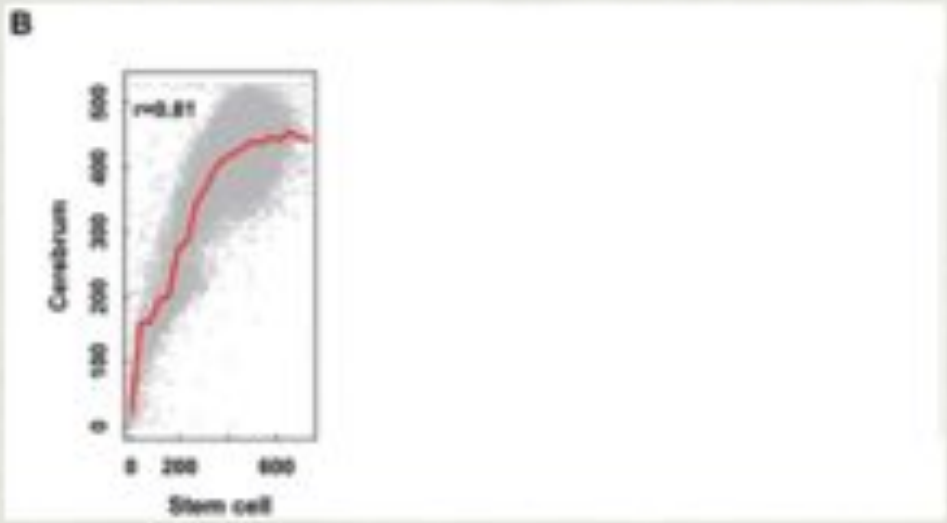


Intron	Fold increase in enzyme activity	Fold increase in mRNA accumulation
COΔCO	1.9 ± 0.7, *n* = 8	1.4 ± 0.3, *n* = 10
CO > UB > CO	17.6 ± 2.8, *n* = 16	7.5 ± 0.8, *n* = 19
CO < UB < CO	15.2 ± 2.6, *n* = 8	7.2 ± 1.2, *n* = 11
CO > AT > CO	10.6 ± 1.7, *n* = 14	5.0 ± 0.9, *n* = 15
CO < AT < CO	4.7 ± 0.8, *n* = 4	3.3 ± 0.6, *n* = 6
At1g66080	11.9 ± 4.1, *n* = 8	5.7 ± 1.6, *n* = 11


A
Chr7
Normalized signal(H3)
0
200
400
0
500
1000
1500
Cerebrum
Testis
B
r=0.81
r=0.87
r=0.96
Cerebrum
Testis
Stem cell
Cerebrum



MASKING USED TO HIDE PARTS OF IMAGE



ADD SHAPES TO HIDE PARTS OF IMAGE

FIGURE 2

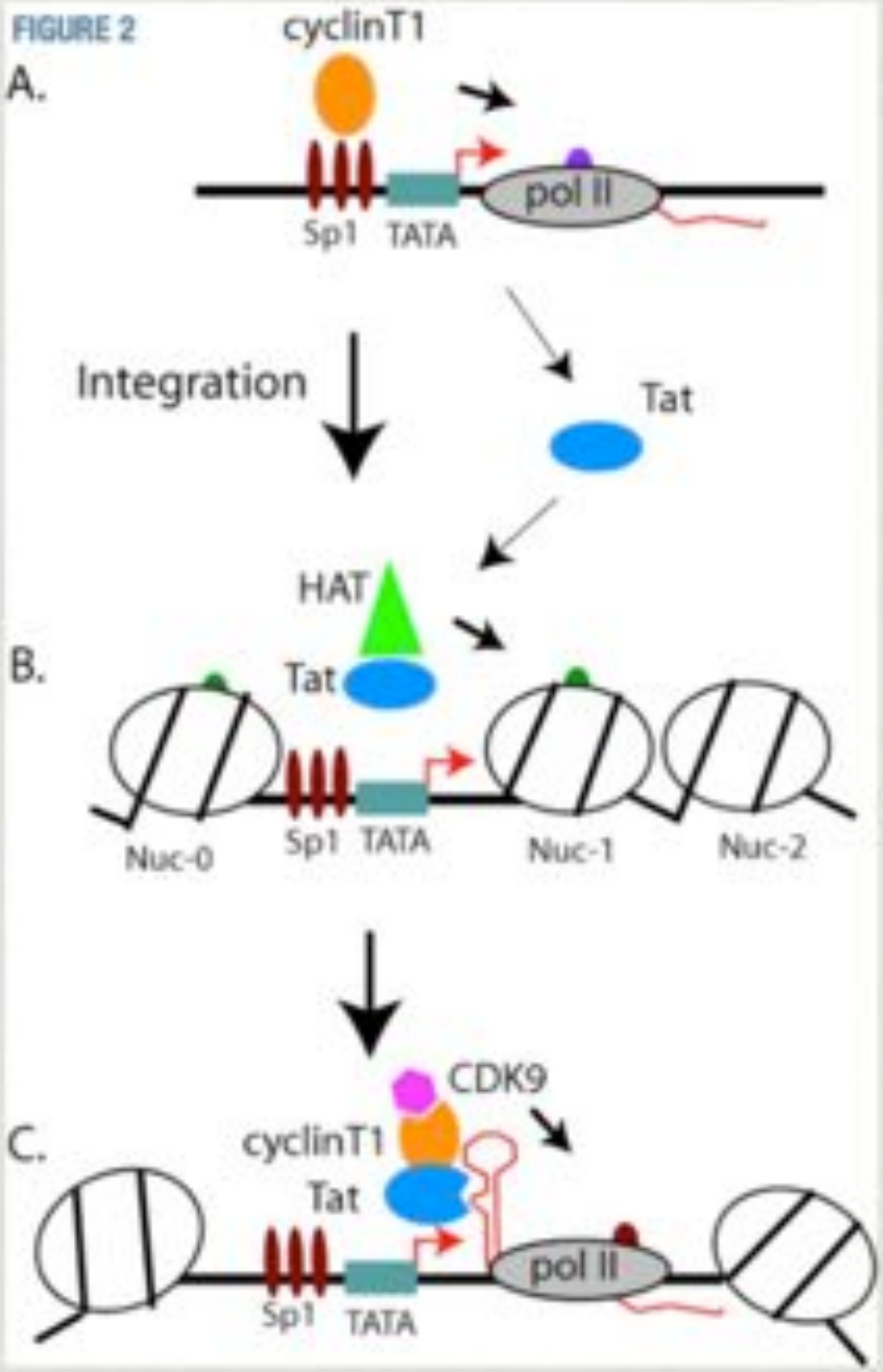
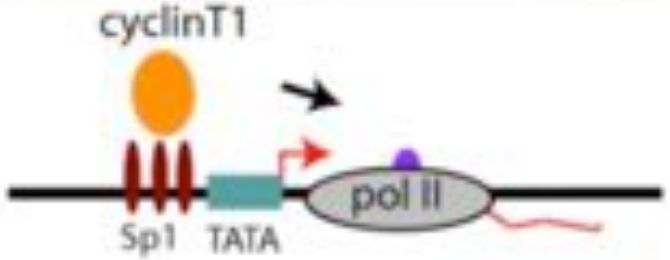

cyclinT1
A.
pol II
Sp1
TATA
Integration
Tat
HAT
B.
Tat
Nuc-0
Sp1
TATA
Nuc-1
Nuc-2
CDK9
C.
cyclinT1
Tat
pol II
Sp1
TATA

FIGURE 2

A.



7) Use your voice

You have an instrument, learn how to play it

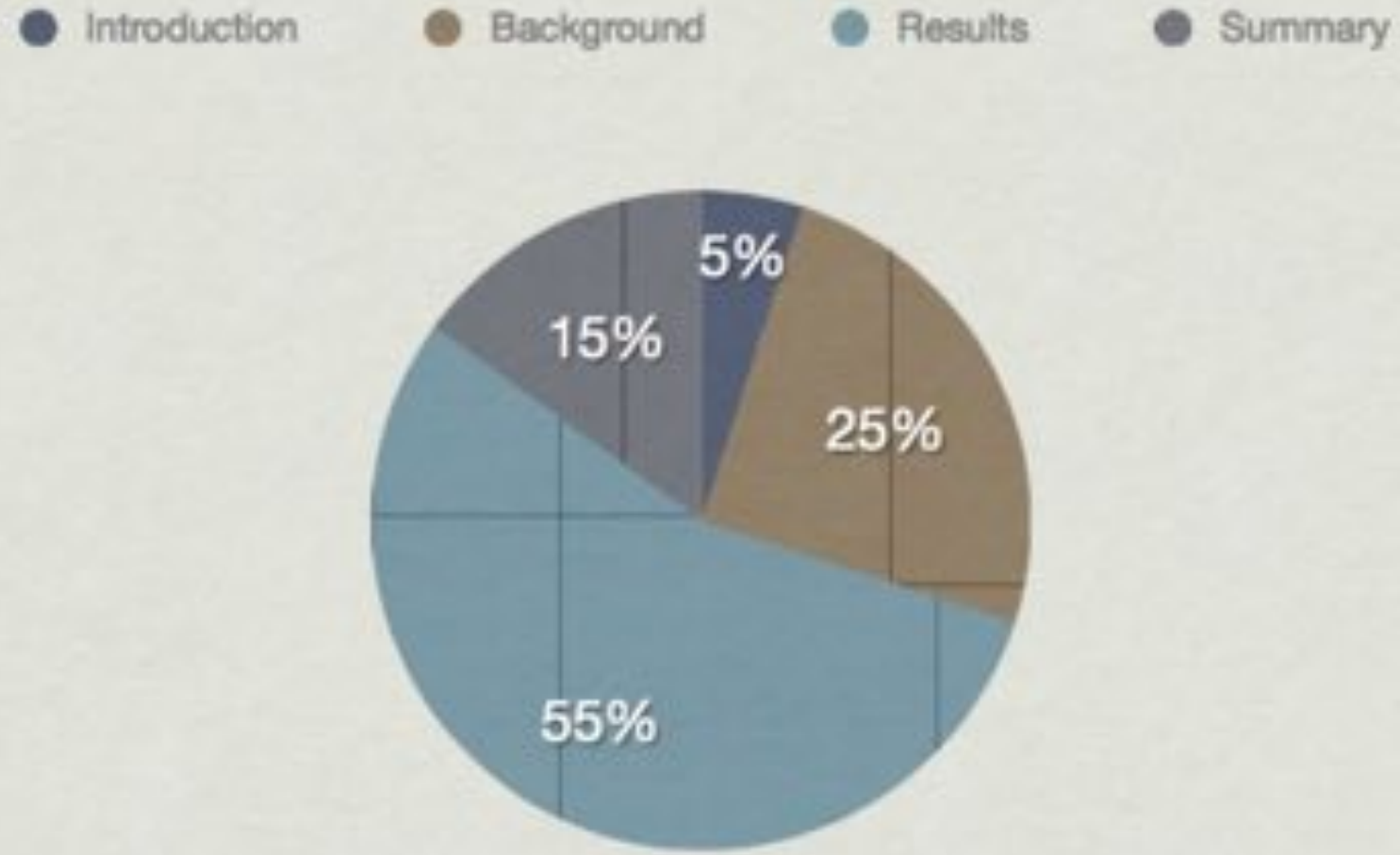
Tips for speaking

- Vary pace & volume
- Use pauses
- Practice words you may be unfamiliar with
- Avoid excessive reading of text
- Be confident

8) Content

How do you choose what to say?

Anatomy of a talk



Background material

- Make sure you include sufficient background!!!
- Make sure background is appropriate to audience

This good guy (Luke Skywalker) finds out that this bad guy (Darth Vader) is really his dad.

But Luke still becomes a Jedi and kicks his dad's ass to piss off the Emperor

And the good guys blow up this Death Star thing and crush the evil Empire. Yay, the good guys win.

The End.

9) Have a plan

Do you know how to get from A to B?

Tell a story

Make your talk flow

- The order in which you produced results is not necessarily the order in which you present results!

Have a goal

- What are the key ‘take home’ messages?
- If you don’t know what they are...
- ...your audience won’t either

10) Practice!

People will notice if you haven't practiced

What to practice?

- Timing
- Opening words (of talk and/or each slide)
- How to say unfamiliar words
- Run through entire talk (vocally)

Learn to use software

- Do you know how to use Powerpoint/Keynote?
- Do you *really* know to use them?
- Can you:
  - mask/crop an object?
  - align all objects to an edge
  - rotate objects by exactly 90°?
  - animate an object along a custom path?

Practice, practice, practice!

- Practice rehearsing your talk *as you will give it*
- Check every slide, animation, and transition
- Get feedback from friends/colleagues
- Be prepared to edit and refine slides
- Know your talk inside and out

Summary

Giving a talk is easy

Giving a *good* talk is hard

Giving a *great* talk is difficult!

One great talk could change your career forever...

...so take the time to make every talk fantastic.

Good luck!