How to prepare a scientific talk in five easy steps

Bill Tansey

Cell and Developmental Biology

Step 1: Consider your audience

Step 2: Establish priorities

Step 3: Prepare an outline

Step 4: Design slides

Step 5: Practice

Step 1: Consider your audience

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Who are they, what do they know, and why are they there?

Step 1: Consider your audience

Who are they, what do they know, and why are they there?

Lay audience

Institutional seminar

Departmental seminar

Scientific meeting

Group meeting

Step 2: Establish priorities

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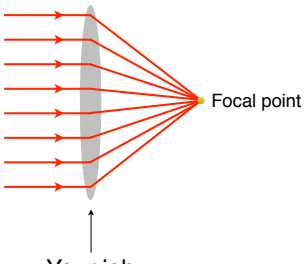
iPSC
replicative stress
phylogeny
annual cancer deaths
funding mechanisms
elutriation
MYC
ChIP-exo
epitope-tagging
disease
super enhancers
xenograft
MACS
gel filtration
ENCODE
facilitated recruitment
immunoprecipitation
super enhancers
MYC boxes
amplifier model
synthetic lethality
next generation sequencing
imaging
chromatin
angiogenesis
histone modifications
structural biology
apoptosis
FPA assay
targeting MYC through WDR5
HCF
JQ1
G4 quartet DNA
Omo-MYC
Burkitt's lymphoma
E-box
DMPK
CRE-lox
metastasis
SILAC
two-hybrid
acknowledgements
CRISPR
NMR fragment screen

Priority #1 = the focal point

What is the ONE thing you want the audience to remember?



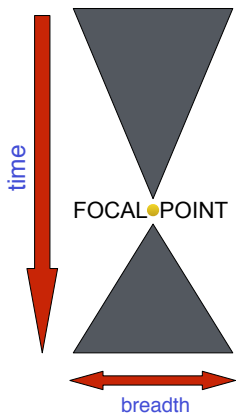
Give the right information

Give it in the right sequence

Emphasize certain things

Ignore certain things

Scientific talks have a common structure



Introduction to the **TALK**

Introduction to the **FIELD**

Introduction to the **PROBLEM**

Introduction to the **STRATEGY**

Description of the **RESULTS**

Analysis of how the results relate to the **PROBLEM**

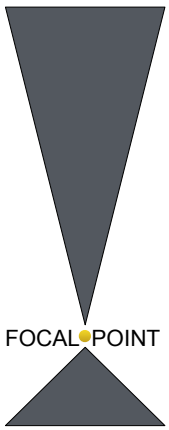
Analysis of how the results relate to the **FIELD**

Analysis of how the results relate to the **BIG PICTURE**

Summary of the **TALK**

Acknowledgements

Step 3: Prepare an outline



AACR Targeting Vulnerabilities in Cancer (22 mins talk; 8 mins Qs)

Slide #	Title	Notes
1	**Targeting MYC**	title of talk
2	**Conflicts of Interest Disclosure**	must include! Template from AACR
3	**MYC proteins and cancer**	intro to MYC
4	**MYC proteins are transcription factors**	how MYC works
5	**MYC proteins are validated anti-cancer targets**	why targeting MYC in cancer is a good idea
6	**MYC proteins are challenging drug targets**	why its so difficult to target MYC
7	**BLACK SLIDE**	transition from intro to results—PAUSE
8	**One third of MYC is unchartered territory**	cartoon of MYC; proteomic and 2HYB screens
9	**Identification of WDR5 as a MYC interaction partner**	coIP with endogenous proteins; recombinant proteins
10	**WDR5 is a versatile chromatin modifier scaffold**	intro to WDR5
11	**MYC and WDR5 co-localize across the genome**	ChIP and ChIP-seq
12	**MYC binds WDR5 via Mbillb**	mapping; FPA
13	**The MYC–WDR5 co-complex**	X-ray crystal structure
14	**Mutants that disrupt the MYC–WDR5 interaction**	coIP with retroviral proteins; recombinant proteins
15	**The WBM mutant fails to bind chromatin**	ChIP and ChIP-seq
16	**Interaction of MYC with WDR5 is required for iPSC reprogramming**	iPSC photo and graph
17	**Interaction of MYC with WDR5 is required for tumorigenesis**	graphs and photos of mice/tumors
18	**Facilitated recruitment of MYC to chromatin by WDR5**	model-new paradigm for target gene recognition by MYC
19	**MYC proteins are challenging drug targets**	same as slide 5
20	**Targeting MYC through WDR5**	same as 17, but include structure
21	**WDR5 drug discovery pipeline**	overview of HTS and hit-to-lead
22	**MYC–WDR5 inhibitor status**	stats
23	**Mechanism of action studies**	plans and systems
24	**Applications of MYC–WDR5 inhibitors**	same as slide 2
25	**Acknowledgements**	include funding

Plan on approximately one slide per minute

Step 4: Design slides

Three critical elements of slide design

1. Content — What does the slide say?
2. Style — What does the slide look like?
3. Use — What do you say?

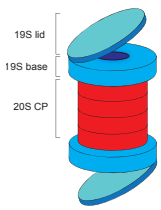
Managing content

The three main types of content

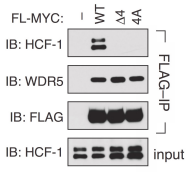
1. Words

The Mona Lisa is a painting by a Leonardo Di Caprio, who was an Italian actor best known for his roles in 16th Century movies directed by Martin Freeman, who later himself achieved fame as Dr. Watson on BBC's "Sherlock". The painting itself is much smaller than you would expect, and is protected beneath a thick layer of bullet proof glass and Japanese tourists. Scholars over the years have speculated on whether Mona's tempting but slight smile reflected her desire for the artist, embarrassment over her poorly-fitted wooden teeth, or digestive flatulence. Careful inspection of the painting reveals that Mona's pinky was once adorned with a large, bejeweled, ring carrying the phrase "Thug Life", which seems to have been painted over some time in relatively recent history, most likely during the last days of the Obama administration. Di Caprio's "smufato" technique, in which soft layers of paint are built upon one another to avoid harsh transitions and create a sense of depth, is pretty cool.

2. Models



3. Data



Keep words to a minimum

These data show, for the first time, that protein 1 binds to protein 2 and that the complex formed specifically signals process A in B-cells. Moreover, the unique structure of the 1-2 complex immediately suggests a mechanism for how signals generated under condition W could initiate an XYZ response.

Keep words to a minimum

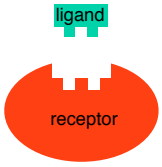
These data show, for the first time, that protein 1 binds to protein 2 and that the complex formed specifically signals process A in B-cells. Moreover, the unique structure of the 1-2 complex immediately suggests a mechanism for how signals generated under condition W could initiate an XYZ response.

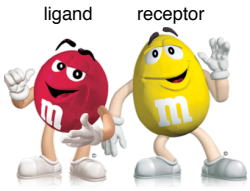
Read it verbatim? Moment of silence? Paraphrase?

Models are powerful symbols

The Mona Lisa is a painting by a Leonardo Di Caprio, who was an Italian actor best known for his roles in 16th Century movies directed by Martin Freeman, who later himself achieved fame as Dr. Watson on BBC's "Sherlock". The painting itself is much smaller than you would expect, and is protected beneath a thick layer of bullet proof glass and Japanese tourists. Scholars over the years have speculated on whether Mona's tempting but slight smile reflected her desire for the artist, embarrassment over her poorly-fitted wooden teeth, or digestive flatulence. Careful inspection of the painting reveals that Mona's pinky was once adorned with a large, bejeweled, ring carrying the phrase "Thug Life", which seems to have been painted over some time in relatively recent history, most likely during the first days of the Trump administration. Di Caprio's "smufato" technique, in which soft layers of paint are built upon one another to avoid harsh transitions and create a sense of depth, is pretty cool.

Models—use the power wisely





Models are powerful symbols

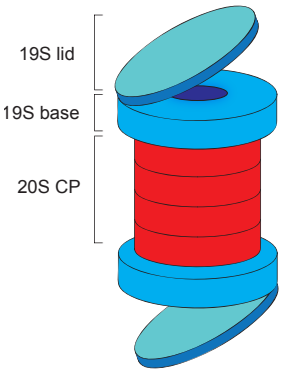
Be aware of conventions

Be consistent

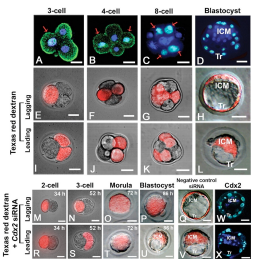
Strip out unnecessary things

Make it easy to see most important bits

Avoid visual distractions



Data–the currency of science

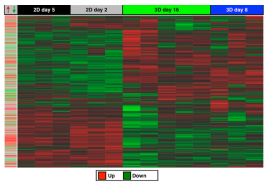


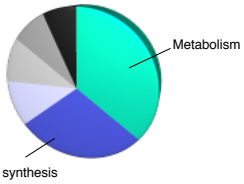
Why do we show data?

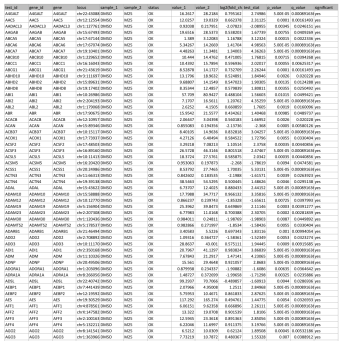
Interpretation

1. What you show
2. How you show it
3. What you claim

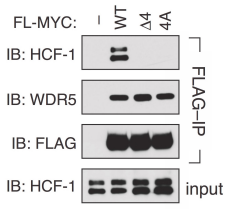
Process data depending on interpretation

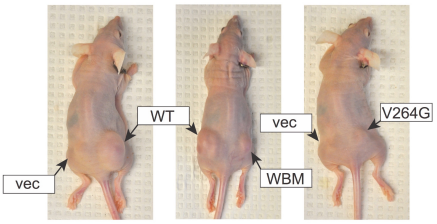






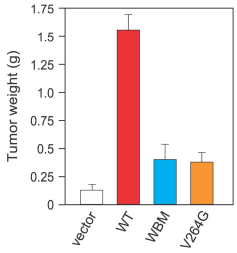
Use representative data carefully

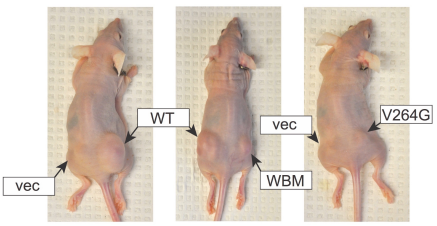




But often **representative** = **best**

A blended approach can work well





Managing style

Declarative title

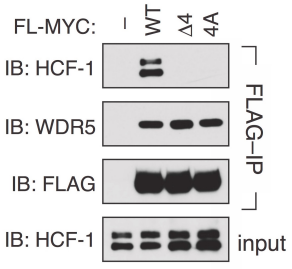
Data or model here

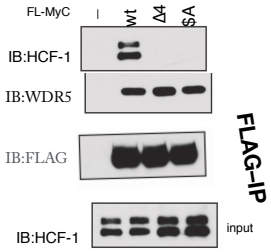
All slides identical format

Notes in front of me if necessary
(not on screen)

Maybe a description of what the experiment is (depends)

Appearance matters





Embrace simplicity

Is this slide as simple as it can be?

Is there a single unnecessary pixel?

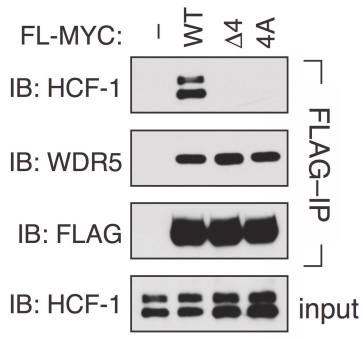
Extraneous information

Logos

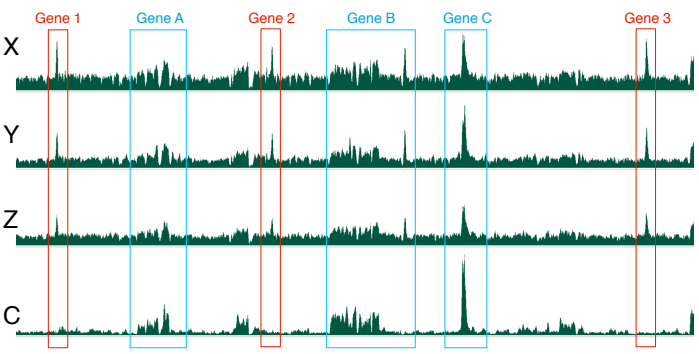
Photos of cat/ grandma/ vacation

Crazy animations

Use the real estate wisely



Build complex images in stages



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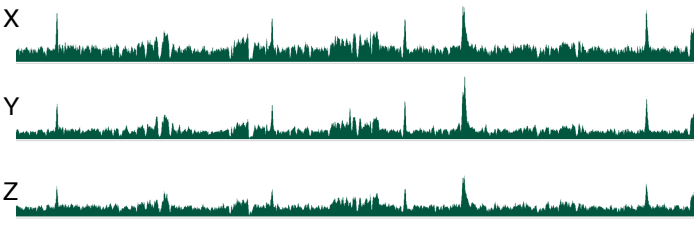

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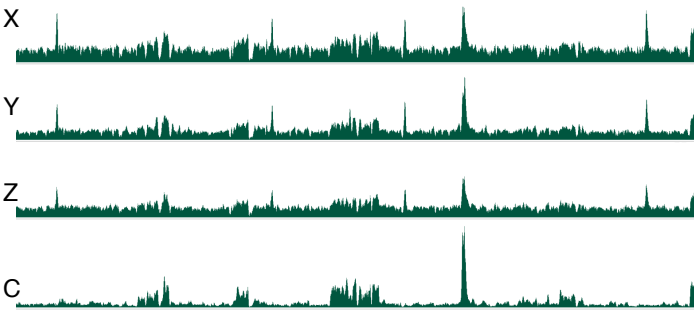

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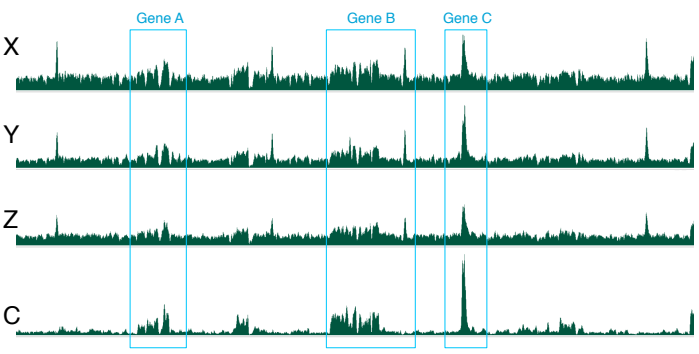

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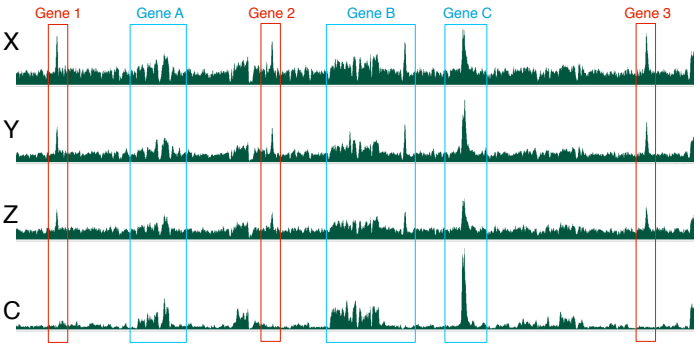
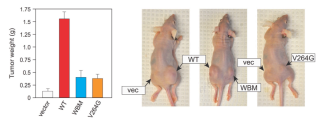


Check your work

Use a blended approach where possible



Can it be simpler?

Does it really make its point?

Does it represent me well?

Is everything consistent?

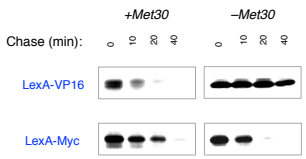
What do my colleagues think?

Managing use

The image and the words go together

What do I need to say?

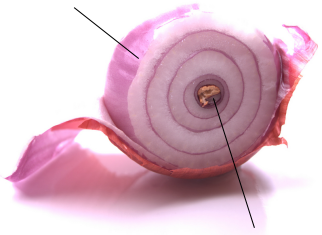
How do I say it?



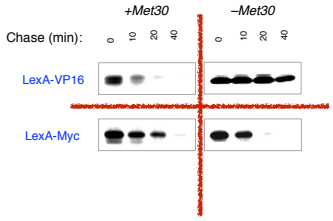
Where do I point?

Interact with a slide in layers

Most general



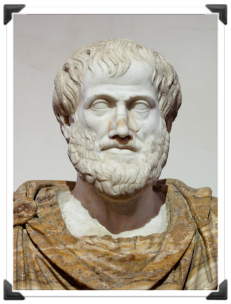
Most specific



divide and conquer

Step 5: Practice

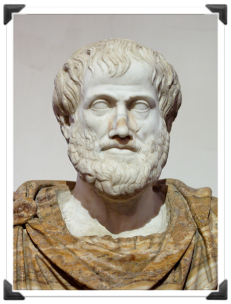
Practice makes perfect



"For things we have to learn before doing them, we learn by doing them."

–Aristotle

Practice makes perfect



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Practice methods can vary

Practice with your lab

Practice with your mentor

Practice with family/friends

Practice alone

Practice methods can vary

Practice with your lab

Practice with your mentor

Practice with family/friends

Practice alone

Goal: BEFORE your talk, be able to run through it smoothly and ON TIME.