

Making and delivering a compelling presentation

From quick and dirty talks to TED talks

Paul Albert

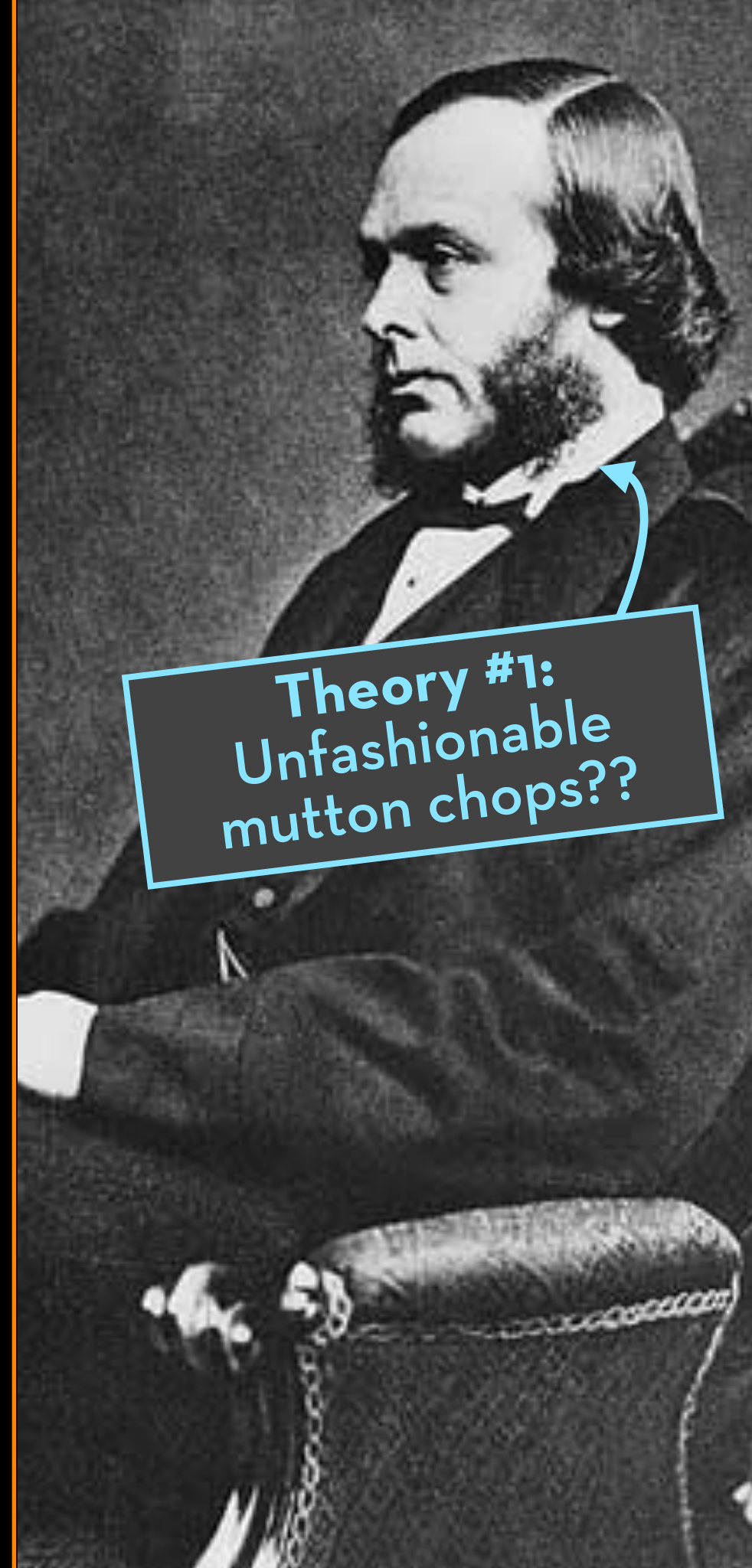
Information Technologies and Services / Library
Weill Cornell Medicine



Weill Cornell Medicine

Why did it take so long for antiseptic surgery to be accepted?

- **1865** - Joseph Lister realized that compound fractures (where the skin is broken) have a poor prognosis compared to simple fractures. Discovers and begins to promote antiseptic surgery.
- **Late 1880s/1890s** - Surgeons start to use sterile gowns and gloves.



Theory #1:
Unfashionable
mutton chops??

Clever people with ground-breaking ideas give lackluster presentations all the time.

KT

or

QI

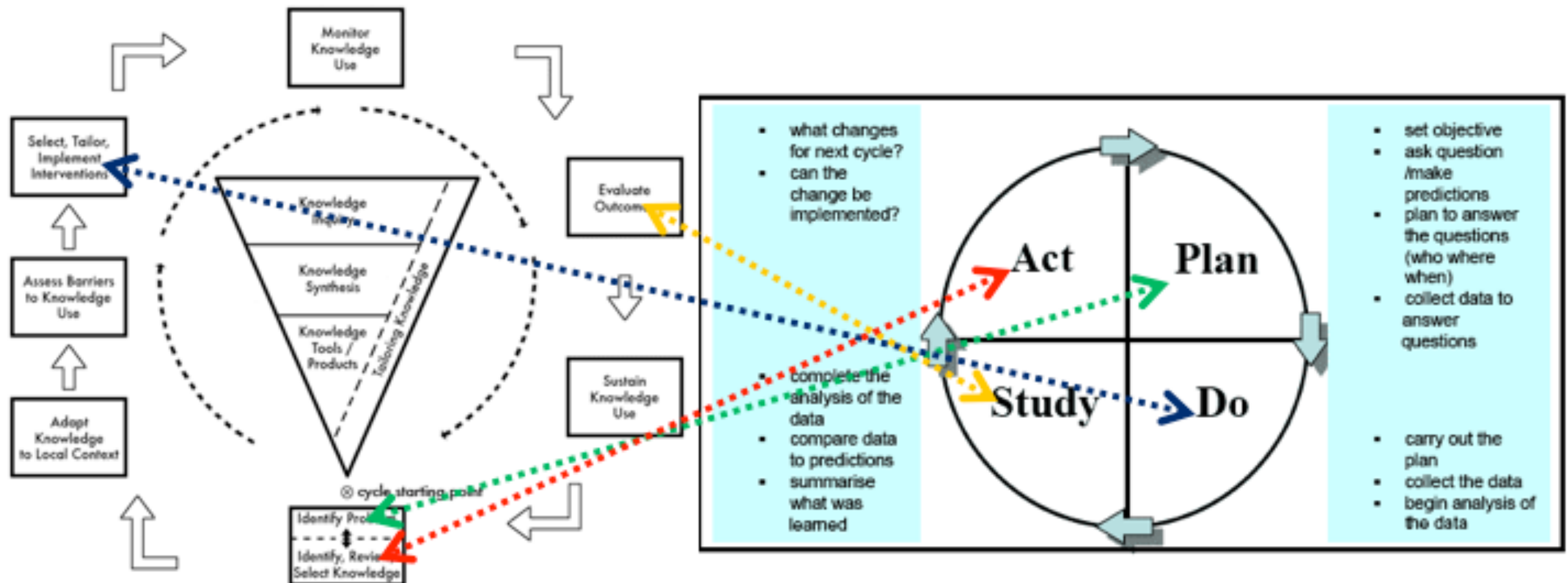
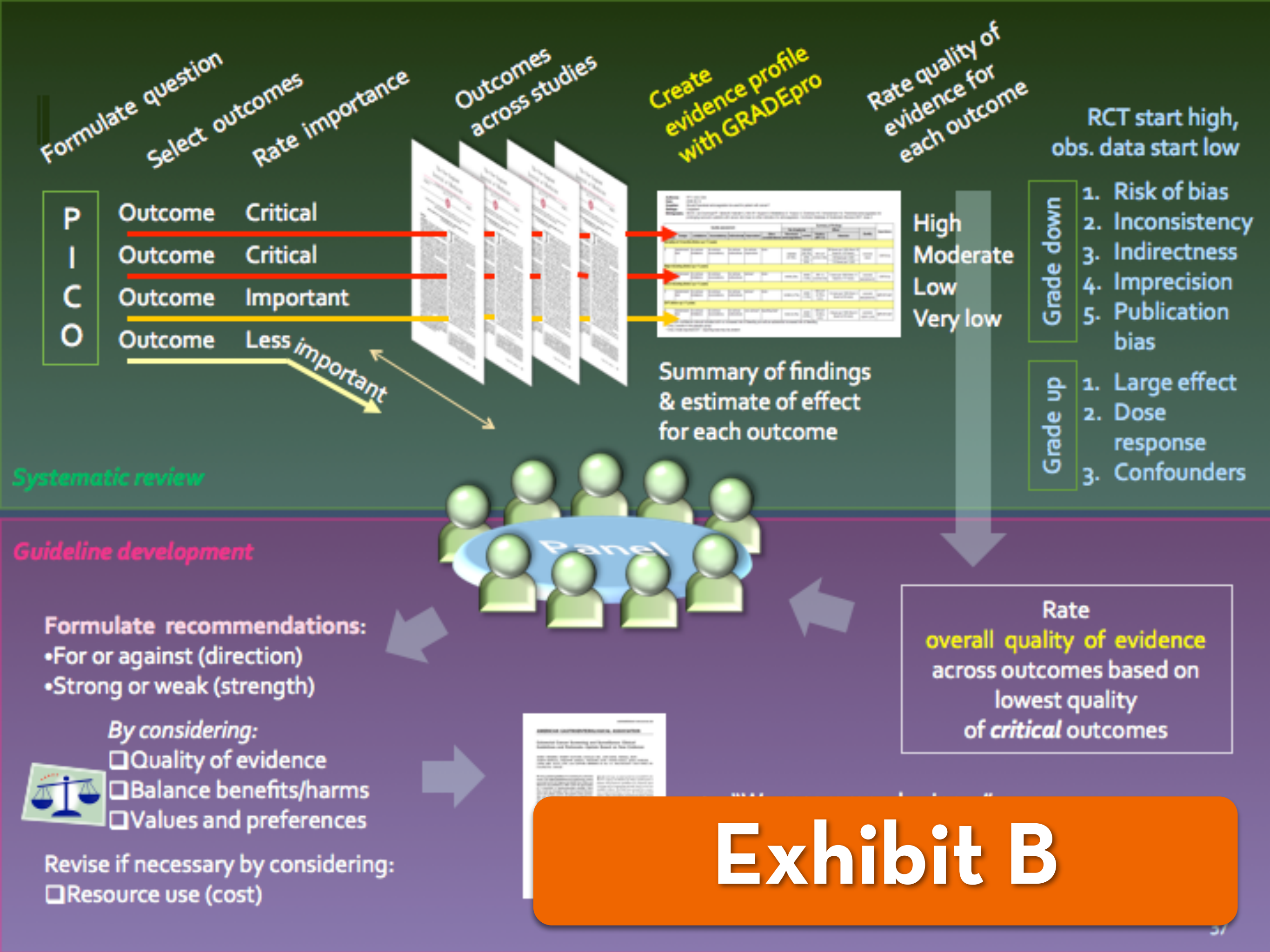



Exhibit A



Afghanistan Stability / COIN Dynamics

 = Significant Delay

■ Population/Popular Support
■ Infrastructure, Economy, & Services
■ Government
■ Afghanistan Security Forces
■ Insurgents
■ Crime and Narcotics
■ Coalition Forces & Actions
■ Physical Environment

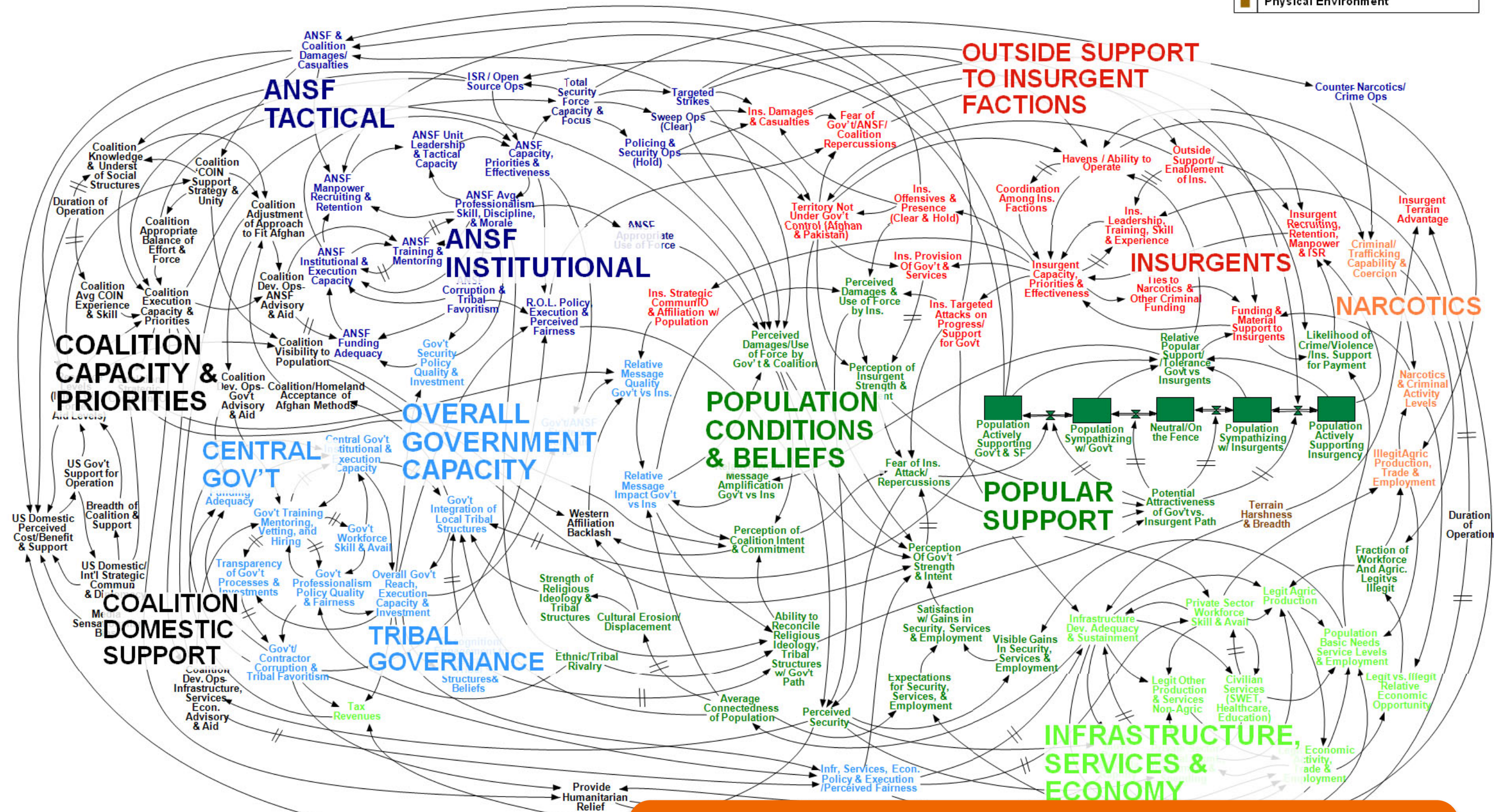
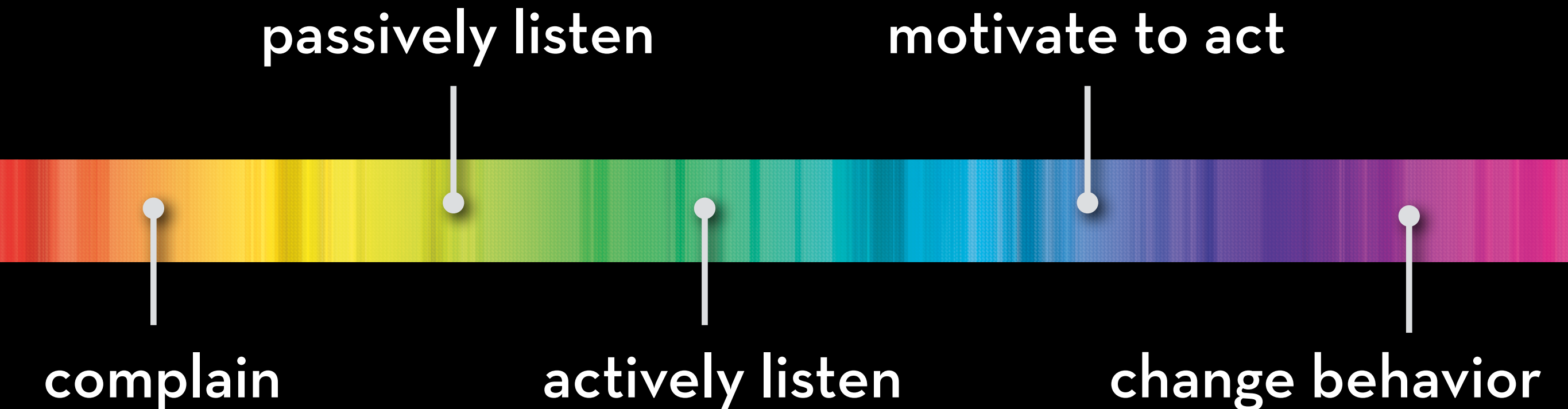


Exhibit C

The spectrum of possible audience reactions



Agenda

- Thesis and narrative
- Connecting with your audience
- Speaking style – know your content, don't read from your slides
- Slide structure
- Visual considerations – big fonts, ample contrast, minimalism...
- Reinforce your key points
- Now you try!

**Strong presentations
are driven by a thesis**

Proc Natl Acad Sci U S A. 2004 Dec 28;101(52):18099-104. Epub 2004 Dec 16.

TBX21: a functional variant predicts improvement in asthma with the use of inhaled corticosteroids.

Tantisira KG¹, Hwang ES, Raby BA, Silverman ES, Lake SL, Richter BG, Peng SL, Drazen JM, Glimcher LH, Weiss ST.

+ Author information

Abstract

TBX21 encodes for the transcription factor T-bet (T-box expressed in T cells), which influences naive T lymphocyte development and has been implicated in asthma pathogenesis. Specifically, the T-bet knockout mouse spontaneously develops airway hyperresponsiveness and other changes consistent with asthma. Because airway responsiveness is moderated by the use of inhaled corticosteroids in asthma, it is conceivable that genetic variation in TBX21 may alter asthma phenotypes in a treatment-specific fashion. Here we demonstrate that the nonsynonymous variation in TBX21 coding for replacement of histidine 33 with glutamine is associated with significant improvement in the PC(20) (a measure of airway responsiveness) of asthmatic children in a large clinical trial spanning 4 years. We note that this increase occurs only in the children randomized to inhaled corticosteroids and that it dramatically enhances the overall improvement in PC(20) associated with inhaled corticosteroid usage. The average PC(20) at trial end for subjects on inhaled corticosteroids possessing a variant allele was in the normal range for nonasthmatics. In cellular models, we show that the **TBX21 variant increases T helper 1 and decreases T helper 2 cytokine expression comparably with wild type**. TBX21 may thus be an important determinant pharmacogenetic response to the therapy of asthma with inhaled corticosteroids.

PMID: 15604153 PMCID: [PMC539815](#) DOI: [10.1073/pnas.0408532102](#)

[PubMed - indexed for MEDLINE] [Free PMC Article](#)



Full text links



Save items

★ Add to Favorites ▾

Similar articles

Pharmacogenetic study of the effect of the NK2R G231E G8 [J Clin Pharm

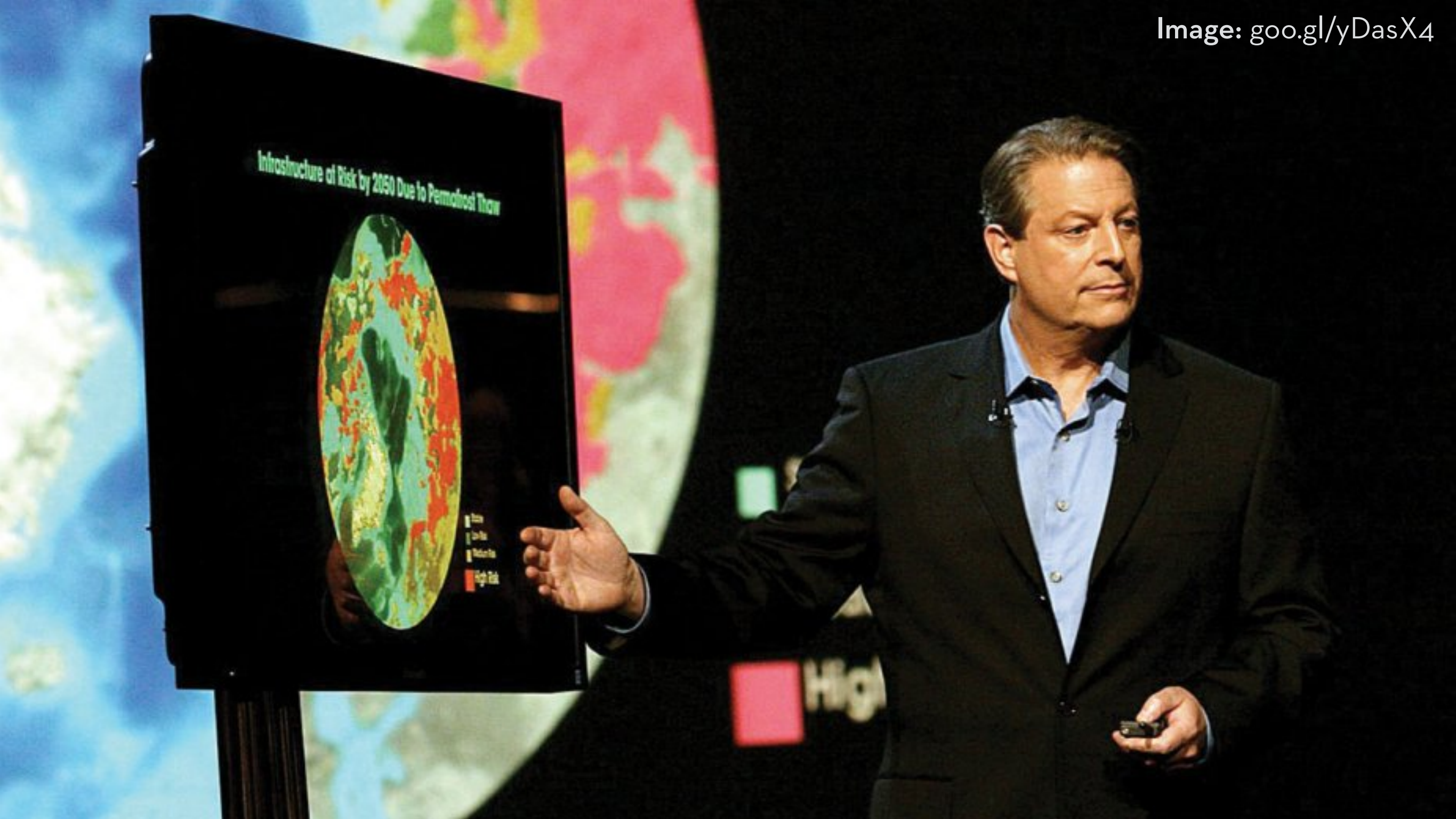
Genetic variation of TBX21 gene and the risk of asthma and its [J Hum C

Genome-wide association identifies a gene as [Am J Respir Crit Care

Review Combination of inhaled corticosteroids and long-acting beta2 agonists for asthma [Cochrane Database Sys

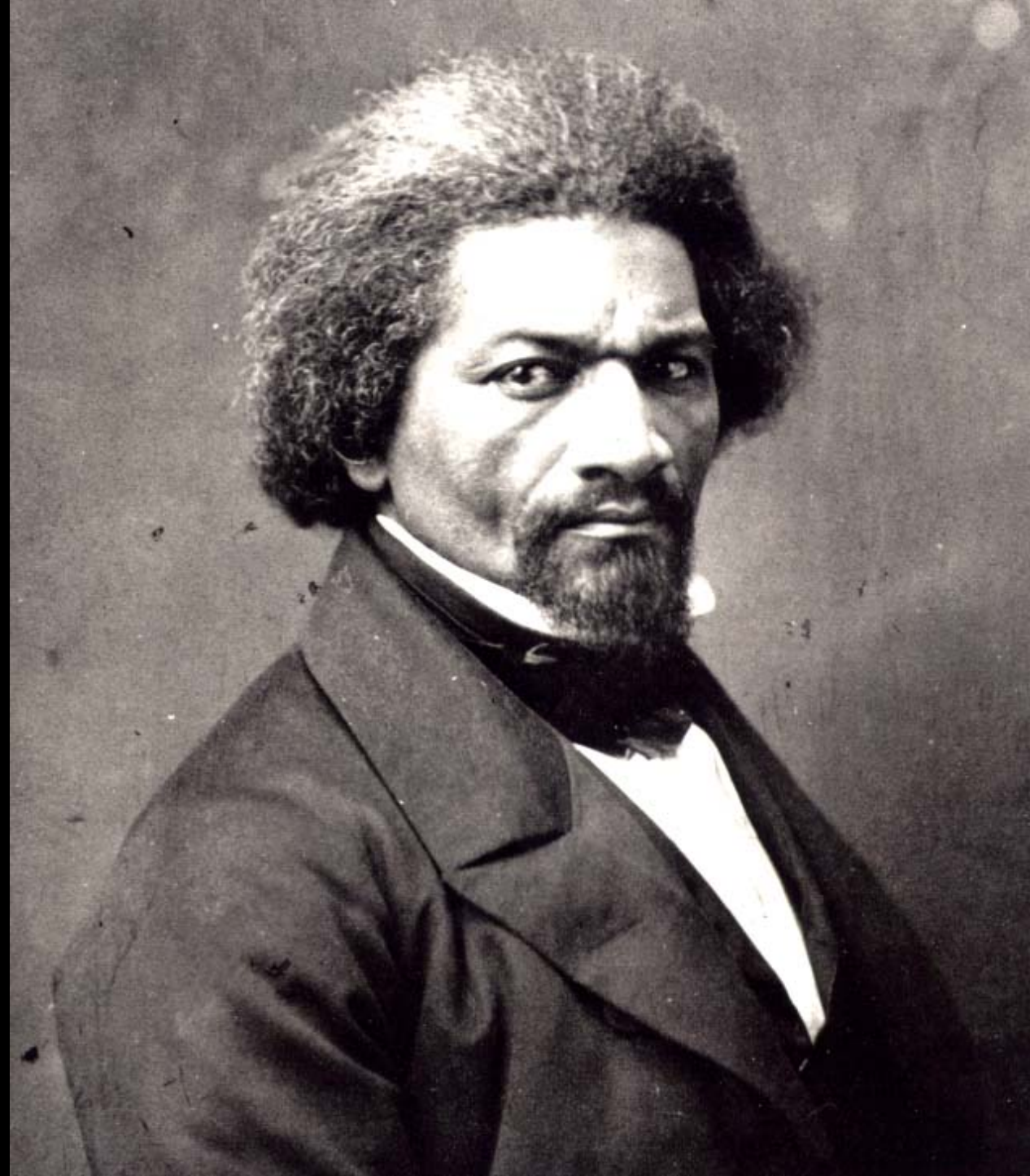
Review Addition of inhaled long-acting beta2 agonists to inhaled corticosteroids for asthma [Cochrane Database Sys

In clinical and biomedical research, an abstract's final or penultimate sentence often represents the thesis



Presentation: Al Gore, *An Inconvenient Truth*, c. 2006

Thesis: “In the absence of immediate action, climate change will have catastrophic effects.”



Presentation: Frederick Douglass *“What to the Slave is the Fourth of July?”*, c. 1852

Thesis: “Slavery is antithetical to American values of freedom.”



Presentation: Steve Jobs, *iPhone* product launch, c. 2007

Thesis: “My phone is better than your phone.”

The most important work happens before making a single slide

1. Identify a topic
2. Gather raw information
3. Interpret what you've collected
4. Draft the thesis
5. Draft an outline based on the thesis
6. Revise and edit
-
7. Produce slides, returning back to and tweaking outline as necessary



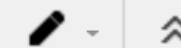
100%

Normal text

Arial

11

More



1. Thesis: We can solve administrators' longstanding needs by offering tools that allow for disintermediated reporting.

1. Introduction

- a. Purpose: This is a talk about failure, specifically why we fail when it comes to faculty reporting, and how we intend to turn it around.
- b. Scope: relevant to faculty data reporting infrastructure, to putting up a VIVO

2. Weill Cornell has failed to provide effective reporting to administrators.

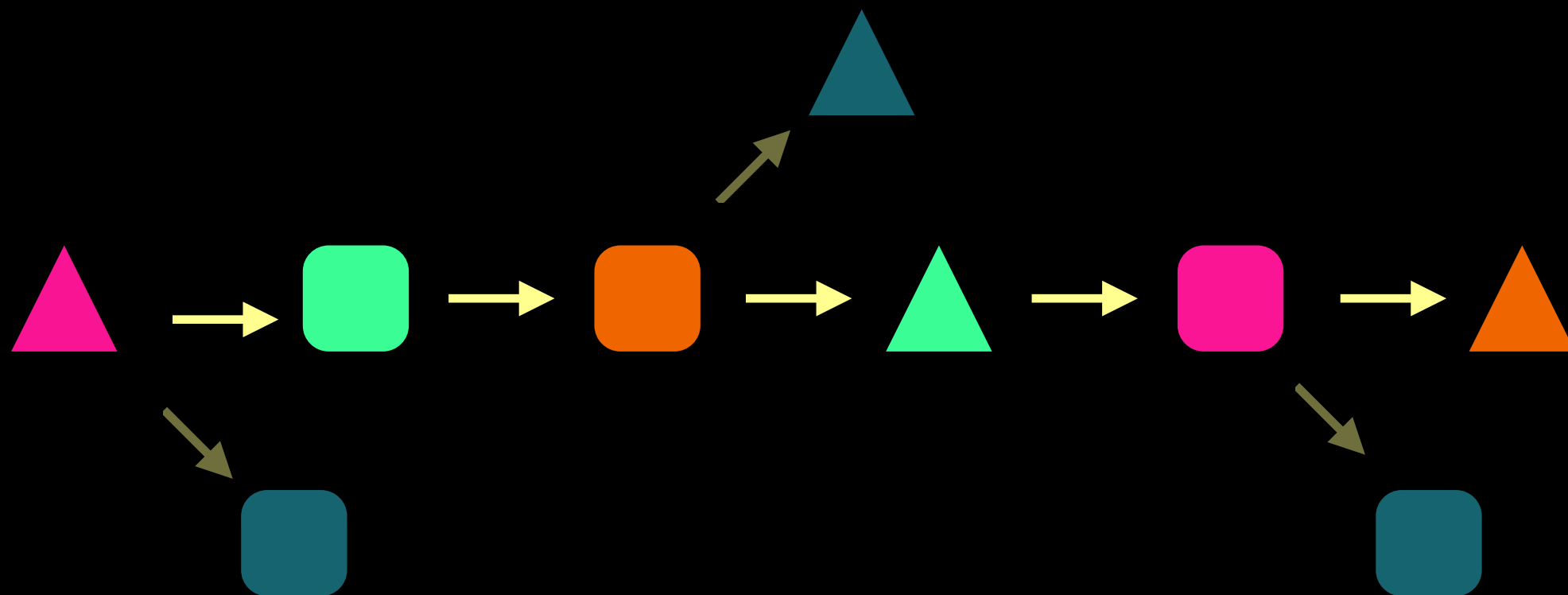
- a. We have largely failed. Why?
 - i. Not a monolithic system.
 - ii. Shadow systems perform the same function. Lots of duplication, not only in our person identifiers but also in our processes
 - 1. HR vs. WOOFA - show onboarding workflow.
 - 2. Describe how duplicate CWIDs are created for Epic users.
 - iii. Lack of agreement on basic terms. (There are three definitions for faculty.)
 - iv. Our existing systems are designed to solve one problem at a time. The HR system wants to know tenure? Here have a PDF.
 - v. Reporting is fundamentally a skunkworks endeavor. (Dept. of Med. has gone so far as to build their own Faculty Affairs system)
- b. What do we lack? I would categorize into three big buckets:
 - i. principles - what is fundamentally important to us?
 - ii. processes - confront institutional inertia around processes
 - iii. technology

3. Consumers desired outcomes

- a. On demand: I can generate a report whenever I
- b. Caveat free: I know the assumptions behind the
- c. Well documented: If I don't know them, I can look
- d. Consistent: The report is consistent.
- e. Tools for interaction: I can interact with the data, faceting or filtering.
- f. If I had to say one word, it would be disintermediation - reduction in the

One idea begets the next, and each idea serves the thesis.

Strong presentations are well-edited



**In writing, you must kill
your darlings.**

William Faulkner

*Count of slides
unceremoniously excised
from this presentation*

31



Good and bad reasons for including something



- It serves the single idea.



- It's interesting.
- It's somewhat related.
- The source material mentions it.
- Already created the slide. I may as well.



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**Subdivide your outline
into individual ideas.
These are your slides.**

**Why deliver a
presentation when you
could just give handouts?**

**Telling stories to each other
is a fundamental human
impulse.**



**Compelling stories have a
narrative**

**...even in Medicine and
biomedical research!**

Strong narratives need not be chronological

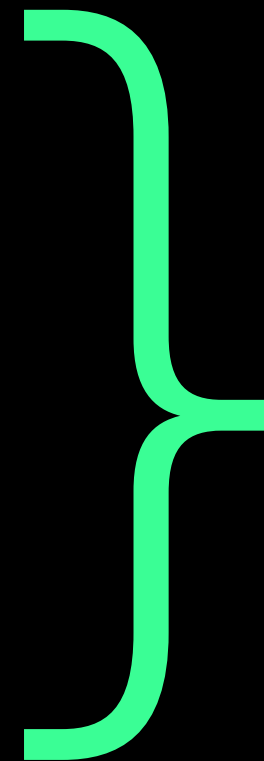
Entire history of the field



Recent developments



What you're working on



Boring

One option: start in the middle



The Odyssey



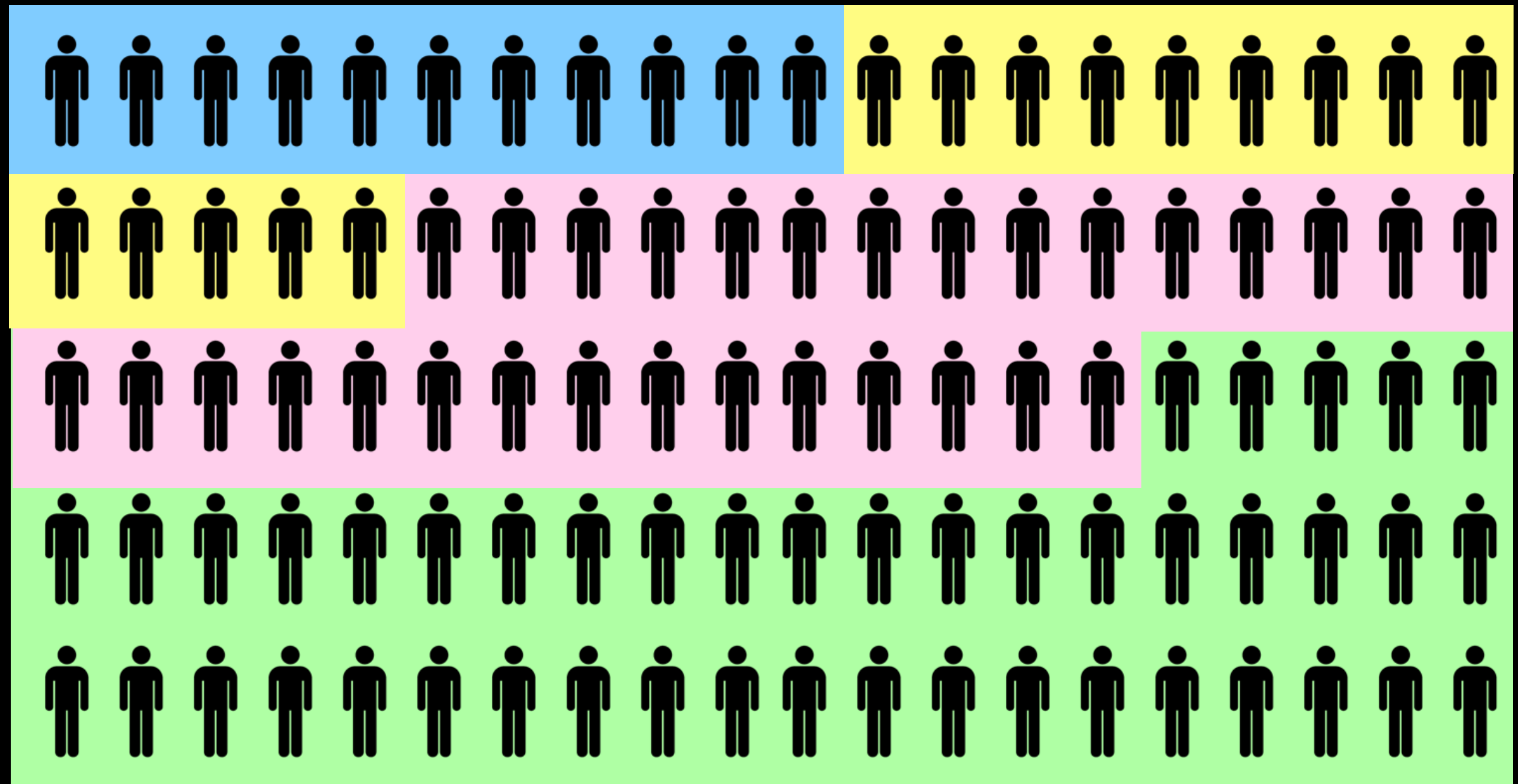
Divine Comedy



Raging Bull

**Another option: pique
your audience's interest
early on**

The leading cause of death of firefighters is not work-related



■ Trauma
■ Burn/asphyxiation

■ Other
■ Cardiovascular death

Source: FEMA

Engaging your audience

According to learning theory, knowledge is constructed. What is the existing structure you must build upon?



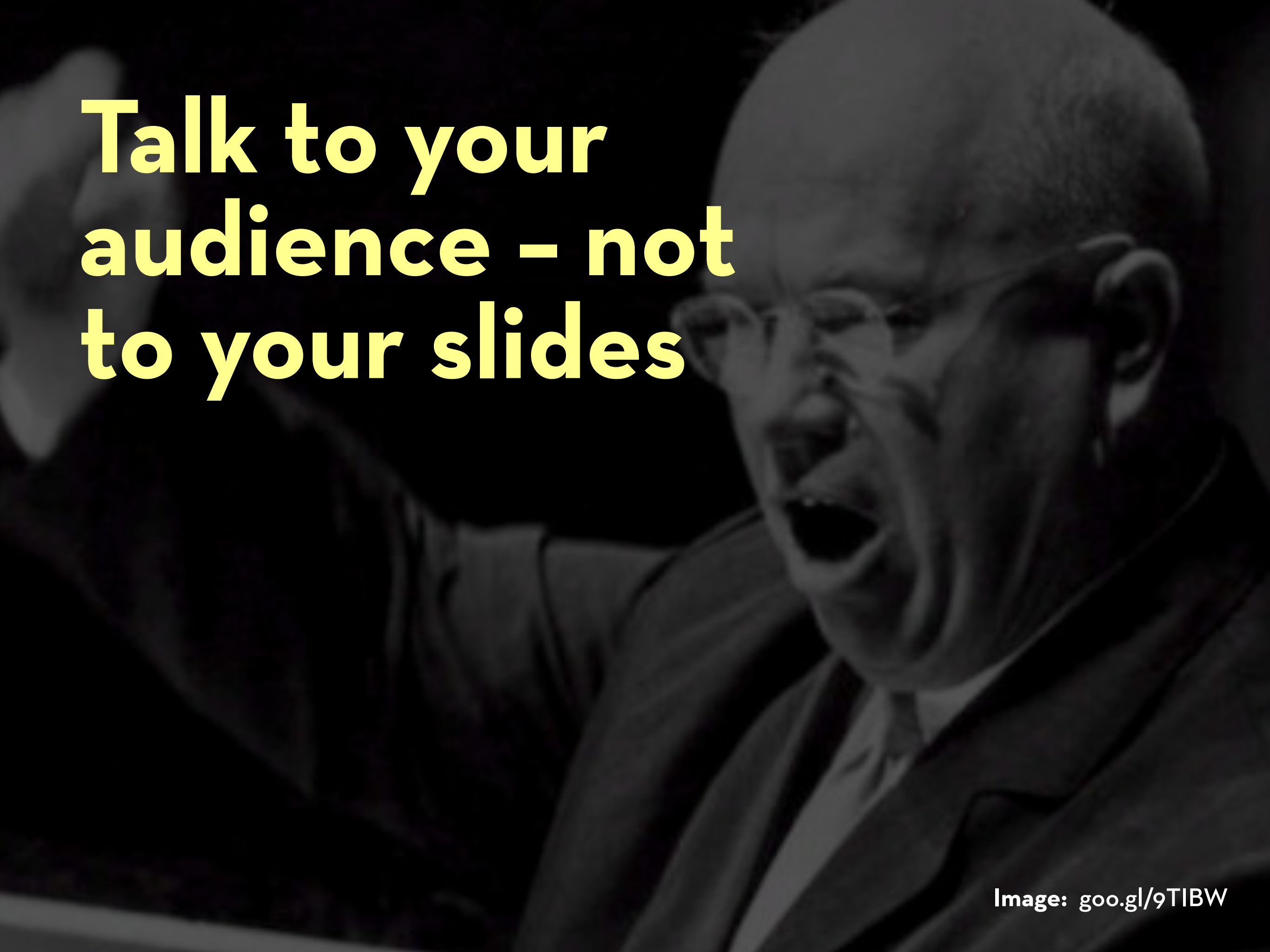
Who is your audience?

- **Education, training, and knowledge base** – Where are they starting from? Which acronyms or concepts require explanation?
- **Reasons for attending** – To learn something new? To make money? To evaluate you? Because they were compelled?
- **Receptivity** – What are their biases?

Presentations should be tailored to the anticipated audience

- Researchers in the field of your presentation
- Researchers in another field
- 8th graders
- Patient groups
- Journalists
- Congressmen
- Chief residents
- Attending physicians

**How exactly does one
talk good?**

A dark, grayscale background image of Barack Obama speaking into a microphone, with his mouth open and hand near his face.

**Talk to your
audience – not
to your slides**

Your slides should:

- illustrate key information
- reinforce messages
- serve as a prompt

Your slides should NOT:

- serve as a script

**Use strong
eye contact**



Skip the fillers

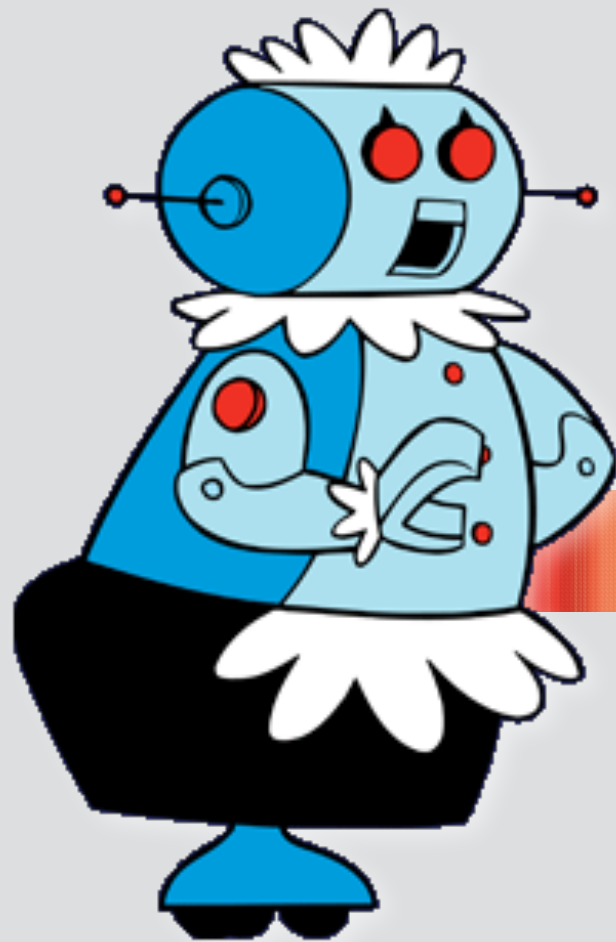
Like... Umm... Uhh... Er...
So... Well... If you will...
Sort of... Ah... You know...
Actually... Technically...
Basically... I guess... I
mean... Now...



Image: goo.gl/rgUj4

How enthusiastic should a presenter be?

Low



High



Natural state for most people

Socratic ideal for presenters

Do you have a mousy voice?



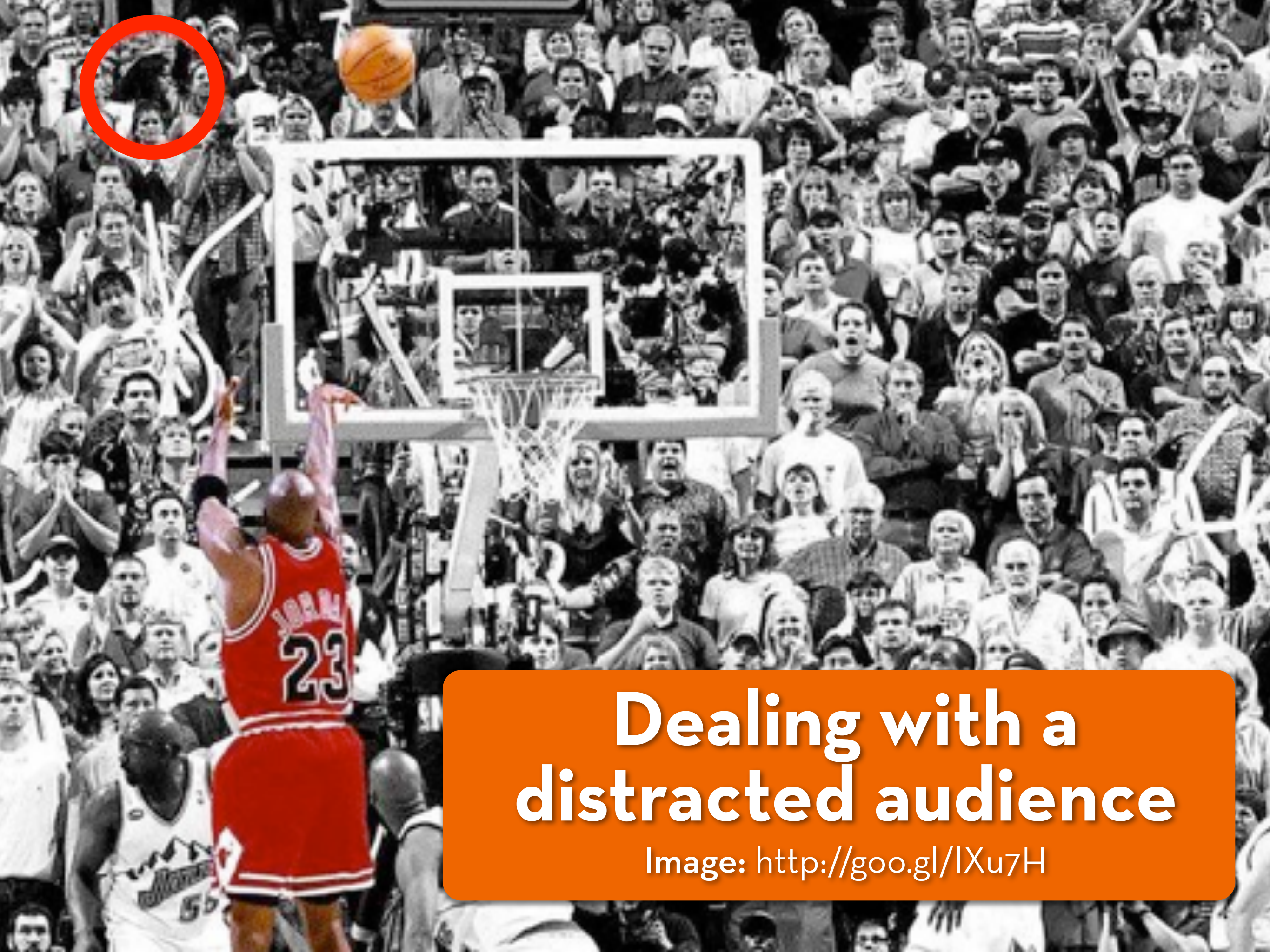
Image: goo.gl/izgKN

Channel your inner construction worker and speak up!

Be this guy.



Image: goo.gl/vGscu



Dealing with a distracted audience

Image: <http://goo.gl/lXu7H>

Combatting distraction



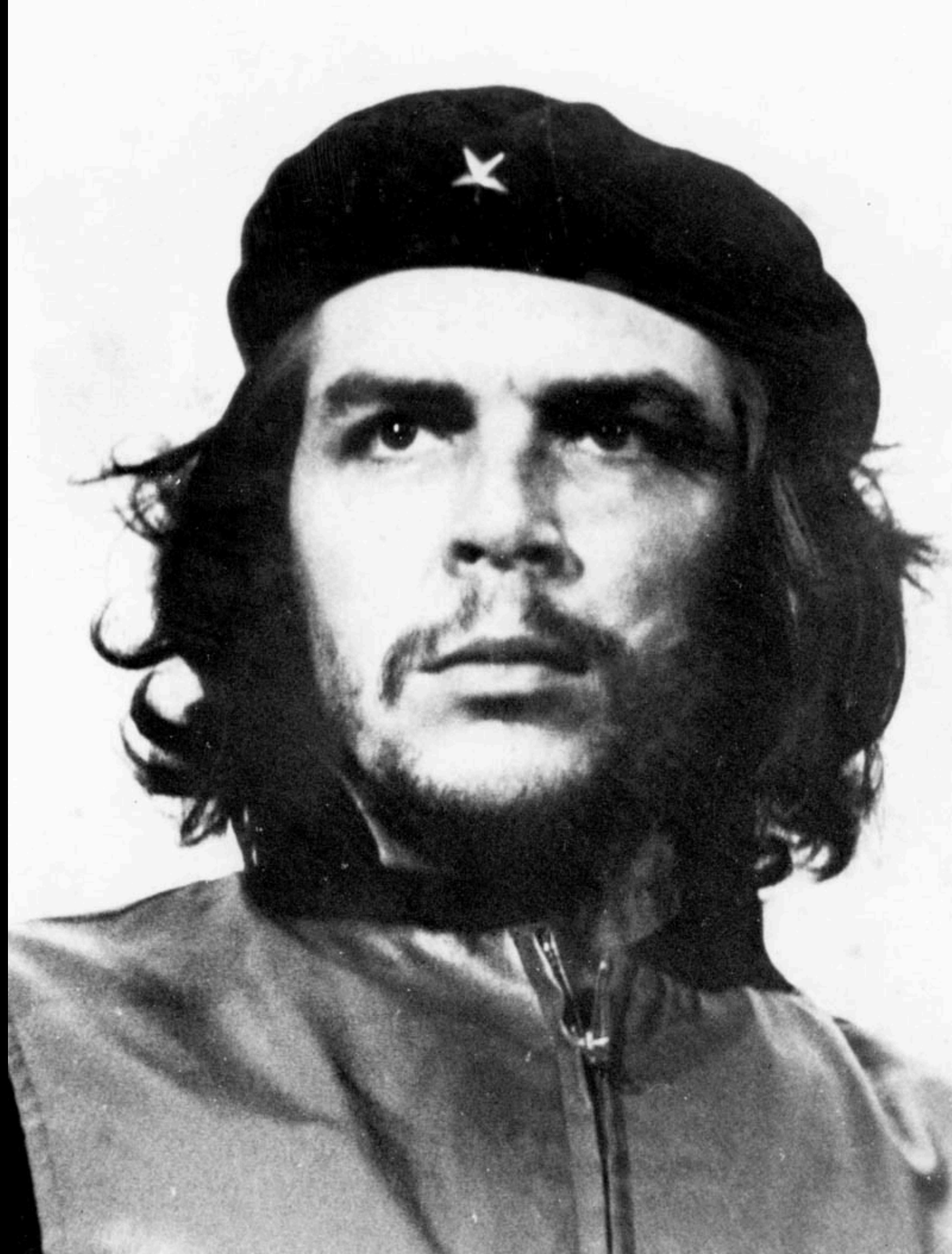
- circulate among the audience, slightly invading personal space
- ask a question
- assign a task



- sit on lap of people who aren't paying attention
- stare menacingly
- smash their iPhones

**Effective graphical
communication is not an
accident.**

**What about successful
visual propaganda
makes it resonate?**





We Can Do It!



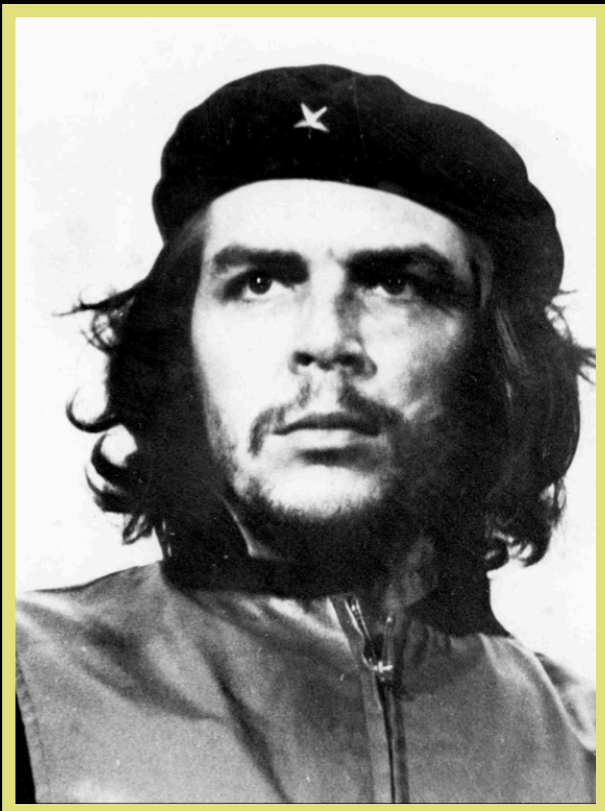
POST #10-10-70-000-00



WAR PRODUCTION CO-ORDINATING COMMITTEE







**How effective are these
competing approaches?**

Humans are controlled by a metagenome

- Human microbiome have millions of genes vs human genome which have 20,500 genes
- Thousands of microbial cells can persist inside a single infected human cell.
- Combined genetic contributions of microbes provide a vast number of gene products not encoded by our own relatively small genomes.
- Considerable similarity between the functions of the bacterial organisms and the human organisms

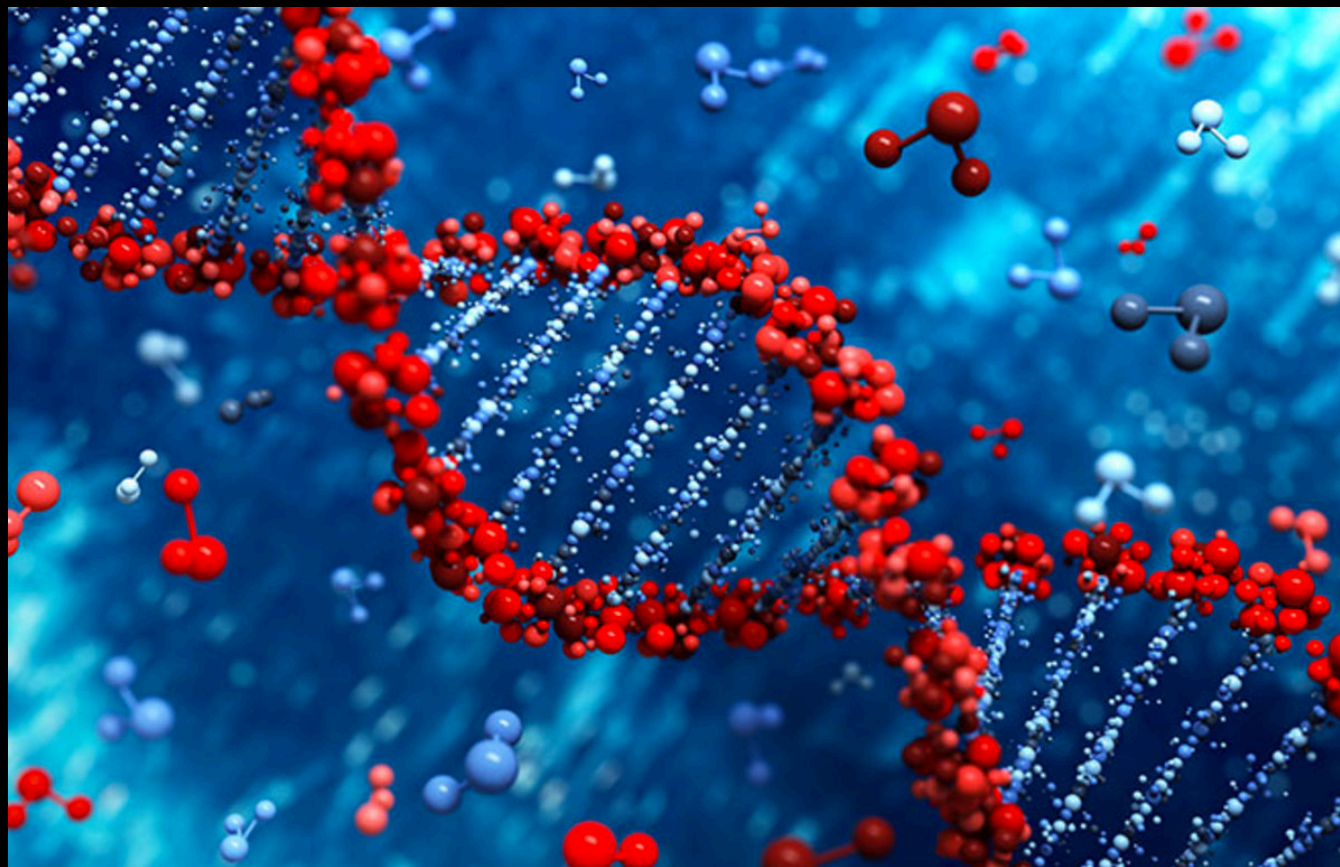
Humans are controlled by a metagenome

- Human microbiome - millions of genes
- Human genome - 20,500 genes



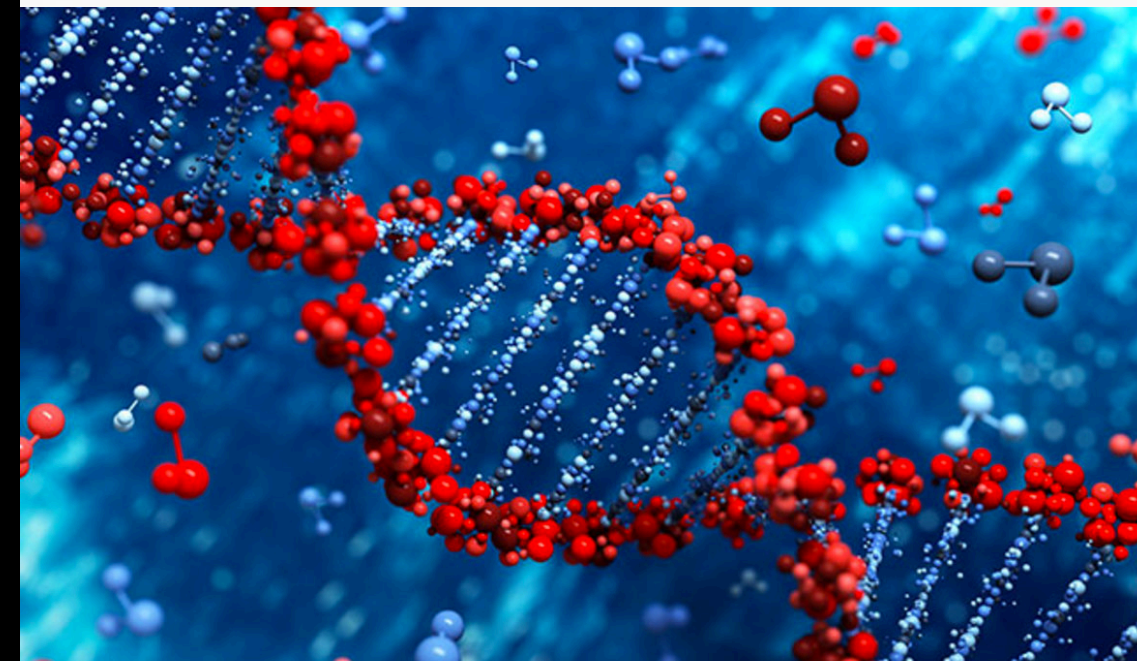
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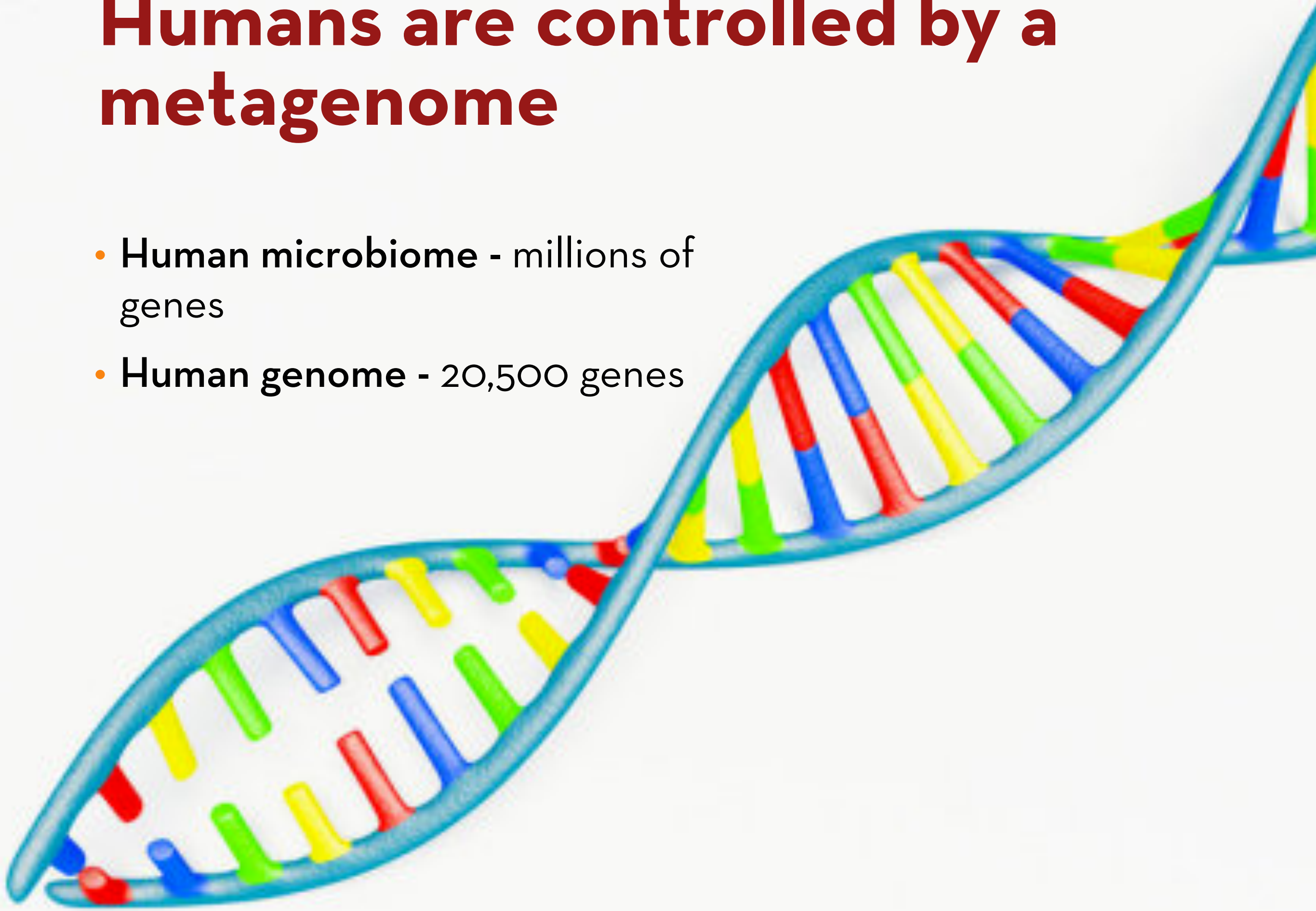
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Humans are controlled by a metagenome

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Humans are controlled by a metagenome

- Human microbiome - millions of genes
- Human genome - 20,500 genes

Humans are controlled by a metagenome

Human microbiome
Millions of genes

TCTGCGAGACTGGATTGTGTAGACAATAAGCACAGAGCAGGT
TGTTGTGATGGCTATCTGCGAGACTGGATTGTGTAGACAATAA
GCACAGAGCAGGTTGTTGTGATTGGCTATCTGCGAGACTGGA
TTGTGTAGACAATAAGCACAGAGCAGGTTGTTGTGATTGGCTA
TCTGCGAGACTGGATTGTGTAGACAATAAGCACAGAGCAGGT
TGTTGTGATTGGCTTCTGCGAGACTGGATTGTGTAGACAATAA
GCACAGAGCAGGTTGTTGTGATGGCTATCTGCGAGACTGGAT
TGTGTAGACAATAAGCACAGAGCAGGTTGTTGTGATTGGCTAT
CTGCGAGACTGGATTGTGTAGACAATAAGCACAGAGCAGGTT
GTTGTGATTGGCTATCTGCGAGACTGGATTGTGTAGACAATAA
GCACAGAGCAGGTTGTTGTGATTGGCTTCTGCGAGACTGGAT
TGTGTAGACAATAAGCACAGAGCAGGTTGTTGTGATGGCTATC
TGCGAGACTGGATTGTGTAGACAATAAGCACAGAGCAGGTTG
TTGTGATTGGCTATCTGCGAGACTGGATTGTGTAGACAATAAG
CACAGAGCAGGTTGTTGTGATTGGCTATCTGCGAGACTGGAT
TGTGTAGACAATAAGCACAGAGCAGGTTGTTGTGATTGGCTTC
TGCGAGACTGGATTGTGTAGACAATAAGCACAGAGCAGGTTG
TTGTGATGGCTATCTGCGAGACTGGATTGTGTAGACAATAAGC
ACAGAGCAGGTTGTTGTGATTGGCTATCTGCGAGACTGGATT
GTGTAGACAATAAGCACAGAGCAGGTTGTTGTGATTGGCTATC
TGCGAGACTGGATTGTGTAGACAATAAGCACAGAGCAGGTTG
TTGTGATTGGCTTCTGCGAGACTGGATTGTGTAGACAATAAGC
ACAGAGCAGGTTGTTGTGATGGCTATCTGCGAGACTGGATTG
TGTAGACAATAAGCACAGAGCAGGTTGTTGTGATTGGCTATCT
GCGAGACTGGATTGTGTAGACAATAAGCACAGAGCAGGTTGT

Human genome
20,500 genes

TCTGCGAGACTGGATTGTGTAGACAATAAGCACAGAGCAGGT
TGTTGTGATGGCTATCTGCGAGACTGGATTGTGTAGACAATAA

Humans are controlled by a metagenome



The diagram features a large yellow circle on the left and a smaller pink circle on the right. The yellow circle is labeled 'Human Microbiome' and 'Millions of genes'. The pink circle is labeled 'Human Genome' and '20,500 genes'. The circles are positioned to show the relative scale of the two genomes.

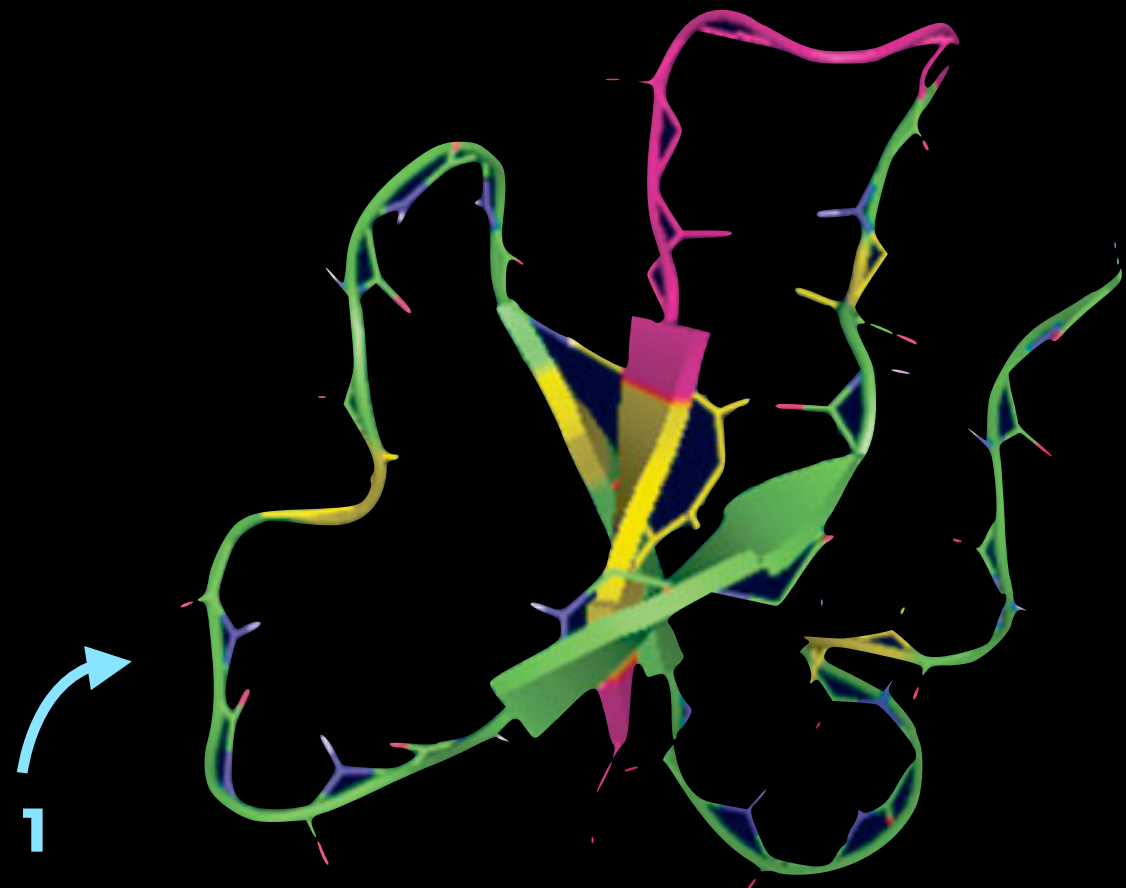
Human Microbiome
Millions of genes

Human Genome
20,500 genes

One idea per slide

Chronic microbes alter expression of the body's metabolites

human beta-defensin 1
(hBD-1)



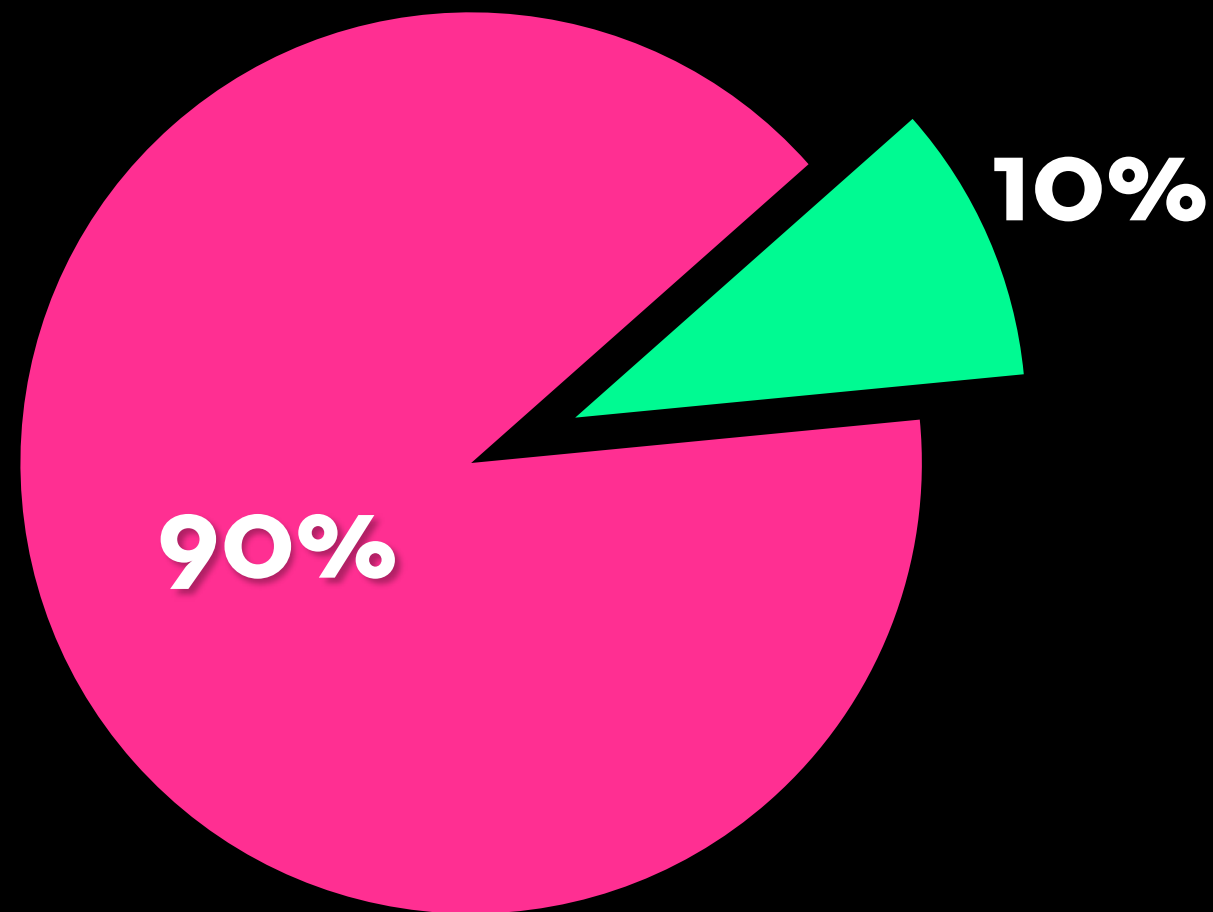
PMID: 21248835

Cut design elements



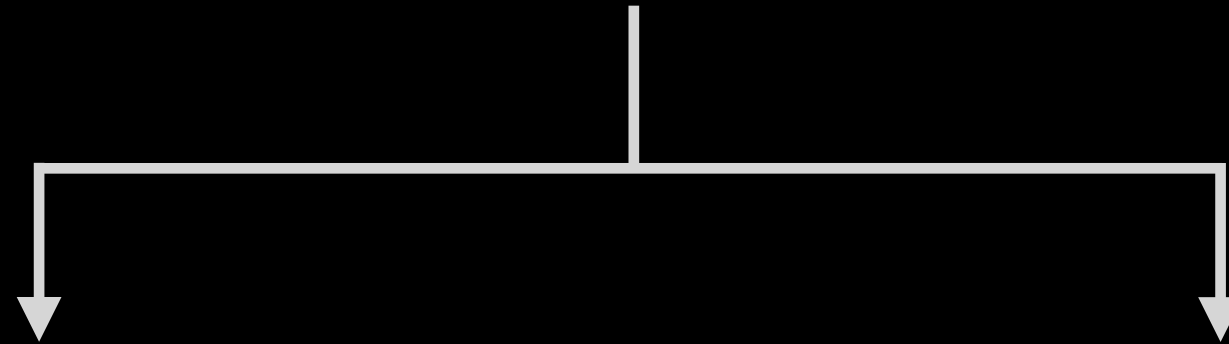
**White space implies value.
Are your ideas valuable?**

The vast majority of bacteria in the human body have yet to be cultured



Source: Nature. 2007;449(7164):811-8.

The Vitamin D Receptor transcribes a variety of key genes



Autoimmune genes

Insulin-like growth factor-
binding protein 3
(IGFBP-3)

Cancer genes

Metastasis suppressor
protein 1 (MTSS1)

**Repurpose the same
visual elements for a
polished look**

Strong presentations
are driven by a thesis

9

In clinical and biomedical research, an abstract's final
or penultimate sentence often represents the thesis

10

Presentation: Al Gore, *An Inconvenient Truth*, c. 2006
Thesis: "In the absence of immediate action, climate
change will have catastrophic effects."

11

Presentation: Frederick Douglass "What to the Slave is
the Fourth of July?", c. 1852
Thesis: "Slavery is antithetical to American values of
freedom."

12

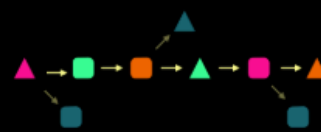
Presentation: Steve Jobs, *iPhone product launch*,
c. 2007
Thesis: "My phone is better than your phone."

13

In writing, you must kill your
darlings.

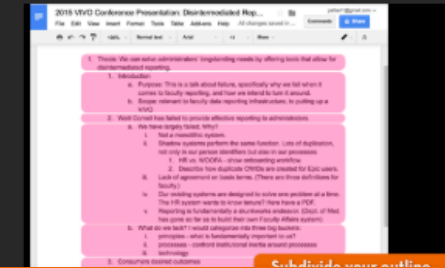
William Faulkner

Strong presentations are
well-edited



Good and bad reasons for
including something

- ✓ It serves the single idea.
- ✗ It's interesting.
- ✗ It's somewhat related.
- ✗ The source material mentions it.
- ✗ Already created the slide.



These slides use the same visual conventions

23

24

25

26

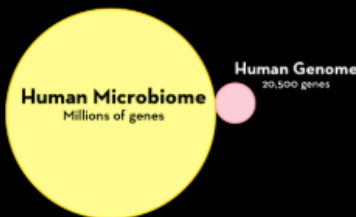
27

Who is your audience?

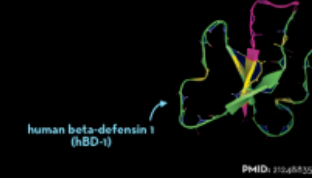
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- Receptivity - What are their biases?

One idea per slide

Humans are controlled by a
metagenome



Chronic microbes alter
expression of the body's
metabolites



Speak such that
your audience can
listen

30

31

32

33

34

Use strong
eye contact



Skip the fillers

Like... Umm... Uhh... Er...
So... Well... If you will...
Sort of... Ah... You know...
Actually... Technically...
Basically... I guess... I
mean... Now...



How enthusiastic should a
presenter be?



Do you have a mousy voice?



Channel your inner cowboy
worker and speaker



Consistency implies sanity

- Header font
- Header font size
- Header font color
- Body font
- Body font size
- Body font color
- Distance between header and top of slide
- Distance between body and left of slide

Consistency implies sanity

74px

79px

Neutra Text Bold, 63px, #FFFB83
Aligned center

- Header font
- Header font size
- Header font color

98px

- Body font
- Body font size
- Body font color

Neutra Text Regular, 35px, white

- Distance between header and top of slide
- Distance between body and left of slide

Use templates smartly

Institutional templates

- The template for Weill Cornell Medical College is available on the College's site:
 - <http://brand.weill.cornell.edu>
- You are supposed to use these templates in any talks in which you represent the College.



Pros of templates

- Institutions tend to mandate that you use them
- It's less work to create PowerPoints with them
- Consistent look and feel can make the presentation seem more professional

Cons of templates

- Depend on the template
- Many have small default text, inviting you to include too much content
- You don't want to compete against your slides for your viewers' immediate attention.

Cons of templates

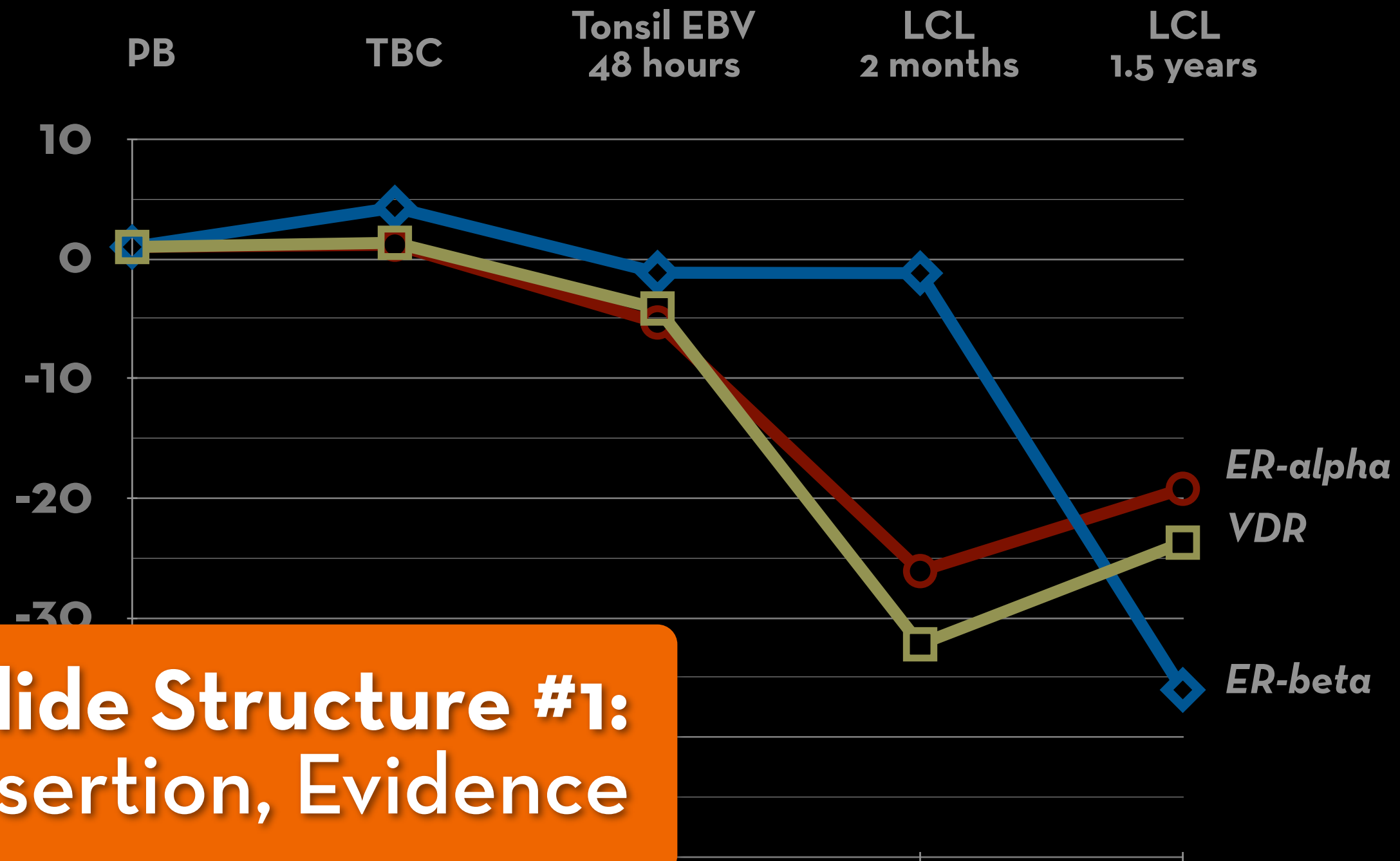
↖ I bolded the header!!
(*not a felony except in Texas*)

- Depend on the template
- Many have small default text, inviting you to include too much content
- You don't want to compete against your slides for your viewers' immediate attention.

There's no rule that says you can't tweak a template.

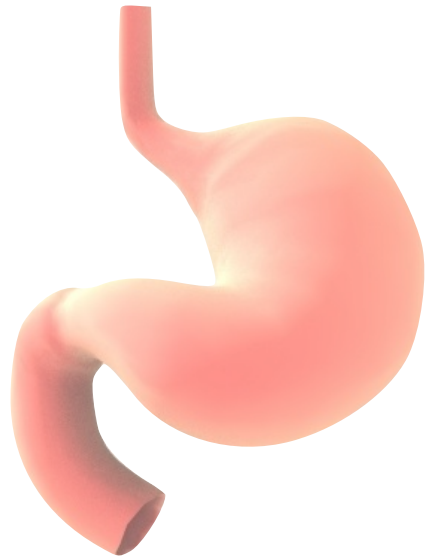
Slide structure: organizing content on a slide

Nuclear receptors' mRNA expression is downregulated upon infection of B-cells with EBV



Slide Structure #1:
Assertion, Evidence

Source: *Experimental Oncology*. 2009; 31(2): 92-96.



Stomach microbiome

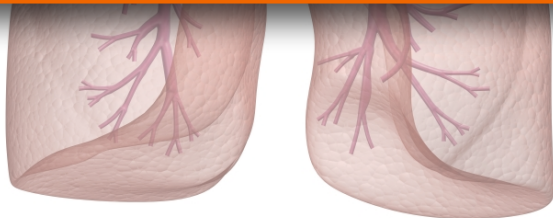
PMID: 16407106



Blood microbiome

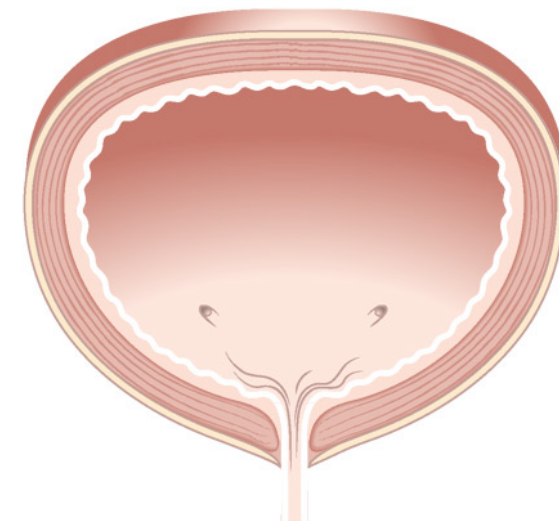
PMID: 21364979, 12454193

Slide Structure #2:
Topic



Lung microbiome

PMID: 22683412



Bladder microbiome

PMID: 22278835


Slide structure #2: Examples of good and bad topics

- Good topics:

- EBV's effect on B-cells' mRNA expression
- Epstein-Barr virus and protein expression in B-cells
- How does EBV interact with white blood cells' nuclear receptors?

- Bad topics:

- Epstein-Barr virus
- Results



Maybe not so bad if you stick to the standard structure of a paper: Introduction, Methods, Results, Discussion, Conclusion.

“Autoantibodies” target microbes

Antibody	Shown to be generated in response to...	PMID
RO, La, dsDNA	Epstein-Barr virus (EBV)	17917546
RF	A variety of viral, bacterial, and parasitic infections	9198668
	Chronic infections	8898963
	Subacute bacterial endocarditis	214511
anti-EBNA-1	Lupus-specific autoantigens such as Sm or Ro	17121489
antibodies against annexin-V, prothrombin and laminin	Acute infections in patients without autoimmune disease	17121489
Anti-microbial antibodies	Targeted against microbes including <i>Lactobacilli</i> , <i>H. pylori</i> , <i>E. coli</i> , <i>M. tuberculosis</i> , <i>M. pseudotuberculosis</i> , and <i>Listeria</i>	18262391

Slide Structure #3:
Table



Koch's
postulates did
not anticipate
the presence of
a **metagenomic
microbiota.**

Slide Structure #4:
Assertion, No evidence

How wonderful that we have met with a paradox. Now we have some hope of making progress.

Niels Bohr

**Slide Structure #5:
Quote**

Avoid verbose slides

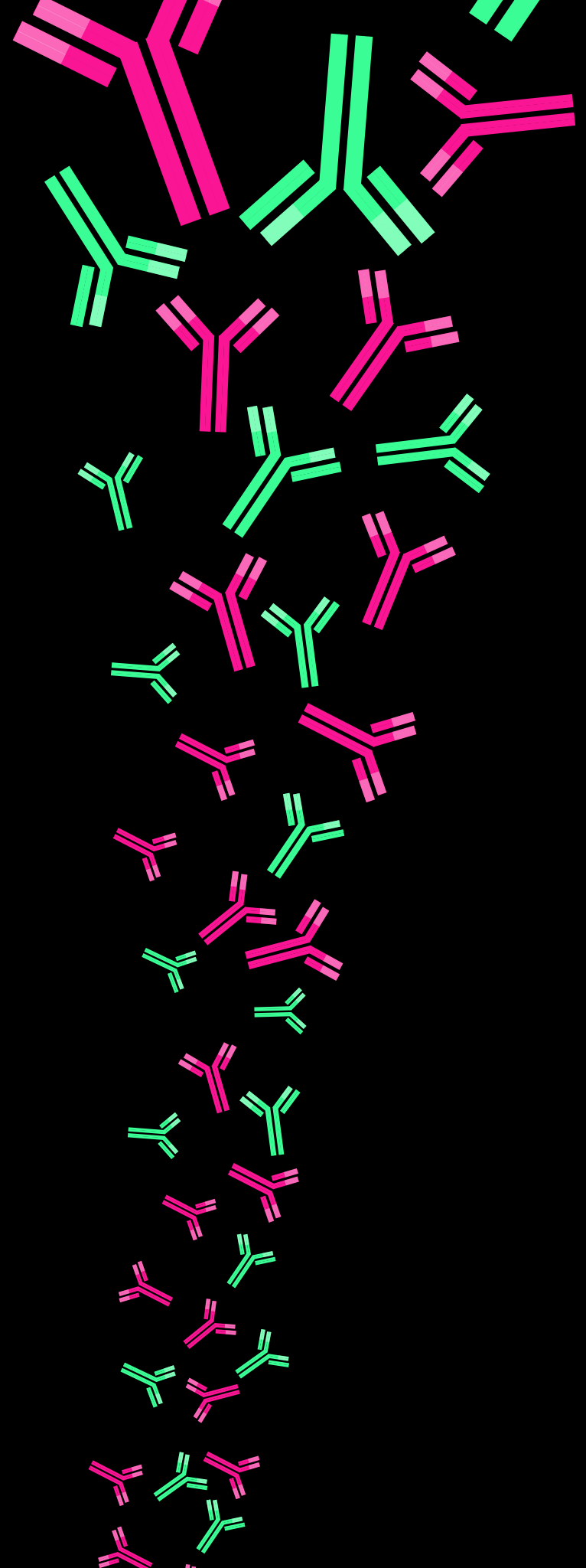
Предстоящая тарифная кампания

1. ФСТ должна утвердить федеральные факторы в новой структуре (они составляют ~ 90% от конечного тарифа). После этого региональные регулирующие органы должны утвердить тарифы для конечных потребителей в рамках предельных.
- Все федеральные факторы будут утверждены 20-30 ноября 2005 года. Причина – задержка Постановления Правительства о порядке вывода субъектов на ОРЭ и утверждения индивидуальных тарифов с ОРЭ.

Knowing the language doesn't make this slide less terrible.

Idea and image: <http://slidesha.re/ppt22>

**We must
reevaluate the
autoantibody**



**If you must use lots of
words, highlight the
key points**

Even 13 year ago, estimates of resident microbial flora were far too low

Nasal secretions – 10^6 organisms/mL

Dental plaque – 10^{11} organisms/g

Saliva – 10^9 organisms/mL

Lungs – sterile

Stomach – 10^3 organisms/mL

Liver – sterile

Bile – sterile

Small intestine – 10^4 organisms/g

Large intestine – 10^{11} organisms/g

Skin (axilla and groin) – 10^6 organisms/cm²

Skin (other sites) – 10^3 organisms/cm²

Conjunctiva – < 10 organisms/mL

Pancreas – sterile

Kidneys – sterile

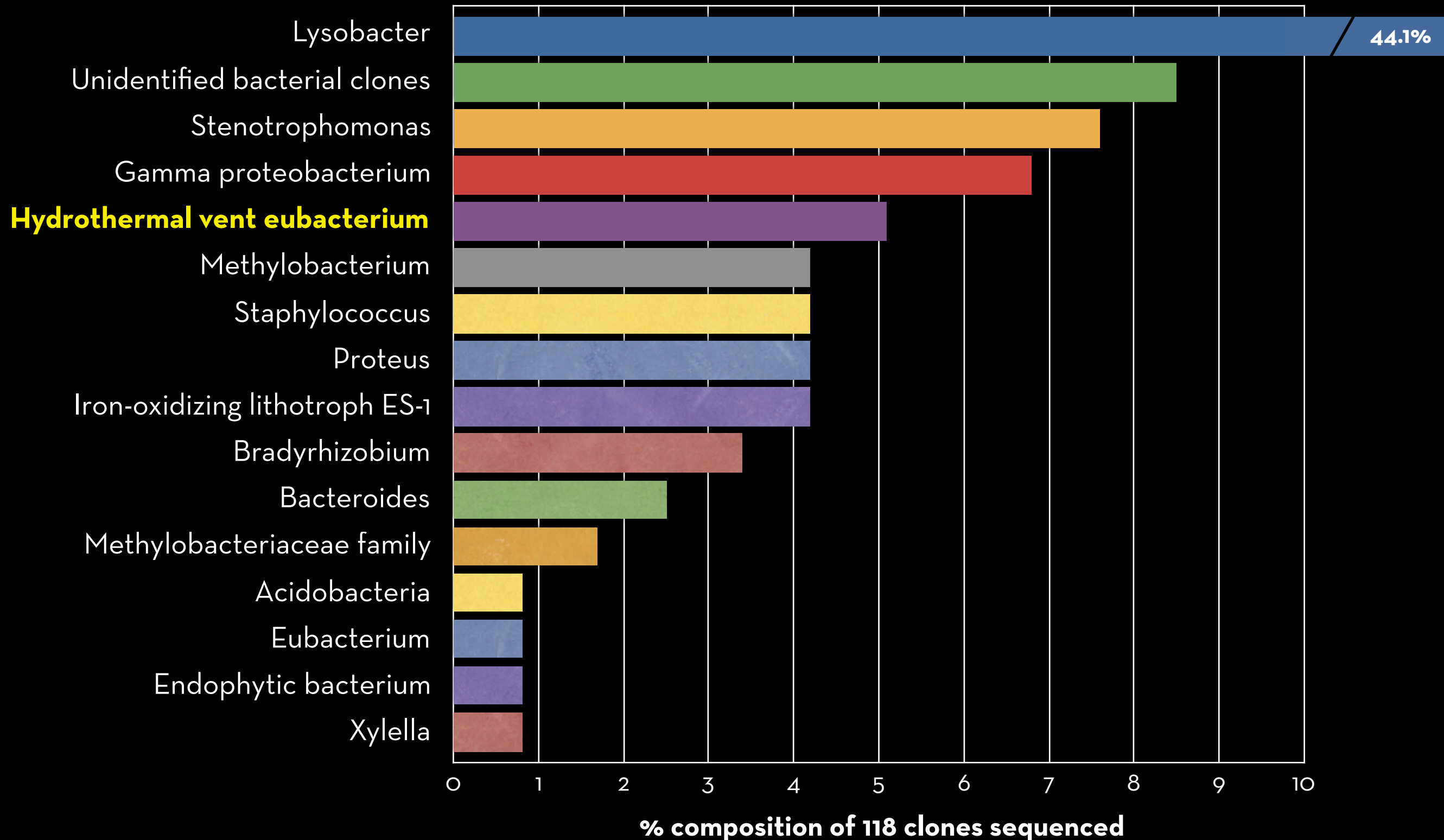
Bladder – $< 10^3$ organisms/mL

Uterus – sterile

Vaginal secretions – 10^9 organisms/g

Hip joint microbiome

Source: Dempsey. 2007. *Arthritis Res Ther* 9 p. R46.



**Opt for easy-to-read
sans serif fonts**

Helvetica *EASY TO READ*

Verdana *WIDE, GOOD FOR HEADERS*

Arial *EASY TO READ*

Calibri *AVAILABLE ON MOST RECENT COMPUTERS*

Georgia *EASIER TO READ THAN TIMES NEW ROMAN*

Neutra Text *NICE FONT BUT, LIKE ALL NON-STANDARD FONTS, REQUIRES
INSTALL ON PRESENTER COMPUTER*

Impact *HARD TO READ*

Times New Roman *HARD TO READ*

Comic Sans *CRIME AGAINST HUMANITY*

**Use a mix of fonts
from the same font
family**

**This presentation uses four
fonts from the same family**

Neutra Text Bold

Neutra Text Book

NEUTRA TEXT BOLD SC ITALIC

Neutra Text Bold Italic

Use big font sizes

[illegible]

**Can you have a
powerful slide with no
imagery?**

Yes.

**If you include them,
images must
meaningfully contribute
to the message**

[illegible]

Images: 101cliches.com



Even this generic image
of viruses offers little

Epstein-Barr virus and protein expression in B-cells

**Full-screen images as
backgrounds can
serve your message**

Humans are a superorganism



Image: [usgs.gov](https://www.usgs.gov)

M. tuberculosis downregulates VDR by a factor of 3.3.

Source: Flannagan. 2009. *Nature Reviews Microbiology* 7 355-366.

Image: bit.ly/mtb23

The VDR expresses at least 913 genes, many connected to autoimmune conditions and cancers.

PMID: 16002434

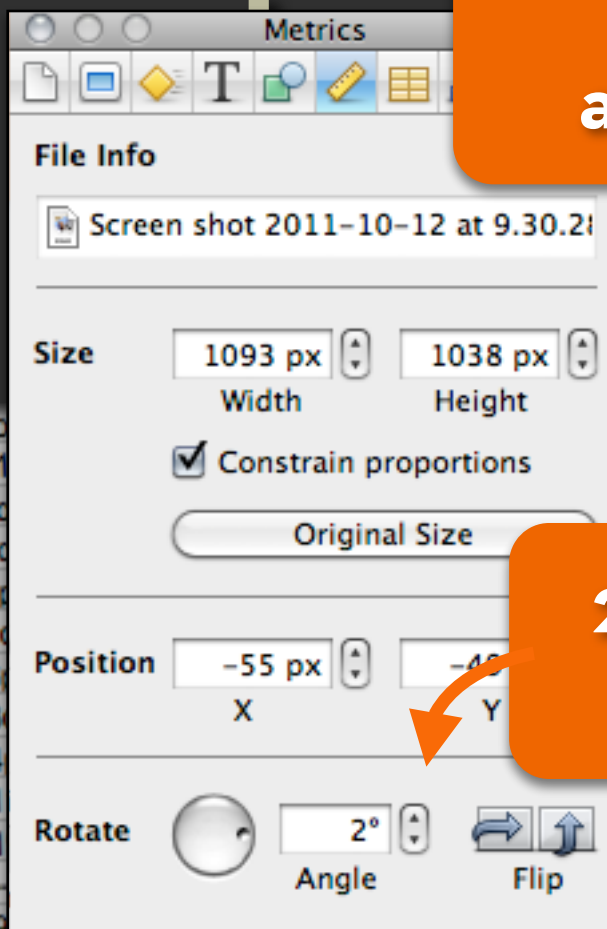
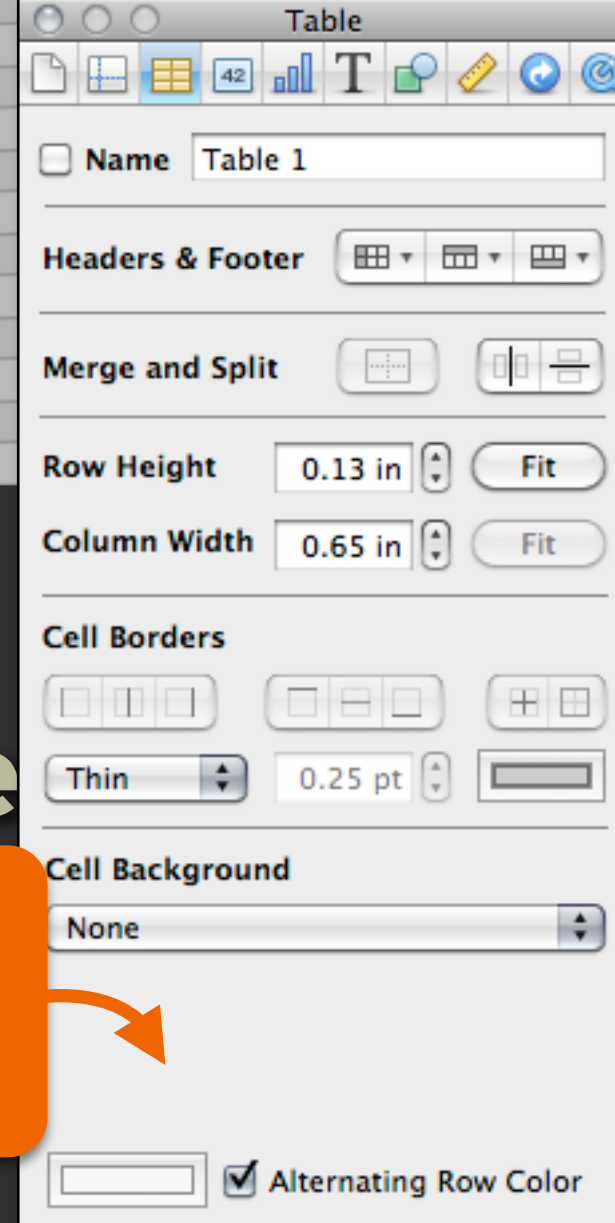
at	NM_000782	20q13	cytochrome P450, family 24, subfamily 1, polypeptide 1	IL1RL1	9173	12.26373346	0.408474318	ALOX5
s at	NM_003856	2q12	interleukin 1 receptor-like 1	ALOX5	240	10.86848461	0.408474318	TSLP
s at	NM_000698	10q11.2	arachidonate 5-lipoxygenase	TSLP	85480	10.49226764	0.408474318	EFTUD1
at	AW118681	5q22.1	thymic stromal lymphopoietin	EFTUD1	79631	9.521727202	0.408474318	---
at	NM_024580	15q25.2	elongation factor Tu GTP binding domain containing	---	---	9.500213101	0.408474318	HTR2C
at	AL137538	---	---	HTR2C	3358	9.468764071	0.408474318	SLCO1A2
at	NM_000868	Xq24	5-hydroxytryptamine (serotonin) receptor 2C	SLCO1A2	6579	9.322934871	0.408474318	FLJ38736
s at	AF085224	12p12	solute carrier organic anion transporter family, member 1	FLJ38736	256764	9.226917628	0.408474318	FLJ31340
at	AK096055	15q21.3	hypothetical protein FLJ38736	FLJ31340	222223	9.031076985	0.408474318	CYP26B1
at	AI797353	7q21.12	hypothetical protein FLJ31340	CYP26B1	56603	8.928081064	0.408474318	LOC126669
at	NM_019885	2p13.2	cytochrome P450, family 26, subfamily B, polypeptide 1	LOC126669	126669	8.476686564	0.408474318	SEMA6D
at	AI797276	1p21.3	Hypothetical protein LOC126669	SEMA6D	80031	8.194610682	0.408474318	MGC34032
at	AL036088	---	---	---	---	---	0.408474318	COL13A1
at	AA001450	---	---	---	---	---	0.408474318	FLJ20054
s at	M33653	---	---	---	---	---	0.408474318	GIMAP8
at	NM_019049	---	---	---	---	---	0.408474318	MGC34032
at	AI611648	---	---	---	---	---	0.408474318	CRISPLD1
2 at	AW020413	---	---	---	---	---	0.408474318	FLJ23235
at	AF142573	---	---	---	---	---	0.408474318	---
at	NM_02494	---	---	---	---	---	0.408474318	SLC1A1
9 at	BC041050	---	---	---	---	---	0.408474318	MGC33692
at	AW235061	---	---	---	---	---	0.408474318	FLJ31340
9 s at	AW470714	---	---	---	---	---	0.408474318	LOC93349
7 at	BF035563	---	---	---	---	---	0.408474318	C1orf24
1 at	AK023116	---	---	---	---	---	0.408474318	KLK6
7 s at	AF288391	---	---	---	---	---	0.408474318	MGC34032
3 at	NM_00277	---	---	---	---	---	0.408474318	ITGA7
79 a at	NM_15269	---	---	---	---	---	0.408474318	MARCH3
1 at	AK022548	---	---	---	---	---	0.408474318	SEMA3B
6 at	AW59399	---	---	---	---	---	0.408474318	CD274
1 at	NM_0046	---	---	---	---	---	0.408474318	FLJ10375
8 at	AI608902	---	---	---	---	---	0.408474318	SERPINB1
0 at	NM_01807	---	---	---	---	---	0.408474318	LOC284837
2 s at	AI554300	6p25	serine (or cysteine) proteinase inhibitor, clade B, member 1	LOC284837	284837	6.274134422	0.408474318	IL1RL1
088 a at	BC034348	21q22.3	hypothetical protein LOC284837	IL1RL1	9173	6.260288239	0.408474318	KLF4
66 at	AL117622	2q12	Interleukin 1 receptor-like 1	KLF4	9314	5.983071422	0.408474318	TMEM40
66 s at	NM_004235	9q31	Kruppel-like factor 4 (gut)	TMEM40	55287	5.978925341	0.408474318	DUSP10
03 s at	NM_018306	3p25.2	transmembrane protein 40	DUSP10	11221	5.886732425	0.408474318	SERPINB1
01 s at	AK022513	1q41	dual specificity phosphatase 10	SERPINB1	1992	5.85407177	0.408474318	GEM
68 at	NM_030666	6p25	serine (or cysteine) proteinase inhibitor, clade B, member 1	GEM	2669	5.789179552	0.408474318	KLHL5
72 at	NM_005261	8q13-q21	GTP binding protein overexpressed in skeletal muscle	KLHL5	51088	5.763224213	0.408474318	MMP1
01 at	AK002174	4p14	kelch-like 5 (Drosophila)	MMP1	4312	5.71385768	0.408474318	RHPN2
75 at	NM_002421	11q22.3	matrix metalloproteinase 1 (interstitial collagenase)	RHPN2	85415	5.632681297	0.152808268	---
96 at	BG054987	19q13.11	rhophilin, Rho GTPase binding protein 2	---	---	5.600032022	0.408474318	KLF4
33 at	AA732944	---	Transcribed locus	KLF4	9314	5.565029234	0.408474318	GPR115
341 s at	BF514079	9q31	Kruppel-like factor 4 (gut)	GPR115	221393	5.561581204	0.408474318	MGC33692
690 at	W67511	6p12.3	G protein-coupled receptor 115	MGC33692	414918	5.532109307	0.408474318	TXNRD1
378 at	AW466979	---	similar to RIKEN cDNA 1700027J05 gene	TXNRD1	7296	5.528292961	0.408474318	LOC401548
266 at	NM_003330	12q23-q24.1	thioredoxin reductase 1	LOC401548	401548	5.509575138	0.408474318	C1orf24
			thioredoxin reductase 1					

Use a spreadsheet as a striking background

The VDR expresses at 913 genes, many connected to auto

1. Take screenshot of a spreadsheet with alternating row colors.

2. Rotate image two degrees.



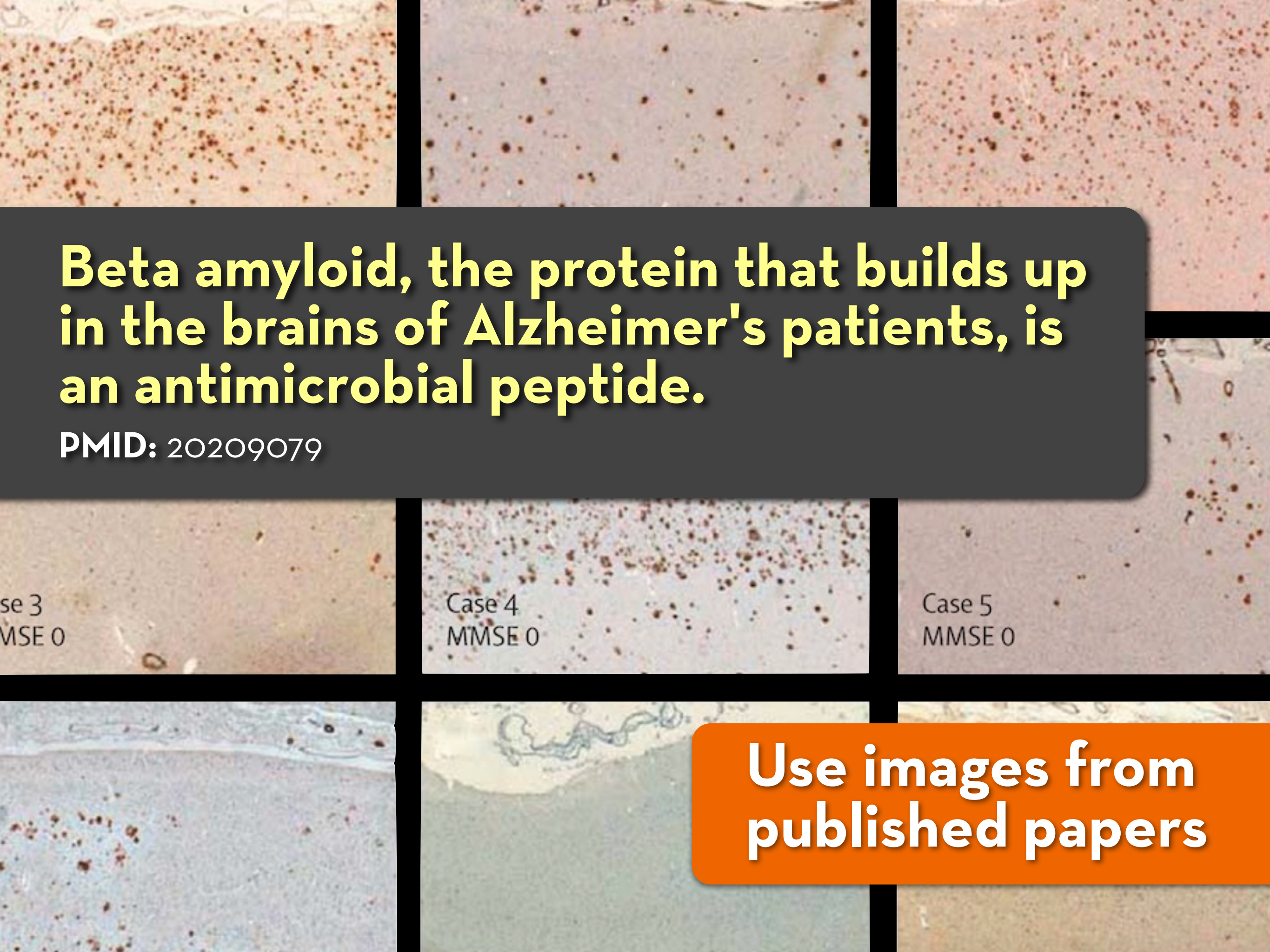


**Sometimes text
is unnecessary as in
this slide on aging.**



Image: Michael Albert

**Be resourceful about
finding images that
serve your message**

The background of the slide is a collage of six microscopic images of brain tissue. The top row shows three panels with dense clusters of small, reddish-brown spots (beta amyloid plaques) on a light pink background. The bottom row shows three panels: the left one has sparse plaques, the middle one is labeled 'Case 4 MMSE 0' and shows many plaques, and the right one is labeled 'Case 5 MMSE 0' and shows fewer plaques. A large dark grey text box is overlaid on the top right, and an orange text box is in the bottom right.

Beta amyloid, the protein that builds up in the brains of Alzheimer's patients, is an antimicrobial peptide.

PMID: 20209079

se 3
MMSE 0

Case 4
MMSE 0

Case 5
MMSE 0

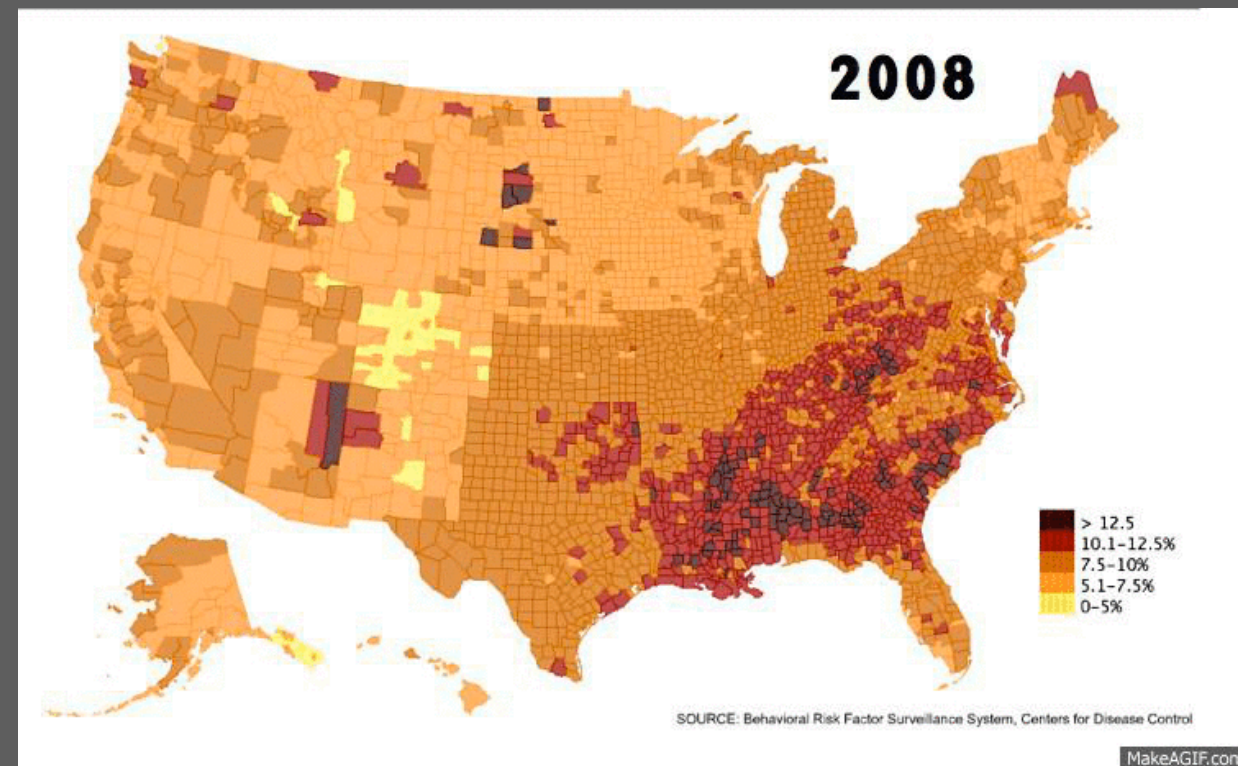
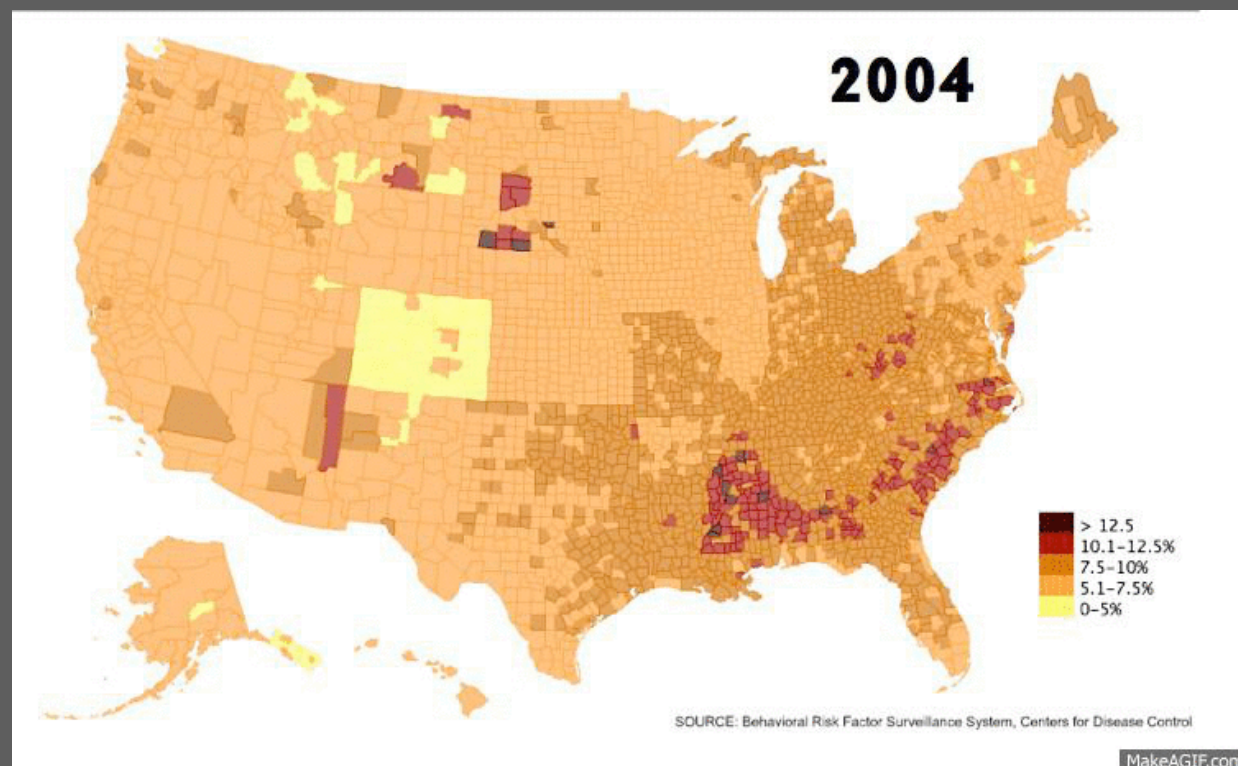
**Use images from
published papers**

Or, use images from
Flickr or iStockPhoto.

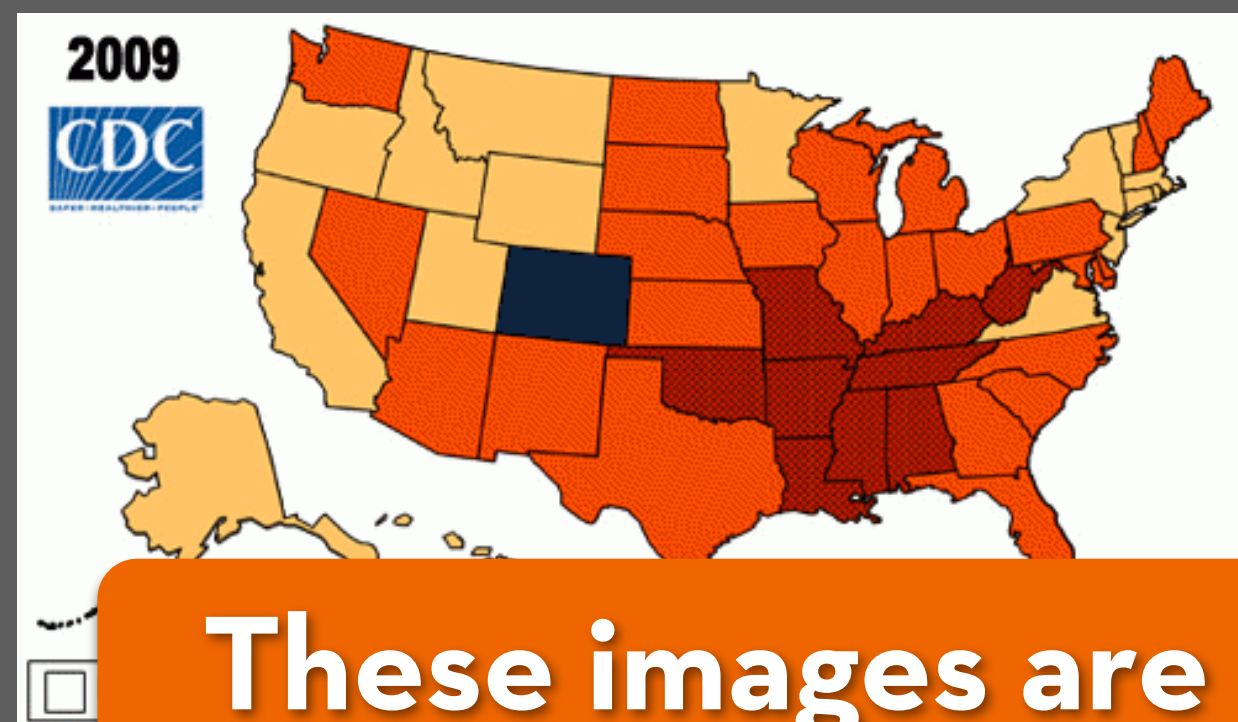
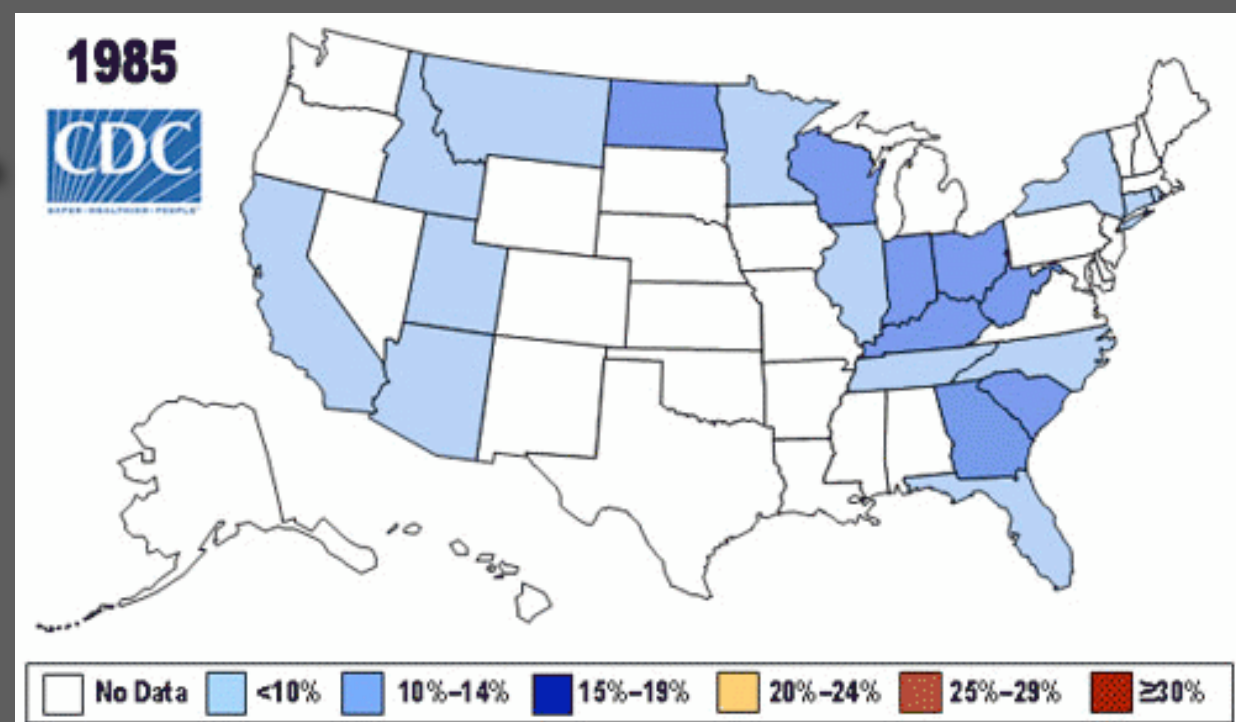
NIH: 90+% of cells
in *Homo sapiens* are
non-human.

Sources: Michael and
Katie Albert flickr

Diabetes



Obesity



These images are from the CDC.

**Preserve images'
aspect ratio**

Good



Boo, hiss, etc.



Image: goo.gl/WMqwk

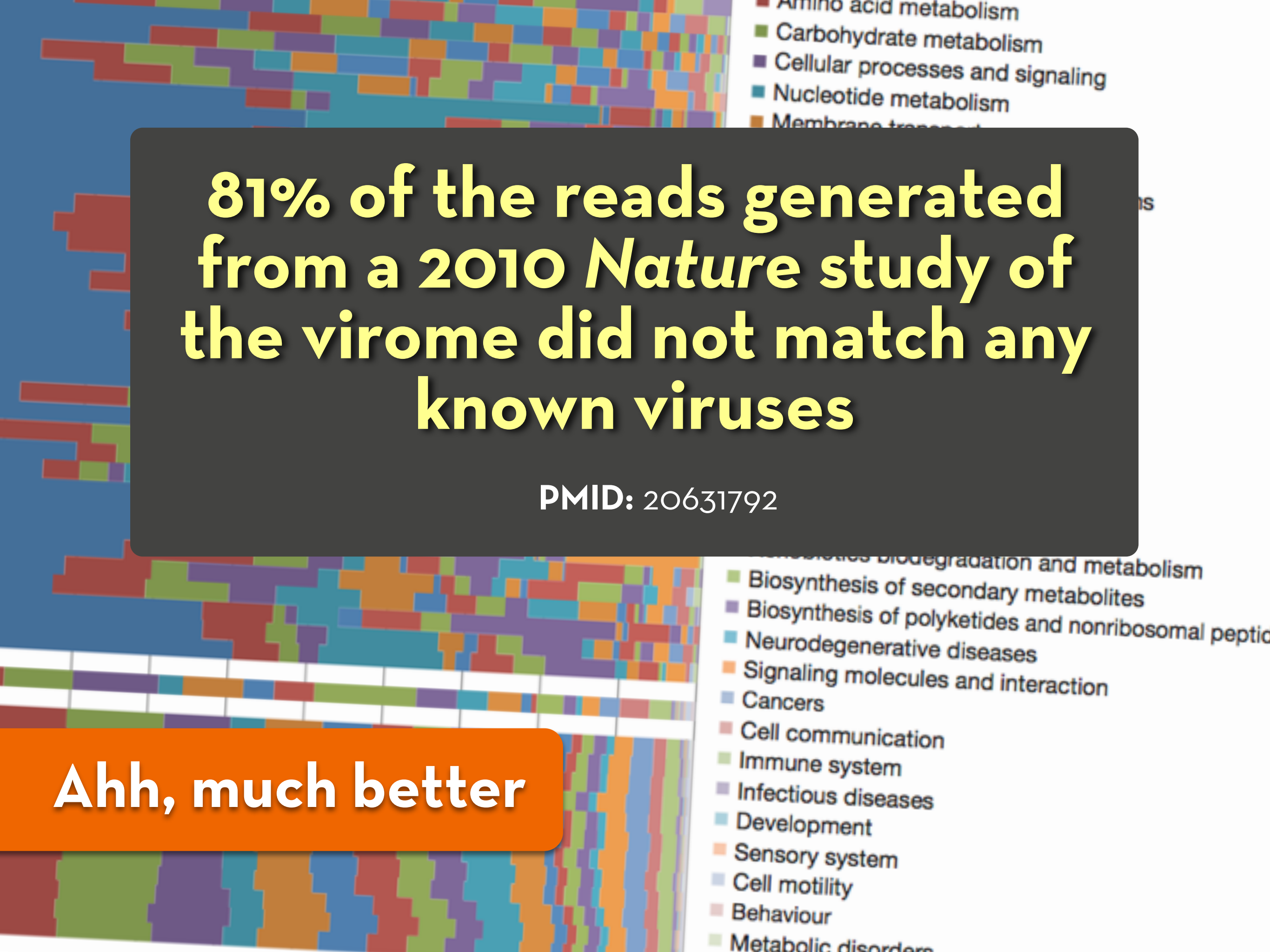
Use ample contrast



**81% of the reads generated
from a 2010 *Nature* study of
the virome did not match any
known viruses**

PMID: 20637566

**What is wrong
with this slide?**



**81% of the reads generated
from a 2010 *Nature* study of
the virome did not match any
known viruses**

PMID: 20631792

Ahh, much better

Inflammaging

A process to describe how aging is accompanied by a low-grade chronic, systemic upregulation of the inflammatory response.

Underlying inflammatory changes are common to most age-associated diseases.

What is wrong with this slide?

Inflammaging

A process to describe how aging is accompanied by a low-grade chronic, systemic upregulation of the inflammatory response.

Underlying inflammatory changes are common to most age-associated diseases.

Ahh, much better

Inflammaging

Text has a subtle black shadow (as does this box!)

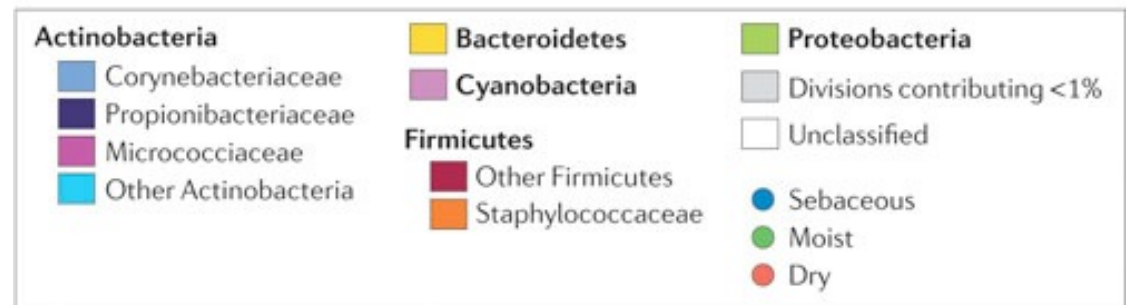
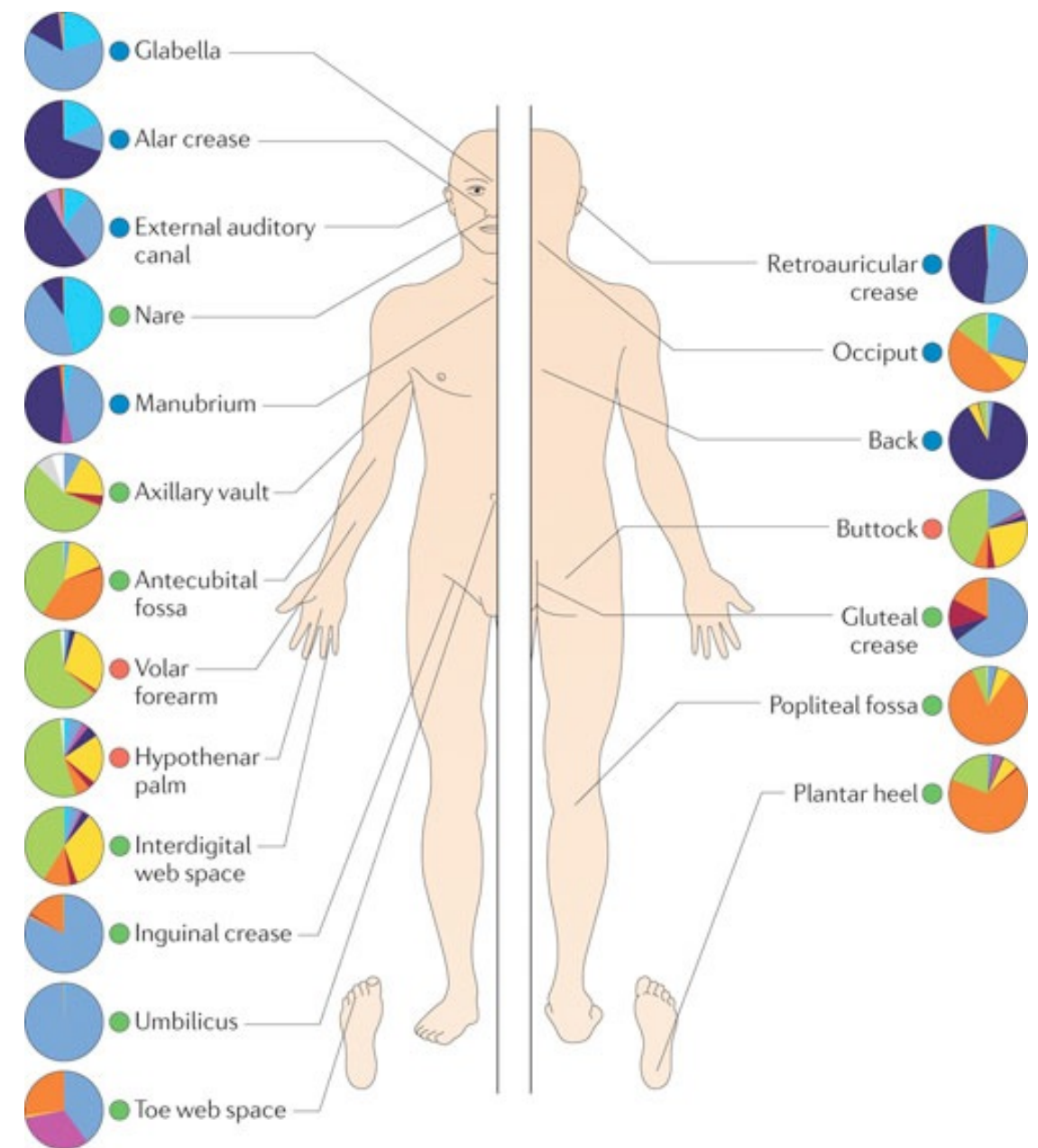
A process to describe how aging is accompanied by a low-grade chronic, systemic upregulation of the inflammatory response.

Underlying inflammatory changes are common to most age-associated diseases.

Image brightness reduced to 43%

Forearms and underarms, though located just a short distance apart, are as “ecologically dissimilar as rainforests are to deserts.”

PMID: 19478181



PMID: 21407241

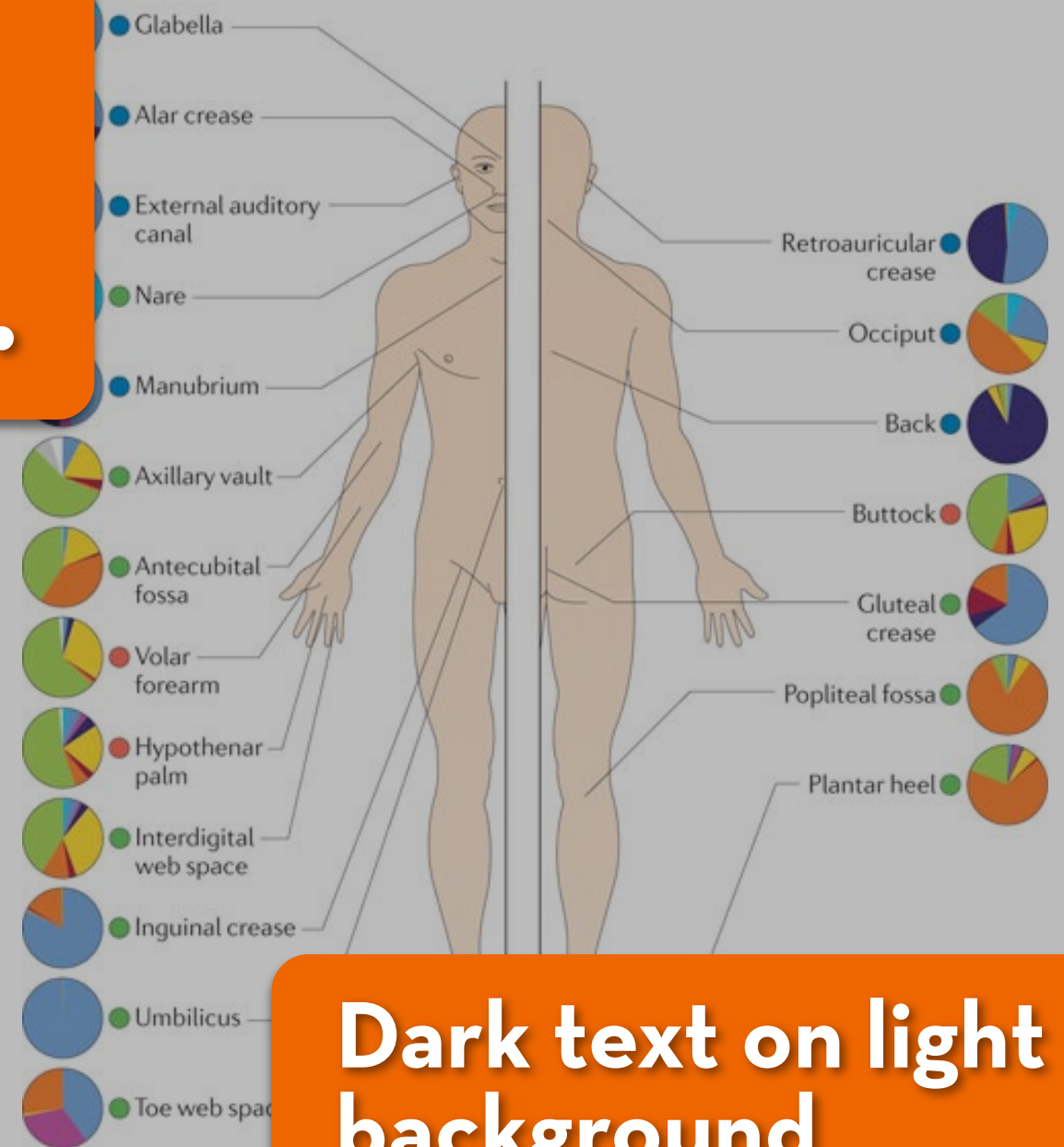
Nature Reviews | Microbiology

Mixing up dark on light, and light on dark pleases the eye.

located just a short distance apart, are as “ecologically dissimilar as rainforests are to deserts.”

Light text on dark background

PMID: 19478181



Dark text on light background

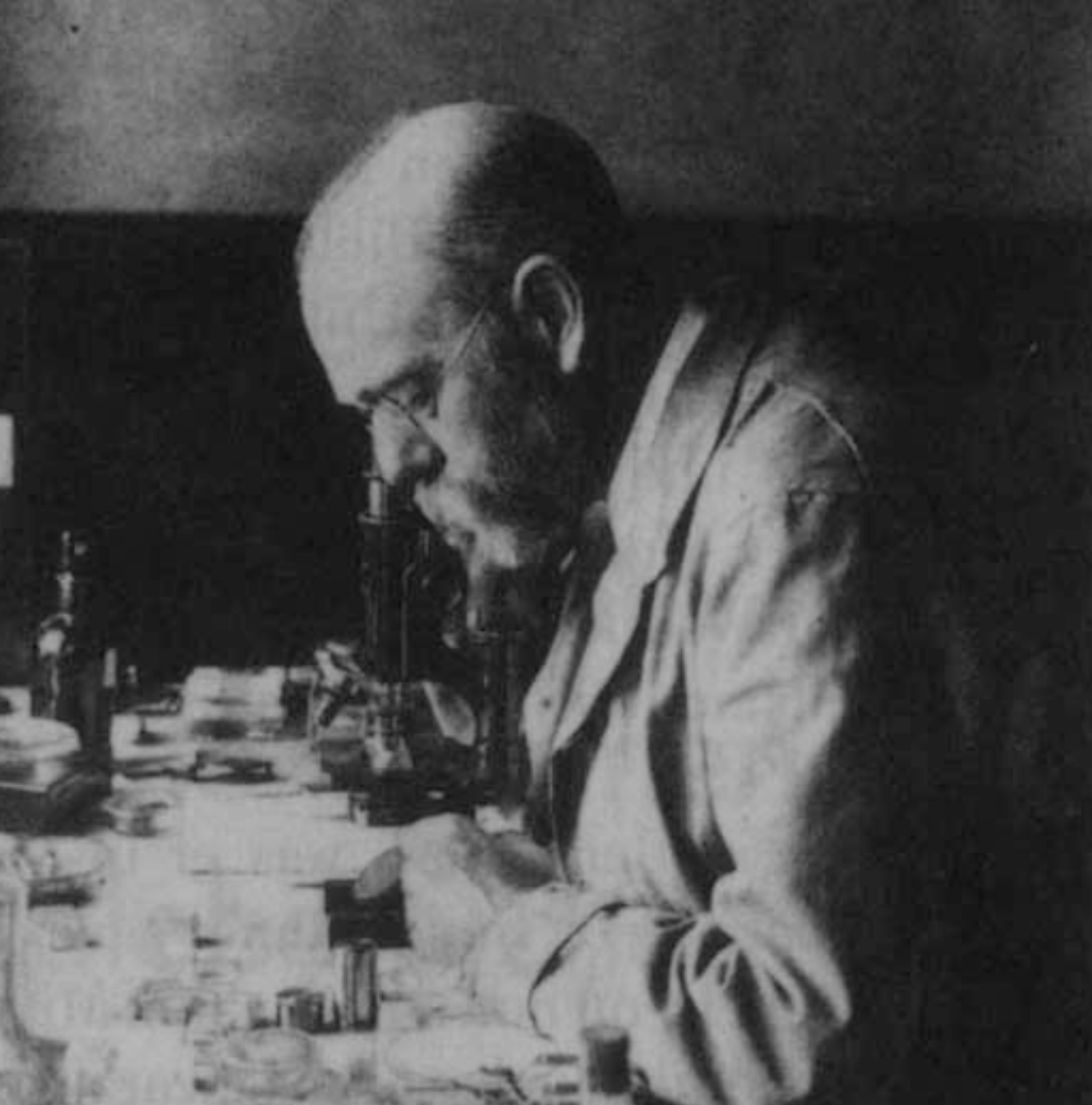
PMID: 21407241

Nature Reviews | Microbiology

Stick to a color palette



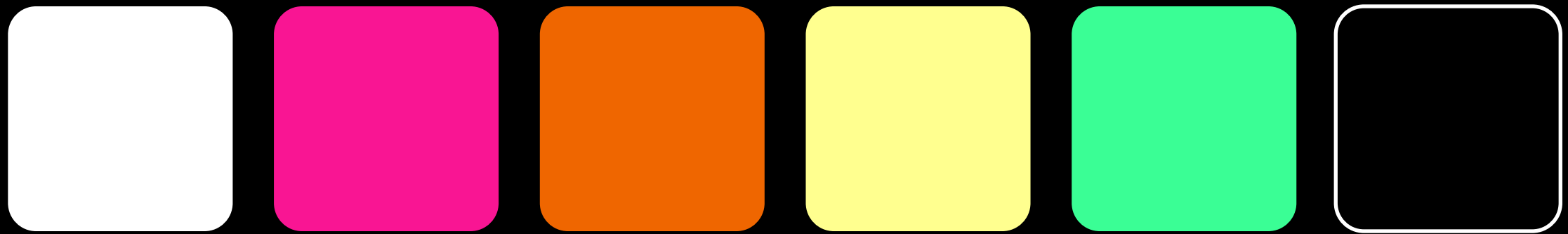
Koch's
postulates did
not anticipate
the presence of
a **metagenomic
microbiota.**



**Koch's
postulates did
not anticipate
the presence of
a metagenomic
microbiota.**

**This slide relies on small
amounts of bright colors
on a dark background**

This presentation's color palate



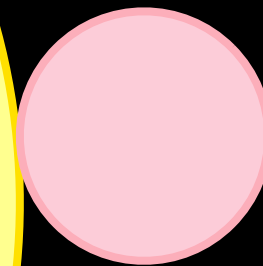
Other combos: kuler.adobe.com

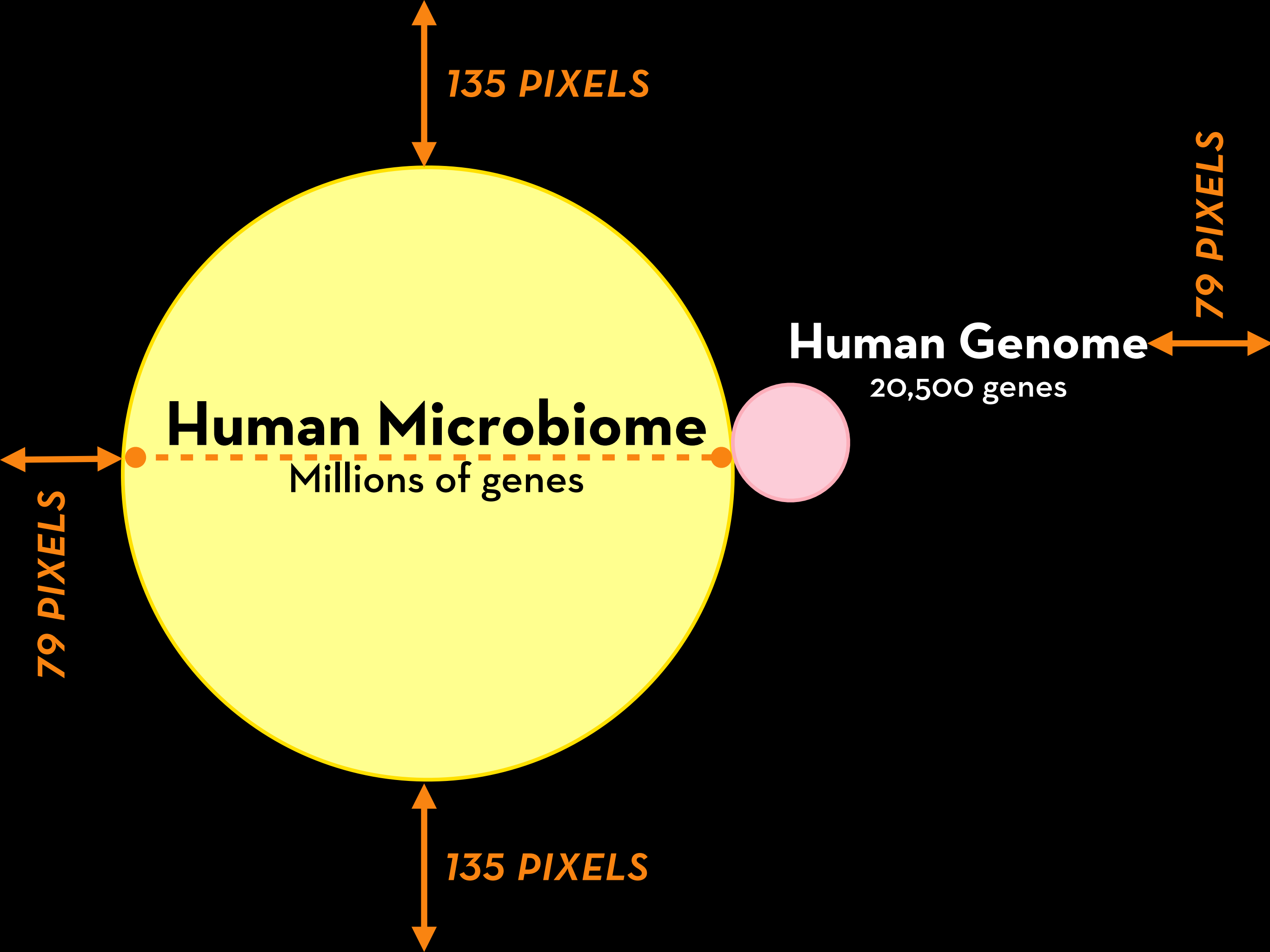
Alignment 101: how to position your visual elements

**How is alignment
used here?**

Human Microbiome
Millions of genes

Human Genome
20,500 genes

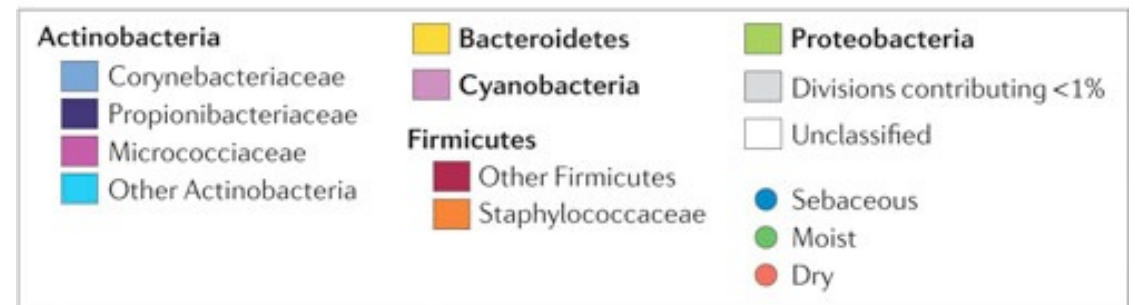
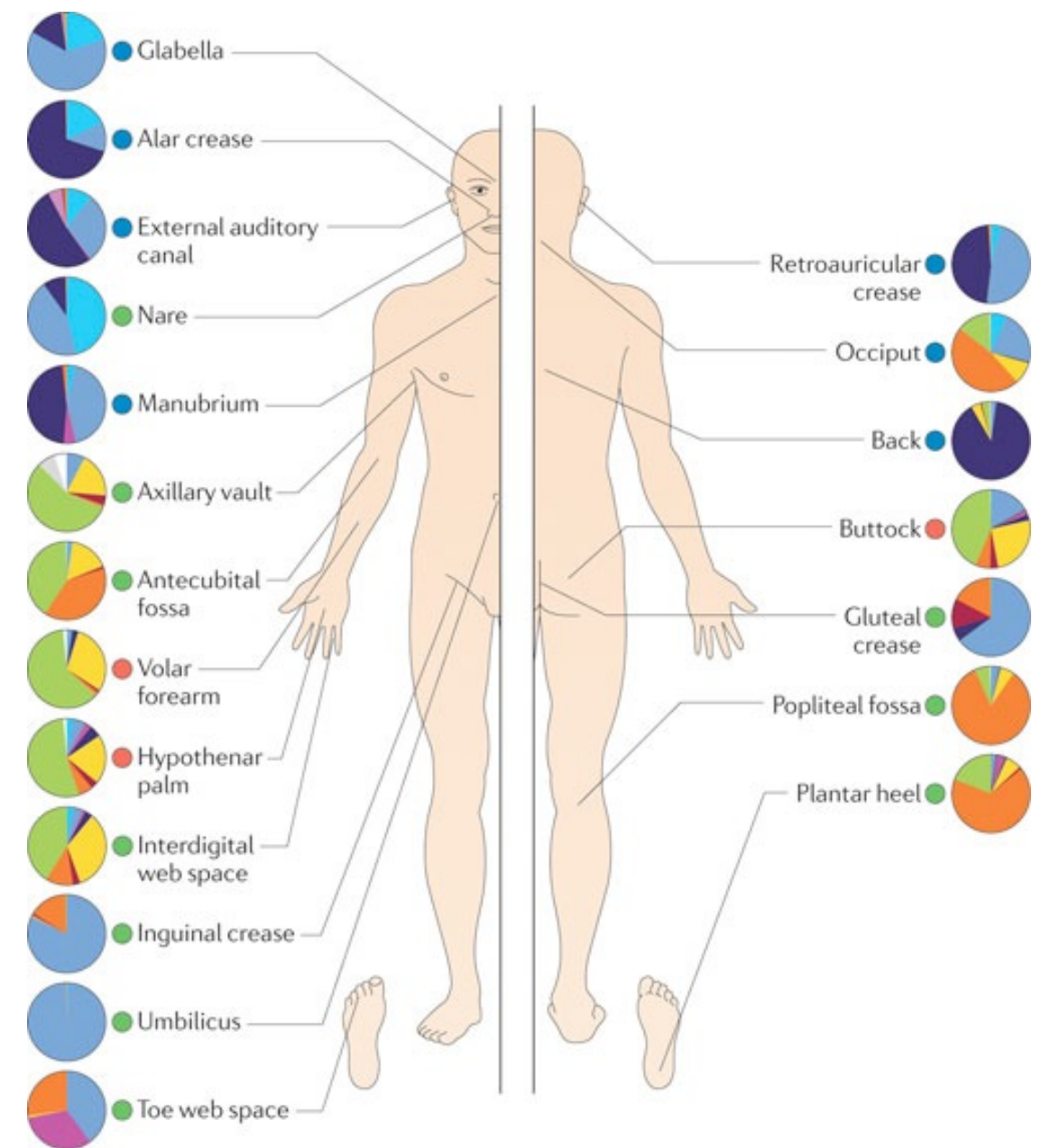




How is alignment used here?

underarms, though located just a short distance apart, are as “ecologically dissimilar as rainforests are to deserts.”

PMID: 19478181



PMID: 21407241

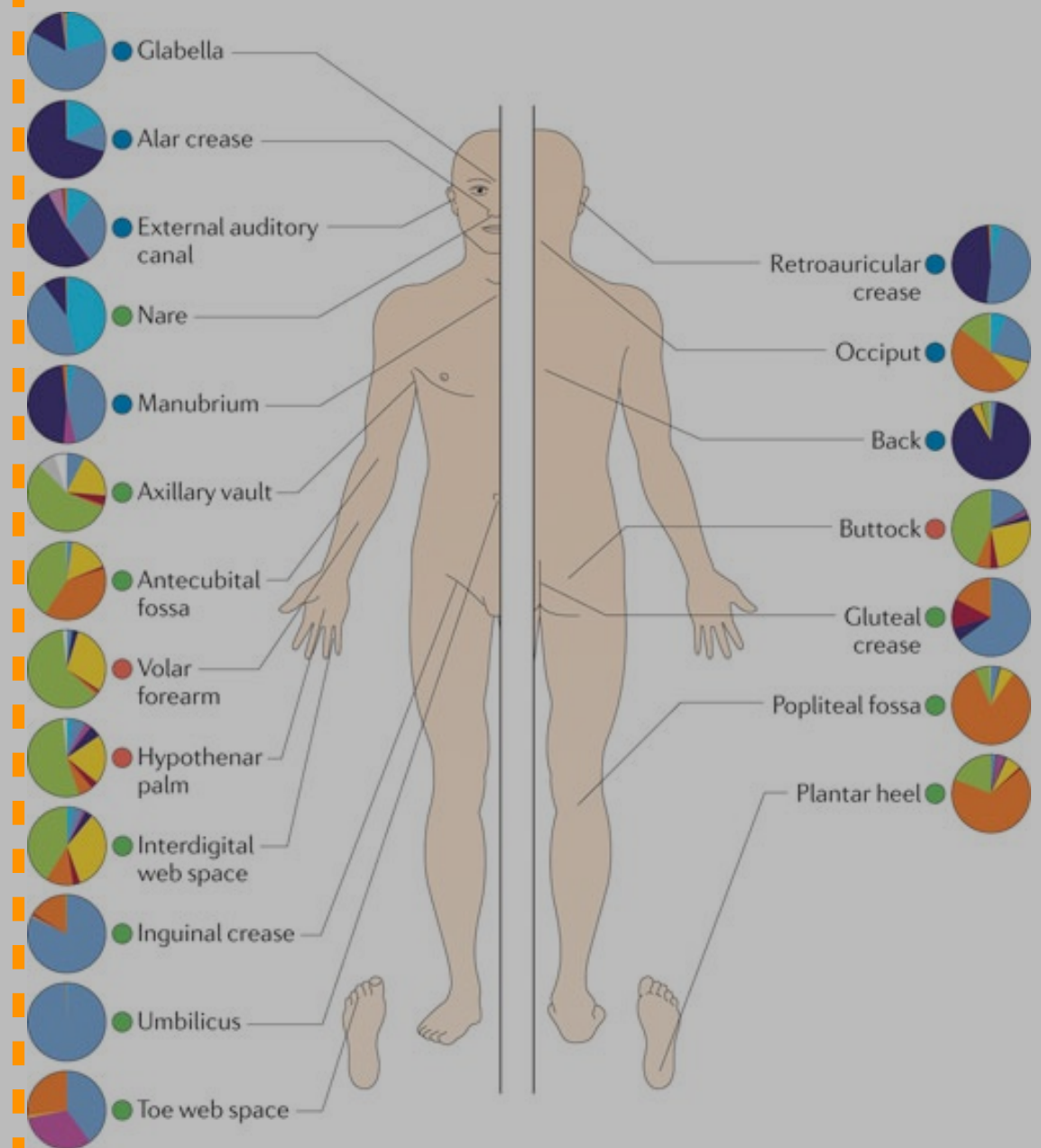
Nature Reviews | Microbiology

Forearms and underarms, though located just a short distance apart, are as “ecologically

Line bisects page

rainforests are to deserts.”

PMID: 19478181



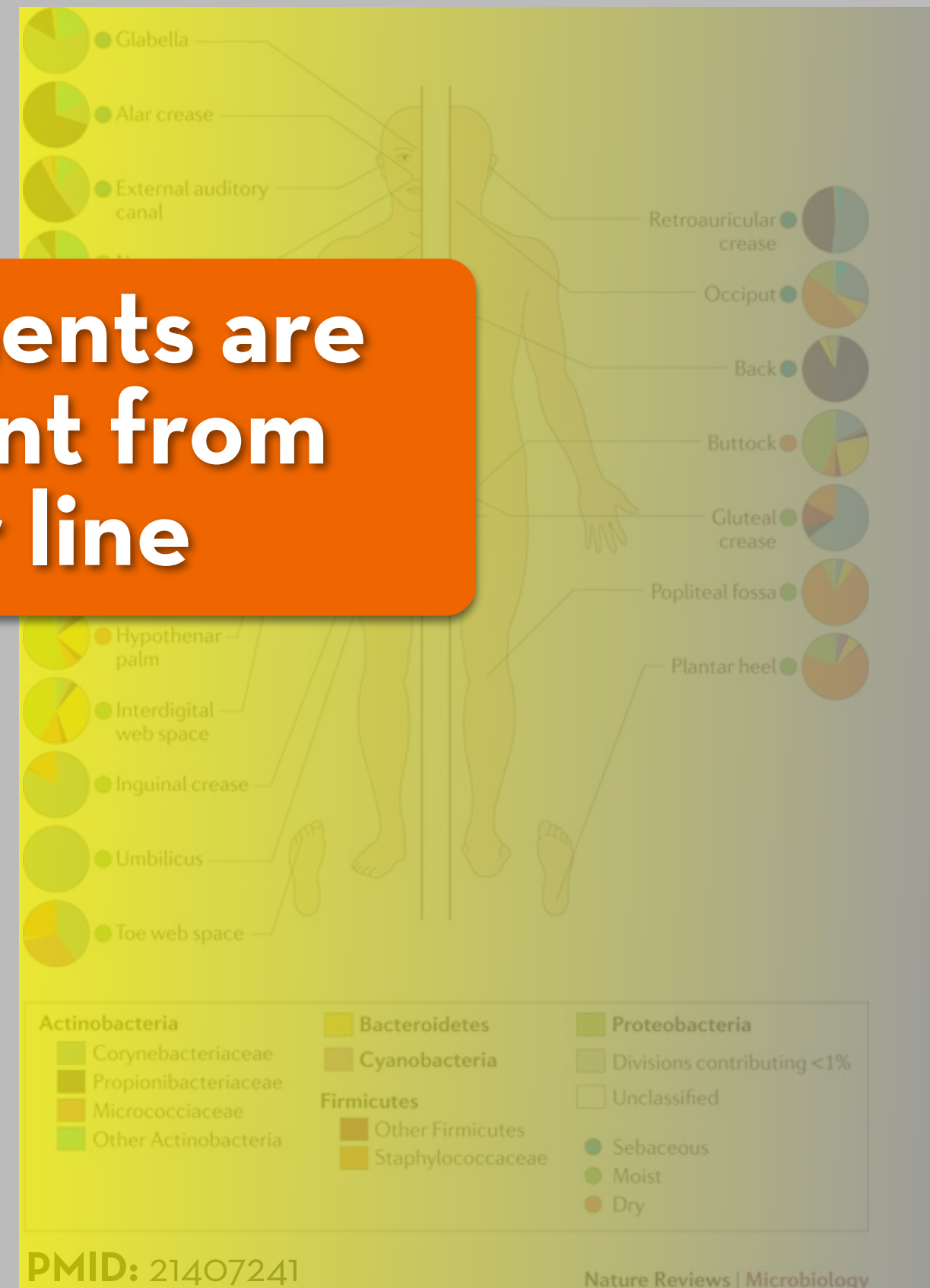
Align elements when practicable

PMID: 21407241

Forearms and underarms though located just as far from the center line as “ecotopes” as rainforests are to deserts.”

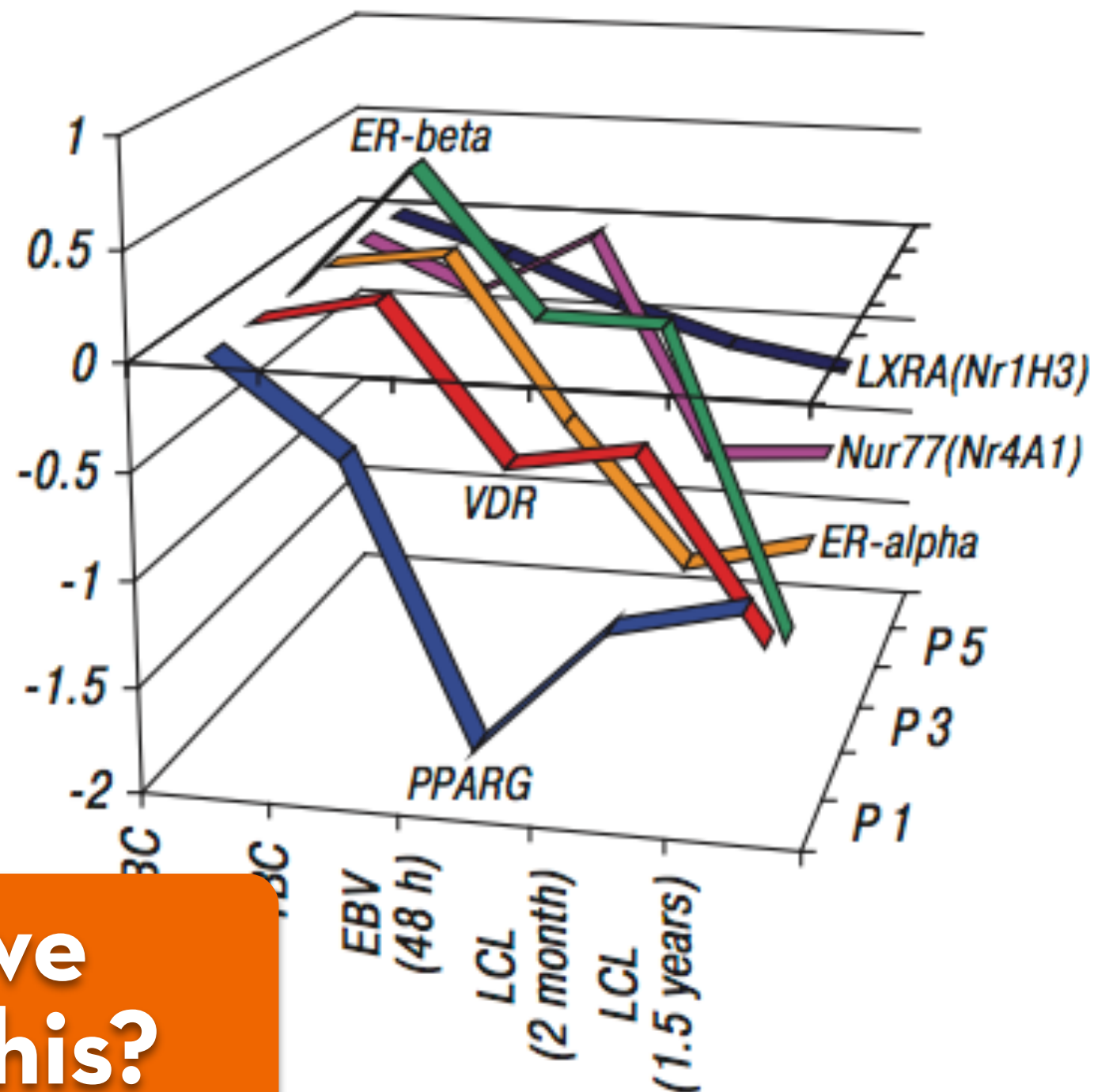
PMID: 19478181

Main elements are equidistant from center line



**Use bright colors and
cut “chart junk” to
create striking graphs**

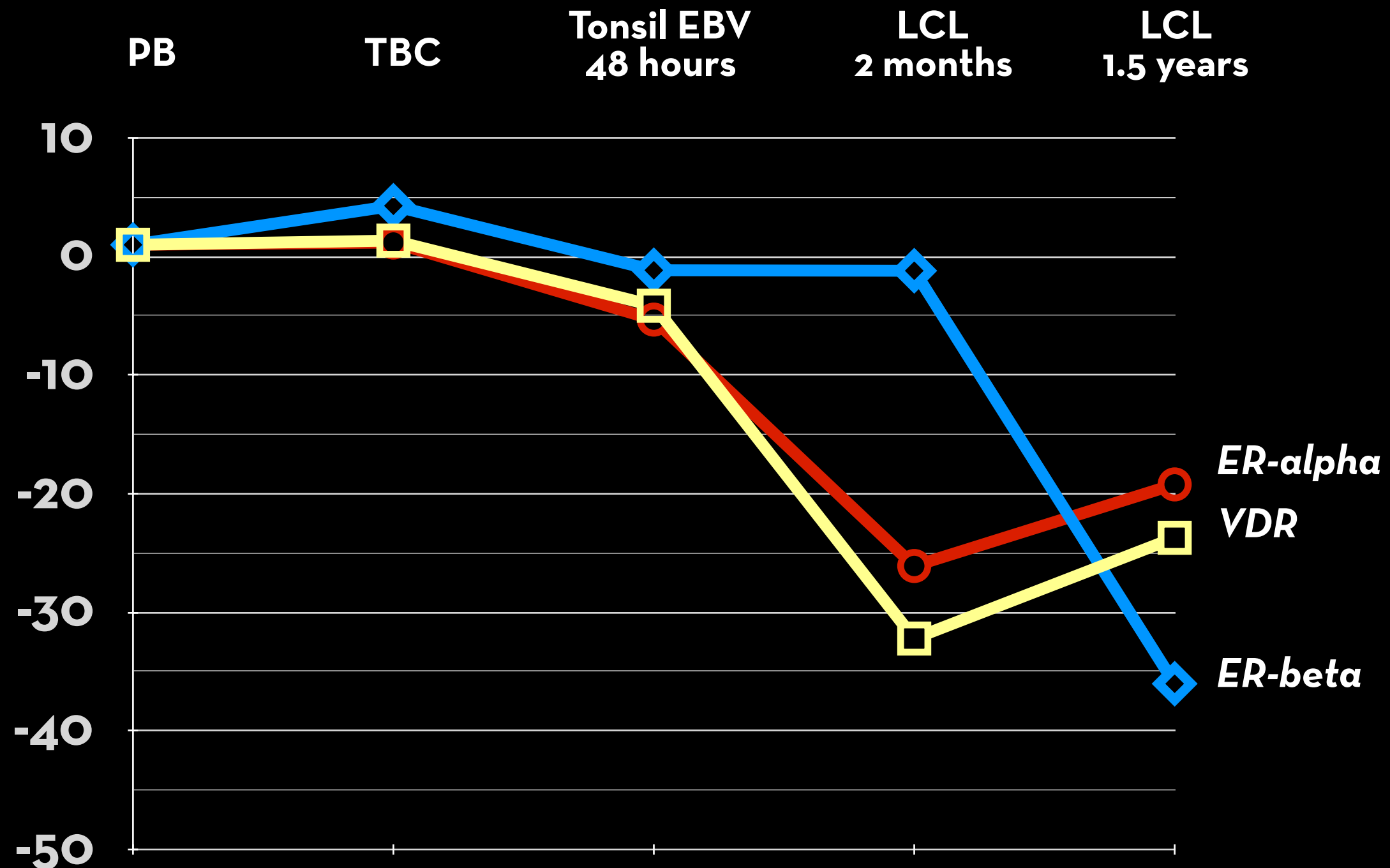
Nuclear receptors' mRNA expression is downregulated upon infection of B-cells with EBV



How can we improve this?

Source: *Experimental Oncology*. 2009; 31(2): 92-96.

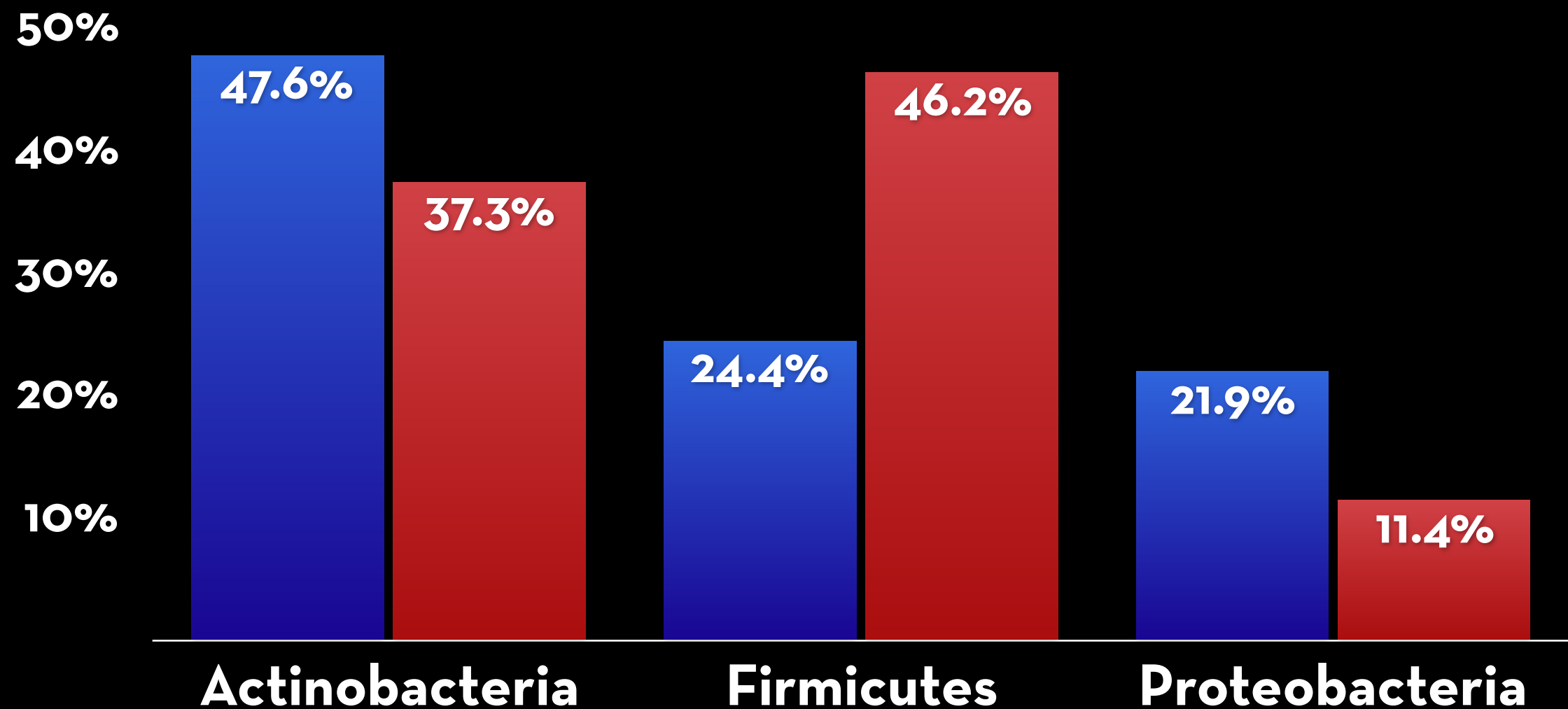
Nuclear receptors' mRNA expression is downregulated upon infection of B-cells with EBV



Source: *Experimental Oncology*. 2009; 31(2): 92-96.

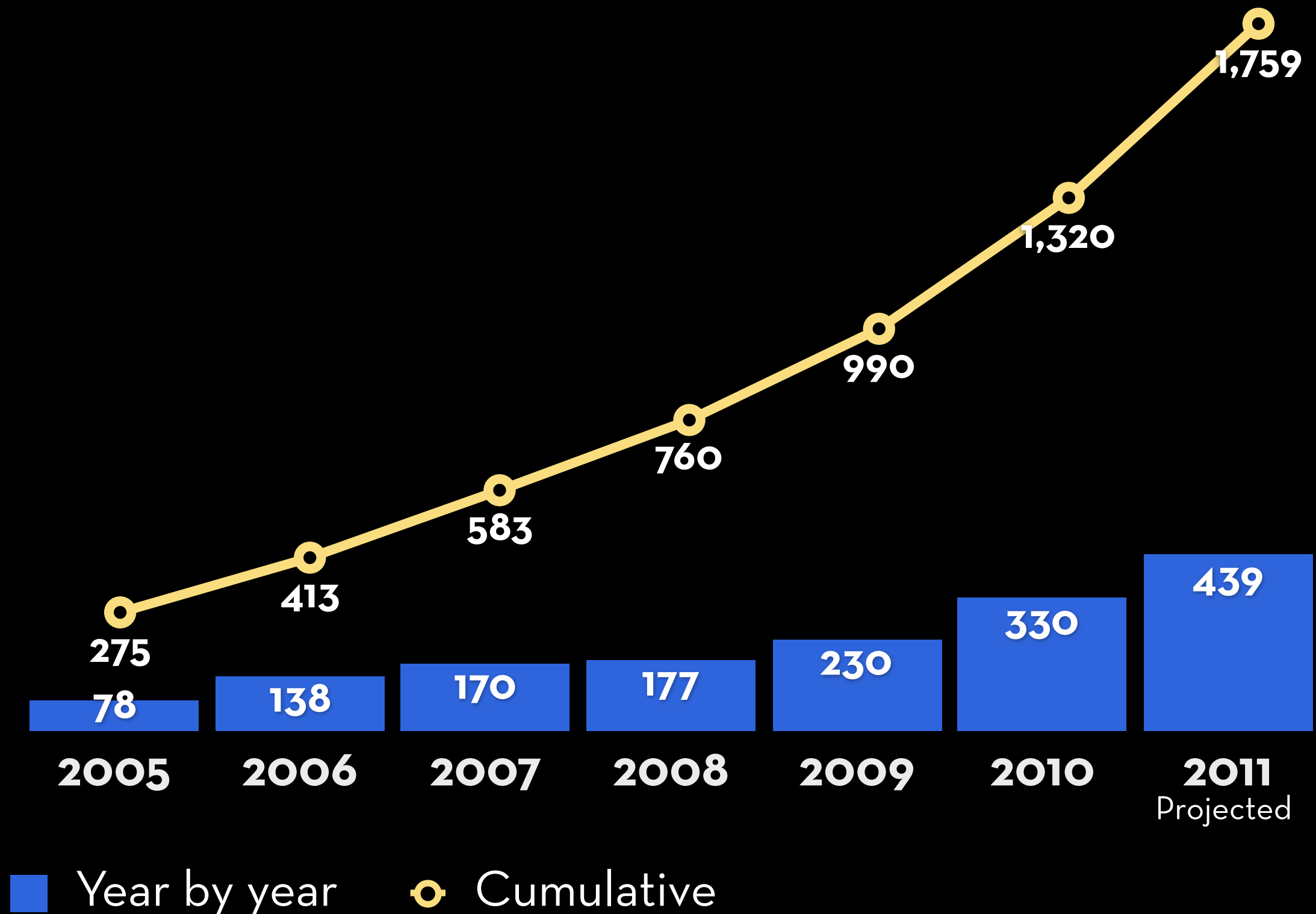
Bacterial composition of psoriatic vs. healthy skin by select phyla

■ Healthy controls
■ Unhealthy skin of psoriasis patients



Source: PLoS ONE. 2008; 3(7): e2719

Published bacterial genomes



Source: GenomesOnline.org

Creating striking tables

“Autoantibodies” target microbes

Antibody	Shown to be generated in response to...	PMID
RO, La, dsDNA	Epstein-Barr virus (EBV)	17917546
RF	A variety of viral, bacterial, and parasitic infections Chronic infections Subacute bacterial endocarditis	9198668 8898963 214511
anti-EBNA-1	Lupus-specific autoantigens such as Sm or Ro	17121489
antibodies against annexin-V, prothrombin and laminin	Acute infections in patients without autoimmune disease	17121489
IgG or IgA autoantibodies against ghrelin, leptin, vasopressin, and insulin	Over 30 microbes including <i>Lactobacilli</i> , <i>H. pylori</i> , <i>E. coli</i> , <i>Yersinia pseudotuberculosis</i> , and <i>Listeria monocytogenes</i>	18262391

Different fonts from same family

target

Brightly colored header row

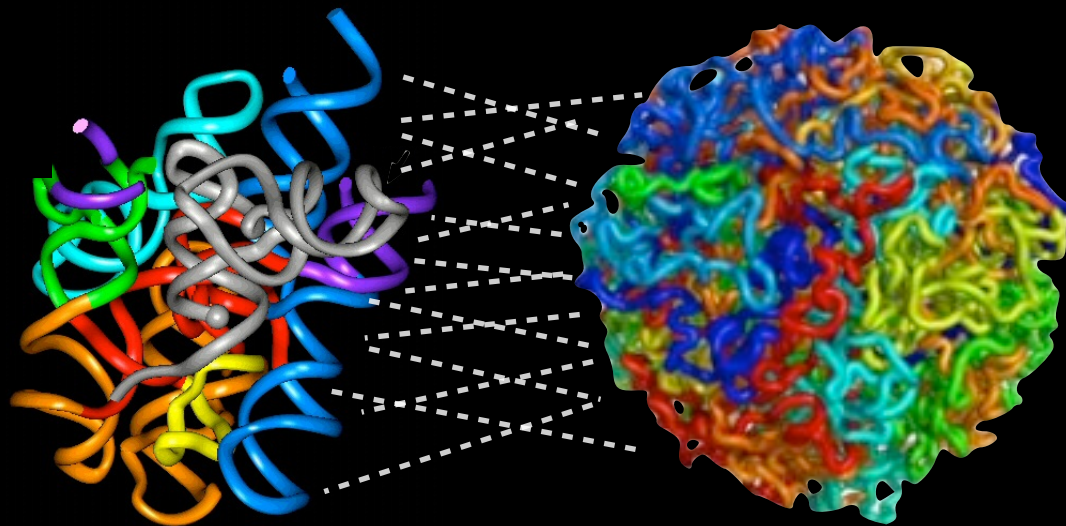
Antibody	Shown to be generated in response to...	PMID
RO, La, dsDNA	Epstein-Barr virus (EBV)	17917546
RF	A variety of viral, bacterial, and parasitic infections	9198668
	Chronic infections	8898963
	Subacute bacterial endocarditis	214511
anti-EBNA-1	Lupus-specific autoantigens such as Sm or Ro	17121489
antibodies against annexin-V, prothrombin and laminin	Acute infections in patients with autoimmune disease	17121489
IgG or IgA autoantibodies against ghrelin, leptin, vasopressin, and insulin	Over 30 microbes including <i>Lactobacilli</i> , <i>H. pylori</i> , <i>E. coli</i> , <i>Yersinia pseudotuberculosis</i> , and <i>Listeria monocytogenes</i>	18262391

Subtle striping of rows

**Holy Grail: use design
to simplify complex
concepts**

The Interactome

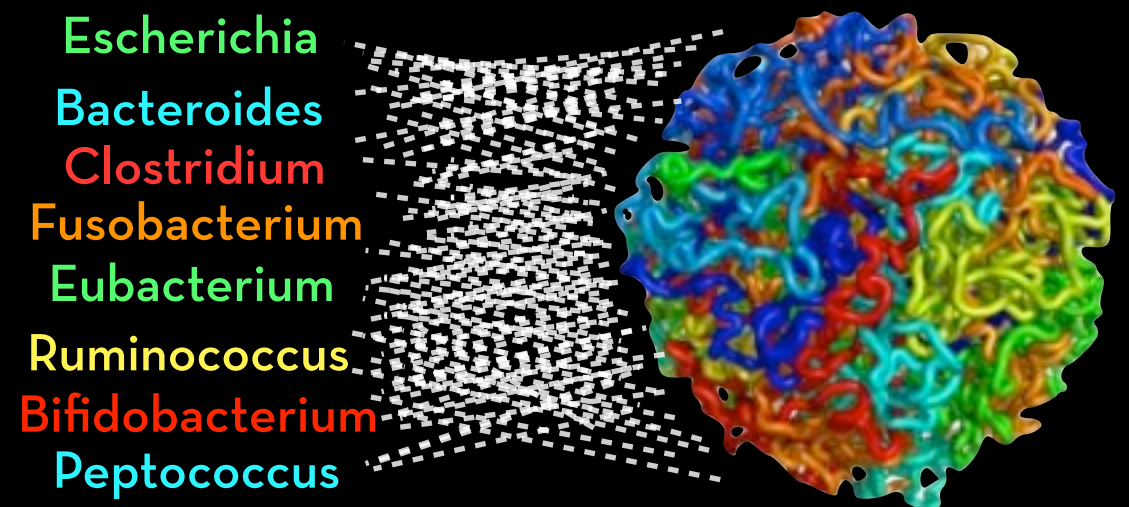
1,443 direct interactions



HIV
19 proteins

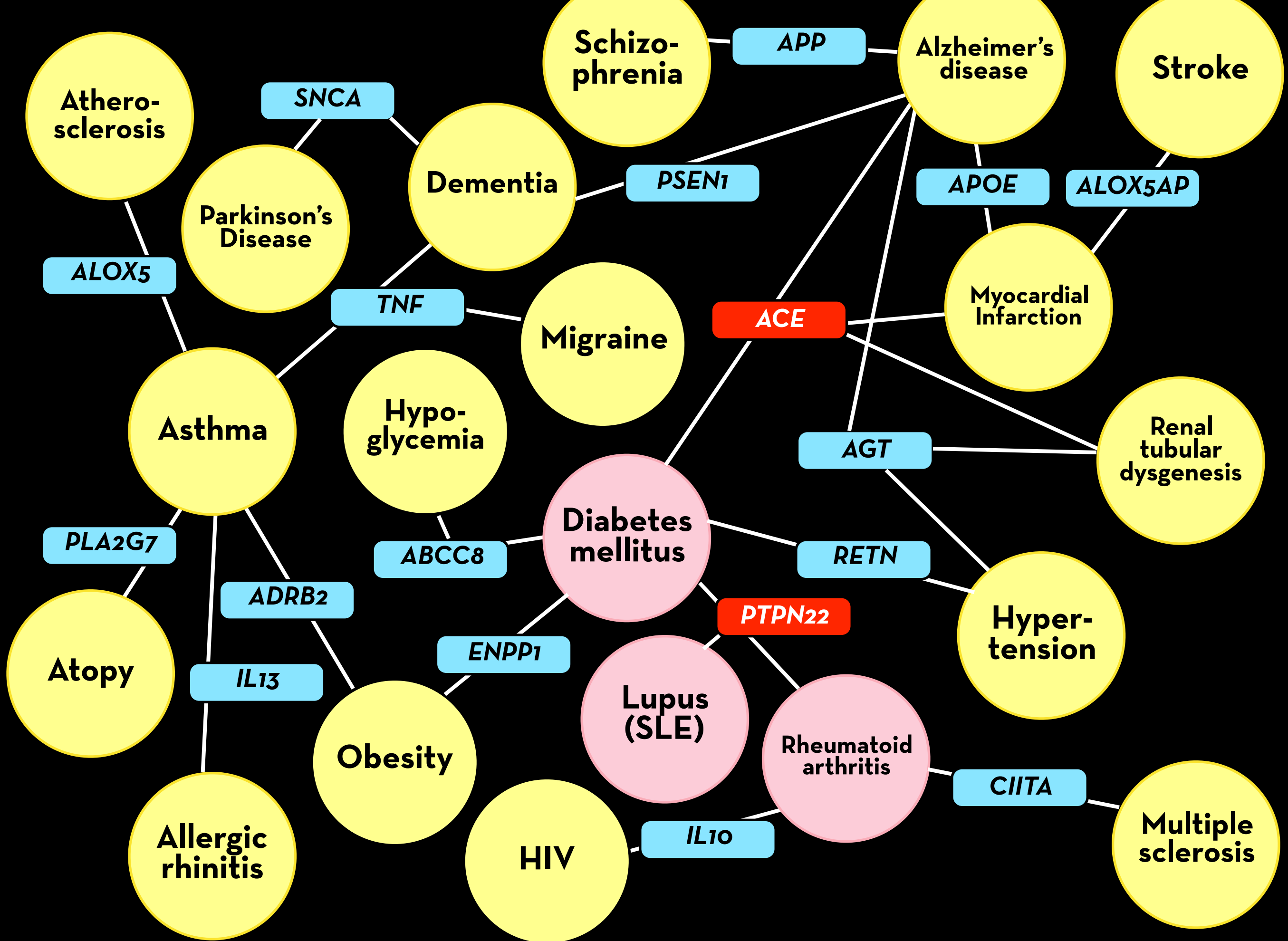
Homo sapiens
100,000
proteins

$10^{??}$ interactions



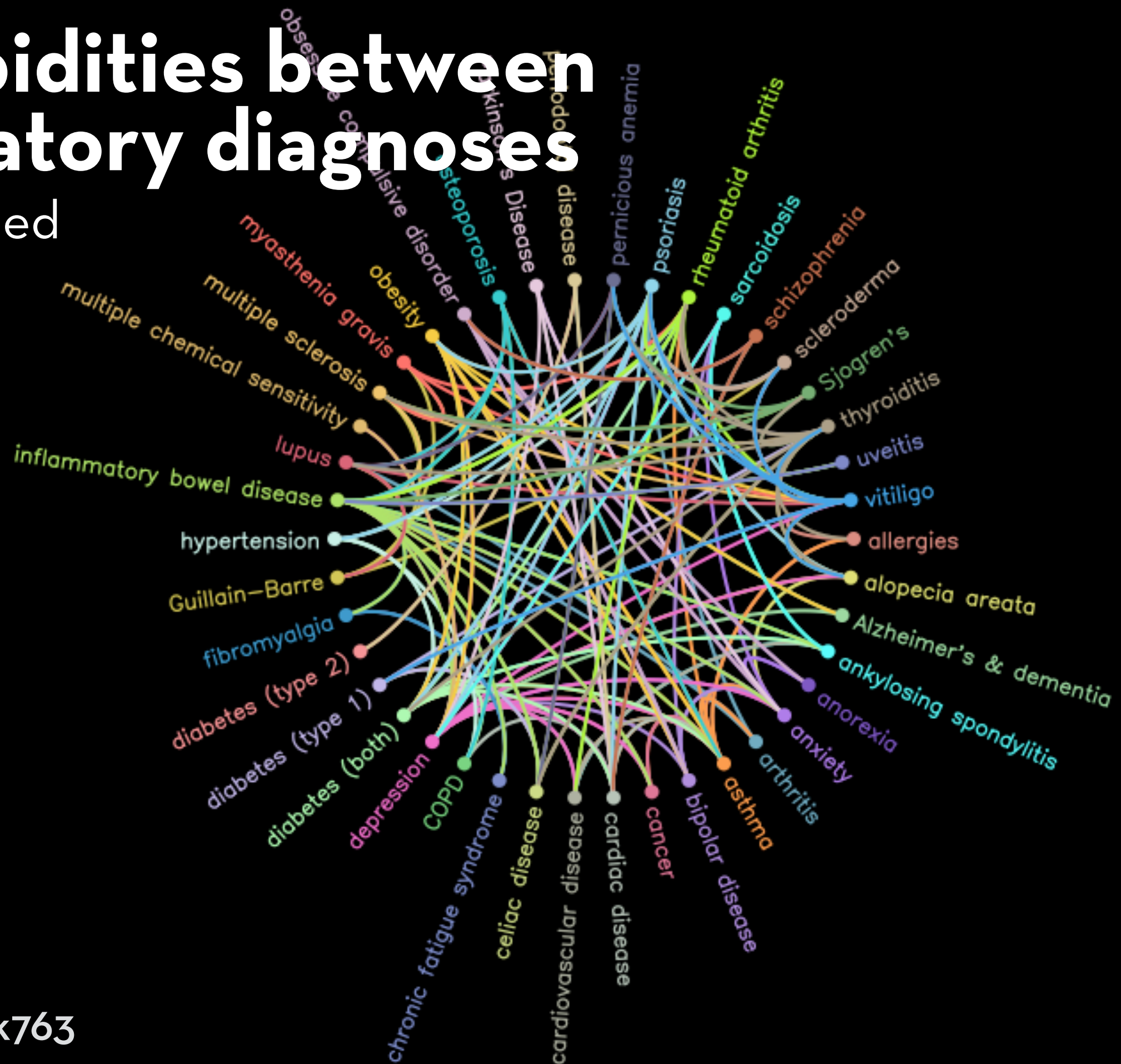
Gut microbiome
9 million unique
genes

Homo sapiens
100,000
proteins



Co-morbidities between inflammatory diagnoses

Source: PubMed



Code: goo.gl/d3k763

**Cite research and
images**

Health vs. disease in the microbiome

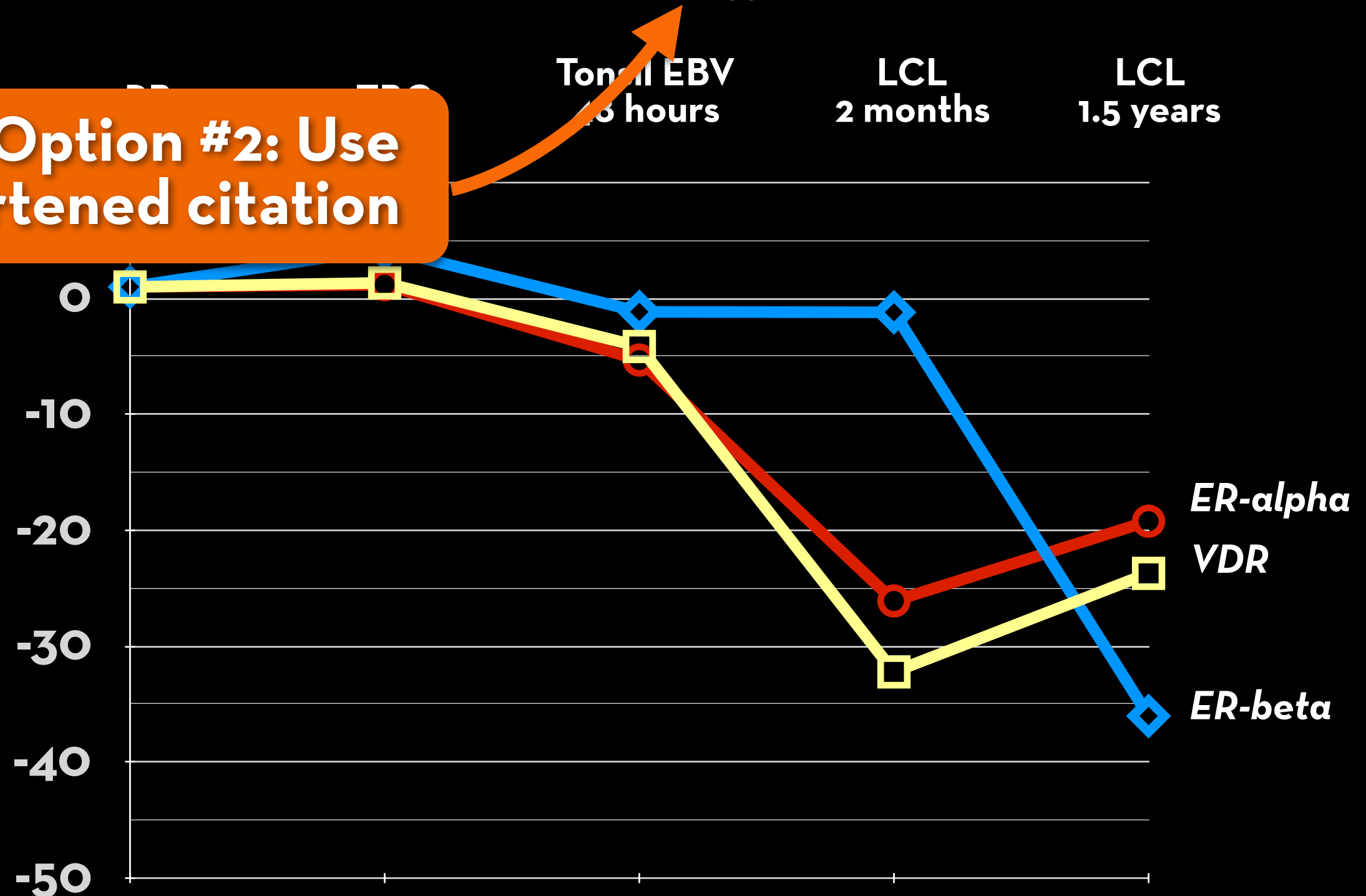
Disease	Finding	PMID
Chronic fatigue syndrome	738 unique proteins in cerebrospinal fluid of CFS patients vs. controls	21383843
Celiac disease	Higher levels of <i>Lactobacillus</i> , <i>Enterococcus</i> and <i>Bifidobacteria</i> than in controls	21970810
Diabetes, Type I	Lower diversity in gut bacteria relative to controls. High prevalence of <i>Bacteroides ovatus</i>	20613793
Diabetes, Type II	Higher levels of lipopolysaccharides and beta-amyloid, an antimicrobial peptide, than controls.	17090751 18950899
Obesity	Obese humans and mice have a 50% relative reduction in the abundance of <i>Bacteroidetes</i> and a proportional increase in Firmicutes.	16033867
Psoriasis	Significant differences in three families of bacteria in infected tissue	18648509

Option #1: Use PMIDs for compact shorthand

Nuclear receptors' mRNA expression is downregulated upon infection of B-cells with EBV

Source: *Experimental Oncology*. 2009; 31(2): 92-96.

Option #2: Use shortened citation



The Vitamin D Receptor

- expresses many genes connected to autoimmune diseases and cancers
- regulates expression of several families of key antimicrobial peptides
- TLR2 TLR4 expression

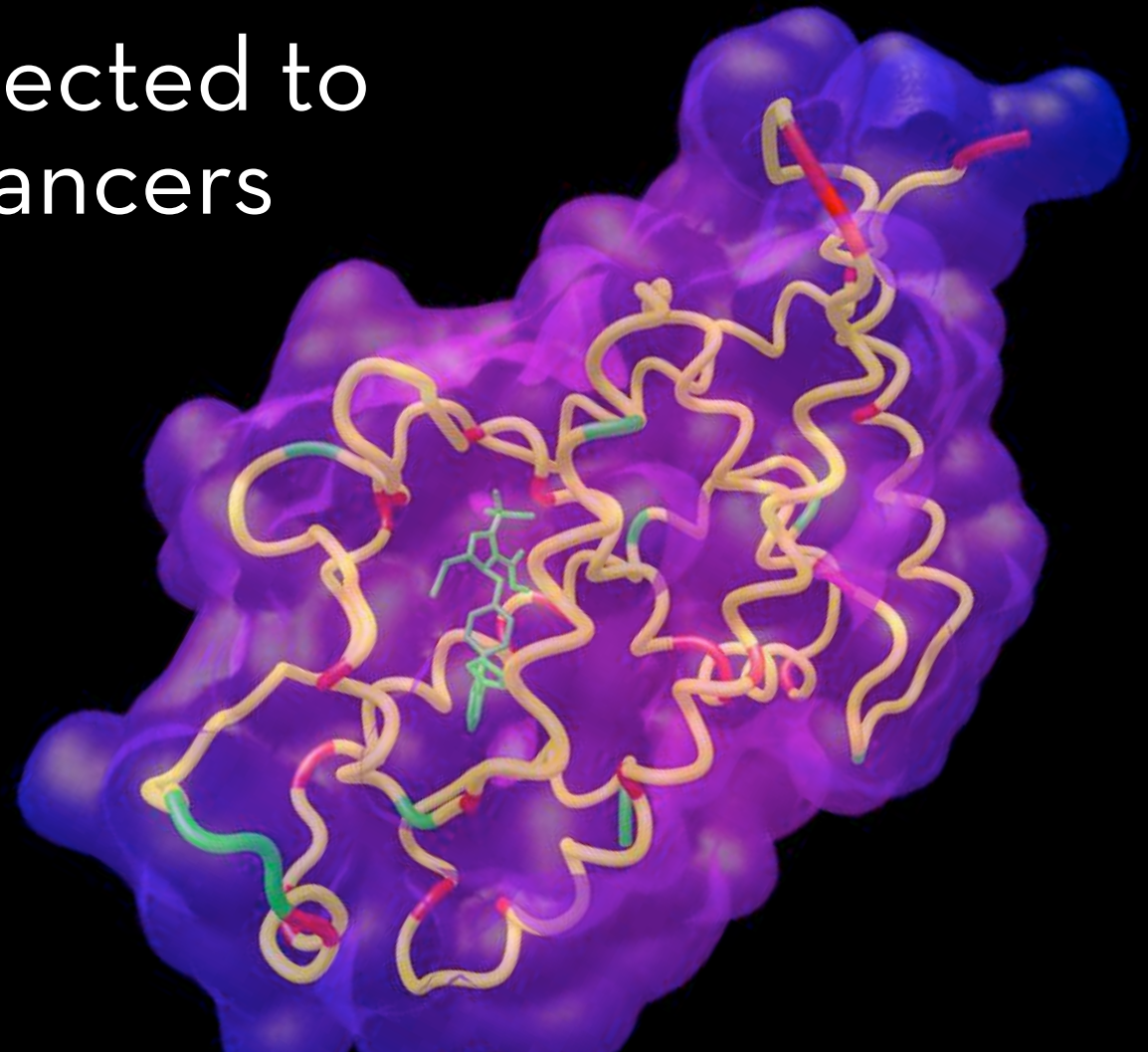


Image: Trevor Marshall

Cite your images too!

Google Images lets you do a reverse image search



Search by image



Search Google with an image instead of text. Try dragging an image here.

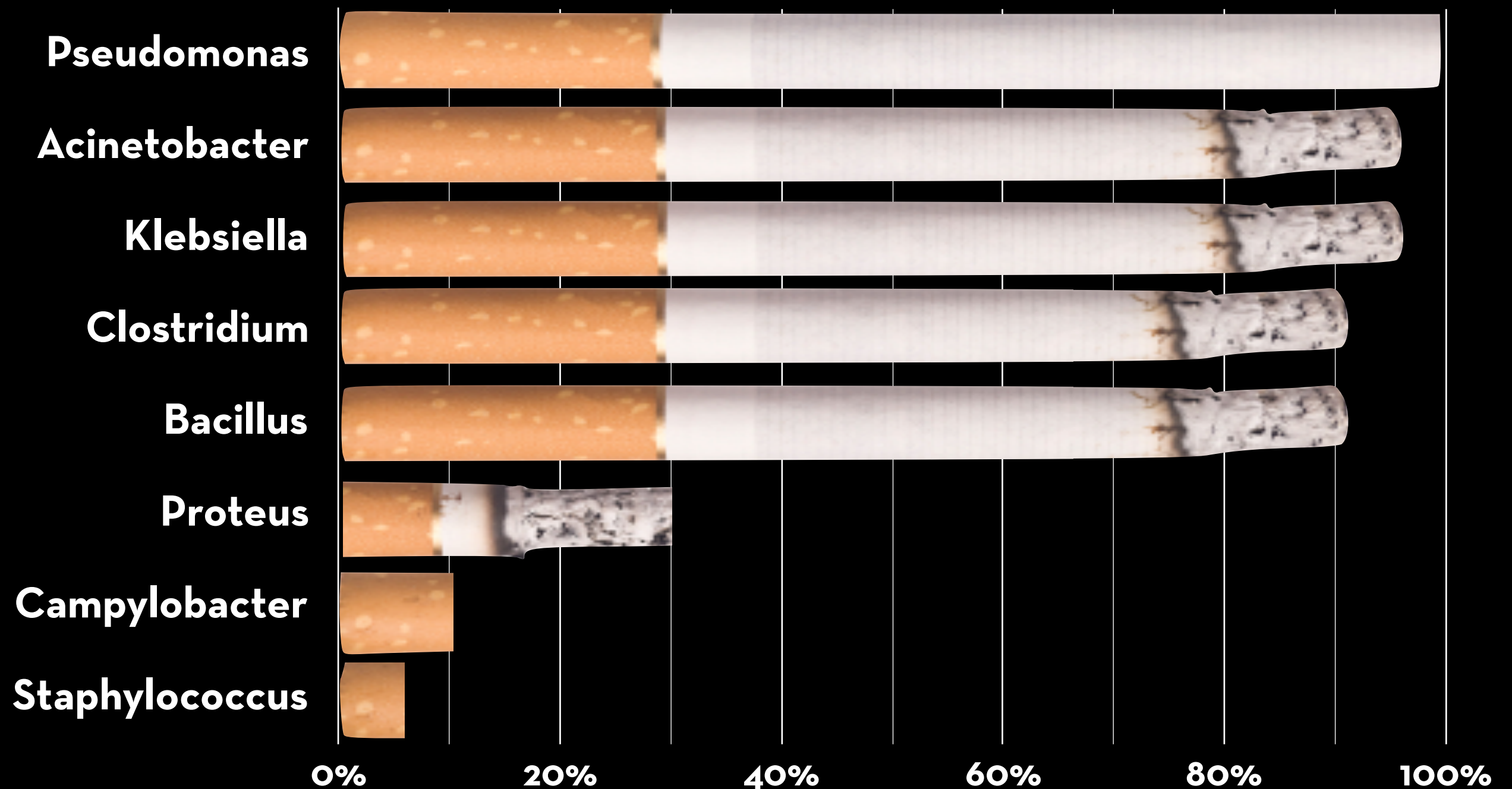
Paste image URL 

Upload an image

Search by image

**Strive for slides that
make an indelible
impression**

Select bacteria in commonly smoked cigarettes



Source: Environ Health Perspect. 2010 Mar;118(3):351-6.

Available tools

PowerPoint

- The industry standard; should be on every display computer
- Not particularly user friendly



Keynote

- Only on (some) Macs
- Lots of great tools; easy to quickly create great presentations
- Can export to PowerPoint but some features not supported



Prezi

- For presenters who are impressed by animations and think their audience will be too
- “Portable Prezi” available
- May require Dramamine



PDF

- Should be on every display computer
- Best of both worlds: export Keynote to PDF
- Color is okay but not perfect

**Proud of your slides?
Share them!**

Share your slides with shortened URLs

1. Save your slides as PDF.
2. Upload them to a public site. Options:
 - Cornell's e-Commons
 - Slideshare
 - Dropbox

Available here: goo.gl/uFFRL8

Review what you did

Agenda

- Thesis and narrative
- Connecting with your audience
- Speaking style – know your content, don't read from your slides
- Slide structure
- Visual considerations – big fonts, ample contrast, minimalism...
- Reinforce your key points
- Now you try!

Thanking the audience



Never thank your audience for paying attention as that implies weakness.

Now, you try!

Use the institutional template to rescue this slide

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Microbiome in autoimmune diseases

Significant differences can be found in the microbiomes of patients with autoimmune diseases such as diabetes types I [18] and II [19], Crohn's [20], ulcerative colitis, and psoriasis [21]. Even the composition of the cerebrospinal proteome is significantly altered in autoimmune disease. Schutzer et al. found that while healthy subjects, and patients with chronic fatigue syndrome (CFS) [22], harbored many of the same proteins in the cerebrospinal fluid, 738 of 2,783 detected proteins were unique to patients with CFS [23]. Because so many of the proteins created in the body are microbial, these changes are a direct reflection of alterations to the human interactome.

18. Giongo A, Gano KA, Crabb DB, Mukherjee N, Novelo LL, Casella G, et al. Toward defining the autoimmune microbiome for type 1 diabetes. *Isme J.* 2010.

19. Larsen N, Vogensen FK, van den Berg FW, Nielsen DS, Andreasen AS, Pedersen BK, et al. Gut microbiota in human adults with type 2 diabetes differs from non-diabetic adults. *PLoS One.* 2010; 5:e9085.

20. Morgan XC, Tickle TL, Sokol H, Gevers D, Devaney KL, Ward DV, et al. Dysfunction of the intestinal microbiome in inflammatory bowel disease and treatment. *Genome Biol.* 2012; 13:R79.

21. Gao Z, Tseng CH, Strober BE, Pei Z, Blaser MJ. Substantial alterations of the cutaneous bacterial biota in psoriatic lesions. *PLoS One.* 2008; 3:e2719.

**And now for the
correct answer...**

Microbiome in autoimmune diseases

- diabetes, types I and II
- Crohn's disease
- ulcerative colitis
- psoriasis

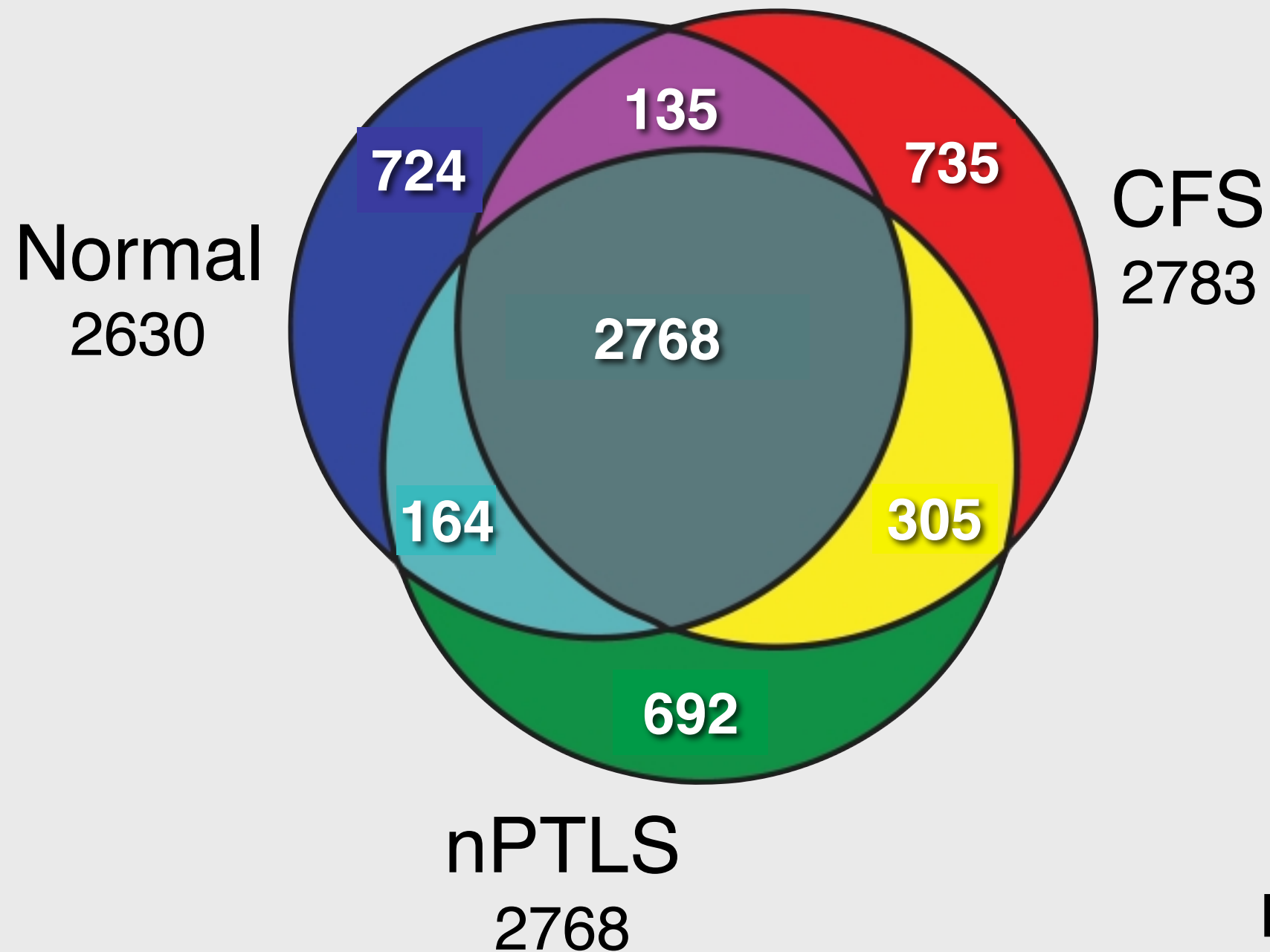
Proteome in CFS

Schutzer found that while healthy subjects, and patients with chronic fatigue syndrome harbored many of the same proteins in the cerebrospinal fluid, 738 of 2,783 detected proteins were unique to patients with CFS.

PMID: 21383843



Microbiome in autoimmune diseases



PMID: 21383843

Follow up

Resources for follow up

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Checklist

goo.gl/fz7USI

This presentation

goo.gl/zQdmiD

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