



The art of science communication:

Sarah Schreiner, PhD

STROBE Associate Director of Outreach and Broadening Participation

About me – Graduate school @ Yale in Cell Biology



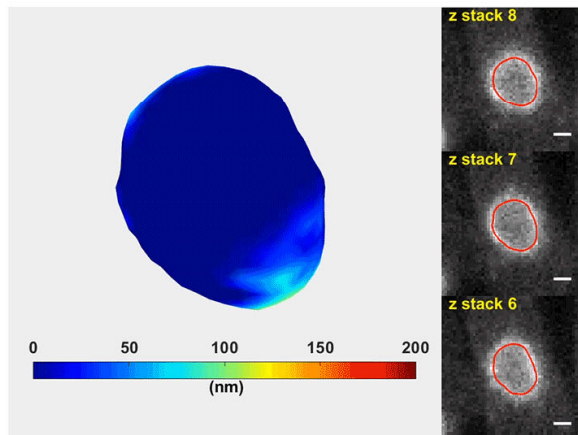
YaleNews

EXPLORE TOPICS ▾



Research in the news: putting the squeeze on a cell's nucleus

By Bill Hathaway | JUNE 15, 2015



Nuclear membranes protect genes — life's most precious cargo — but little is known about why.



About me – Science communication experience



ComSciCon
Rocky Mountain West
September 23rd - 24th, 2017
University of Colorado Boulder

Learn **science communication** from editors, writers, policy makers, industry communicators, & scientists at our intensive professional development workshop.

SCIENCE
in the NEWS



Professor (Adjunct) of Molecular, Cellular, and Developmental Biology
robert.bazell@yale.edu

Robert Bazell is adjunct professor in the Department of Molecular Cellular and Developmental Biology. Before his arrival at Yale in 2013 he served for 38 years as chief science and health correspondent for NBC News. In that capacity he earned many awards including five Emmys, the Peabody Award and the DuPont Columbia. He has also written extensively for many peer reviewed and general interest publications and websites. He authored a best selling book called "Her-2: the making of a revolutionary treatment for breast cancer" which was adapted as a TV film At Yale in the CTL and the CST before it, he has set up a series of

SEARCH

The New York Times

SCIENCE



Matter

Matter. It's the stuff of everything — large and small.



ALAN ALDA CENTER FOR
COMMUNICATING SCIENCE

Science Out Loud

Why is communicating effectively important for scientists?

- Engaging the public
- Collaborating across disciplines
- Interacting with news and media
- Talking with legislators
- Gaining support from funding agencies and donors
- Career advancement (academia and industry)

What are challenges scientists face when communicating their work?

Game time!

Clustered regularly interspaced short palindromic repeats (CRISPR)/CRISPR-associated (Cas) systems provide bacteria and archaea with adaptive immunity against viruses and plasmids by using CRISPR RNAs (crRNAs) to guide the silencing of invading nucleic acids. We show here that in a subset of these systems, the mature crRNA that is base-paired to trans-activating crRNA (tracrRNA) forms a two-RNA structure that directs the CRISPR-associated protein Cas9 to introduce double-stranded (ds) breaks in target DNA. At sites complementary to the crRNA-guide sequence, the Cas9 HNH nuclease domain cleaves the complementary strand, whereas the Cas9 RuvC-like domain cleaves the noncomplementary strand. The dual-tracrRNA:crRNA, when engineered as a single RNA chimera, also directs sequence-specific Cas9 dsDNA cleavage. Our study reveals a family of endonucleases that use dual-RNAs for site-specific DNA cleavage and highlights the potential to exploit the system for RNA-programmable genome editing.

It's hard to communicate clearly



“Pinker, a cognitive scientist, says it boils down to “brain training”: the years of deep study required of academics to become specialists in their chosen fields actually work against them being able to unpack their complicated ideas in a coherent, concrete manner suitable for average folks.

Translation: Experts find it really hard to be simple and straightforward when writing about their expertise.

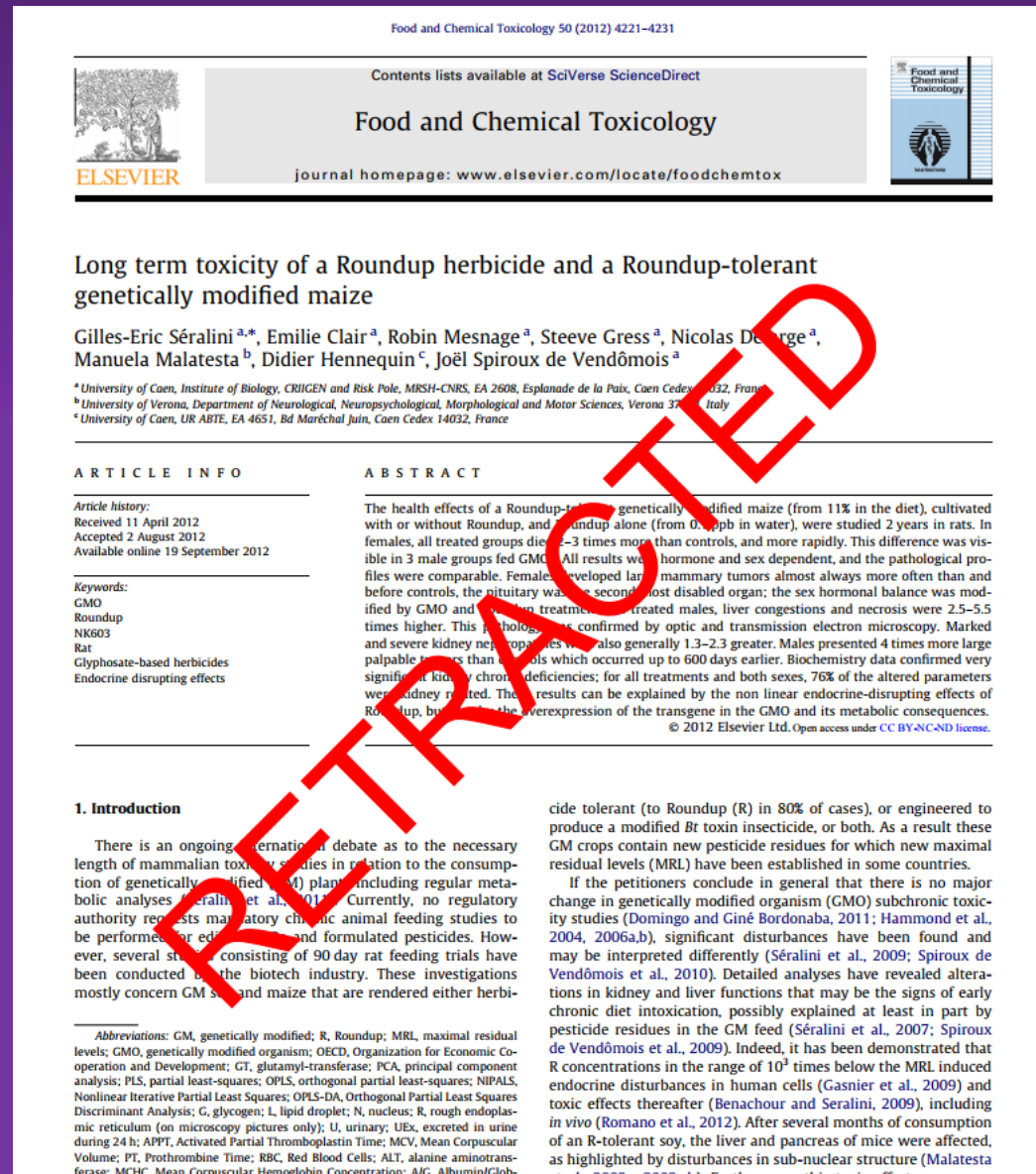
[Pinker] calls this the “curse of knowledge” and says academics aren’t aware they’re doing it or properly trained to identify their blindspots—when they know too much and struggle to ascertain what others don’t know.

In other words, sometimes it’s simply more intellectually challenging to write clearly.”

Personal example of poor science communication



- Background:
 - What are GMOs?
 - How are GMOs made?
 - What GMOs currently exist?
- Are GMOs safe?



Where is there a disconnect between scientists and the public?

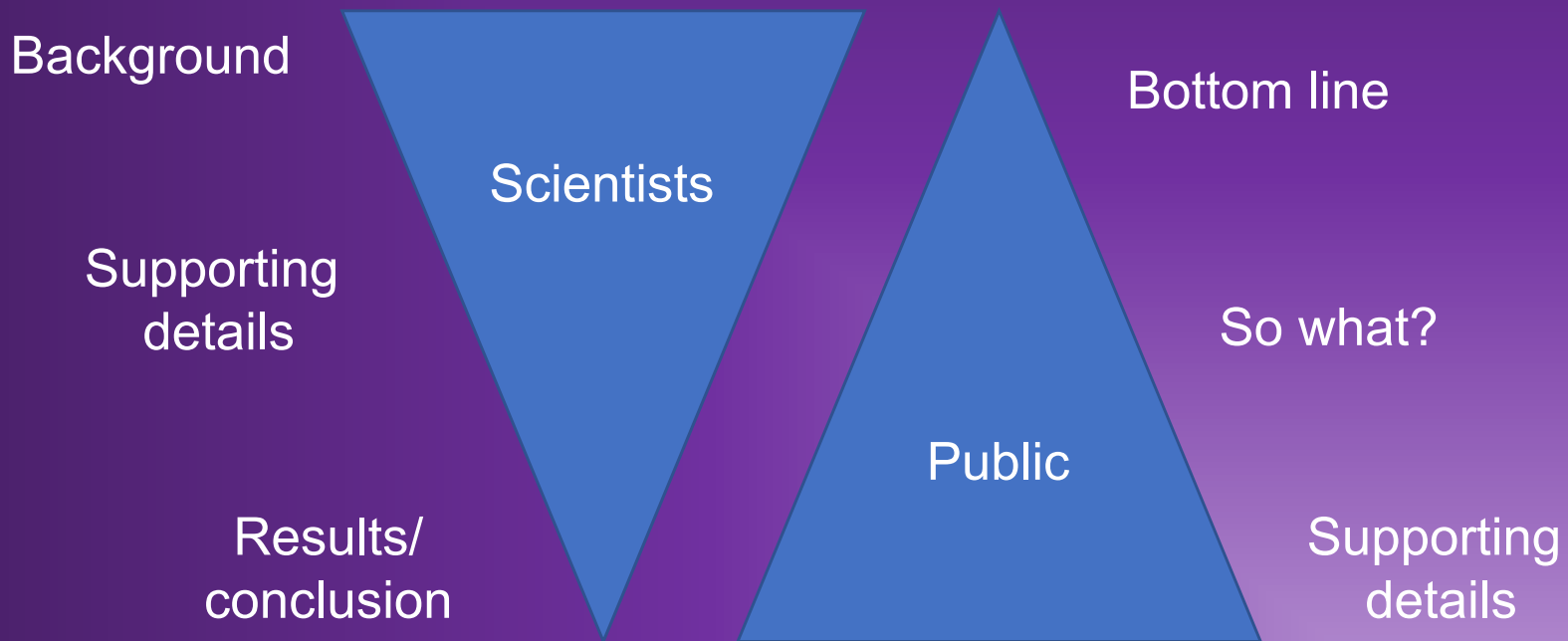


Deficit model - People's opinions differ from scientific consensus because they lack scientific knowledge

Backfire effect - Presenting facts that conflict with an individual's worldview can cause people to dig in further.

“Respondents who knew more about science generally, regardless of political leaning, were better able to identify the scientific consensus ... Yet, when the same people were asked for their own opinions about climate change, [their opinion did not match scientific consensus]. It showed that even when people understand the scientific consensus, they may not accept it.”

Where is there a disconnect between scientists and the public?



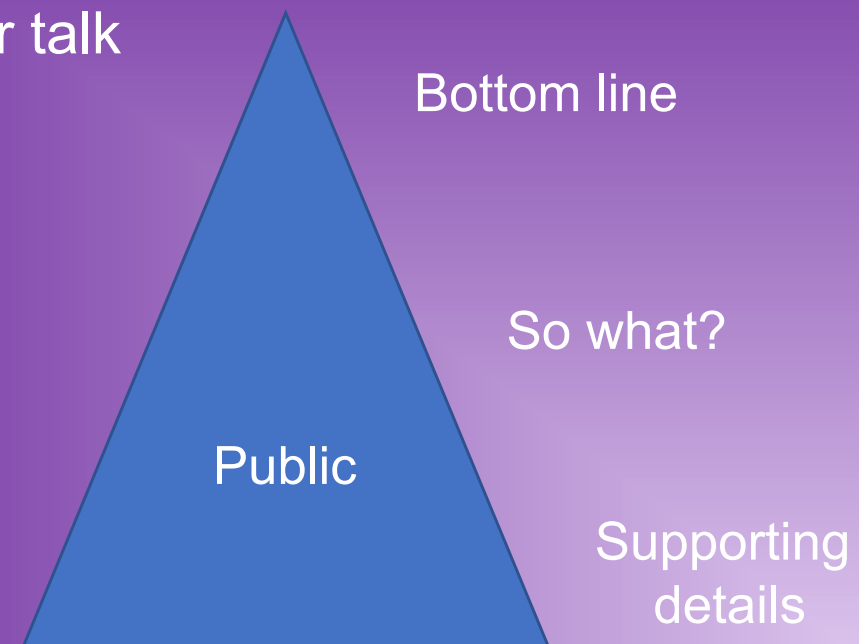
How to determine the Bottom Line and the “So What?”

- Know your audience!



How do you communicate effectively?

- Know your audience!
- Engage your audience within the first minute
 - Start with the big picture then go into details
- Find the “so what” or the why of your research
 - Tie this into the first minute of your talk



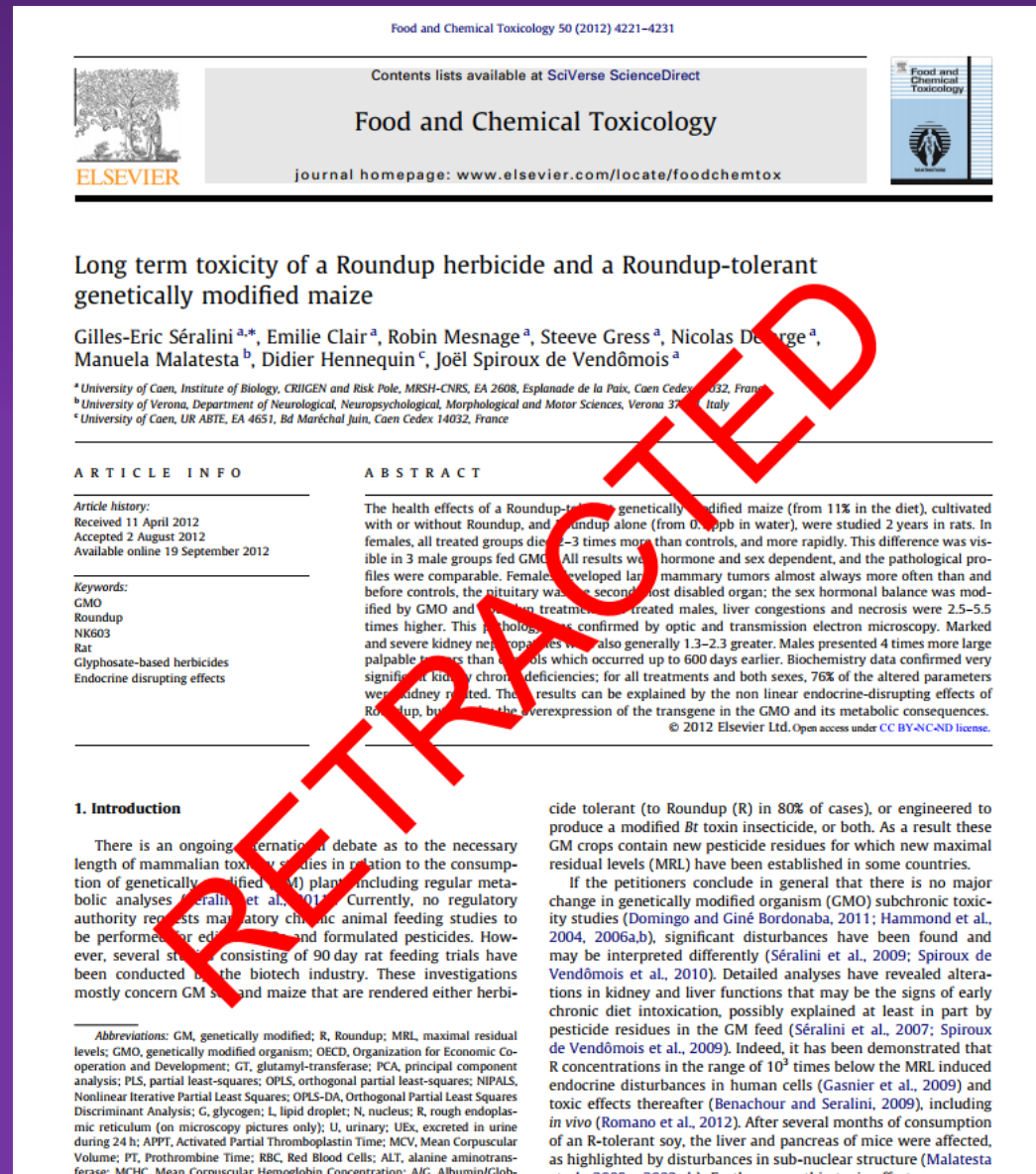
How to communicate effectively?

- ▶ Define your audience
- ▶ Define one take away message
- ▶ Think of a useful analogy for the work (if appropriate)
- ▶ Think of a lead in sentence that draws your audience in

Personal example of poor science communication



- Background:
 - What are GMOs?
 - How are GMOs made?
 - What GMOs currently exist?
- Are GMOs safe?



Practice, practice, practice