Practical tips to communicate successfully

Mastering science communication

by Elodie Chabrol

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Practical tips to communicate science

Mastering science communication

This booklet accompanies the training session you attended with me. It's designed to remind you of key concepts and serve as a useful resource in the future.

Science communication is a broad field with numerous benefits. It serves as a social tool to ensure the general public has access to scientific knowledge, facilitates discussions, and allows scientists to incorporate public-sourced data. Moreover, it enhances your communication skills, which is crucial for advancing your research career. Mastering the art of presenting your research to diverse audiences, including scientific peers and juries, can significantly boost your science career.

Science communication encompasses a wide range of formats, from podcasts and blogs to conferences and creative approaches like immersive games, mobile micro museums or even science raves. When starting in science communication, consider these two crucial questions:

- Is this format/platform suitable for the audience I want to reach? For example, creating TikTok videos might not effectively engage an older audience.
- What would I enjoy doing? Especially if you're new to science communication, choose formats that you find enjoyable. This will make the process more rewarding and sustainable.

You don't need groundbreaking results or a senior scientist status to communicate your research. All you need is a passion for your subject. You can discuss topics beyond your specific research, such as techniques. What might seem mundane to you can be fascinating to others. For instance, a PhD student once captivated a Pint of Science audience by explaining a new microscope at her institute, showcasing its capabilities and how it differed from traditional expectations.

Even if you don't have results yet, you can still share your project by focusing on its introduction and context. For the general public, understanding your interests and motivations can be engaging enough.

To assist you in your science communication journey, I've developed a six-step recipe based on successful (and not-so-successful) talks and insights from fellow science communicators.

These practical tips are easy to implement, so there's no excuse not to start today!

MY MAGIC RECIPE TO EFFECTIVE SCIENCE COMMUNICATION

1. KNOW OR PICK YOUR AUDIENCE

Understanding your audience is crucial in science communication—and in any form of communication. It's essential to consider who you're addressing. I say "know or pick your audience" because, in some cases, like writing a blog post, you may not know exactly who will read it. However, you should aim to target a specific audience because it's impossible to create content that resonates with everyone.

Knowing your audience goes beyond merely distinguishing between experts and non-experts. In labs, we often default to using jargon with fellow scientists and simplify our language for the general public. However, you might have experienced attending talks outside your domain where the content was difficult to grasp. This happens because scientists don't know everything, and the further someone is from your specific field, the less familiar they will be with your jargon and acronyms.

This advice is vital for your science career. While it's necessary to adapt your communication for the general public by considering factors like age and scientific literacy, it's equally important to apply this exercise when communicating with other scientists. Strive to learn as much as possible about your audience, including their age, interests, and level of scientific understanding. This knowledge will guide you in choosing the appropriate examples and analogies for different audiences.

2. THINK ABOUT YOUR MESSAGE

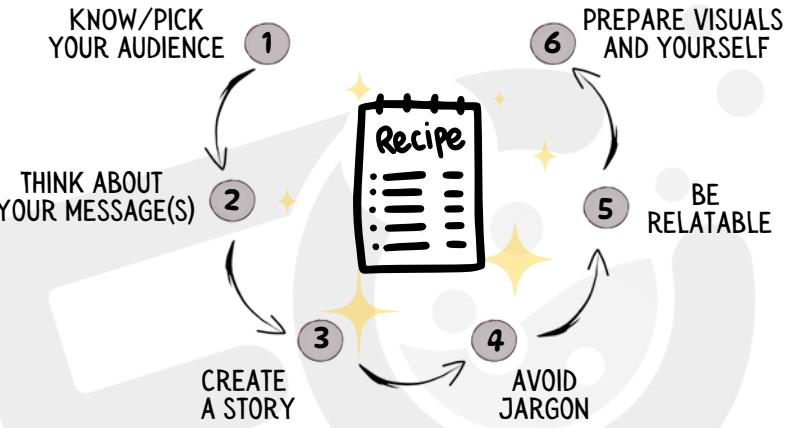
Your message is the key takeaway that people should remember from your talk. It is typically a single sentence. The shorter your talk or communication piece, the more crucial it is to stay focused on this message.

For instance, if you have just 3 minutes to discuss a scientific topic, ensure you don't diverge into multiple directions, explaining various things that might confuse your audience. By the end of your talk, they should clearly understand the core message of what you were discussing. Even in longer presentations, it's vital to stay on message.

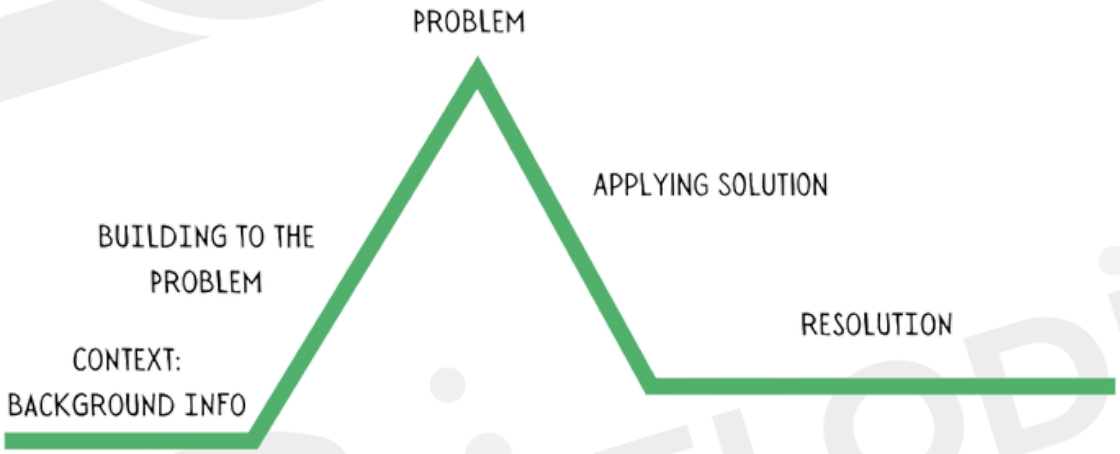
Everything you include should either help understand the context, develop the message, or illustrate the consequences of your work. The worst outcome is to confuse your audience by veering off in multiple directions.

In science, we often start by gathering existing slides and then decide what to say. This approach can lead to missing key elements or including irrelevant details that detract from the message. Therefore, it's essential to define your message before you begin preparing your materials.

3. TELL A STORY



When communicating science, ensure that your audience doesn't feel like they've landed mid-season of a TV show, lost and confused. A well-crafted story needs to have a clear introduction with context—something often overlooked in science due to excitement about the details. It's crucial to explain the "why" behind your project. Start with the context, introduce the problem, discuss how you plan to address it, and conclude with the resolution or potential outcomes.



This storytelling structure is effective for both the general public and scientists. While scientists might need less context, don't assume they know everything. Different fields have varying backgrounds, so always include some foundational context.
Think of a story like packing a backpack for a hike: include only what's essential, avoiding unnecessary weight. Choose details carefully, ensuring they contribute to the narrative without overwhelming it. If a detail feels tangential, it might not be necessary.

For general public talks, don't forget to include personal elements. Share why you're passionate about the subject, your background, or what fascinates you. Showing your enthusiasm can engage your audience and make your topic more relatable.

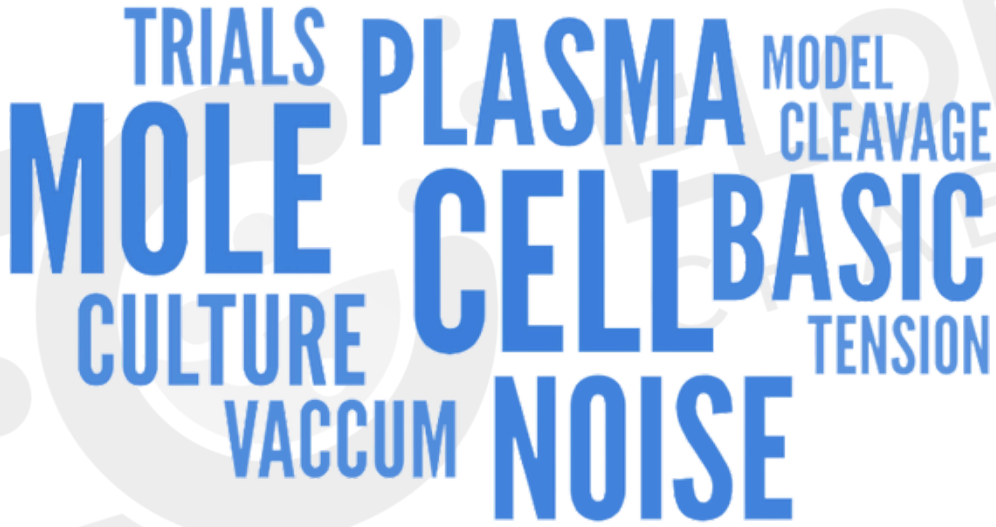
4. AVOID JARGON

Avoiding jargon is just as crucial as knowing your audience. If you choose your audience but don't adjust the jargon, or vice versa, you risk miscommunication. Here's how to handle jargon effectively:

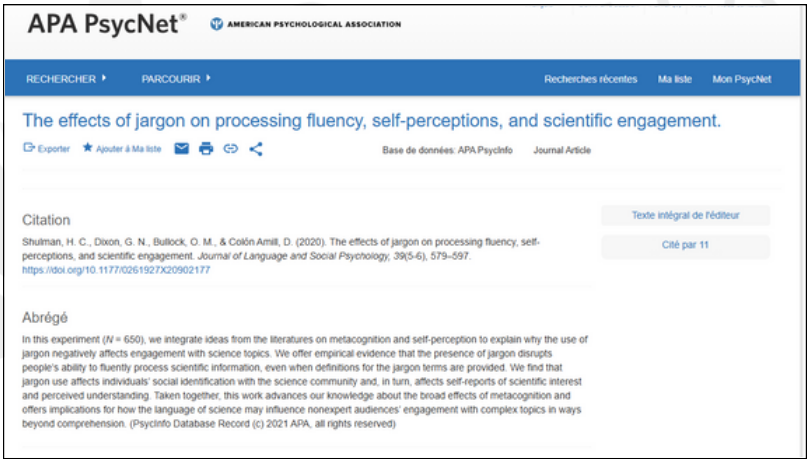
Acronyms: These are usually easy to spot. Always define them, preferably more than once. If possible, replace acronyms with full words. Even among scientists, don't assume familiarity with every acronym. Define them at least twice to ensure comprehension.

Technical Words: These can be tricky. Ensure that the technical terms you use are not too niche for your audience. For example, "PCR" might be familiar to some due to COVID-19, but its full meaning—Polymerase Chain Reaction—may not be known. Always clarify.

Common Words with Different Meanings: Some words might seem common but carry different meanings in scientific contexts. Be aware of these and provide clear definitions.

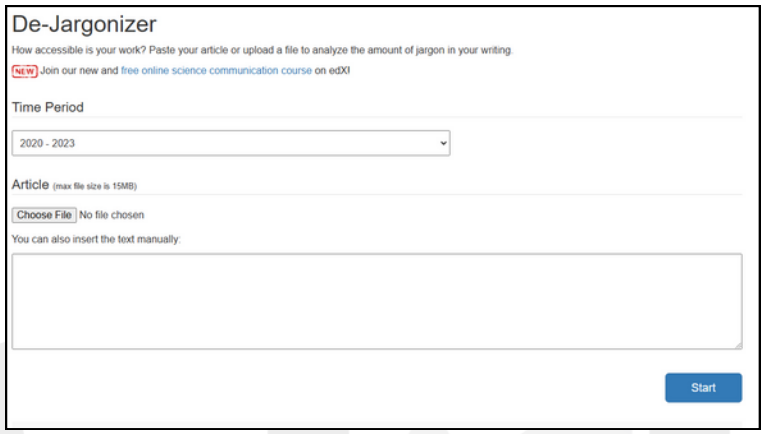


I hope I've convinced you that jargon can be problematic. Even discussing jargon can sometimes lead to confusion, as this article illustrates. I'm sure you can recall a time when jargon or acronyms left you puzzled. To prevent this from happening in your talks, it's crucial to be mindful of your language.



While you'll inevitably need to use some technical terms, it's essential to eliminate unnecessary ones. Some jargon might remain, but **the best approach is to first explain the concept, then introduce the technical term**. In the worst-case scenario, if people understand the concept but forget the term, you've still succeeded.
If you begin with a complex term, your audience might not pay attention to your explanations. They could become preoccupied with understanding the term, leading to frustration. If they're reading, they might stop or search online, distracting them from your message. The worst outcome is losing their interest entirely. Always start by explaining the concept first to keep your audience engaged and informed.

I've gathered some really cool tools tools for each play with and try to make your science more accessible. (next page)



DE-JARGONIZER

Helps spot jargon in English texts. While it doesn't know your audience, it can be a useful starting point.

DUMB-IT-DOWN: AI TOOL

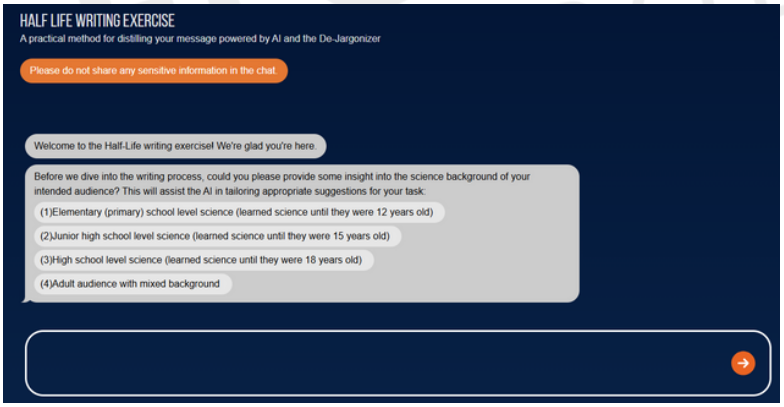
Assists in simplifying text, though it requires careful review.

UP-GOER SIX TEXT EDITOR

Highlights common and less common words, helping you adjust your language accordingly.

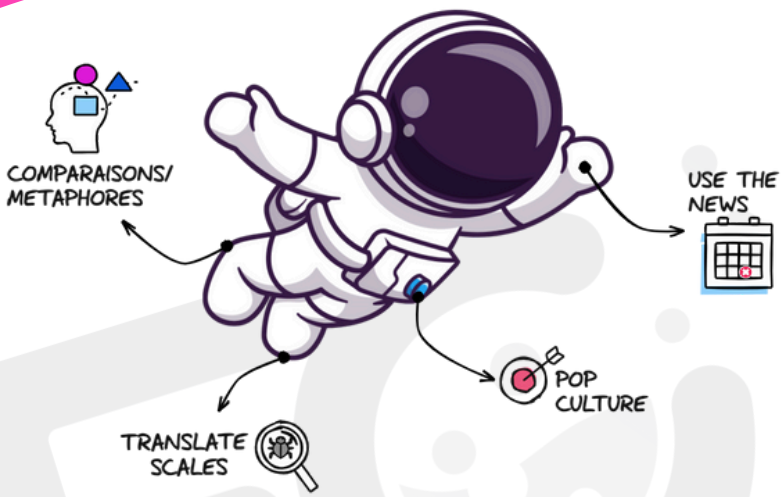
FIVE GOER TEXT EDITOR

Limits you to using the 1,000 most common English words. This exercise pushes you to explain concepts without technical jargon, often unlocking new ways to communicate your research



HALF-LIFE WRITING EXERCISE

Start with 120 words, then reduce to 60, then 30, and back to 120. This exercise helps you refine your message and learn to convey complex ideas succinctly.



5. BE RELATABLE

To be relatable, it's essential to place science in contexts that people are familiar with, like everyday life. Use comparisons and metaphors, and incorporate pop culture references—just ensure they're appropriate for your audience's country and age. You can also use news stories, whether local or global, and they don't need to be recent; events from a few years ago can work too.

A crucial aspect is translating scales. For example, if you're discussing something very small, like 10 nanometers, the general public might not grasp that measurement. However, if you explain that a human hair is 100 micrometers and cutting it into ten pieces equals the size you're interested in, it becomes more tangible.

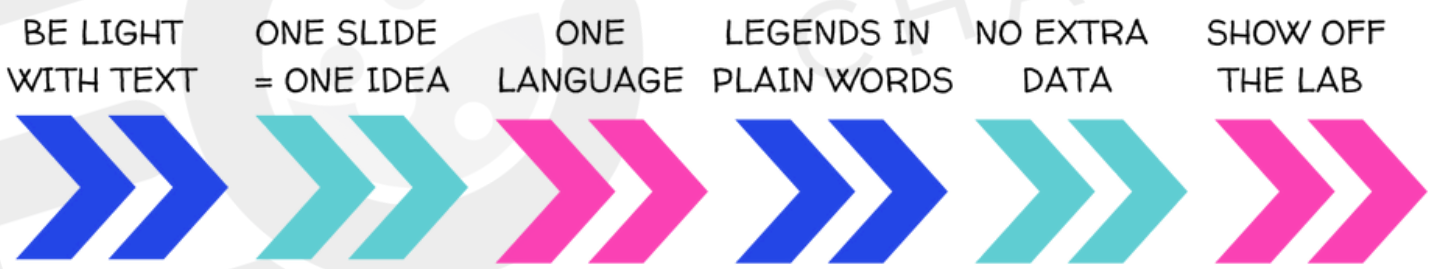
I recall a scientist in epigenetics who studied DNA compaction in cells. She explained that each cell contains 2 meters of DNA. Instead of stopping there, she made it relatable by comparing it to fitting 13 kilometers of spaghetti into a tennis ball. This comparison vividly illustrates the concept.

For fun and creative ways to translate measurements and distances, tools like "Stupid Converter" and "Stupid Measurement Unit" can be helpful (and fun).

STUPID MEASUREMENT UNIT

CONVERTISSEUR STUPIDE

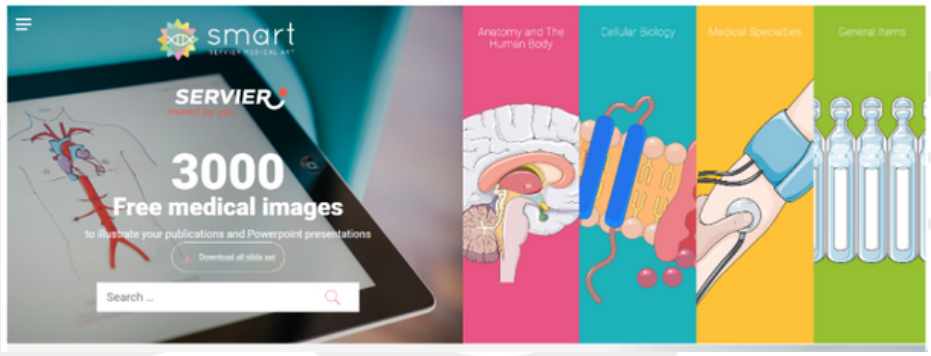
6. WORK ON THE VISUALS AND YOUR PRESENTATION



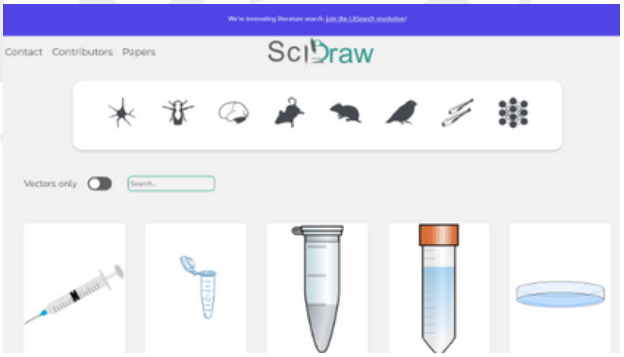
- **Keep text light:** Avoid slides overloaded with text; it can be overwhelming and unreadable.
- **One slide, one idea:** Focus on conveying a single idea per slide. It's better to have more slides with clear concepts than fewer slides cluttered with multiple points.
- **Consistent language**: Ensure the language on slides matches your spoken language to avoid confusion.
- **Simplify legends**: Use plain words for labels and avoid complex equations.
- **Use animations wisely:** Introduce new items on each slide incrementally. This method works well even in PDF format.
- **Focus on relevant data:** Only include data you intend to discuss. Remove unnecessary columns or rows to prevent distraction.
- **Avoid overloading slides:** Don't use slides as a backup plan for more data. Mismatched content and speech can confuse audiences.
- **Visual aids**: For general audiences, show your lab, experiments, and scales. Use familiar objects for scale, like a coin or bananas

SIMPLICITY IS KEY: IF YOU DON'T TALK ABOUT IT, IT SHOULDN'T BE ON THE SLIDE.

Use tools for visuals and presentations to enhance your delivery. And simulators that can help you check if your presentation is suitable for colorblind individuals.

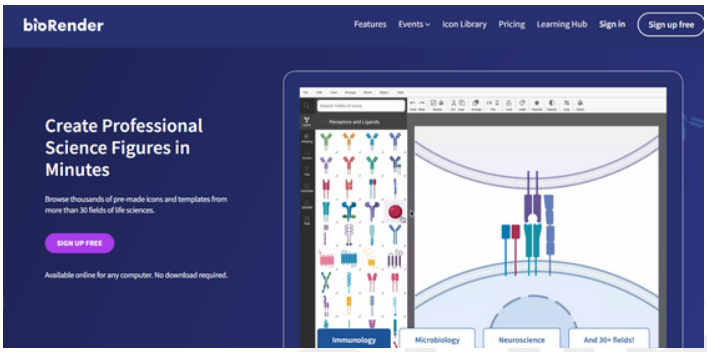


SERVIER MEDICAL IMAGES



SCIDRAW

BIOICONS



BIORENDER

THE COLOR BLINDNESS SIMULATOR

VIZ PALETTE

FACE

PARALINGUISTIC

POSTURE

MOUVEMENTS

You are part of the visuals: your non-verbal communication is crucial. Be natural and authentic.

- **Eye Contact:** Maintain eye contact by looking at the audience's level. Avoid staring at one spot.
- **Vocal Delivery:** Pay attention to your pace, volume, and clarity.
- **Posture:** Appear relaxed but confident. Avoid awkward body positions.
- **Hand Gestures:** Use them to emphasize points, but ensure they are purposeful.

YOUR VOICE IS KEY TO TELL YOUR STORY :

Stress each bold word and see how it's changing the sentence meaning of the sentence "Scientists never said vaccines cause autism."

SCIENTISTS never said vaccines cause autism.
- *(scientists didn't, but maybe someone else did)*

Scientists **NEVER** said vaccines cause autism.
- *(absolutely did not say it)*

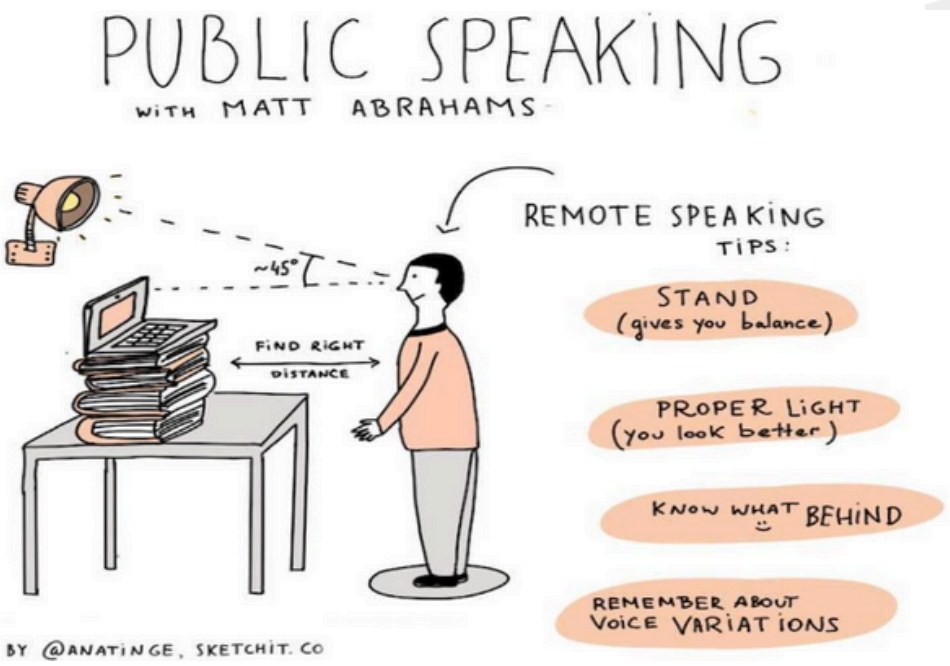
Scientists never **SAID** vaccines cause autism.
- *(maybe implied or suggested, but never explicitly stated)*

Scientists never said **VACCINES** cause autism.
- *(maybe said something else causes autism, but not vaccines)*

Scientists never said vaccines **CAUSE** autism.
- *(maybe said they're linked or correlated, but not that they cause)*

Scientists never said vaccines cause **AUTISM**.
- (maybe said they cause other conditions, but not autism)

EXTRA TIPS : ONLINE PRESENTATIONS



- Stand When Possible: Standing can add dynamism to your voice and gestures.
- Camera and Lighting: Keep the camera at eye level and ensure good lighting from the front.
- Background Awareness: Be mindful of what's visible behind you.

EXTRA TIPS : 3MIN / 5MIN PITCHES

USE ORAL LANGUAGE (VOICE TYPING)

SHORT ACTION SENTENCES

150 WORDS PER MINUTE

THAT'S IT! THIS IS MY RECIPE FOR EFFECTIVE SCIENCE COMMUNICATION!

I hope it helps you enjoy sharing science with the public and supports you in advancing your science career as far as you wish to go. Remember, communication is an evolving skill, and applying these strategies will not only enhance your impact but also enrich your journey.

Don't hesitate to reach out to me via email or on social media for any questions or further assistance.

AS I TRAINER I LOVE RECEIVING STORIES ON HOW THE TRAINING HELPED YOU SO PLEASE, DON'T HESITATE TO TELL ME YOU NEXT COMMUNICATION WIN!

To read more about science communication, download the free #ScicommGuide I edited in 2021