The SciComm Toolkit

Chapter 1: The Science Communication Framework

What You Will Learn: How to structure your scientific communication—be it a talk, presentation, or article—so that it's engaging and easy to follow.

Strategy: Use the "S.I.C." Framework: Story – Insight – Clarity

- **Story**: Start with a relatable problem or question.
- **Insight**: Share your key findings or argument.
- **Clarity**: Wrap up with a clear takeaway and relevance.

Real-Life Example 1: A cancer biologist is presenting a talk on metabolic changes in gliomas. She opens with a story of a young patient diagnosed with an IDH-mutant glioma. She transitions into her research insight—how altered metabolism drives tumor growth. Finally, she ends by explaining how her findings could lead to better diagnostics.

Real-Life Example 2: A plant scientist is presenting findings on drought resistance in crops. He begins by discussing the real-world impact of climate change on food

production, then shares his discovery of a key gene involved in water retention, concluding with implications for agricultural biotechnology.

Toolkit Resource: 60-Second Lay Summary Template

Now it's your turn to apply the S.I.C. structure.

Use this template to practice your own science story in 60 seconds:

- *The problem is…*
- *My research explores…*
- *This matters because...*

Example:

- **The problem is** that treatment resistance in gliomas remains poorly understood. **My research explores** how IDH mutations affect metabolic signaling. **This matters because** it may lead to new diagnostic markers for aggressive gliomas.

Try This: Write your own 60-second lay summary based on a current project or recent talk you've given.

Quick Quiz:

1. What does the "S" in the S.I.C. framework stand for?
2. Why is it important to end with clarity?
3. Can you identify the three parts in a recent presentation you watched?

Take Home Messages:

- Structure is everything. Think: beginning, middle, and end.
- Storytelling draws people in.
- A clear takeaway leaves a lasting impression.

Chapter 2: Know Your Audience

What You Will Learn: How to tailor your scientific content to resonate with different audiences without compromising accuracy.

Strategy: Apply the "Lens Adjustment" Method:

- Identify audience type: Specialist, Generalist, or Public
- Adjust depth and jargon accordingly
- Use analogies and real-world relevance

Real-Life Example 1: You're invited to give a talk on CRISPR to a group of high school students. Instead of diving into molecular details, you compare CRISPR to a pair of genetic scissors and explain it through the lens of DNA as a recipe book.

Real-Life Example 2: A neuroscientist presents to a policy-making body. She avoids detailed neuroimaging stats and instead emphasizes the societal impact of her research on Alzheimer's disease by linking it to caregiver burden and health care costs.

Toolkit Resource: Email-to-Collaborator Script

Use this when you need to explain your project or propose an idea via email—especially to collaborators, funders, or stakeholders.

5-Sentence Structure:

1. Brief context
2. Your main idea
3. Why it matters
4. What you're proposing
5. Call to action (e.g., "Would you be open to a quick chat?")

Example:

- I'm **currently exploring** CRISPR applications in drought-tolerant maize. I believe **your lab's phenotyping platform** could really enhance our dataset. This **could improve predictive models** for climate-resilient crops. I'd love to **collaborate by integrating** your tech into our workflow. **Would you be open to a short call next week?**

Try This: Rewrite an email to a stakeholder, applying this structure.

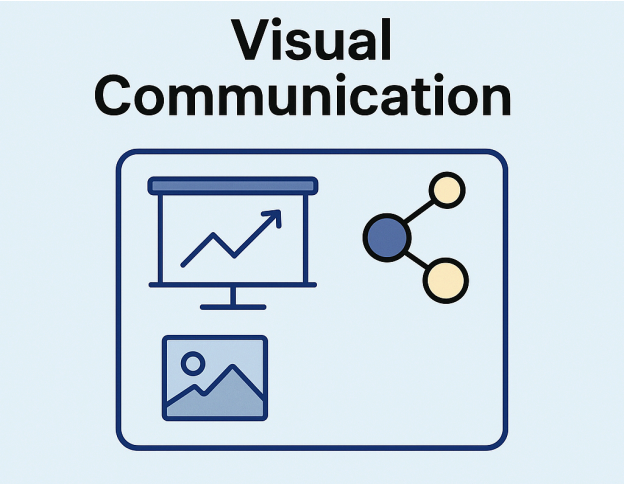
Quick Quiz:

1. What are the three audience types?
2. What's one risk of using too much jargon?
3. What analogy could you use to explain protein folding to a general audience?

Take Home Messages:

- Knowing your audience builds trust.
- Use analogies and context.
- Simplicity does not mean dumbing down.

Chapter 3: Visual Communication



What You Will Learn: How to design visuals that support and enhance your scientific message.

Strategy: Follow the "S.E.E." Rule: Simplicity – Emphasis – Explanation

- **Simplicity**: Eliminate clutter
- **Emphasis**: Highlight what matters
- **Explanation**: Annotate graphs/images for clarity

Real-Life Example 1: A proteomics researcher is showing a volcano plot. Instead of a dense axis and legend, she highlights 3 key differentially expressed proteins with color coding and uses simple text annotations to explain their relevance.

Real-Life Example 2: A data scientist presents a heatmap comparing gene expression. He uses consistent color palettes, limits labels to the top 10 genes, and adds a brief slide animation to walk through key clusters.

Toolkit Resource 1: Visual Storytelling Checklist

Use this when preparing scientific figures or slides for any audience.

Checklist Questions:

- Is the main insight immediately obvious?
- Have I highlighted key data points with color, arrows, or text?
- Is there too much text, or can I simplify?
- Will this format be familiar to my audience?
- Did I annotate graphs with plain-language notes?

Toolkit Resource 2: Slide Design Template – One Story per Slide

Use this when building or editing slide decks for talks, pitches, or webinars.

Slide Structure:

- **Title:** Clear, not cryptic
- **Visual:** One image, graph, or icon
- **Key Message:** 1 sentence
- **Takeaway or Transition:** What the audience should remember or feel

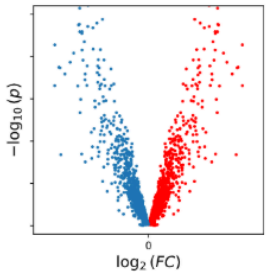
Design Tips:

- Use white space generously
- Stick to 2–3 colors and fonts
- Avoid clutter—if it doesn't support the story, cut it
- Add a slide number

Try This: Choose one slide in your next presentation and reformat it using this structure.

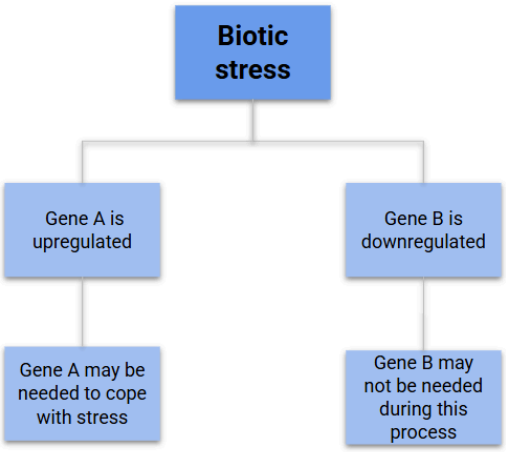
Example of a slide with too much text and visuals that are hard to follow:

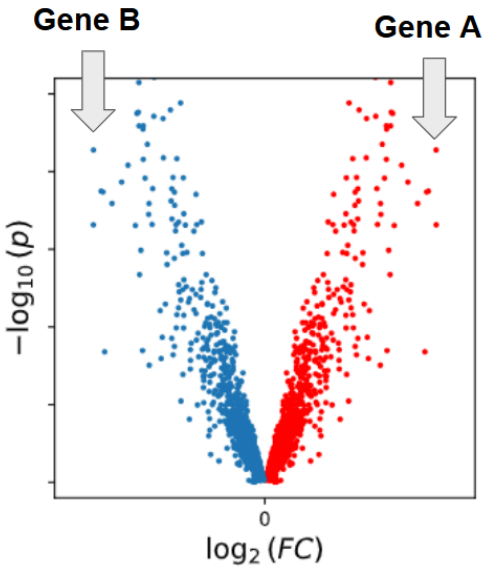
Under conditions of biotic stress, our transcriptomic analysis revealed that Gene A exhibited significant upregulation, while Gene B was concurrently downregulated. This inverse expression pattern was validated through qRT-PCR and suggests a potential regulatory mechanism where Gene A may suppress or antagonize the function of Gene B. These findings contribute to our broader understanding of plant defense signaling pathways and indicate possible targets for genetic engineering to enhance stress resilience



Example of a slide with clear visuals that are easy for the audience to follow:

Transcriptomics analysis





Gene A and B are distinctly regulated under biotic stress conditions

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Chapter 4: Delivery and Presence

What You Will Learn: How to improve your verbal and nonverbal communication to deliver confident and credible presentations.

Strategy: Use the "V.O.I.C.E." Technique:

- **V**oice modulation (tone, pace, volume)
- **O**pen posture
- **I**ntentional pauses
- **C**onnection with eye contact
- **E**ngagement through storytelling and movement

Real-Life Example 1: During a virtual symposium, a scientist discussing GLP-1 analogs slows down her pace, looks at the camera for eye contact, and uses hand gestures within the camera frame. Her confidence and calm tone captivate her audience.

Real-Life Example 2: At an international conference, an early-career researcher overcomes nerves by starting with a question to the audience, breathes between points, and moves calmly across the stage to engage both sides of the room.

Toolkit Resource: Presentation Rehearsal Tracker

Use this tool to rehearse and refine your delivery using the **V.O.I.C.E.** technique. Repeat this before a big talk or lecture to build confidence.

Rehearsal Checklist

Voice Modulation

- Did I vary my tone, pace, and volume?
- Did I avoid a monotone delivery?

Open Posture

- Were my shoulders relaxed and open?
- Did I avoid crossing arms or slouching?

Intentional Pauses

- Did I pause between major points?
- Did I allow time for my audience to absorb key messages?

Connection with Eye Contact

- Did I look into the camera or at the audience?
- Did I scan the room (if in person) naturally?

Engagement Through Storytelling/Movement

- Did I move with purpose (not pacing)?
- Did I use a personal story or analogy to connect?

Track Your Progress (See Sample Table Below):

Practice Date	What I Did Well	What I'll Improve Next Time
Date – Day1	Clear pauses, confident voice	More eye contact, less hand fidgeting
Date – Day2	Great movement and energy	Need smoother transitions

Try This: Record yourself practicing a 2-minute segment of your talk. Watch it back and fill in the tracker. Do it again the next day and compare!

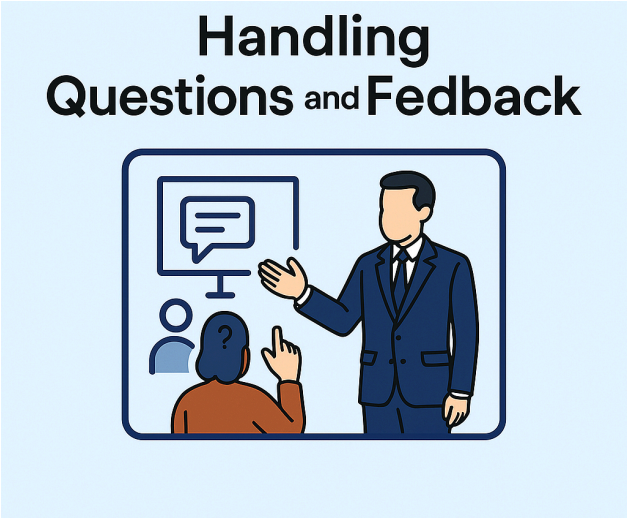
Quick Quiz:

1. What does the "O" in VOICE stand for?
2. What is one way to appear more confident when speaking?
3. Why are pauses powerful?

Take Home Messages:

- Your presence reinforces your message.
- Engage both verbally and physically.
- Practice makes powerful.

Chapter 5: Handling Questions and Feedback



What You Will Learn: How to manage audience questions and critical feedback with professionalism and ease.

Strategy: Adopt the "R.E.A.C.T." Framework:

- **R**epeat the question (clarify)
- **E**mpathize with intent (even if critical)
- **A**nswer honestly
- **C**onnect it back to your key point
- **T**hank them

Real-Life Example 1: After a talk on lipidomics, you're asked why you didn't use a specific method. Instead of getting defensive, you repeat the question, explain your choice, acknowledge their expertise, and relate it back to your study goal.

Real-Life Example 2: At a grant pitch session, you're challenged by a reviewer who doubts the feasibility of your proposed workflow. You take a moment, acknowledge the concern, share validation data from a pilot study, and end by reinforcing the impact if successful.

Toolkit Resource: Research-to-Impact Worksheet

Use this when preparing to answer tough questions or communicate the significance of your work.

Guided Prompts:

- What's the broader problem my work addresses?
- What industries, fields, or communities does it impact?
- What could this lead to in practice (policy, technology, clinical care, etc.)?
- How does my research fill a gap in current knowledge or methods?

Try This: Complete this worksheet as prep for your next Q&A session, grant pitch, or job talk.

Quick Quiz:

1. What's the first step in the REACT framework?
2. Why should you thank someone for a tough question?
3. What's a constructive way to handle "I think you're wrong" feedback?

Take Home Messages:

- Stay calm, stay kind.
- Every question is an opportunity.
- Your credibility is built in how you respond.

How to Use This Toolkit:

- Treat it as your **"grab-and-go" library** for any presentation, proposal, or scientific conversation.
- Print or bookmark it. Use it live during slide prep, email writing, or grant outlining.
- Reference it throughout the course to turn theory into action.

Want Personalized Science Communication Coaching?

I offer a **free 30-minute consultation** to help you take your science communication skills to the next level—whether you're preparing for a presentation, working on your writing, or navigating tough audience questions.

No attachments, no hidden fees—this session is completely free.

To book your free session, simply click the link below:

👉 Book your free consultation

Let's work together to make your science clearer, more impactful, and more engaging!

Omar Arias-Gaguancela, PhD
SciComm Coach

Connect with me on LinkedIn: https://www.linkedin.com/in/omarariasgaguancela/