Brainstorming list for mentoring scientific communication

General strategies

- Remember that generating, repeating, paraphrasing, and summarizing in any mode are valuable in overall development.
- Acknowledgement matters.
- Stay involved and responsive. Be supportive and approachable while making clear you expect excellence in scientific communication.

Setting up the environment for success

- Set expectations and structure ahead of time.
- Identify a list of “pré”-editors. You can set up a list and provide it to trainees, or you can ask each trainee to find their own. The main point is to know who your pre-editors are ahead of time rather than trying to find someone at deadline. Encourage trainees to give the pre-editor a heads’-up as early as possible.
- Consider establishing a rule in your lab that every trainee manuscript must go through pre-edit before it comes to you.
- Consider writing retreats: ½ day, full day, whatever.
- Encourage students to write in some kind of social setting if they feel isolated when they write.
- Get a regular developmental editor at Scientific Publications if possible.
- Use peer editing service.
- Have regular talks with trainee about their manuscript plan and what their role and author order on various manuscripts will be. This can be in the context of a general progress meeting.
- Make it clear that you will ask for regular updates on writing and presenting projects, and then follow through.
- Consider how to provide recognition or some kind of reward for communication achievements. This can even be selecting a trainee to feature a description of their manuscript in a meeting or journal club. Or if a trainee receives favorable review comments on a submitted manuscript, ask them to share what they did well with the others.
Continuous learning

- Consider requiring an “elevator speech” (90-second summary including certain required elements) before every paper, grant, or presentation.
- Try to work in as many opportunities for smaller writing assignments as possible—summaries, opinions, critiques, etc.
- Have trainee come in and verbally describe the manuscript to you. Allow them to articulate fully, as that process is as valuable as the feedback you will give.
- Dedicate a lab meeting to explaining writing policies and procedures (including unintentional plagiarism, authorship, etc.). You could assign trainees to present parts of this.
- Anything that involves reading or listening and then writing something about that is helpful.
- Make a ‘manuscript’ or ‘grantwriting’ club instead of a journal club?
- Have someone compile a list of common sentence types for your discipline, and provide to trainees to help them craft sentences more easily. This would be a useful assignment for a trainee to complete.
- Consider requiring that all trainees ask at least one question or make an observation after a lecture or presentation or in a meeting.
- Provide question scripts if you think it would be helpful.
- Include trainees in as many professional meetings as possible.
- Insist on rehearsal w/ feedback. Include small group of colleagues. Trainee may also want to invite someone. For those with extreme anxiety, start with private rehearsal. Know in advance who has extreme anxiety.
- When trainee is preparing an oral presentation, walk through possible scenarios of questions or comments that a challenging audience member might ask. Help trainee develop answers. Ex: That’s outside the scope of this discussion. Maybe we can discuss that further during the break.
- Be considerate of L2s in allowing more text on presentation slides. Gently urge them to gradually let go of visual prompts.
- Videotaping—a godsend for some, way too intense for others. Use judiciously.
- Draw trainees out in lab meetings (Ming, what do you think about that? Beatriz, we haven’t heard from you yet.) Let them know you will be doing this. Be patient if they need a few seconds to formulate their response, but don’t pressure them too much.
- Make sure that L2 trainees can pronounce key terms of their research perfectly. Focus on the number of syllables the word has and which one is accented. Ex: Metastasis. TASS. Me-TASS-ta-sis.
- For independent accent training: Audacity, http://audacity.sourceforge.net/. Audacity allows you to upload audio files or create your own, and then
analyzes your voice as you repeat words and phrases, providing a live sound pattern that you can compare with the original. The program needs a bit of set-up, but is a great way for L2’s to practice imitating native speakers.

- Encourage L2’s to take Scientific English.

**Giving feedback appropriately**

- Always address content and ideas before commenting on sentences, grammar, etc. Show that you have thought about the content and the author’s or speaker’s intentions.
- Resist the urge, if you have it, to comment only on minutiae.
- Give a suggestion or an instruction of what the trainee needs to do to improve. Ex: Please develop this paragraph with more detail. Provide more of your reasoning for this statement. Shorten your sentences.
- Remember that L2 trainees (and some L1’s) aren’t sure of the tone or implications that particular words or phrases hold. Help them understand the shades of meaning.
- For grammar (in writing), note but do not correct errors—indicate that the writer should correct it. For some things, you can just circle them. Ex: Spelling (sp). Sentence fragment (frag). Articles (or: the).
- Refrain from correcting spoken grammar or rushing to take over for trainee in public settings.

**Useful Resources for Trainees:**


EXAMPLE OF SCAFFOLDING ACTIVITIES:
A STRUCTURED, ANNOTATED TEXT HIGHLIGHTING RHETORICAL MOVES

Note: Highlighted phrases show how the item can be ‘flagged’ with key phrases. Bubbles indicate some of the ‘rhetorical moves’. LABELS indicate key elements that will be widely familiar to experienced research writers.

Sample Elevator Speech: “15-lox in EMT”

Part One: Who are you?
Hello. My name is SF, and I’m a summer research intern in the Department of X at MD Anderson, working with Dr AB. My current project concerns the role of the enzyme 15-lox in the EMT process and subsequent metastases.

Part Two: What are you doing and why are you doing it?
BACKGROUND: Recent studies have shown that EMT, or epithelial-mesenchymal transition, plays an important role in tumor metastasis, the main cause of death in patients with cancer. EMT results in cells which migrate easily and are not differentiated, meaning that they have not developed into a specific cell type. We believe that the enzyme 15-Lox may play an important role in EMT because it has been shown to promote cell differentiation. GAP IN KNOWLEDGE: But it has not yet been demonstrated that the downregulation, or decreased expression, of 15-lox will directly result in EMT. PURPOSE: Thus, our goal is to verify the connection between the downregulation of 15-lox and the EMT process in order to justify the eventual development of 15-lox-focused treatments to prevent metastasis. METHODOLOGICAL APPROACH: To accomplish this, I will be using several cell lines, some with “knocked down,” or limited, expression of 15-lox, and analyzing gene and protein expression to determine the extent of EMT in each cell line. RESULTS: [“Recent findings suggest”...“So far, I have found that...”] (This writer did not yet have results.)

Part Three: What will be the outcome of what you’re doing?
SIGNIFICANCE: This connection between 15-lox and EMT is especially important right now due to the establishment of EMT as a major player in the development of deadly metastases. IMPLICATIONS: This procedure could eventually lead to targeted treatments which delivered metastasis-preventing 15-lox specifically to cancer cells. NEXT STEPS: As this project

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progresses, we will look more deeply into how 15-lox affects differentiation and prevents EMT with a special focus on the role of the break-up of connections between cells, especially the adherens junctions. Eventual goals include the further development of treatments which involve targeting 15-lox to cancer cells in order to prevent EMT and metastasis.
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WORKSHEET FOR CREATING STRUCTURE OF ELEVATOR SPEECH—
STUDENT COMPLETES 1 SENTENCE FOR EACH ELEMENT (MAXIMUM 2 SENTENCES)

Part One: Who are you?

Part Two: What are you doing and why are you doing it?

BACKGROUND (RESEARCH NICHE (1 SENTENCE) + CLAIM OF CENTRALITY (1 SENTENCE)):

GAP IN KNOWLEDGE:

PURPOSE (OR HYPOTHESIS):

APPROACH:

RESULTS:

Part Three: What will be the outcome of what you’re doing?

SCIENTIFIC CONCLUSION (IF AVAILABLE):

SIGNIFICANCE:

IMPLICATIONS:

NEXT STEPS:
Advocacy & Inquiry Idioms

Providing these and other prompts and suggestions to junior or to L2 students can make it easier for them to increase participation in scientific conversations.

1. Tell me more about that. (inquiry)
2. What are your thoughts about X? (inquiry)
3. I was wondering if anyone else has seen this? (inquiry)
4. Help me understand... (inquiry)
5. Could you talk a little bit about how what you’ve just described relates to Y? (inquiry)
6. Can I just jump in here for a second? (turn-taking/advocacy)
7. I would like to add to what you’ve just said. (advocacy)
8. In my experience.../ What I’ve seen is that... (advocacy)
9. Let me explain my reasoning behind this... (advocacy)
10. What if we tried ... (advocacy)
11. My concerns about that have to do with... (advocacy)
12. Let me see if I understand you correctly. (clarification)
13. My understanding/experience is that... (polite clarification/contradict)
14. What I was intending to say was that... (clarification)
Giving Writing Feedback: Faster, Better, EASIER

Key principles:

- Focus on responding to the content more than correcting the language.
- Think and communicate to the writer in terms of stages of drafting; don’t try to deal with everything in one stage.
- The strategies below can be effective only if you are disciplined about setting early deadlines to review multiple iterations of the draft.
  - Set forth expectations when a new trainees or students join your group. Consider providing written guidelines.
  - Make sure to be available for short meetings to provide verbal feedback on writing.
  - Collect resources: know about your institution’s writing center, writing groups, and courses on writing; identify trainees in your lab who are excellent writers and can mentor others; be on the lookout for model writing pieces that reflect your disciplinary style and standards that you can discuss with trainees.

Stage 1: Responding to the intellectual content

1. Read the entire draft without marking anything. Then, respond first to the main ideas the trainee was presenting. Acknowledge the trainee’s thinking or intention first. This does not necessarily mean praise or criticism, but at a minimum it means noticing and responding.
2. Then go through the major sections and address the writer’s ‘rhetorical moves’, i.e., establishing the importance of the issue addressed, providing a gap in knowledge or a need in the scholarship, stating a clear and explicit purpose for the work described, stating a coherent scientific conclusion resulting from the work, limitations, implications, etc. Are all the important elements there? Once they are identified, the student will be in a better position to elaborate.
3. If these items need extensive work, write a few comments about that. After the trainee has digested your written feedback, meet with the trainee in person for brief clarification and guidance.

Stage 2: Responding to the writing

1. After trainees have a good understanding of the direction of the paper, allow them to redraft.
2. On this draft, respond to organization, strengths and weaknesses of the argument or presentation of evidence, proportion of elements (e.g., introduction too long, discussion too short, insufficient description of methods), quality of integrating other sources, flow, etc. Making frequent references to “what readers expect to see next/here/when you discuss this/etc.” is helpful.
3. L2’s may need additional guidance on word choice, idioms, and complex grammar.
4. Wherever possible, attempt to give feedback in positive terms ('Try this') rather than negative terms ('This is wrong').

5. Do not correct the mechanics. You can note them in the margin, or use codes such as ‘sp’ for spelling, ‘gr’ for grammar, etc. But it’s the writer’s job to figure out the correct usage. If they realize there is no alternative, it will happen. By the way, it’s not unusual for writers to find and correct their own typos or minor errors upon rewriting the draft even without having them marked.

6. Consider asking trainees to engage in peer review or get feedback from a third party as to readability, and tell them that you will look at the draft again after they have utilized that resource. These feedback providers could be other trainees in the lab, classmates of the student or trainee, scientific editors, writing center consultants, or others. NB: For novice (and not-so-novice) writers, providing feedback is as instructive as receiving feedback!
Good morning/afternoon. I am Richard McDaniel. I am a graduate research intern in the department of Health Disparities Research, under the menthership of Dr. Elizabeth Trahan. My current research addresses the link to between social network, physical activity, and perceived mental health in a faith-based cohort of African Americans.

**Background:** African Americans have a disproportionate burden of obesity coupled with low rates of physical activity. There is evidence that physical activity promotes psychological well-being and even reduces the incidence of obesity-related cancers. Previous studies have found that social disconnectedness or loneliness is associated with low levels of physical activity, other studies have examined the influence of social network on physical activity among African Americans, but there is limited research investigating the relationship between social network, physical activity, and mental health among African Americans in faith-based organizations.

**Purpose:** The purpose of our study is to examine the link between social connectedness, physical activity status, and perceived depression and stress among a cohort of African Americans in a faith-based organization.

**Approach:** To do so, we will analyze third-year cohort data from 1,294 participants.

**Results:** ....

**Significance:** Study results will better our understanding of the potential influence of social connectedness on physical activity and perceived mental health in this population.

**Next Steps:** As Project FAITH continues, we will explore the role of social network and social support on physical activity. Once we understanding the influence of social network and support on physical activity, we will develop interventions that will take advantage of individuals’ social network to increase physical activity and ultimately reduce obesity in this population.

**CONTENT FEEDBACK HERE:**

Richard, the linkages you propose are important, and this project has a lot of potential. Go ahead with this overall structure, but follow through with key details that give your talk depth and credibility.

Please set up an appointment for us to review your next draft within 2 weeks.

**CC**
CASE STUDIES

Scenario 1:

You have a grad student who needs to give her first presentation at a student symposium. She is from a disadvantaged background, about 10 years older than the other students, and is a single parent of an adolescent boy. Although she knows her science very well, writes well, and appears to be extroverted, she keeps finding excuses to postpone her rehearsal. You talk with her about it, and she confides that she has a lot of anxiety about formal presentation. She in fact is saying that she ‘just can’t do it’ and she’s digging in.

1. What do you do about this situation?

2. In retrospect, what could you have done to minimize the possibility of this occurring?
Scenario 2:

Your L2 postdoc really struggles with putting together a coherent introduction or discussion section for his manuscripts. You have suggested an English course at the community college more than once, but he doesn’t seem to have tried that. Whenever he submits anything to you, you spend hours getting it in shape. Then it happens again.

1. What is your diagnosis of the various aspects of this situation?

2. What could you do to improve the situation?
**Scenario 3:**

Your dissertation student seems to struggle with procrastination. He is late for writing deadlines again and again.

1. What do you do about this situation?

2. In retrospect, what could you have done to minimize the possibility of this occurring?