

PRIMARY LITERATURE RESPONSE

Throughout the course, we'll build most of our discussions on primary literature - articles published in peer-reviewed journals, reporting the results of original neuroscience research. It's important for you to read each article carefully before you come to class, to enable you to participate in discussion. Further, reading (and understanding) primary literature is a critical skill for anyone involved in the scientific enterprise - researchers, teachers, clinicians, policy-makers.

Assignment:

Before class, use these primary literature response questions to structure your thinking (and test your comprehension) as you read the assigned journal article. **Address each of the questions below, and turn in your responses at the beginning of class** - you may turn in a hard-copy to me at the beginning of class, or you may submit an electronic copy by email (which I must receive by the beginning of class). The goal of this assignment is not to give you busywork - each question should help you understand what you're reading (or identify things that you don't understand, so that we can address them together in class).

There are no length requirements for any of the questions - write enough to convey your understanding, or to clarify what you don't understand. Though your responses should be clear and legible, the format need not be formal. When I grade your responses (see rubric below), I'm primarily concerned with your earnest effort to engage with the material. Again, the point of this assignment is to help you prepare for discussion and improve your primary literature comprehension skills. **If you can only address part of a question because you are confused about the rest, you may write out a response that includes a clear description of what confused you and why.** Let me know what you do understand, and discuss what you don't understand. If it's clear that you've thought the question through (even though you're still confused), you will still receive credit for addressing that question (see rubric below).

Primary Literature Response:

Please include your name at the top of each page, and write the title of the article at the top of the first page of your response. Then, address each of the following questions. Note: The assigned question is in bold - other text suggests ways in which you might think about each assigned question, but you need not directly address all of those suggestions in your answer.

- 1. What is the significance of this research?** What "big question" in neuroscience does it seek to address? How does it relate to human health? Why is this study worth doing? Are particular technical or conceptual aspects of this study innovative? Why will the results of this study be important for our understanding of the nervous system? Does your assessment of this study's significance differ from the authors' assessment?
- 2. What are the specific questions addressed in the paper, and how do they relate to each other?** For this question, try writing out a flow chart of the Results section - first, they asked A and found B, which led them to ask C and find D, and so forth. You need not be exhaustive here - pick out the highlights, to outline the scientific narrative of the paper.
- 3. Choose one of the specific questions you've highlighted in question 2, and outline the approach to this question. State the question, describe the technical approach (including controls or method checks), and address possible limitations in the interpretation of the data.** For example, you might state the question, write a couple of

sentences about the rationale for the approach (i.e. why they chose to use a particular technique to answer that question) and its limitations (i.e. parts of the question that this approach can't answer), then diagram the technique(s) used. Again, you don't need to be exhaustive, but you should include details that you think are particularly important for interpreting the results. You can think of this as annotating the figure(s) in the paper - the point here is to clarify for yourself exactly what they did, why they did it that way, and how the results might be limited by their approach.

- 4. Choose one term or technique from the paper that confused you when you first read it. Look up more information about it, and write out a brief definition in the context of the paper.** This could be a vocabulary word that you've never heard before - or never understood before. This could be a piece of jargon that is unclear. This could be any piece of the technical approach - reagent, transgenic line, viral vector, animal model strain, piece of equipment, data analysis, etc. You don't need to write a report on it - just look up the meaning and write enough to clarify its use in this paper.

POINTS EARNED	0	3	5	
Question 1	Not completed	Surface-level statement of significance only (pulled directly from text, without independent comment)	Thoughtful response, including the student's considered opinion of the study's significance	Some discussion of significance, with a clear description of why the question is confusing
Question 2	Not completed	Some questions identified, but without a clear logic about how each question relates to the next (or with glaring gaps in the sequence of questions presented)	Major questions identified and placed into a clear logical progression	Some questions identified, with a clear description of why the other questions are confusing or difficult to place into a logical progression
Question 3	Not completed	Surface-level description of the approach only, without insights into the rationale	Clear description of the specific question, with sufficient detail to understand the rationale for the technical approach - and how it relates to interpretation of the data	Clear description of the specific question and some details of the rationale and approach - with a clear description of where the approach becomes confusing
Question 4	Not completed	Term identified but not addressed	Term identified and clearly addressed	Term identified, with a clear description of sources used to attempt to address it (and what is still confusing about it)

FOLLOW-UP QUESTIONS

During in-class presentations and discussions, we will have plenty of questions that deserve further attention but that we will not have time to investigate during class. These questions will be assigned to individual students to investigate on their own. Each student will pursue the question to some conclusion (see below), then briefly and informally present his or findings at the beginning of the following class period.

Assignment:

At the end of class, **write down your assigned follow-up question**. On your own, investigate this question further. You may use any resources you wish, but take care to choose your sources carefully - **look for authoritative scientific sources**.

These sources might include: primary literature; review articles; books; popular science articles (published in reputable periodicals); conference abstracts; dissertations; technical websites (e.g. microscope manufacturers); core facility websites (e.g. DNA sequencing facility at a university); online multimedia materials (e.g. TED Talks); scientific institute websites (e.g. NIH, NSF, HHMI and Janelia Farms); personal communications with faculty or research staff. Use your investigative savvy (and your imagination) - but do always consider the limitations or bias of the source material. If you have any questions about authoritative resources, please come and talk with me - I'm happy to help.

Spend at least thirty minutes of focused attention in earnest pursuit of an answer to the follow-up question. (Certainly, you may spend more time - but at least spend half an hour.) If you find a clear answer to the question, that's great. If you earnestly search and can't find a clear answer, that's great, too - because you've probably learned a lot during the chase. Either way, **take some notes about what you've found and how you found it** (your sources, your process, any challenges or obstacles you encountered along the way).

At the beginning of the next class period, you will spend about five minutes presenting your search and your conclusions. This will be an informal presentation, but please be prepared to speak clearly and answer questions. You may bring a visual aid if you wish, but it isn't required. Your objective is to share what you learned (and how you learned it) with your classmates.

POINTS EARNED	0	3	5
Presented findings	Not completed		Addressed the assigned question
Presented sources	Not completed		Described the sources used and the route taken to address the question
Presentation style	Not completed	Often unclear Lack of organization throughout	Clear and concise Well-organized Responsive to questions