

Topics of Brain Function (PSL 460)
Fall Semester 2023
Mondays 10:20AM-12:10 PM
BPS 3280

Instructor:

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Course Description:

This is an advanced course that will examine the basic research regarding neurophysiological alterations in animal models of autism spectrum disorder (ASD) with an initial emphasis on fragile X syndrome (FXS).

Goals:

- 1) Reinforce and increase your knowledge of neuroscience and neurophysiology.
- 2) Learn to discuss the alterations in neuronal function associated with neurodevelopmental disorders.
- 3) Improve reading and comprehension skills for primary research articles.
- 4) Improve writing and oral communication skills.

Course Format:

This course involves *active discussion* among the entire class as well as within small groups. *Your attendance and participation are critical for the success of this course.* Absence from class affects your participation grade unless there is a valid reason, in which case an additional assignment will be given.

Assignment tips and Grading:

Final grade will be determined based on the scores from the assignments noted below.

| % points received | grade |
|--------------------------|--------------|
| 90-100 | 4.0 |
| 85-89.9 | 3.5 |
| 80-84.9 | 3.0 |
| 75-79.9 | 2.5 |
| 65-74.9 | 2.0 |
| 60-64.9 | 1.5 |
| 55-59.9 | 1.0 |

Note: Each day that an assignment is late will result in a deduction of 10% from the grade. Thus, a written report turned in 3 days late will receive, at best, 70% credit.

Expectations: It is expected that you come to class ready to participate and contribute to the discussion. The class will have discussions where there are no right or wrong answers – your

opinion is important to contribute. The ideal student will contribute to discussions but will also let others participate.

1) Pre-class preparation (20%)

For each scientific paper assigned for class discussion, please read the assigned paper and complete the **Figure Facts** worksheet *prior* to the start of class. The **Figure Facts** should be submitted via D2L prior to start of class. The **Figure Facts** may be used to facilitate the class discussion about the paper.

2) In class participation and presentations (15%)

You must come prepared for class. All students need to read the assigned articles and understand them so that you can participate in class discussions. Completing the **Figure Facts** worksheet will help you to think about what you have read, prompt you to do some additional relevant searches on your own and integrate current information with prior information/conclusions that we have discussed in prior classes.

Additional questions to think about for class discussion:

- 1) What was the most significant finding of the study?
- 2) Do you believe their conclusion is supported by the results?
- 3) What else would you like to see in the paper?
- 4) What are two questions you have about the paper?

3) Research Paper (35%)

Nov. 8: Complete Draft version of Research Paper due

Dec. 10: Final version of Research Paper due

The research paper will focus on alterations in neural structure/function associated with specific animal models of autism. This will be similar to a review article in which *you must use primary literature as your major resource*. Utilizing primary literature, concisely summarize current understanding, consider short comings of our knowledge, weaknesses of the studies, strengths of the studies, significant advance in our understanding?

The research paper should include:

- 1) Title page (topic title, author's name, email, course number PSL 460, date of submission).
- 2) Background (*all citations must be peer-reviewed publications, not websites*).
- 3) Hypothesis or Central theme being addressed.
- 4) Summary and Critique of Results.
- 5) Significance of findings (This should be similar to a discussion section, synthesizing the multiple studies referenced).
- 6) References (>8).

The report should be 7-10 pages double-spaced, numbered pages (NOT counting title page) in 12-point font. Figures may be used to illustrate important concepts or models and should be included at the end of the written report (these are not included within the 7-10 pages). If figures are reproduced from an outside source, the source should be identified in the legend of the figure. You may also develop your own figures, models, graphs, or tables in your written paper.

References should be noted in parentheses at appropriate places in the text with a number and then listed in your reference list. Below is the form that references:

Grubb, B.F. , T.D. Rogers, R.C. Boucher, and L.E. Osterowski. Ion transport across cystic fibrosis and normal murine olfactory and ciliated epithelium. American Journal of Physiology, 296:1301-1309, 2009.

3) Written Paper Peer-Review Critiques (15%)

Nov. 20: Critiques due

You will be assigned 2 of your classmate's research papers to provide peer feedback. Critiques should be written in the word file provided to allow "track changes" and commenting.

4) Final Oral Presentation (15%)

15-minute presentation in which you summarize the topic, central theme, significance, and conclusions of your Research Paper. The presentation must be clear (not too many words on each slide), should have an **introduction/background** (help the class understand the problem and why it is important to study), the **hypothesis** being tested, **approaches** used, **data** (you should show some of the actual data from paper), **what it means** in the big picture (significance), **conclusions**.

You will be evaluated on your preparation (quality of slide show), oral presentation (logic, delivery, timing), question period (completeness of answers), and clarity of presentation and answers.

Suggestions:

Preparing written reports

- a. Begin by locating and reading appropriate background material and searching electronic databases for recent reviews and primary research papers.
- b. Once you have located and read an appropriate amount of source material prepare an outline and then write your report. You may use subheadings.
- c. Remember to give appropriate credit to idea that are not your own by citing the relevant primary source, review, book or website. It is permissible to paraphrase other authors on occasion, but NEVER COPY something verbatim from another text without attribution (referencing). THIS IS PLAGIARISM and is NOT ACCEPTABLE. Word-for-word quotations from other works should be short and should be used sparingly. When used they should be set off by quotation marks and properly referenced. Note that the software "TurnItIn" may be used to check for Plagiarism in accordance with MSU policy.

Preparing Oral Reports

- a. Construct your presentation around the outline of your written report.
- b. Make abundant use of visual aids including charts, graphs, figures and written text. These should be prepared ahead of time so that you do not spend time drawing them during your talk.
- c. Avoid slides with lots of small text and tables on them. Make text large and make figures large so all can see them. Check all visuals for typographical or grammatical errors.
- d. ***Practice your presentation ahead of time*** to make sure it can be presented in the allotted time. If not, cut down the material.

- e. Plan your visuals so that they will help you make transitions between thoughts and so that you don't have to flip back and forth between them. Don't try to memorize your presentation word-for-word.
- f. Try to anticipate points at which questions might be asked and think through possible answers. Be ready to be flexible, not dogmatic in your replies. If necessary defer the answer to the end of the talk, but never be rude or defensive when responding.
- g. When presenting, try to project self-confidence and enthusiasm for the subject. If you don't care, the audience certainly won't either.

CLASS CALENDAR

| | |
|----------|---|
| Aug. 28 | Introduction of class and expectations Background reading: Animal models of Autism |
| Sept. 11 | FXS: anatomical changes (Figure Facts due) |
| Sept. 18 | FXS: mGluR theory/plasticity (Figure Facts due) |
| Sept. 25 | FXS: intrinsic properties (Figure Facts due) |
| Oct. 2 | FXS: molecular (Figure Facts due) |
| Oct. 9 | ASD: student chosen (Figure Facts due) Team #1 presents |
| Oct. 16 | ASD: student chosen (Figure Facts due) Team #2 presents |
| Oct. 23 | No Class: <i>Fall Break</i> |
| Oct. 30 | ASD: student chosen (Figure Facts due) Team #3 presents |
| Nov. 6 | Peer-review process & composing critiques |
| Nov. 13 | ASD: student chosen (Figure Facts due) Team #4 presents |
| Nov. 20 | ASD: student chosen (Figure Facts due) Team #5 presents |
| Nov. 27 | Individual Presentations (on research paper topic: no Figure Facts) |
| Dec. 4 | Individual Presentations (on research paper topic: no Figure Facts) |

KEY DEADLINES:

Paper selection for group presentations

- Sept. 25:** Team #1
- Oct. 2:** Team #2
- Oct. 16:** Team #3
- Oct. 30:** Team #4
- Nov. 6:** Team #5

| | |
|----------------|-------------------------------------|
| Nov. 8 | First Draft of Research Paper due |
| Nov. 20 | Peer Review Due |
| Dec. 10 | Final version of Research Paper due |

Steps for using the Figure Facts Worksheet (FFW):

1. Adjust the FFW as necessary. Specifically, add rows to match the number of figures in the paper. If a figure has multiple panels (ex. 1A, 1B, 1C), add the appropriate labels (ex. A, B, and C) to the “panel” column of the FFW.
2. Examine Figure 1. Get as much information as you can out of the figure and legend. Then, read the corresponding text for Figure 1. Complete the FFW for Figure 1. Use phrases and abbreviations. Use your own words. Do NOT copy or paraphrase from the text or legend.
3. Repeat the process for all of the figures. Always look at the figure first and then the text. Always put the descriptions in your own words.
4. Develop **3 questions** related to the research article that can be asked during class to stimulate discussion. These can be questions related to things not understood when reading the paper.

Figure Facts Worksheet

| | | | |
|---|--|-------------------|-------------------------|
| Author & year: | | | |
| Experimental question being asked/addressed: | | | |
| Figure 1 | Panel | Technique: | These data show: |
| Figure X | | | |
| 3 questions pertaining to the paper | <ol style="list-style-type: none"> 1. 2. 3. | | |