

# General Guidelines for Research Proposal, Lab Notebook and Final Report

## Section 1: Guidelines For Oral and Written Research Proposal

### Oral Presentation of Research Proposal

#### **50 points total**

- Sufficient background information (Introduction) on the chemical or drug of interest was provided. The background material helps the audience understand the purpose or significance of the project. (10 points)
- The group was able to explain a clear hypothesis of the proposal. (5 points)
- The group was able to tell the audience how the experiment would be conducted (aims and methods). (10 points)
- The group was able to tell the audience what results they anticipated. (10 points)
- The group was able to answer questions from the audience and clearly demonstrate their understanding of their proposed research. (5 points)
- The overall presentation was well organized and easy to follow. Proper citation was made throughout the presentation whenever it was necessary. (10 points)

### Written Research Proposal

#### **50 points total**

- Research proposal contained all elements including title, names of group members, background, hypothesis, aims, methods, anticipated results and references. (10 points)
- Sufficient background information on the chemical or drug of interest was provided. The background material helped the audience understand the purpose or significance of the project. (10 points)
- A detailed and feasible research plan for investigating the effect of drug on neurite outgrowth or neural degeneration was provided. (10 points)
- The anticipated results were well laid out and the proposal described how the research will contribute to an understanding of how the chemical would affect brain cell development or neurodegeneration. (10 points).
- The overall proposal was well organized and written with minimal errors. Citations and references were made properly. (10 points)

## **Section 2: Guidelines For Lab Notebook**

A lab notebook is a complete record of the actions you take, the reagents you use, the observations you make, and the relevant thought processes you have that would enable another scientist to reproduce your results. A typical experiment can be divided into the following five sections:

- Goal of the Experiment
- Materials and Methods
- Experimental Procedures
- Results
- Discussion or reflection (your notes about what worked or not worked, and why).

### **50 points total (25 points for each turn in)**

- Lab Notebook is organized and contains elements such as lab section date, the purpose of experiment, protocols, raw data, observations, things that worked or failed, etc. (5 points)
- Notebook entries include protocols in which sufficient detail is provided to repeat the experiment. (5 points)
- Raw data is included either directly or as an attached material for each weekly lab. (5 points)
- Notebook includes observations taken during the experiment, noting trends or unusual observations. (5 points)
- The notebook for all labs is complete and well organized. (5 points)

## Section 3: Guidelines For Oral and Written Final Report

### Oral Presentation of Final Research Project

#### **50 points total**

- **Introduction:** The group was able to provide a brief but sufficient background information about the current understanding of the actions of chemicals or drugs on neurons. The background material helped remind the audience their initial research question, hypothesis, and objective of the project. (5 points)
- **Materials and Methods:** The group was able to explain the materials they used and the experimental designs, techniques, software, and statistical methods they used. (10 points)
- **Results:** The group was able to clearly explain what results were obtained and what statistical methods were used when presenting pictures, bar graph or tables (including indications in graph or tables if there was significance). (10 points)
- **Conclusion:** The group was able to conclude or summarize their results and tell the audience whether their results agree or disagree with their initial hypothesis. (5 points)
- **Discussion:** The group was able to discuss how their results are related to other studies in the field and how the data will contribute to our knowledge in this field. (5 points)
- **Future studies or alternative approaches:** The group was able to talk about future directions or experiments the group would like to pursue if given the opportunity. The group was able to discuss any possible mistakes they might have made that may lead to invalid results and what would be better designs that could be attempted in the future. (5 points)
- The overall presentation was well organized and easy to follow. Images, pictures, or graphs were professionally made and clearly labeled. Proper citations were made throughout the presentation whenever necessary. (10 points)

### Written Report

**50 points total** (follow the format of a word template on blackboard - modified from JUNE journal, also check online: <http://www.funjournal.org/for-authors/>)

- Research paper contains all elements including a title, names of group members, Abstract, Materials and Methods, Results, Discussion, and References. (5 points)
- **Abstract** (250 words maximum, including citations): The abstract should be clearly written and should provide a concise summary of the background, objectives, methodology, key results, major conclusions, and a brief statement of the significance. It should be written in complete sentences with or without subheadings. (10 points)
- **Introduction** (no words limit): The introduction should provide enough background information to clarify what the study was undertaking and what hypotheses were tested. (5 points)
- **Materials and Methods:** This section should provide brief but sufficient information about animals, cells, chemicals, techniques, software, etc. that were used and how

each step was done (can be brief in this case, but use complete sentences). (10 points)

- Results: The section should present clearly but succinctly the experimental findings. Figures and figure legends should be included in this section and labeled as Figure 1, Figure 2, etc. Statistical data, significance, and number of samples analyzed should be given in the text. (10 points)
- Discussion: The discussion section should include a brief statement of the principal findings, a discussion of the validity of the observations, a discussion of the findings in light of other published work dealing with the same or closely related subjects, and a statement of the possible significance of the work. (10 points)