

## BI 358 Investigations in Medical Physiology Guidelines for Research Paper & Presentation

### General Guidelines & Research Focus

**Your paper and presentation should cover the same topic.** You may focus your study at any level of organization (molecular, cellular, tissue, organ, organ system, whole body/organism, community, population, ecosystem). Your only limitation is to pick a precise area of interest associated with human and/or medical physiology. It is crucial that you begin your focus and search immediately at the beginning of this term, because your specific topic and brief paper outline are due on **January 14 (T)**! If you are not sure what you might be interested in, simply let us know, and we will try to help you develop your focus. Some who are not familiar with physiology or searching have difficulty isolating a particular topic of interest. For example, they might indicate that they are intrigued with *cardiovascular medicine* (the medical study of the heart, vessels, and blood), and sense that this is fairly specific. Yet, when they input keywords *cardiovascular and medicine* in a PubMed search <http://www.ncbi.nlm.nih.gov/pubmed/>, they find there are 482,929 articles that contain these two key words—38,665 of which were published between January 1, 2019 and December 31, 2019! So, it is crucial that you narrow down your focus soon, and as much as conceivably possible. [My professor, Dr. Eugene Evonuk said "Be like a bullet, not like buckshot and first and foremost put it down on paper!" I still struggle with this after > 40 yr of practice! ☺] We encourage you to pick a topic that is current and controversial to enable creativity and to stimulate discussion during your presentation. Please ask us if you need guidance!

### Paper Guidelines

Your final paper should be neat and of the highest quality and submitted double-spaced (to leave room for comments), double-sided (to conserve paper), and stapled in the upper left-hand corner. Ideally, your paper should be 6 pages of double-spaced text, that is 3, double-spaced, double-sided pages, with 1 page or less of references (for a total of 7 pages absolute maximum). The page limitations include figures, flowcharts, and tables. Use a typeface/style that is simple (such as Arial, Universal, Verdana or even Times New Roman like a newspaper) rather than frilly or complex (such as *Bradley Hand* or *Forte*) to make it easier to read. Use approximately 1" margins and no smaller than 12-point type also to help the myopic and presbyopic reader (Pat)! Thanks sincerely for not using plastic or stock folders or a title page (also to conserve resources). You should have 10 references, at least 5 of which are within the last 5 yr, that is,  $\geq 2015$  year of publication. Be sure to emphasize articles rather than textbooks to help ensure that your paper is up-to-date. Limit background information—your introduction should be no more than 2-3 paragraphs and should not exceed 3/4 of your first page. Your *review* paper should be clear and concise and ultimately tell *what, where, how, and why*. Please do not use a title page, rather type in bold and caps the title of your paper in the upper left hand corner of the page. Use a short specific title indicating the precise nature of your investigation. Then on the next line, type your name also in bold. Two examples of this are illustrated below:

#### **CAN GREEN TEA HELP PREVENT CANCER?**

**Barbara A. Brehm**

#### **MOLECULAR BIOLOGY OF SELECTIVE SEROTONIN RE-UPTAKE INHIBITORS**

**J. David Symons**

For the body of your paper, indent three spaces then begin typing text like this using double-spacing. Be sure to print on both sides of the page. [Feed pages back through your printer if double-sided printing is not enabled.] Be sure to use headers and sub-headers to demarcate sections and to help establish continuity and flow. This is detailed in the section on **Grading** below. We'll stop the double-sided sample now.

In the body of your paper, you may use standard abbreviations without definition (e.g., *hr* for hour/hours, *kg* for kilogram/kilograms). Nonstandard abbreviations should be placed in parentheses after the first use of the word in the text, but should be kept to a minimum. [For example, you might use *creatine phosphate (CP)* the first time, but thereafter abbreviate *CP*.]

### **Grading & Sectional Hints**

Your paper will be graded according to 5 separate areas: (1) Introduction/Focus, (2) Text/Content, (3) Continuity/Integration, (4) Directions for Future Research + Summary & Conclusions, (5) References. [The grading scale for each separate area is: 5.0 = clearly exceptional ( $\equiv$  Science News writing), 4.5 = very good, 4.0 = good, 3.5 = satisfactory, 3.0 = marginal, 2.0 = low marginal, 1.0 = extremely poor, 0.0 = non-existent or was not addressed.] Your paper should include at least the following headers or sections: **Introduction...**, **Summary & Conclusions**, **Directions for Future Research**, **References**. Examples of topic/section headers for a paper on selective-serotonin reuptake inhibitors (SSRIs) might be *Introduction*, *Chemistry of Serotonin*, *SSRIs Mechanisms of Action*, *Summary & Conclusions*, *Directions for Future Research*, *References*. [Also, see sample outline on p. viii.] Be sure to try to link sections together in a smooth, continuous fashion with short ending and beginning, transition sentences.

**Please use a *variable-by-variable* rather than a *study-by-study* approach or writing style.** This will limit your paper's content of bulky background and methods information and help you focus on results and discussion. A variable-by-variable approach that is the most difficult to write and synthesize, links together results and conclusions from a large number of studies in a coherent, cohesive, and compelling fashion (similar to a review paper). [You should plan to indicate methods not much at all, unless this is the focus of your paper—e.g., your intention is to examine a technique like radio frequency ablation for the treatment of heart conduction defects.]

### **Due Dates**

Before your Discussion session on **January 14 (T)**, e-mail your brief (1-page) outline with references in MS Word *.docx* or *.doc* attachment (1 file) to [lombardi@uoregon.edu](mailto:lombardi@uoregon.edu). Also, be sure to print out and bring 4 hard copies of your outline with references (each copy  $\leq$  1 double-sided page) to share with group members for review during our Discussion session on **January 14 (T)**. Later, you should also e-mail your outline to group members for follow-up review. [See sample outline on p. viii.] You will be responsible for giving detailed feedback to members within your designated group. I am sorry that you also have a quiz on this Discussion day, but there was no way around the scheduling.

Prior to your Discussion session on **February 11 (T)** send your **paper draft** by way of e-mail attachment in .docx or .doc format to either Bella [isalinis@uoregon.edu](mailto:isalinis@uoregon.edu) or Mea [jsongco@uoregon.edu](mailto:jsongco@uoregon.edu) based on the time of your Discussion section. Also, print out and bring (double-sided) copies of the **draft** of your paper at the beginning of your Discussion session on **February 11 (T)** to provide for all group members. You will also e-mail copies of this draft by way of attachment to members of your assigned group, who will provide detailed comments as part of their participation grade. **Your final, spelled-checked, peer-reviewed paper (hard copy, double-sided, stapled upper left-hand corner, without title page and without folder) is due no later than 5:00 pm, March 17, Tuesday, in Pat Lombardi's box in the Main Biology Department Office (77 KLA).** You are welcome to turn in your final paper earlier if you would like to finish it before your presentation and/or avoid the end-of-term rush during exam week.

### **Presentation Guidelines**

You will be scheduled to give an individual, 12-minute, oral presentation (*NB*: 12-minute total presentation time including question-and-answer period) during your Tuesday discussion section on **February 18, February 25** or **March 3**. Your total time allotment may vary by 1-2 minutes based on the number of presentations in your discussion section. You will have ~8 minutes to discuss the topic of your paper, while ~4 minutes will be allotted for questions and answers. PowerPoint or Prezi presentations, overheads, short film clips/DVDs, posters, are all permissible, but no specific format is required. Please keep in mind that your time will be limited strictly because several of your colleagues are presenting during the same session, so you must present only a summary of your work and include only 3-5 key take-home messages. For a PowerPoint presentation, the recommended total number of slides is 5-7. This means that after a very brief introduction, it is best to provide some key mechanisms and then summary and conclusions (i.e., do not detail methodology). You must notify us at least 72 hr in advance if you plan to use special media or require unique equipment, software or supplies. Also, please identify the type of equipment or computer format you desire (e.g., PC/Mac). **If you plan to use PowerPoint or other electronic medium (e.g., Prezi, Keynote...), a copy of your final presentation is due no later than 4 pm, the Monday prior to your presentation.** Deliver your final saved presentation by way of e-mail attachment (.ppt or .pptx format if PowerPoint or Keynote, .pdf if Prezi) to [lombardi@uoregon.edu](mailto:lombardi@uoregon.edu) with cc: to [isalinas@uoregon.edu](mailto:isalinas@uoregon.edu) or [jsongco@uoregon.edu](mailto:jsongco@uoregon.edu) (depending on your Discussion section). **As a backup, please also bring a PC-/Mac-compatible electronic copy of your presentation (flash-drive/CD) to your discussion section on the day of your presentation.** Bring your own computer if you use Keynote, as we do not have it in the lab. Again, your presentation grade will be determined 50% by peer review and 50% by instructor review. [See sample scoring sheet on p. x.] Our goal is to provide you with some feedback on the same day you present, immediately after all in your section are finished.

### **Additional Help Researching Your Paper-Presentation Topic**

After Discussions 1 & 2, go to the Price Science Commons & Research Library and conduct computer searches to help explore and focus your research presentation topic. [For sample prior topics, see p. ix.] To begin searching for references log on to the U of O library system <http://libweb.uoregon.edu>. Under *Keyword*, select *Subject*, then type in keywords of interest and use quotation marks for an exact match.

You may use any search engine/databases you like (e.g., there are 8 under Biology, 17 under Medicine/Health) but a top choice is *PubMed*, which accesses data in the US National Library of Medicine <http://www.ncbi.nlm.nih.gov/pubmed/>. *PubMed Help* is an exceptional resource and advanced searches with *You Tube* tutorials are available <http://www.youtube.com/watch?v=dncRQ1cobdc&feature=relmfu>. All PubMed indexed journals are approved for your paper. If you need help with specific references, please let us know. *Google Scholar* <http://scholar.google.com/> can be used to conduct some final reference redundancy checks, though it is not as comprehensive or up-to-date as PubMed. For virtually all search engines/databases, you simply enter the search terms/key words in the search box. You can limit/more fully specify your search by using pull-down menus or typing in special limiting criteria (e.g., publication dates/range, languages, species, age, gender, article type, journal type,...). The Orbis Cascade Alliance <https://www.orbiscascade.org/member/> is a library catalog that combines information from Pacific Northwest academic libraries into a single unified database. You can request delivery of a book located anywhere in the system and the goal is to have your requested material delivered to the library circulation desk within 2 business days. Do keep in mind though, that in order to remain very current, it is best to rely most heavily upon peer-reviewed journal articles, not texts which often may be 1-2 yr out-of-date by the time of publication.

### **Additional Comments to Help Organize & Write Your Paper**

Below is an e-mail inquiry and response which may help you develop an outline and write your paper.

#### **Inquiry:**

Dear Professor Lombardi:

I am totally stressing out/freaking out about this outline due Tues. I have spent all of my available time since last Thursday doing literature searches, copying journal articles etc, and I STILL have not managed to narrow down to a suitable paper topic, LET ALONE read & digest the articles! And I know there's no way in hell I'll have time to in the next two days--and how can I write an outline until I've read all the literature, assimilated, sorted it, weighed the various aspects... I don't understand your timetable on this. To me an outline is something you write when you've been researching the topic in depth for a MONTH, when you essentially have the whole paper in your head! And our outline before we've had time to read the literature! I am so puzzled, stressed etc by this I'm considering dropping the class! All I can think of, is maybe you have a totally different definition of "outline" than I do? Please clarify!!!

#### **Response:**

Dear \_\_\_\_\_:

An outline is merely the shell or a cookbook recipe that you use to achieve your goal (writing a comprehensive, yet concise, cohesive, review paper). That is, it should contain the title of your topic (concise, but focused, e.g. Sleep Deprivation and T-Lymphocytes instead of The Physiological Effects of Chronic Sleep Deprivation on T-4 Helper Lymphocytes, T-8 Suppressor Lymphocytes and Cytotoxic T-Cells). At first you must examine primary research literature, but with practice you can review about 300 abstracts from *PubMed* in a few hours. The idea is to synthesize your brief review and condense it into a workable outline format. Certainly, it is not intended that you know all of the answers and it is implied that your outline may change--but at least it is a formal start requiring that you focus (often the most painful part of the process) and put things down on paper. Remember the simple questions: what is it?, where is it located?, how does it work?, and why is it important? It's best to provide  $\geq 5$  or so references with your first outline hand-in. So please don't "stress out"--simply put something on paper to formalize your direction. I've included a sample outline below, but please if you need any help, call me at 346-6055. Hope this helps out. Remember to call or write if you have any questions!

Sincerely,

vpl

## Creatine Monohydrate & Strength Training Sample Outline

- I. Introduction (remember, short-and-sweet)
  - A. Creatine
  - B. Creatine phosphate, creatine phosphokinase (CPK) reaction & ATP
  - C. Creatine vs. creatinine vs. creatine monohydrate
  - D. Frequency of use in strength training
- II. Sources
  - A. Endogenous
  - B. Exogenous
- III. Theoretical Benefits & Potential Side Effects (include compare-and-contrast table)
- IV. Molecular Mechanisms
  - A. Absorption & fate
  - B. Concentrations in plasma, interstitium
  - C. Intramuscular concentrations & bioavailability/half-life
- V. Enhancements in Strength
  - A. Acute & chronic increases in females & males
  - B. mTOR pathway & dietary influences
- VI. Summary & Conclusions
- VII. Directions for Future Research.

### References

1. Bassit RA, Pinheiro CH, Vitzel KF, Sproesser AJ, Silveira LR, Curi R. Effect of short-term creatine supplementation on markers of skeletal muscle damage after strenuous contractile activity. *Eur J Appl Physiol*. 2010 Mar;108(5):945-55. <http://www.ncbi.nlm.nih.gov/pubmed/19956970>
2. Candow DG, Chilibeck PD, Burke DG, Mueller KD, Lewis JD. Effect of different frequencies of creatine supplementation on muscle size and strength in young adults. *J Strength Cond Res*. 2011 Jul;25(7):1831-8. <http://www.ncbi.nlm.nih.gov/pubmed/21512399>
3. de Moraes R, Van Bavel D, de Moraes BS, Tibiriçá E. Effects of dietary creatine supplementation on systemic microvascular density and reactivity in healthy young adults. *Nutr J*. 2014 Dec 15;13(1):115. <http://www.ncbi.nlm.nih.gov/pubmed/25511659>
4. Ferretti R, Moura EG, Dos Santos VC, Caldeira EJ, Conte M, Matumura CY, Pertille A, Mosqueira M. High-fat diet suppresses the positive effect of creatine supplementation on skeletal muscle function by reducing protein expression of IGF-PI3K-AKT-mTOR pathway. *PLoS One*. 2018 Oct 4;13(10):e0199728. <https://www.ncbi.nlm.nih.gov/pubmed/30286093>
5. Forbes SC, Sletten N, Durrer C, Myette-Côté É, Candow D, Little JP. Creatine monohydrate supplementation does not augment fitness, performance or body composition adaptations in response to four weeks of high-intensity interval training in young females. *Int J Sport Nutr Exerc Metab*. 2017 Jun;27(3):285-92. <https://www.ncbi.nlm.nih.gov/pubmed/27768397>
6. Kaviani M, Abassi A, Chilibeck PD. Creatine monohydrate supplementation during eight weeks of progressive resistance training increases strength in as little as two weeks without reducing markers of muscle damage. *J Sports Med Phy Fitness*. 2019 Apr;59(4):608-12. <https://www.ncbi.nlm.nih.gov/pubmed/29722252>
7. Jagim AR, Oliver JM, Sanchez A, Galvan E, Fluckey J, Riechman S, Greenwood M, Kelly K, Meininger C, Rasmussen C, Kreider RB. A buffered form of creatine does not promote greater changes in muscle creatine content, body composition, or training adaptations than creatine monohydrate. *J Int Soc Sports Nutr*. 2012 Sep 13;9(1):43. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3479057/>
8. Outlaw JJ, Wilborn CD, Smith-Ryan AE, Hayward SE, Urbina SL, Taylor LW, Foster CA. Acute effects of a commercially-available pre-workout supplement on markers of training: a double-blind study. *J Int Soc Sports Nutr*. 2014 Aug 15;11:40. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4190923/>
9. Stares A, Bains M. The additive effects of creatine supplementation and exercise training in an aging population: a systematic review of randomized controlled trials. *J Geriatr Phys Ther*. 2019 Feb 8; Epub ahead of print. <https://www.ncbi.nlm.nih.gov/pubmed/30762623>
10. Rahimi R, Mirzaei B, Rahmani-Nia F, Salehi Z. Effects of creatine monohydrate supplementation on exercise-induced apoptosis in athletes: A randomized, double-blind, and placebo-controlled study. *J Res Med Sci*. 2015 Aug;20(8):733-8. <http://www.ncbi.nlm.nih.gov/pubmed/26664419>