PSL 460 Section 002: Autoimmunity of Organ Systems (2022)

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Office hours: Fridays, 3-5 PM, 2174 BPS; by appointment, or by Zoom when in-person classes are not in session.

Class Schedule	Class Topics	Readings and Abstracts **DUE**
10 January	Class intro: Autoimmune Diseases	
17 January	MARTIN LUTHER KING DAY – NO CLASS -- LIBRARY EXERCISE!!!	
24 January	The Normal Immune System I **Choose a Disease**	Wikipedia "Immune System", "Antibody", "Antigen", "T cell", "B cell", "Macrophage", "Dendritic cell"
31 January	The Normal Immune System II	Wikipedia: "Clonal Selection", "Major Histocompatibility complex", "Human Leukocyte Antigen", "Complement system"
7 February	Theories of Autoimmunity	Wikipedia: "Autoimmunity", "Autoimmune Diseases," "Immunological Tolerance"
14 February	Type 1 presentations	Wikipedia: "Granuloma", "Fibrosis", "Necrosis", "Inflammation"
21 February	Type 1 presentations	Presentations abstract
28 February	Type 1 presentations	Presentations abstract
7 March	SPRING BREAK – NO CLASS	
14 March	Type 1 presentations	Presentations abstract
21 March	Type 1 presentations	Presentations abstract
28 March	Type 2 presentations	Presentations abstract
4 April	Type 2 presentations	Presentations abstract
10 April	Type 2 presentations	Presentations abstract
17 April	Type 2 presentations	Presentations abstract
24 April	Type 2 presentations	Presentations abstract
2 May	Finals week	Presentations abstract

Course Requirements: Students will write abstracts on assigned readings and on the presentations made by other students. Each student will give **two 20 minute Powerpoint presentations** on ONE (1) autoimmune disease of the student's choice. The first presentation will be on the symptoms and pathophysiology of the disease; the second on the mechanisms and models that may explain the nature of the disease. Each student will **write two papers**, the first on the symptoms and pathophysiology of the disease; the second on theories, models and treatments of the disease.

An Honors Option is available, which will require some simple proteonomics research resulting in a short research paper. Learning the computer-based proteonomics research strategies will require some additional time during office hours or by appointment with the instructor.

Attendance is required and you are expected to be on-time. You will lose 10 points for each unexcused absence; 5 points for being tardy or having to leave early.

Grades will be calculated based on 350 possible points:

Abstracts on readings and presentations (12 points x 10):	120 points
Student in-class presentations (50 + 50):	100 points
Report papers (50 + 50 points)	100 points
Questions (up to 2 points x 15)	30 points
TOTAL	350 points

Grades will be awarded on a percentile basis. Lowest abstract will be dropped. There will be no curve. There will be no extra credit.

95-100% = 4.0; 89-94% = 3.5; 83-88%= 3.0; 77-82= 2.5; 71-76%= 2.0; 66-70%= 1.5; 60-65%= 1.0; <60%= 0.0

All assignments can be turned in for feedback and preliminary grading

ONCE up to THREE days prior to their due date.

HELP: I will read and comment ***ONCE*** on drafts of abstracts up to **three** days before they are due and presentation- and paper-drafts up to a ***week*** before they are due. In addition, I will provide feedback on in-class presentations within a couple of days of the presentation so that you have time to incorporate corrections and additions into you written version. So, with a bit of planning, you can achieve whatever grade you desire in this class! If my feedback is not sufficient, I strongly urge you to make use of the MSU Writing Center: https://writing.msu.edu/services/

ABSTRACTS: Each reading assignment and each SET of in-class presentations will be abstracted and the abstract graded.

(See Abstract handout for details). These abstracts are due the day indicated in the syllabus. Abstracts cannot be turned in late without instructor permission.

POWERPOINT PRESENTATIONS: The details and grading of each Powerpoint presentation are provided in the individual presentation guidelines at the end of this syllabus. The overall objectives are to become comfortable with producing presentations characterized by simplicity, clarity and completeness of content. Content should be delivered with a professional demeanor.

PAPERS: You have two weeks to write up your presentation as a paper. Feedback will be provided by the instructor on your presentation within a few days so that corrections and deficiencies can be amended in the written version.

MISSED WORK:

Missed work is expected to be made up when possible. If you must miss class due to perform in an athletic or other event, or if you have a professional interview, please let the professor know in advance and arrangements will be made to excuse you from the work or to make it up in an appropriate matter Similarly, if illness interferes with your ability to perform your classwork, please inform the instructor as soon as possible and appropriate accommodations will be made.

Grief Absence Policy: Academic governance developed and approved a university-wide grief absence policy that provides clearer direction of student and faculty rights and responsibilities for students who have lost an immediate family member or suffer a similar serious bereavement. Please see the following website for university policy regarding missed work:

https://reg.msu.edu/roinfo/notices/griefabsence.aspx

Letters of Recommendation

Students who think they may want me to write a letter of recommendation for them at some time in the future are encouraged to meet with me in office hours or make appointments to talk with me (by Zoom if in-person classes are not in session). I do not write recommendation letters for students I know only from their classroom performance.

Type 1 Presentations (Disease Symptoms and Pathophysiology):

A Type 1 presentation will be a 20 minute PowerPoint talk that focuses on the symptoms and pathophysiology of an autoimmune disease. How does the disease present clinically (in other words, what are the patient's symptoms and what does the physician observe)? Is there anything that makes the disease difficult to diagnose? What physiological systems are affected? What is the normal function of these systems? What are the consequences of the functional failure? How do these produce the disease symptoms? How does the body try to compensate for loss of function? What are the long-term consequences?

Begin by describing the symptoms that a patient experiences or that a health care provider might observe in the patient upon presentation. Review normal physiological function for the organ or system affected by your disease. Then, given what we know about the physiology of a body system and its regulatory systems, describe what effects you would EXPECT to see if a particular component of that system was attacked by the immune system. In other words, **make a set of predictions** based on your knowledge of physiology. Then describe what effects we ACTUALLY OBSERVE in the disease: do the symptoms match prediction or are there more symptoms or different ones than one might expect? Are there some symptoms that do not obviously follow from the functional failure? (For example, diabetics are far more prone to die of pneumonia than the typical, age-matched individual: can you explain why? Liver autoimmunity often presents as heart disease: what's the connection?)

Type 1 Presentations will NOT address the causes of, models of, or treatments for the disease. The purpose of Type 1 Presentations is to review basic physiology of organ systems; use that knowledge to think about how our knowledge of

normal function can predict (or not) the effects of system failures; and to tie this academic knowledge into practical medical observations.

Presentations should be based on one or more recent scientific reviews of the disease, which should be provided in a reference list on the last slide of your presentation. I do not care what format you use for your references as long as the information is complete (authors, title, journal/book, volume, date, pages); a URL of DOI for sources is appreciated but not required.

Type 2 Presentations:

Type 2 presentations will also be 20 minute PowerPoint talk, but these will focus on how well the various theories of autoimmunity that we study in the course apply to your disease. Start by very briefly reviewing the pathophysiology of your disease (just a slide or two!) to remind the class of the basics. Then launch into your new material: What does each major theory of autoimmunity that we have studied predict that one should find if that theory applies to your disease? In particular, address whether suspected infectious triggers for the disease fit a molecular mimicry, antiidiotype, or complementary antigen theory of autoimmunity. If other theories are relevant, describe the evidence for them as well (otherwise, you can ignore the other theories. Is there relevant evidence? Does that evidence support or contradict the predictions made by each theory? Issues of particular importance are whether there is a genetic predisposition to the disease; are there animal models for the disease and how are these are created; do the animal models mimic the human disease symptoms accurately; do the animal models mimic the etiologies of human autoimmune diseases; and have the animal models led to any treatment breakthroughs? Have the theories led to new animal models or treatments? In other words, tie together and integrate the various aspects of the course as they apply to your disease.

If you are doing an Honors Option, these Type 2 Presentations may also be a forum for presenting some of the proteonomic tests results that we will learn to perform in the course. MORE ADVICE ON THESE PRESENTATIONS AND FOR WRITING FINAL PAPERS IS PROVIDED AT THE END OF THIS SYLLABUS!!!

Presentations should be based on a review of relevant literature concerning the disease and a bibliography of this literature should be provided on the last slide of the presentation. Formatting of references should be as above for Type 1 Presentations.

PRESENTATION GRADING: All presentations will be graded on five (5) components:

1) Does the presentation address all of the questions listed above and does it do so accurately and succinctly?

2) Is the presentation well-illustrated and are the illustrations, figures, or data provided relevant, insightful, as simple as possible, easily read (e.g., large enough, good contrast, etc.)?

3) Is the presentation well-researched and based on current peer-reviewed literature? (I. e., avoid website sources that do not lead back to well-vetted medical literature that you can cite directly.)

4) Is the information delivered clear, cogent and complete? Is the presentation well-focused? Does it "tell a story" in the sense of linking each component to the next in a logical manner? Does the presentation have a point?

5) Is the presentation delivered in a professional manner? E.g., is the speaker comprehensible and loud enough to be heard easily? Is the delivery such as would be expected at a professional meeting? Does the presenter show mastery of his/her material when questioned?

Each of these five elements will be worth 10 points (50 points total).

PAPERS:

The object of the papers is to reformulate your PowerPoint presentations as an essay. Write clearly and succinctly. Try to link the various aspects of the disease and its study to each other. Summarize what we know – and what we do not! – about the causes of the disease

These essays should be well-documented with a complete bibliography of relevant scientific papers and these papers should be cited where appropriate in the text. You can use any scientific bibliographic format for your references.

There is no page limit for papers, but most will be 6-10 page, double-spaced essays. These essays will cover the same material and questions as the presentations, but they MUST take into consideration comments from the instructor in response to the presentations and any points that clearly confused the audience. Anyone who does NOT utilize the feedback from the instructor in writing their presentation will be penalized severely.

Essays will be graded on five criteria (10 points each; 50 total): 1) Completeness (does it answer the entire set of questions listed in the presentations); 2) Research (is each factual point properly referenced with an up-to-date bibliography); 3) Clarity and Accuracy (are the technical points made in a clear and comprehensible manner); 4) Organization (do factual points follow logically and is there a clear argument); 5) Writing (is the writing concise, precise, grammatical, etc.).

Honors Option Research:

Honors students may obtain honors credit for the course by contributing to a long-term research program being carried out by the course Professor that involves proteonomic methods. Students will learn how to perform basic proteonomic searches. One aspect of proteonomic research involves similarity searching. Similarity searching is a procedure by which one protein is compared with another. Many autoimmune diseases are associated with preceding viral and/or bacterial infections. Various theories of autoimmunity posit that the similarity between proteins in these viruses or bacteria and the proteins in the human host may permit the immune response to a virus or bacteria to cross-react with similar human proteins. Moreover, while most theories of immune function posit that "self-reactive" T cells are eliminated during development, our lab has found that in autoimmune diseases, the T cell receptors often mimic both the proteins of the human body and the viruses and bacteria they are supposed to protect the body against. Honors Option students will be introduced to the online search techniques that can be used to investigate these forms of immune system-infection mimicry as they apply to their own autoimmune disease. The Honors Option will be satisfied by performing this additional research and then writing a brief research report on the results.

WRITING ABSTRACTS – PSL 460 – DR. ROOT-BERNSTEIN

The purpose of writing an abstract is to condense the material you have read into the most succinct form. To abstract is to pare away the unnecessary elements of an argument or its presentation to discover its essence. Since every narrative contains many levels of discourse and many themes, abstracting requires you to make informed decisions about what elements are most important. These decisions will depend on the questions you are asking and the problems you are

trying to solve. You can't do a good job of abstracting until you have a clear question or problem in mind! Before you start reading, ask yourself what you want to know. Keep your question or problem in mind as you read!

It is often easiest to write out whatever comes to mind in answering your question without regard to length and then to go back and pare away at it to make it suitably short.

If you have done your job well, your abstract should be able to achieve the brevity of a TV Guide description of a movie plot. It should state the basic problem and its resolution: "Man meets married woman, kills her husband, who turns out to be his twin brother adopted out at birth." A line this succinct should form the first sentence of your abstract. The abstract itself should then consist of a short paragraph or two (no more than a page, single spaced – double preferred!) that describes the most important elements of the plot line you describe in your first sentence. Try to balance generalizations with one or two specific examples.

Your abstract must include:

1) the main argument or arguments made by the author(s);
2) the key concept(s) upon which they base their argument(s);
3) the main points or data that support their argument(s).
4) Definitions of any key technical terms

You need to write ONE (1) abstract for each **SET** of readings that is assigned, or for each **SET** of presentations that we have in class.

Abstracts are due in class the week the reading is listed in the syllabus, and the week after the class presentations. When more than one presentation is made, your abstract should compare and contrast the major points, rather than simply summarizing each presentation. Do some intellectual work – digest the material!

Focus Questions for Note-Taking, Reading and Abstract Writing

This is a physiology course, so although the topic is immunology, the focus of presentations (and therefore notes and writings) should be on how immunology affects general physiological processes. Stay focused on the "BIG PICTURE"! (Note-taking and writing in other courses would have different foci!)

Physiological processes generally have four key elements:

1) Maintenance of homeostatic mechanisms

2) They are based in organ or tissue systems

3) These systems are highly integrated

4) These systems share common components

Immunology adds four additional elements:

A) Prevention of disease

B) Response to, or elimination of, disease states

C) Maintenance of host integrity ("housekeeping processes")

D) Healing processes

When comparing and contrasting presentations or readings, you should focus on discovering common principles:

i) What are the common principles that guide the interactions between the immune and physiological systems that run through the set of material that is being compared?

ii) If there are exceptions to these common principles, what makes them exceptional and what additional principle makes them so?

iii) What's the "BIG PICTURE" take-home message of the set of presentations or readings? HOW IS EVERYTHING INTEGRATED?

Not all nine of these focus questions will be relevant to every presentation or abstract, but one should still consider each one to make sure! SO BEAR THESE QUESTIONS IN MIND WHEN YOU TAKE NOTES AND START YOUR READINGS!

If you have a pattern of expectation in mind when you listen or read, you will better be able to place the information you learn into a coherent framework of understanding and also identify what is missing or problematic.

Questioning

Every student is expected to ask at least one question during each class period. These will be submitted via the "Chat" function on Zoom. A question that is not thoughtless (see below) will be given 1 point (15 opportunities for 15 points total). One additional question may be submitted during each class session and, if valid and insightful, will count also be given a point (1 point each), up to 22 additional points. Instructor feedback will be provided. Please label your problem type (see below, second page).

There Are No Stupid Questions – But There *Are* Thoughtless Ones!

There are no stupid questions: anything that you don't understand is something that I guarantee puzzles someone else. Acknowledging your ignorance or confusion is no cause for embarrassment; quite the contrary, it is the first step towards understanding. If you can clearly state what you don't know, or what the source of your confusion is, then you have taken the first step towards learning what you need to know. Publicly stating a question may also be the first step towards helping other people to understand because they often don't know they don't known something until they hear someone else state a penetrating question.

Is every question, then, a useful question? No! I once had a student who interrupted my lectures every five minutes to paraphrase what I had just said and then ask if he had understood me properly. Another asked me to restate every important point in a different way. These are *thoughtless* questions. that avoid coming to grips with the material merely waste class time. Please avoid thoughtless questions!

What Characterizes Good Questions?

Good questions are composed so that they generate clear answers. The more specific you can be about the problem that underlies your question, the more likely it will be to elicit a useful response. Practice being precise. Rather than,

"You said such and such occurs: why?" try instead, "You said such-and-such occurs. I get that. What I don't understand is why that is important. What does such-and-such explain?"

Good questions also tend to link different elements of what you are learning: "How does this phenomenon in this disease compare with this other phenomenon in that disease?" "If this effect occurs under these circumstances, why don't we see it when that similar thing occurs?"

As a Presenter, Don't Be Afraid to Admit that You Can't Answer a Question

Questions don't always have answers. Sometimes this is because the question involves abstractions that make any simple answer impossible: What is love? Who is God? What is life? In the context of science, however, it is more likely that a really insightful question will not have an answer because there is still so much we still do not know. Good questions can stimulate new research.

More frequently, however, you may not be able to answer a question because you personally don't know enough. If that happens to you, just say, "Excellent question; I don't know". Try to follow up with, "Here's how we could find out…" DO NOT try to B. S. an answer because there is almost always someone in your audience (in this case me, the professor) who will know that you don't know what you are talking about. Then you will not only appear to be ignorant but foolish as well!

A Guide to Question Types

Definitional questions: How do you define a process, phenomenon or classification of something? How does that definition differ from similar concepts? What would happen if you defined the concept, process, etc. in some other way?

Theory question: How is the process or phenomenon explained by some process or concept? How is that explanation applied in a particular situation or disease? How can the explanation be tested? What are the boundary conditions limiting the proper application of the theory? Are all of the assumptions that go into the theory testable and supported?

Data questions: What is the evidence supporting an explanation? Is there evidence that challenges the explanation? Are there gaps in the evidence?

Technique or Methods questions: How was the evidence collected? Using what methods or techniques? How reliable are those methods and techniques? What assumptions were made in producing the data?

Evaluation questions: How does one compare two sets of data or techniques/methods in terms of validity, reliability, utility?

Integration questions: How do two definitions, two theories, two sets of data, or two sets of techniques or methods fit together? If they don't fit, what is the problem that prevents them from being integrated?

Extension questions: Can a theory that was developed to explain one phenomenon be extended to work for another phenomenon? Can a method or technique that yields data in one range (say within one mile or using visible light) be extrapolated to yield data in another range (say at astronomical distances or in the infrared)

Application questions: How can this theory, data set, new method be used to accomplish something new? What are the challenges involved in translating it from the lab to the clinic or the marketplace?

Known unknowns: What are the things we know we don't know? These tend to be the kinds of things that drive research because they involve well-known unsolved problems.

Unknown unknowns: What are the things we don't know we don't know? These types of questions often become apparent as a result of running experimental controls that shouldn't work or obtaining results that make no sense.

Misknowns: What are the things we think we know but we do not? These are things that we learn in textbooks or are told by experts that turn out to be false (e.g., malaria was caused by "bad air").

Unknown knowns: What are the things we think we don't know but we do? These are things that are often found in unusual source or in the practices of people who are not considered to be experts or even legitimate sources of knowledge (e.g., old wive's tales; the practices of shamans).

Taboo questions: What are the forbidden questions we're not supposed to ask? Sometimes political correctness, cultural traditions, respect for authority, etc. can interfere with asking what needs to be asked. These are questions that are dangerous to someone's power or reputation.

Methods for Generating Questions

Turn it on its head: What questions arise if you propose exactly the opposite of the current explanation? E.g., "Germs don't cause disease; the host creates the context in which germs arise" – what would you need to ask in order to find out whether such a proposition has any validity or why it's pure nonsense?

Play devil's advocate: If there are multiple explanations or methods or data sets, try to make the case that one of these that is rejected by the presenter is actually better than the one being defended. (You'll probably be wrong, but you'll learn a great deal more about why the accepted one is the one that dominates the field… and sometimes you might get a surprise and be right!)

Extrapolate: Every theory, set of data and method or process has limitations so find where these are by pushing them beyond their limits. The ways in which something breaks tells you something about what we don't know that may lie beyond the accepted boundaries.

Challenge assumptions: Every theory, explanation, method or technique has some (often unstated) assumptions about how nature and technologies work. Good questions often involve ferreting out these assumptions and then challenging them to see how important they may be.

Identify anomalies: Anomalies are repeatable observations and experiments that contradict the expectations of established theory of hypothesis. These can raise questions about unstated assumptions or the limitations or boundary conditions on the theory or hypothesis. Anomalies can also be the result of "artifacts", which are repeatable results of experiments that result from methodological flaws.

Embrace paradoxes and contradictions: Where two theories or explanations, or two sets of data, or a set of data and a theory are at odds, there are always exciting problems to be solved and questions to be asked. How can light be both a wave and a particle? How can we remain human beings, generation after generation, if mutations are constantly accumulating in our genome? How can a billion lymphocytes recognize a billion-billion different possible antigens?

Sources:

Root Bernstein, R. 1982. The problem of problems. *Journal of Theoretical Biology* 99, 193 201.

Root-Bernstein R. 1989. *Discovering: Inventing and Solving Problems at the Frontiers of Knowledge*. Cambridge MA: Harvard University Press, pp. 60-65, 407-420.

Root-Bernstein R, Root-Bernstein M. 1993. *Honey, Mud, Maggots and Other Medical Marvels*. New York: Houghton Mifflin, pp. 245-258.

Root-Bernstein, R. 2003. Nepistemology: Problem generation and evaluation. In Shavanina LV, Ed., *International Handbook on Innovation*. Amsterdam: Elsevier, pp. 170-179.

Root-Bernstein, R. 2008. I don't know. In Vitek W, Jackson W, Eds. *Virtues of Ignorance: Prospects for a new Worldview*. Salina, KA: University Press of Kentucky.

Witte M, Kerwin A, Witte CL. 1988. On ignorance. *Perspectives in Biology and Medicine*, 31: 524-525.

Witte M, Kerwin A, Witte CL, Scadron A. 1989. A curriculum on medical ignorance. *Medical Education* 23: 24-29.

Advice on Preparing Presentations, also Relevant to Papers!

As with all other aspects of the course, I'm always available to help!

Start by telling us (in summary) what you intend to tell us; then tell it to us; then summarize it. So begin by reviewing key points of your Type 1 presentation in 3 or 4 slides.

MAKING ORAL PRESENTATIONS – PSL 439 – DR. ROOT-BERNSTEIN

The content of an oral presentation is like writing a paper:

1) Tell the audience what you are going to tell them (i.e., begin with an abstract of your talk outlining the flow of your key points or arguments)
2) Fill in the details, one key point or argument at a time. Think of the presentation in terms of paragraphs, with ONE topic per paragraph, which means ONE major slide per point.
3) When you are done, recap the "take home points" – these should go on one slide. This is what you want your audience to remember.

Tell a story. Every discovery and invention has a plot. Diseases are only relevant in as far as they affect a real person. So tell a story about how a person (even if that person is fictititous) would be affected by your disease. What does the patient experience? What does the clinician observe? What knowledge would the clinician bring to bear on her/his observations? What tests would s/he carry out? What kinds of conclusions would s/he be likely to draw from the results? How do these conclusions lead to a particular treatment regimen? How does the patient experience the results of the treatment? Etc.

Don't read from a script

1) It is best to know your material well enough to work from notes – spontaneous speaking is much more effective than reading from a script.
2) If you must write out your talk to feel comfortable, go ahead – but then make notes of the talk and use the notes, not the full text.

3) NEVER read your talk unless you are so pressed for time, or your argument is so intricate, that you need to make every word and slide count.
4) Practice! Good speakers practice their talks in advance, preferably before a friendly audience. This way you can make your mistakes or find your oversights in advance and without embarrassment!

Use visual aids effectively

1) **<u>Don't put your text on your slides</u>**
2) NEVER EVER read your slides (even if you need to read your talk)
3) At most, put brief phrases on your slides such as you would take for notes
4) Use pictures, graphs, tables, etc. that supplement your text rather than text itself
5) If you use graphs, tables, models or other illustrations, make sure you take time to explain them: just showing a slide without describing what is important about it is not sufficient!
6) If there is more information on a slide than you need, try to modify the slide, or carefully point out what is important and what can be ignored
7) In general, use only one slide per point
8) In general, put up only one slide per minute (average)
9) Rather than address controversial points in the talk, just make your point, but bring extra slides to which you can refer if someone from the audience questions you on such points.

Talk to your audience

1) Talk to everyone in the room
2) Make your voice loud enough for the furthest person to hear you easily – project!
3) Speak slowly and clearly – take your time, don't hurry.
4) Make eye contact – pay attention to how your audience is receiving your pearls of wisdom!
5) Appear confident and speak confidently, no matter how you actually feel – public speaking is a form of acting! If you appear to be convincing, you will be convincing!
6) Better to put too little in a talk and generate questions than to put in too much and not finish.
7) Better to make your key points clearly and well than to overwhelm your audience with so much information they don't know what you told them.

Timing your presentation

1) In general, no more than one slide per minute.
2) In general, two to two-and-one-half minutes per page of written-out text.
3) Cut your content to the bare minimum. Better to finish early and be able to expand on your talk than not to finish.
4) Keep things SIMPLE! If you get the basics right, everything else follows. If you dive right into details, you lose everyone!
5) So put things you had to take out of the main body of your presentation at the end of your presentation (after its conclusion) that you can address in a question and answer period.

I STRONGLY URGE YOU NOT TO USE VIDEOS WITHIN YOUR PRESENTATIONS – THEY RARELY SAY OR SHOW ANYTHING THAT YOU CAN'T SAY OR SHOW WITH A SLIDE AND THEY ALMOST ALWAYS CAUSE SERIOUS INTERRUPTIONS IN THE FLOW OF YOUR PRESENTATION!

Writing well. It's a deep subject!

Yes, that was a pun. If you can have fun writing, you can convey your interest and excitement for your subject. So try to put some passion into your words!

Also try to avoid confusions such as those that I've modeled for the rest of this essay.

Writing well is more involved and better. The question is, more involved and better than what?

Writing well rocks, except when you use a verb that most people think is a noun, such as rocks, which brings to mind wells filled with rocks.

It is always a bad thing to start a sentence with "it is". Good sentences never start with "it is". I never know what "it is" anyway!

They say that starting a sentence with "they say" is also bad, but no one ever identifies who "they" are so maybe their wrong!

Most do not write good sentences and many could be better because they don't identify what "most" refers to (geniuses? trained monkeys?), or whether they mean "many people" or "many sentences".

The misuse of the word "lead" led me to write this sentence in the hopes the people might realize that one can lead a horse to water and carry a lead weight but one cannot have "lead" the horse to water.

One cannot have an amount of people though the number of people who make this mistake is large: discrete objects, such as people and pine cones, come in numbers; things that vary continuously (like water, sound or sunlight) have amounts.

"However" is not "but," but people use the two interchangeably, however incorrect that may be. The simplest way to remember which to use is: "However" starts a sentence; "but" interrupts one.

"Similar" and "like" are not interchangeable words. Similar to me, many writers use "similar to" where they should use "like" and I don't similar it.

People that use "that" after people's names and professions depersonalize them, whereas people who use "who" remind us that they are human! You, who are human, should prefer that to you that are human!

"Which" follows a comma, except in an instance such as this, in which "which" is the subject of the sentence. The rule is that, if there is no preceding comma, use "that".

Barack or The Donald may be your best friend, but it's not polite to refer to either one by his first name in an essay – professionalism requires us to refer to people by their last names and to provide titles where appropriate.

So, try to write clearly. But it is best, however, that that which leads to large good outcomes is well!

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As members of a learning community, students are expected to respect the intellectual property of course instructors. All course materials presented to students are the copyrighted property of the course instructor and are subject to the following conditions of use:

1. Students may (may not) record lectures or any other classroom activities and use the recordings only for their own course-related purposes.

2. Students may (may not) share the recordings with other students enrolled in the class. Sharing is limited to using the recordings only for their own course-related purposes.

3. Students may (may not) not post the recordings or other course materials online or distribute them to anyone not enrolled in the class without the advance written permission of the course instructor and, if applicable, any students whose voice or image is included in the recordings.

4. Any student violating the conditions described above may face academic disciplinary sanctions.