VetClin 576 Introduction to Veterinary Clinical Research (2 credits) 2016 Syllabus

Designing, executing, analyzing and reporting clinical research fundamental to practicing evidence-based medicine.

JM Gay DVM PhD DACVPM 1.0 1/16

Objective:

The purpose is to develop your understanding of clinical research fundamentals and to coach you through developing a strong research grant proposal for research that you will carry out under the guidance of your faculty advisor as a component of your WSU program.

You are expected to obtain your advisor’s guidance and approval throughout this process. Most of your specific research questions must be addressed with your research advisor.

By 1159 PM Friday, April 22 (second to the last week of the semester), you will submit this proposal to the VCS Research Committee chairman for the committee’s evaluation of funding worthiness. This evaluation is the primary component of your grade. They score every proposal as either **Fundable, Not fundable for minor reasons, or Not fundable due to major flaws**.

This proposal may be either for VCS intramural funding or for extramural funding but must meet the budget and format requirements of the funding source. During the class, you will gain perspective by providing critical reviews of classmates’ précis and proposal drafts and receiving same.

Class Goals: At the end of this class you will have:

- Developed a **strong research question**, constructed a **directly testable hypotheses** and **specific aims** for addressing it, and strongly justified your approach
- Performed efficient, specific searches using literature databases (e.g. Web of Science, PubMed through **WSU Libraries**) to identify the strong, **evidence-based primary scientific literature** for citing
- Selected a **suitable study design** to address the question, appropriately incorporating key design components (e.g., randomizing, allocating, blinding, blocking, controlling, replicating) into the design and avoiding major design and analysis flaws
- Understood the logic and layout of grant proposals, the Gold Standards being **NIH Sample Applications**
- Constructed a logically flowing, well explained, well referenced, well written, well presented research grant proposals for evaluating an important question using an appropriate budget with a high likelihood of success
- Written and edited to a concise, active, lucid, and compelling style
- Applied the relevant research reporting guidelines (e.g., **ARRIVE, CONSORT, MIBBI, MOOSE, PRISMA, REFLECT, STARD, or STROBE**) – most listed here NIH **Research Reporting Guidelines and Initiatives**
- Incorporated the relevant, validated, citable clinical and laboratory standard methods and standard materials (e.g., **ATCC, AOAC, CLSI, or OIE**) into your research designs
- Become aware of sources for common laboratory techniques, processes, and protocols, such as D Freifelder’s **Physical Biochemistry**, the Oxford IRL **Practical Approach Series**, **Springer Protocols**, and on-line resources such as **Protocol Online** (use with due caution, of course)
- Become aware of bibliographic software (e.g. **EndNote, Mendeley, RefWorks, Zotero**) options (wiki)
- Become aware of the important groups supporting institutional research (e.g., WSU **OGRD, IACUC, IBC, IRB, OCV**), their services (e.g. identifying funding sources), their requirements (e.g. administrator signatures, budget **spreadsheet, REX forms, ASAP forms, IRB forms**) and their timelines for processing and approval (days)
- Understood the perspectives, expectations, needs and inclinations of your target audience
Course on-line materials:

- Veterinary Clinical Research Links and Resources
  [http://people.vetmed.wsu.edu/jmgay/courses/ClinicalResearchIntro.htm](http://people.vetmed.wsu.edu/jmgay/courses/ClinicalResearchIntro.htm)
- Current Class materials (developed as class progresses)

Instructor: John Gay, DVM (WSU 78), PhD (U Minn 88 - epidemiology), DACVPM (1996)

2005 ADBF 5-0785  jmgay@vetmed.wsu.edu

Office hours – arranged as necessary. Otherwise, my door is usually open; if not knock.

Index page [http://people.vetmed.wsu.edu/jmgay/courses/](http://people.vetmed.wsu.edu/jmgay/courses/)

A quick way to find my index page is to do a Google search for “WSU jmgay”

**Philosophy:** This is an applied “hands-on” class flexible to your needs. Because your programs put heavy demands on your scarce time, I’m happy to modify the class and schedule to meet your needs. I’ll provide various handouts and links to materials to improve your understanding of fundamental research components, such as experimental design, and to improve your efficiency in critical processes, such as concise, active writing. If the class is not meeting your needs or other conflicts arise, please tell me, the sooner the better.

**Meeting time and place:** (tentative)

Tuesday 9:10, Thursday 9:10 ADBF 2020 (elsewhere when 2020 is otherwise reserved, a computer lab is necessary or otherwise as arranged). If you cannot attend class because of an urgent case, please let one of your classmates know.

To accommodate your clinic and other course schedules, you are encouraged to meet in your groups outside of class as part of reviewing your classmate’s précis and proposal drafts.

**Grading:** Grades are based three criteria – VCS Research Committee classification of proposal fundability, meeting in-class deadlines, and class participation

A – **Proposal classified as fundable by VCS Research Committee,** all deadlines met or missed with prior approval, full participation (e.g., thorough, thoughtful, useful critical reviews provided to your peers).

B – **Missing one of the above,** such as proposal ranked as unfundable, missing a major deadline by < 24 hours, or performing a useless, weak, uncritical review

C – **Missing more than one of the above,** such as proposal classified as seriously flawed by VCS Research Committee, missing deadline by > 24 hours, missing 2+ major deadlines, performing poor reviews, multiple unexplained absences

(+ ) – Upward modifier for exemplary performance otherwise

(-) – Downward modifier for further performance weaknesses

Historically the VCS Research Committee classifies between a fourth and a half of the 10 to 20 proposals submitted as fundable, most of the balance having one or more errors or problems precluding funding, and a few as having serious flaws.

**Writing a fundable proposal is a difficult, time consuming task!**

BS (male bovine egesta), procrastination and cramming does not work well at all!
Books: One from each of five areas is strongly suggested: (Listed alphabetically, Amazon links provided for example only and not as a recommended source, * after first choice)

- **A book on clinical research** – three suggestions, the last being most comprehensive:

- **A book on experimental design** – three suggestions:
  - DJ Glass (2014). *Experimental Design for Biologists*, 2nd ed - Amazon $39 *

- **A book on scientific writing** – three suggestions:
  - Schimel (2012). *Writing Science: How to write papers that get cited and proposals that get funded* – Amazon, $28 *

- **A copy editing book:**

- **A broad coverage, in depth biostatistics book for reference**- five suggestions:
  - Pezzullo (2013). *Biostatistics for Dummies*, - Amazon $17
  - Sokal & Rohlf (2011). *Biometry: The principles and practices of statistics in biological research*, 4th ed - Amazon $158 *
  - van Belle et al. (2004). *Biostatistics: A methodology for the health sciences*, 2nd ed - Amazon $156

Suggested statistical analysis and graphics program:

“R” is a free, open source, very powerful programmable statistics program widely adopted for teaching statistics, doing data analysis, and constructing presentation-ready graphs. Its great advantages are that it does not have annual licensing fees, you can immediately download and run it on any computer connected to the internet, you can continue to use it where ever you go, and you can produce documentable, reproducible analyses and plots that are easily recreated and redone.

  - A (very) short introduction to R - pdf
  - An Introduction to R - html
- R-bloggers (aggregator of 573 R blogs) [http://www.r-bloggers.com/](http://www.r-bloggers.com/)

Introductory R books: (don’t overlook the huge mass of on-line courses, introductory guides, blogs, and so on, such as *Applied Epidemiology Using R* (288 pg pdf), [Cookbook for R](https:// CRAN.R-project.org/doc/bib/R-books.html), [Quick-R](https://quick-r.m stat.wisc.edu/))

- Gardener (2012). *Beginning R* – Amazon $25
- Lander (2014). *R for Everyone*: Advanced analytics and graphics – Amazon $23
- Meys & de Vries (2012). *R for Dummies* – Amazon $30