

An abstract is a one-page summary of the essential details of the 4 essential components of your project, as follows:

introduction [1-2 sentences]; what has been shown previously by you or other labs? What is the rationale for you spending the time, effort and expenses of your experiment (i.e. what were you thinking?)? Follow up this “background” with a *clear statement of the hypothesis that you tested* [1 sentence];

methods [1-3 sentences]; General question to be addressed with the methods section: How did you test the hypothesis? Specific questions to be addressed: What materials and methods did you use? How & where did you get your experimental subject (the dirt)? How many of each sample did you run (what is your sample size & sample characteristics)? What controls did you use?

results [1-6 sentences]; General question to be addressed with the results section: What did you find? Clearly describe & summarize your results.

conclusions [1-3 sentences]; what can you conclude as the result of your experiments? What are the implications of your conclusions? Is there a big-picture meaning of your findings? How did your findings compare with your expectations? How did your findings compare with previous findings (mentioned in the intro)?

You need to give your project a title, followed by a list of the authors (those who contributed significantly to the project). Since each person is writing up their own abstract, you should put yourself as the first author, followed by your lab partners. After the title and authors come the affiliations (where was the work done?).

All text needs to be 12 pt font, double spaced, fully justified, one page max (including title, authors & body of the abstract).

You should use BOLD font for “Introduction”, “Methods”, etc (for each of the underlined sections, above). If your abstract is only a half page or less (including title and authors/affiliations), then you are likely being too brief with what you have, or you are missing something. More than a page is too much, and is unacceptable.

Two examples of abstract are below:

Respiratory Resistance Training increases ventilatory capacity in the elderly

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Introduction: Aging is associated with increased breathlessness and declines in respiratory function. These changes may result in decreased exercise with associated consequences on health and quality of life. We hypothesized that respiratory resistance training (RRT) would increase measures of pulmonary function in the elderly. **Methods:** 15 residents of a retirement community in Richmond, IN (82.2±1.7 years old) received spirometry testing (QRS) at baseline (BL) and were then given a PowerLung “Breather” and instructed to breathe through the device 30 times twice/day. After 9 weeks of RRT, spirometry testing was repeated. **Results:** Participants averaged 54±12 breaths per day (~90% compliance) with the device. Maximum Voluntary Ventilation increased with RRT in 11 of 15 participants (47±7 L at BL and 63±9 L at 9 weeks; a 26% increase vs BL, P<0.01). Forced Vital Capacity increased in 12 of 15 participants (from 2.35±0.27 L at BL, to 2.79±0.42 L at 9 weeks; a ~13% increase vs BL, P=0.054). Peak Expiratory Flow Rate increased 21%, from 4.26±0.6 L/s at BL to 4.71±0.58 L/s after 9 weeks of training (p = n.s.). 12 of the 15 participants reported qualitative improvements in the ease with which they breathe and/or decreased breathlessness with exercise. **Conclusions:** These data suggest that RRT increases ventilatory capacity in the elderly. These preliminary data suggest that larger trials of RRT in the elderly may be warranted.

Throw out the lab manual and let the student inquiry begin! Student designed, semester long research projects model the activities of scientists and enrich the undergraduate physiology laboratory experience

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Introduction: Predetermined labs do not require students to ‘think like scientists’ or to be creative. I tested the hypotheses that 1) student designed, semester long original research projects are feasible, fun, and substantial learning experiences, and that 2) peer-review of student writing is an effective teaching tool. **Methods:** 30 A&P students were given the assignment of testing a novel hypothesis based in physiology. The final products of these semester long projects were a poster and manuscript. Prior to submission, manuscripts were peer reviewed. **Results:** All student groups successfully designed novel experiments, recorded physiological parameters, and analyzed their data graphically and statistically. The peer review process encouraged learning, as they were able to see what other groups had done well (or not-so-well) and it instilled the perspective of a critic/grader. Students found the projects to be rewarding. Several students elected to continue their projects as independent studies and have presented their findings at meetings. **Conclusions:** Semester research projects were manageable, and the peer-review process was a powerful teaching tool. The projects gave students firsthand experience with the scientific method, allowed them to follow their interests, served as opportunities for developing analytical skills and further developed the life skills of public speaking and writing. I highly recommend this student centered approach to physiology lab learning.