

Critical reading in quantitative biology

PHYS 259A

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Why this class ?

- to help physicists assess biological findings and help biologists assess quantitative methods/arguments
(“cheapest” way for math/physicists to learn about bio expt and biologists to learn about theory)
- to protect you from basing research on dubious claims
- to make you a better reader and writer, and ultimately a better scientist
- to raise the hygiene standard of the community
- to expose you to different lines of research in qbio

Key elements to reading biological studies

- significance: how would the findings, if true, change how others work/think (on and beyond the subject)
- validity: does the paper establish key claims **beyond reasonable doubt**
 - complexity of living systems
 - heterogeneity of methods (especially for quantitation)
 - perturbation to physiology by the experiment(analogy to legal proceeding)
- attitude: find out how nature **actually works** rather than how it **might work**
(use worksheet to guide yourself through the reading)

Papers after week 2

timeline for each paper:

- start reading as early as possible
- discuss with others in assigned small group
(ask the instructor if there are unresolved questions)
- submit review (one per group) 2 days before class discussion
- class discussion on Friday (**be prepared for all details!**)

ingredients of the review:

- give concise summary of what was done and claimed
(to demonstrate that you have understood the work)
- comment on significance assuming claims are true
- assess the validity of the findings
- suggest additional work if needed
- overall assessment of the study
- worksheet: you do not need to turn it in