Interdisciplinary Collaboration

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Personal Philosophy on Collaboration

- Collaboration is the best way to increase variety and meaningfulness of work
- Can also have major impact on a whole subject area
- Best collaborators have complementary skills and interests
- Subject matter collaborator needs to understand as much about biostatistics as I do about the subject area (≈ 0.12)
- Reproducible research is a must
- Modern analysis methods and graphics should be emphasized
Methodologist must be a good teacher, have curiosity, and be a life-long learner

Strongly delineate consultation vs. collaboration at your institution

We are rewarded because of $\uparrow$ Prob[grant funded]; more proposals getting stat review
Fostering Collaboration

- Shared collaboration protected time across departments
- School leadership and Promotion & Tenure Committee value team science
- Policy limiting the number of very small % efforts a given faculty member can have
- Occasionally run interference for young faculty when investigator balks at new methods or appropriate authorship
- Consultation clinics can generate future collaborations and provide an escape valve
Collaboration Cost-Sharing Protected Time Plan

- Recognize that idea/grant development must be funded
- Existing grants can only fund proposal work for renewals or highly derivative work
- VU plan with 18 division/departments
- Hard $ funding from other groups with 1:4 match from Biostatistics
- Typical funding: 2.5% M.S. biostatistician per 1% PhD
- Functions: helping to launch new research programs, proposal development, analyze pilot studies, short courses, mentoring fellows and new faculty researchers, assist with journal clubs, manuscript assistance
- Allows us to meet NIH effort reporting rules
School’s promotion and tenure guidelines should explicitly reward collaborative research in all tracks.

Faculty typically self-select from among 3 tracks: tenure track, research track, basic science educator track.

Team science can be fostered in many ways; is now emphasized by NIH.
Warning Signs from Collaborators

- Investigator has quick alternate hypotheses ready whenever something doesn’t work
- Ideas are not based on plausible mechanisms
- She does not want to publish “negative” papers
- Other signs of confirmation bias or data torture
- She believes the only thing you have to offer is data analysis
- Long lag time after you provide results
  - Investigator may not have right priorities to be a good collaborator

Seek the company of those who seek the truth, and run away from those who have found it.

Vaclav Havel
Advice

- Choose energetic collaborators with perseverance, great ideas, and without writer’s block
- Success ↑ when collaborators have publication or grant track record
- Multiple research areas are fine but a central theme is advisable (organ, disease, mode of therapy, diagnosis, prognosis)
- Statistician must be engrained in the subject matter
- Collaborators enjoy stupid questions
Advice, *cont.*

- Get the right amount of respect
  - Set the tone immediately and discuss authorship openly
  - Beware of too much respect
  - Don’t imply to investigator that your goal is to “bless” a “uniquely correct” analysis

- Typically get one separate methods paper: four collaborative papers
  - The methods paper may have 1-2 collaborators if they had methodologic contributions
Advice, *cont.*

- Realize that a huge amount of methodologic research can happen during collaborations
  - New methods or new combinations of existing methods frequently needed to serve research goals
  - This balances careers; less pure protected time needed for methods research
  - Nearly 100% of useful methods were motivated by research in subject matter
- Consider *extreme collaboration* to improve efficiency and reduce e-mail
- Practice 100% reproducible research using modern computing tools
- Don’t be enamored with the latest biomedical technology
  - Much of *omics* and biomarker research has been nonreproducible
It is hard to overestimate how powerfully our discipline trains us to think about complicated issues in ways that allow us to quickly diagnose difficulties in esoteric disciplines to which we have had only several minutes of introduction.

Tweedie [1998]

The business of the statistician is to catalyze the scientific learning process.

G.E.P. Box

The best thing about being a statistician is that you get to play in everyone’s backyard.

J.W. Tukey
References


