

# COLLABORATION AND INTERDISCIPLINARITY

## KEY CONCEPTS

**Collaboration** in science means to do research with a team, rather than solo. Collaborative endeavors often extend research along different dimensions, such as: number of investigators; diversity of sites; variety of disciplines; methods or instruments involved; theories or puzzles implicated; and more. Collaborative work provides opportunities, but also comes with challenges, since it generally requires extra interpersonal work—such as communication, open-mindedness, flexibility, patience, and trust.

**Interdisciplinarity** in scientific research means work that spans different scientific disciplines, or domains, or fields. There are different ways to define what constitutes a scientific discipline, or domain, or field: using (e.g.) theory; community; lineage; method; instruments; outcomes; or some combination thereof. However such bounds are drawn, interdisciplinary scientific work is work that spans and crosses these boundaries. Interdisciplinary work can be done individually, but it is very often done collaboratively.

## TEXTBOOKS & REPORTS

- *Facilitating Interdisciplinary Research* (The National Academies Press 2005; free at [nap.edu](http://nap.edu))

## ASSOCIATED ARTICLES

- Ball's (2019) "Lessons from cold fusion, 30 years on" *Nature* 569: 601.
- Berlinguette et al.'s (2019) "Revisiting the cold case of cold fusion" *Nature* 570: 45–51.

## CASES IN THE NEWS

- Woo Suk Hwang and his American collaborator, Gerald P. Schatten—see Lila Gutterman writing for *The Chronicle of Higher Education*



## DISCUSSION QUESTIONS

1. How do potential problems with collaborators or difficulties with interdisciplinarity arise most commonly or significantly for scientific work in your laboratory or research setting?
2. What do you find most challenging about collaborating with scientists from other domains?
3. How should assessment committees count multiple-authored publications when making hiring, retention, tenure, and promotion decisions?
4. Is the interdisciplinary scientific work which you might do seen and rewarded by your department or institution in the same way and to the same extent that the more traditionally or centrally disciplinary work which you might do is?
5. What do you think about the cold fusion collaborative's recent re-investigation of that scientific subject?

## POLICY & REPORTING

Forming new partnerships or making forays into new scientific domains often has great potential. However, ventures like these also come with some risk.

In any sort of collaboration—interdisciplinary, or not—if you see something going drastically and morally wrong, yet internal recourse fails, you should have some idea about other, external sources of redress; you should know how to “blow the whistle.” This might mean contacting your institution’s Research Integrity Officer (or RIO). It might mean using an anonymous reporting service like EthicsPoint.

Note also that all parties and institutions involved should have policies with respect to what constitutes, e.g., discrimination or harassment. There is aid, if a partner violates standards of professional conduct.

## FINE PRINT

In 1992–3, the National Academy of Sciences (NAS) published a pair of reports on *Responsible Science* (Vol. 1–2), and those reports ushered in an era of ethical oversight centered around the concept of the Responsible Conduct of Research (RCR) at federally-funded American research institutions across the nation. By 2009, the National Institutes of Health (NIH) had mandated that “all trainees, fellows, participants, and scholars receiving support through any NIH training, career development award (individual or institutional), research education grant, and dissertation research grant must receive instruction in responsible conduct of research” (NOT-OD-10-019). The National Science Foundation (NSF) recommends—though does not require—something similar. Both agencies suggest that satisfactory RCR instruction tends to cover: research misconduct; conflict of interest; human subjects research; animal subjects research; collaboration and interdisciplinarity; data acquisition and management; authorship, peer review, and publication; mentoring and being mentored; and the relationship between science and society.

This handout introduces the topic of **collaboration and interdisciplinarity**.