

How to Collaborate

By Sharon Ann Holgate Jul. 20, 2012 , 8:00 AM

Scientist seeks honest, reliable fellow scientist for meaningful research discussions and maybe more. Great sense of humor and a view to long-term commitment preferred.

Sound like a comedy version of a lonely-hearts ad? Maybe, but anyone wanting to work in scientific research would do well to take it seriously. A successful science career requires suitable partners with whom to collaborate. “You have to walk into any research project with an understanding that collaboration is going to be needed,” says Daniel Vasgird, director of research integrity and compliance at [West Virginia University](#) in Morgantown. “It is extraordinarily rare to find a publication in almost any discipline in which there is a single author.”

There needs to be a very defined division of labor.

—*Daniel Vasgird*

Because collaboration is such an important part of research—and research careers—it is never too early to start learning how to collaborate and avoid the many pitfalls that can turn a dream relationship into a nightmare.

The first approach

Researchers need to collaborate with each other to complement their knowledge and skills, access specialized equipment, and expand the data they can utilize in a publication. Often, prospective collaborators know each other. Other times, a mutual acquaintance may make the introduction. But what if the person you want to meet is outside your network? The very first step is often the hardest.

Interested in interdisciplinary collaborations? Read [this Perspective](#) by Stephanie Pfirman and Melissa Begg.

Conferences are great settings in which to initiate collaborations because of the many opportunities they provide for one-on-one scientific discussion. But that doesn't mean it's easy. “It can be really intimidating if you want to start a collaboration with one of the bigwigs in your field and approach them at a conference,” says Lisa DeBruine, a reader in psychology at the [Institute of Neuroscience and Psychology](#) at the [University of Glasgow](#) in the United Kingdom. She advises thinking in advance about how you can integrate your skills and expertise with the research of your potential collaborator—before talking with them about that possibility.

Other common settings for professional interactions are social networks. Psychologists often make use of Google+ and Facebook to post ideas for collaborations and to get cross-cultural projects going, DeBruine says.



Lisa DeBruine

Courtesy of Lisa DeBruine

A poor approach—and a mistake frequently made by Ph.D. students—is to e-mail a scientist telling them you want to do research just like theirs, then ask for data, DeBruine says. Your approach probably won't generate much interest as you are not actually offering anything. "You need to explain what you bring to the collaboration besides enthusiasm," she says.

Preliminary data

Don't assume your chosen partner will make a good collaborator just because their work complements yours. Kathryn Neckerman, a sociologist and senior research scholar with the **Institute for Social and Economic Research and Policy** at **Columbia University** warns (in an e-mail to *Science Careers*) that people can find it difficult to work together even if "on paper" the combination seems ideal. "It's like any other relationship—chemistry matters," Neckerman writes. You may find that your working practices and styles are incompatible, or that your dream colleague simply doesn't pull her or his weight when working as part of a team. Or maybe you just don't get along.

So, once you've vetted your collaborators carefully—don't forget to do reference checks with current or former collaborators—set up a trial phase. One low-risk way to try a new collaboration is to offer to analyze your collaborator's existing data in a new way, or to work on a pilot study, before putting a grant proposal together and committing yourself to the relationship, DeBruine suggests.

Finding your feet

Sometimes, especially in research fields where you are automatically thrust into collaborating (such as experimental particle physics and astrophysics), it can be difficult

to find your feet. “Each time a new large collaboration is started, young people (especially if they are coming from small groups) appear bewildered to understand how they can find a visible part of activity in the experiment,” writes Sergio Petrera, a physics professor at the **University of L’Aquila** in Italy, in an e-mail. Petrera was collaboration board chair for the **Pierre Auger Project**—an international astroparticle physics collaboration involving more than 490 scientists—for 2 years. Yet, “even in large collaborations there is enough work for everybody and [enough] interesting issues to allow young people to emerge,” Petrera continues.



Sergio Petrera

Courtesy of Sergio Petrera

Finding your place in collaborations doesn't end at figuring out how to contribute scientifically. You also need to get to know all of the key people and understand the collaboration's dynamics. “Usually when young people approach [a joint] experiment through their tutors, or reading the papers or documents of the collaboration, they have no feel for the relationships that exist,” Petrera writes. The best way to learn about the culture of a particular collaboration is to participate in the meetings and other joint activities, he observes.

These days, often this contact does not happen face-to-face. Petrera, whose role as the collaboration board chair involved dealing with governance and internal policy, communicated with project members via “e-mail, Skype and **EVO meetings**,” he writes. He and his collaborators (he is still part of the Pierre Auger Project) also use Web sites and wiki pages.

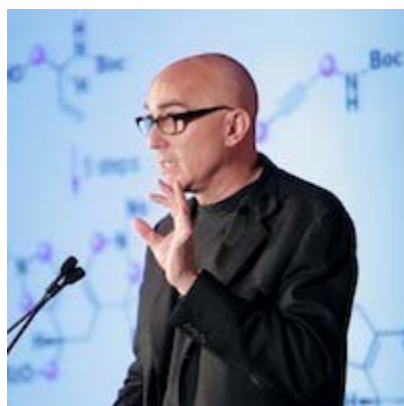
Laying the ground rules

It is vital to put ground rules in place at the earliest opportunity, and to continue to communicate throughout the project. Have an upfront discussion about your mutual expectations of what the work will be about, who will do what, and how. “You need to be clear about what skills you’re bringing to the collaboration and what skills you think the other people are going to be able to bring,” DeBruine says. “There needs to be a very defined division of labor,” Vagird agrees. This includes working out where the work is

going to take place and what techniques are going to be used, explains Vasgird, who has written an online **introductory course** on the basic principles and issues involved in research collaborations for Columbia University.

Project managers and administrative officers are often appointed to coordinate large collaborations, but even if you're in a small project someone needs to be in charge, Vasgird advises. This person must be responsible for setting up meetings so that all the important discussions occur when everyone is present. All key discussions should be noted in minutes, he adds.

Also important is to discuss what you're going to do with the data before they begin to trickle in. "Discussions of expectations regarding critical analyses of data, sharing of data, communicating results, and authorship should occur early and often," says Stuart Schreiber, a professor of chemistry and chemical biology at **Harvard University** and a founding member of the **Broad Institute** in Cambridge, Massachusetts.



Stuart Schreiber

Courtesy of Stuart Schreiber

Think hard and carefully about how to exclude opportunities for research misconduct. While you need to have a certain level of trust, you also need to have a procedure in place to verify every collaborator's data, Vasgird says. "You need to trust and verify. In science these days you don't just take it for granted that [misconduct] can't happen here." If the collaboration is interdisciplinary, and collaborators don't have the expertise needed to check each other's data, they should get someone independent involved, Vasgird says. If somebody feels offended by the idea of having their data verified, "then you probably don't want to work with that person," he states.

Lasting relationships

Once the tasks and responsibilities have been laid out, everyone must stick to them. One potential hazard is to overestimate what you can accomplish. This can be problematic since your collaborators' work will be dependent on yours, Neckerman says; you don't want to be the one who holds things up. "Reliability is a great asset for

collaboration. A good collaborator learns to be realistic about what he or she can deliver,” Neckerman writes.

Also, try to help your collaborators meet their obligations when setbacks occur. “If the delay is due to simple procrastination then a range of strategies from gentle reminders to frank cards-on-the-table talks may help to get things moving again,” Neckerman writes. If there is confusion over what steps to take next, Neckerman recommends going over the division of labor again “in a friendly, non-confrontational way [to] help the collaborator identify and deal with whatever barriers are holding things back.” To collaborate successfully you need to be patient and willing to bend, Vasgird says.



Daniel Vasgird

Courtesy of Daniel Vasgird

Working with the same collaborators on a string of projects can make collaborating easier. Over time, you become familiar with their working methods, says DeBruine, adding that it also makes it easier to avoid disagreements about credit. “You can trade off who is first author and who takes charge of different aspects of the project in different papers,” she explains. Over time, things even out.

Resolving disagreements

Even with ground rules and best practices in place, conflicts can still occur. When dealing with disagreements, “convey your own point of view (whether about process or about the science) clearly and pleasantly,” Neckerman writes. Always listen respectfully to your collaborators. “Know that you may need to compromise sometimes. Part of collaboration is deciding which compromises you can live with and which—such as violations of research ethics—you should not accept,” she writes.

If major disputes arise and the relationship risks turning sour, you may want to get a third party involved. Vasgird recommends asking for independent arbitration from a professor in your department, or from the office responsible for research at your institution.

As with any relationship, collaboration means sharing both the good and the bad. “You’re going to be sharing rewards but also sharing problems and issues,” Vasgird says. You’ve got to share responsibility if things go wrong.

With the correct procedures—and the right collaborators—in place, collaborations should be both effective and enjoyable. “I think my research has gotten so much better since I started collaborating with a lot of different people who have brought in different skills,” says DeBruine, adding that the social aspect of collaborations is one of the nice things about science. “You get to know lots of other people and get other perspectives on your research.”

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