

TAG TEAMS

A collaboration can produce powerful results when everyone pulls together, but if you go about it the wrong way, or with the wrong people, it may all fall down around you.

Kendall Powell finds out how to choose the right partners.

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UNAVAILABLE
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REASONS

Daniel Rizzuto and his postdoctoral adviser study motor control in patients who have electrodes implanted in their brains. As neither is medically qualified, they have to collaborate with neurosurgeons and neurologists.

Crossing the academic-clinical divide, the project hit a major roadblock when ethical considerations ruled out one type of surgery as too risky. Luckily, Rizzuto's partnership at the California Institute of Technology in Pasadena, held two key ingredients to overcome obstacles — good chemistry between the collaborators and open lines of communication. The team eventually settled on a project that met patient guidelines and research goals. "It took a different turn from what we had anticipated, but it's been very fruitful," says Rizzuto.

An unexpected twist is just one of the advantages of collaborating. It can also open up funding opportunities, raise a researcher's visibility and reveal fresh ways to tackle problems. Collaborations come in all varieties — small or multi-group, on campus or between campuses, with big names or with junior peers. New investigators must weigh the benefits of collaboration against their institution's expectations for tenure and the time and resources it may take from core independent research. If lab heads decide to collaborate, they should learn from past efforts the keys to smooth operations — and how to bail out gracefully when collaborations turn sour.

A helping hand

For pre-tenure faculty members thinking of teaming up, the most important consideration is how their department will view collaborative research. Obviously, rookie principal investigators must first establish their own core research programme before branching out. But opinions vary as to whether group work adds to or distracts from that core research.

"There is a perception in some departments that collaboration is a sign of weakness," says Federico Rosei, a nanomaterials physicist at the University of Quebec's National Institute for Scientific Research near Montreal, Canada. But at the same time, he says, collaborations have become increasingly important as scientists now tend to over-specialize in narrow fields.

With expertise in single-molecule measurements, Tom Perkins, an assistant professor at the University of Colorado's physical-sciences institute JILA in Boulder, has several ongoing collaborative projects. Because the work spans diverse disciplines, he says, the individual contributions are clear and no one rides on anyone else's coat-tails. But if there is any doubt, he says, "you want to talk to your chair and understand how your university is going to see this collaboration".

Perkins also notes that team efforts, especially interdisciplinary ones, can provide alternative sources of funding for a beginner. For example, the Human Frontier Science Program (for applicants from much of Europe, Japan, South Korea, Australia and the United States) and the US National Academies' Keck Futures Initiative are "giving out rather large hunks of money to bring people with expertise together", Perkins says.

Small seed grants for collaborations can generate preliminary data for later individual grant applications. But again, a young investigator should know how collaborative grants count in tenure calculations, compared with grants made to a single investigator.

Special cases can also make or break a young collaborator's decision. Steer clear of projects that require international fieldwork or other situations with too many uncontrolled variables. A unique technology can be a boon or a bane — collaborations may be necessary to win institutional support for high-tech, high-cost equipment, but could also lead to getting bogged down with requests.

The right people

There are two main options when it comes to selecting a collaborator: stick to colleagues on your level or shoot for the stars in a field. Rosei warns that collaborating with big shots is a mistake.

"They are busy and will rarely be as committed as you are," he says. Plus, they may get most of the credit even if you do the lion's share of work. Priority and responsibility "will never be equal," he notes.

Tasha Belfiore, a postdoc at the University of California, Berkeley, who has worked on group projects, is especially sensitive to unequal partnerships. "At an early stage, you have a lot more at stake if someone sits on a manuscript or is acting like a jerk," she says. She had better experiences with colleagues "at my own level, where I have more leverage".

But Taekjip Ha, a biophysicist at the University of Illinois at Urbana-Champaign, takes the opposite view. "If you want to work on something that you don't have expertise in, then look for the best person in the world," he says. Having the world's expert in your camp will give the work credibility and ease publication, says Ha. "That's always preferable to working on your own."

Also, Ha adds, well-funded senior collaborators can easily divert resources or postdocs to a project.

If you're a young researcher who joins a group with established, senior investigators, you can jump-start your career, says Simon Watkins, director of the Center for Biologic Imaging at the University of Pittsburgh. "The others will talk about you and raise your visibility — that's important in the hunt for tenure."

Regardless of seniority and reputation, look for personality traits in collaborators such as reliability, honesty and openness. Search out researchers who have the same level of interest, enthusiasm and commitment to pursuing the question at hand. Perkins always begins collaborations with a personal contact by phone or at a meeting, then discusses the idea over several weeks to gauge the other's interest.

Meeting of minds

Most importantly, find someone you 'click' with, says Rizzuto: "If you don't enjoy working with them, how can anything good come of it?" Experienced collaborators say that members of a partnership with complementary knowledge and skills sets will avoid stepping on each other's toes. And those interactions tend to be the most productive.

Catherine Baty, a biological imager at Pittsburgh, says that having collaborators who are businesslike and well organized makes her job easier, but cautions that 'easier' does not always mean 'better'. "Some of my collaborators make me want to take Valium, and yet they are really productive," she notes. "A person who is creative in a different way can make for a potentially powerful collaboration."

The basic recipe for glitch-free collaboration boils down to straightforward communication. The first



S. MYONG



Tips from team players, from top: Taekjip Ha always speaks to collaborators rather than e-mailing; Simon Watkins advises joining established researchers; Daniel Rizzuto says you have to find people you 'click' with; Tom Perkins says check how your university sees your project first.

meeting — ideally conducted in person — should spell out expectations, rules and responsibilities of the collective effort as well as how publication authorship and intellectual property will be divided. Keep all shared data private until the agreed time for disclosure. To ensure no one is left out of the loop, conference calls and e-mails should include everyone involved.

Ha phones colleagues once a month or quarter to be sure projects stay on track and queries get answered. When possible, he invites off-campus collaborators to visit and "tries to feed them well". He also encourages student and postdoc exchanges to learn or at least appreciate new techniques and their limitations.

The written communication of proposals or end results is equally important. Perkins uses online meeting software with his co-authors to edit manuscripts in real-time on the Internet. And the physics-oriented Ha relies heavily on his biochemist partners to keep him from "writing things that are plain stupid, and that would offend reviewers", he says.

When a problem occurs, use the phone and not e-mail, warns Ha, to avoid misunderstandings or delays. If you are at fault, apologize profusely, remedy the situation quickly and move on. Perkins notes that having separate accounts for shared money is a simple way to avoid budget conflicts. And, Watkins points out, on-campus collaborators can always be hunted down on foot for accountability if need be.

Team spirit

If frustrations arise in a large group collaboration, a young investigator should have an ally in the lead investigator, whose role includes that of enforcement officer when someone neglects their duties.

But even with the best intentions, not every collaboration will be a perfect match. "Identify a bad collaboration and weed it out as soon as possible," urges Rosei. Otherwise, it will drag down your other research, siphoning off too much time and energy.

Science becomes more collaborative every day, so young scientists should remember that playing well with others will never go out of style. Team science has its rewards, too. Perkins enjoys learning to speak the disciplinary language of his collaborators and broadening his scientific approach.

He is not stressed about how his collaborations will reflect in his tenure decision. "Fun, interesting science in my field is usually very collaborative," he says. "I'm much more worried about the quality of science I get done, rather than who's on the author list. And then, you just hope your colleagues appreciate getting quality science done."

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WEB LINKS

HHMI/BWF course, Chapter 12 on collaborating
www.hhmi.org/grants/pdf/labmgmt/ch12.pdf
 Human Frontier Science Program
www.hfsp.org
 Keck Future Initiatives
www7.nationalacademies.org/keck