



The new networking nexus

Compared with crafting computational expertise or sharpening gene-splicing skills, networking is one talent many scientists are slow to hone. Luckily, a crop of new websites is encouraging even the most reclusive researchers to rendezvous with colleagues without leaving the lab.

The success of social-networking websites such as MySpace, Facebook and LinkedIn shows the power of the Internet not only to cultivate, but to capitalize on, friendships. Although online networks may seem impersonal, they can do something for scientists that a handshake cannot: highlight common research interests without leaving the comfort of your desk. Say goodbye to name tags and awkward introductions — say hello to profiles and blogs. In the search for jobs, mentors, collaborators or data, these cyber-social mixers are revealing new ways to gain career advice, create collaborations and share resources.

Social scientists

To meet the constant demand for career advice, some scientific associations have harnessed existing sites to provide a networking option. For example, the American Association for the Advancement of Science (AAAS) and the American Institute of Biological Sciences (AIBS) have created networking groups on both Facebook and LinkedIn. There, members search for jobs, seek advice and discuss funding opportunities. Unfortunately, scientific specialties can easily get lost on social networking sites designed to amass large numbers of connections.

A crop of websites is making networking among scientists easier than ever. **Virginia Gewin** logs in.

A growing number of websites, including Nature Network (a product of the Nature Publishing Group, the parent company of *Nature*) and Chemical Forums are coming online to meet more specific needs. Although these sites reach out to a broad spectrum of disciplines, scientists can create more focused forums, groups or blogs to spark more specialized discussions. Some of Nature Network's most popular forums are devoted to evolution and brain physiology. Chemical Forums enables its 7,000 chemists to segregate into everything from physical chemistry to chemical engineering. There's even a Citizen Chemist forum to exchange useful chemistry experiments or download chemistry games.

Scientists with common interests can connect across long distances and disparate scientific cultures. Although Nature Network has portals for London- and Boston-based researchers to find one another, the global forum is the most active. Nature Network editor Corie Lok says quite a few users from the developing world — most notably India, South America and the Middle East — use the site to connect with international colleagues. "For some segments of the scientific world that may feel isolated, online networking sites are a great place to connect," she says.

For example, government research job postings in Italy are hard to find, often posted only in Italian on specific newsletters or websites. Massimo Pinto, a radiology postdoc at the ISS, Italy's higher institute of health, decided to create a portal on Nature Network to translate, publish and so promote these jobs. He wants to encourage transparency and intellectual exchange

between Italy and other countries, traits he admired while doing his graduate work at the Gray Cancer Institute in Oxford, UK. He hopes to see networks create ways to check where people are, so scientists at a conference in Boston can see which of their contacts happen to be nearby for a face-to-face encounter.

With increased funding for cross-disciplinary science, many networks are experimenting with ways to help members collaborate. Chemical Forums founder and moderator Mitch André Garcia, a PhD student at the University of California, Berkeley, set up the Chemmunity website to facilitate a global collaboration to solve a chemical mystery — why hexaiodobenzene changes colour on introduction of liquid nitrogen, only to return to its original colour at room temperature. Garcia hopes it will encourage chemists to work on research outside their niche.

Interestingly, says Lok, interdisciplinary scientists have a strong presence on Nature Network. One computational biologist she spoke to suggested that might be due to the fact that these newer fields don't have established networking channels. As well, computational researchers log serious computer time.

Building a critical mass

Even computer-savvy investigators can find it difficult to kindle an active community. Peter Brantley, executive director of the Digital Library Federation in Washington DC, created a Datanet group on Nature Network to publicize a National Science Foundation (NSF) call for proposals to establish cyberinfrastructure centres of excellence internationally. "I developed the forum as a way for people to communicate outside the bounds of institutional affiliations," he says, but adds that it has been hard to achieve a critical mass of participation.

Another challenge is managing this type of site to ensure that the communication is protected, yet flexible enough to let users discuss sensitive topics. This is a concern for medical professionals, who have been using networks to discuss cases and get advice for more than a decade. For example, the non-profit Doctors.net.uk has firmly planted itself as a must in UK circles. Sermo and Within3 are two new US-based incarnations of the same idea, but for profit. Although Sermo sells member data to companies such as Pfizer (a turn-off to some users), Within3 charges only those hospitals, charities or medical schools that use its service to create a networked sub-community, called a channel. Within3 provides tools for channel partners to document their work as well as conduct polls and surveys or share documents. To attract a wider network of PhDs as well as doctors, Within3 formed a partnership with PrometeoNetwork, a free and non-profit network of doctors and life-scientists.

PrometeoNetwork creator Giovanni Abbadessa, medical director at Ziopharm Oncology in Boston,



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Massachusetts, says that the network has become a way to connect clinicians with basic researchers. He plans to enable users to request job-finding services from PrometeoNetwork. Sermo's newest initiative allows users to post their comments on select journal articles from a "Discuss on Sermo" link established with the journal's publisher. (Nature Publishing Group has created links with 12 of its leading medical journals.) For example, more than 100 physicians participated in a recent discussion of research suggesting that an epilepsy drug might be useful to treat Parkinson's disease. Better communication among practitioners could help speed the translation and adoption of promising treatments.

Some sites do more than just bring people together; they let researchers share data, methodologies and protocols. MyExperiment.org, funded by the UK government, lets users share workflows: the customary protocols for standardizing data, running simulations or conducting statistical analysis on large data sets. Standardized protocols for manipulating large data sets can be tweaked for specific purposes. Users can comment on their usefulness and link to other workflows of interest. Bioinformaticians and geneticists are among those who stand to benefit most. For example, sharing a workflow for identifying biological pathways implicated in *Trypanosomiasis* resistance in cattle allowed another investigator to find pathways involved in sex dependence in the mouse model, says myExperiment project leader David De Roure, a computer scientist at the University of Southampton, UK. Done independently, this type of study could take two years. Such streamlining allows scientists to focus on discovery rather than drudgery, he says.

Tag along with this

Better yet, tagging — assigning a keyword or rating to a bookmarked online workflow or data set — allows myExperiment to connect users with similar resources that may be of interest. NanoHub, part of the NSF-funded Network for Computational Nanotechnology, lets users rate the courses and simulation tools it hosts. "In MySpace, tagging often introduces you to a new music band. On NanoHub, tagging uses the collective wisdom of the community to introduce you to appropriate simulation software," says Noshir Contractor, director of the Science of Networks in Communities lab at Northwestern University, Evanston, Illinois. He says scientists can expect more such sites streamlining their ability to find the right tools and algorithms.

Networking may get more efficient, says Contractor. Its unrealized potential is the ability to take data from networks that currently reside separately, and mash, or merge, them. He says users will soon be able to collectively mine the data of projects funded by several US agencies to see who is collaborating on what topics.

Unfortunately, some 90% of social networking sites won't succeed, says Contractor. "For every MySpace and Facebook, hundreds of others have failed," he says. Science sites that constantly update their offerings with career-enhancing capabilities have the best chance.

And of course, networking sites have their limits. Although they can facilitate connections, blogs aren't likely to become a wholesale substitute for a few beers after work any time soon.

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Job-finders: Giovanni Abbadessa (left) and Massimo Pinto.