Q&A

Data on display

Risking being scooped and having patents refused, some scientists are posting their data online as they produce them. Organic chemist **Jean-Claude Bradley** (left) of Drexel University in Philadelphia, Pennsylvania, and biochemist **Cameron Neylon** of the University of Southampton, UK, describe this 'open notebook' approach.

DREXEL UNIV.; C. NEYLON

What is an 'open notebook'?
Bradley: The basic philosophy of open-notebook science is to have no insider information. Essentially all the information that is available to the [research] group is available to the rest of the world. You have an objective, a procedure and a log section, in which you report what you actually do. Then you've got your raw data files, and you link to those. That is all the information that any scientist needs to be able to figure out what you did and to analyse it. I use a wiki space that gives me a time stamp on the entries.
Neylon: We're aiming to improve scientific communication. The ultimate form would be if everything were available as it happened. That's never going to be for everybody. You still have issues such as patient privacy, the safety of people doing animal experimentation and so on. So in some cases, data shouldn't be made fully or immediately available.

What are the main concerns?
Neylon: The main issue is the fear of rivals stealing data. The second one is: will I be able to publish? And that depends on the publisher. Most publishers regard what we do as the equivalent of presenting at a conference, or a preprint. That hasn't been tested across a wide range of publishers, and there's at least one — the American Chemical Society — that doesn't allow prepublication in any form whatsoever. There's also a legitimate concern that a lot of people will put out a lot of rubbish.

Is this going to make traditional publishing obsolete?
Bradley: No. I'm publishing a paper [based on work that is openly available on my online notebook]. The notebook is about publishing data as quickly as possible. The paper is about synthesizing knowledge from all those results. But we want the best of both worlds, so we want to publish using traditional channels and we want to link back to the notebook.

Are scientists working in industry interested in the idea?
Neylon: The people within companies who are trying to do this are finding it a very hard sell to the board but it is being talked about.
Bradley: If patenting is important to you, you cannot do open-notebook science, it's that simple. But in big pharma, there's an awful lot of background data, which they call precompetitive work, which are really valuable to other people but end up not being as valuable to the company.

Has your open notebook ever been used to claim priority over a discovery?
Neylon: On our blog we had a statement with evidence that a piece of research worked before a paper from another group came out, although probably after the paper was submitted. I'm interested in putting the statement "we were the first to report it" in our paper when we publish the work and seeing what the response is. People's views differ about whether that would be reasonable.

When will the idea become more popular?
Neylon: Open notebooks are practical but tough at the moment. My feeling is that the tools are not yet easy enough to use. But I would say that a larger proportion of people will be publishing electronically and openly in ten years.
Bradley: There are different ways to do this. If you use a wiki-based approach, that's something you could do overnight. But the whole lab needs to realize that it's something they need to do.
Neylon: An important point that sometimes get missed about electronic systems is that other people might be looking at them, so they tend to force much higher standards of record-keeping. The record becomes much better and more flexible, but it involves a lot more work to keep it up to date.
Interview by Katherine Sanderson

INNOVATIVE IDEAS

GARRISON PHOTOGRAPHY

In the third of our election-themed podcasts available online, *Nature* looks at where US innovation policy might go under a new president. Excerpts from our panel discussion:

"One of the things I would like to see the candidates understand — I think Obama gets it intuitively, and McCain may be coming around to it — is that technology and innovation drive long-term economic growth … Real national leadership on these issues, on a consistent and ongoing basis, would be what I want to see from the next administration."
Stephen Ezell, senior analyst, Information Technology and Innovation Foundation, Washington DC

"It's astounding that over the past eight years, the number of computer-science graduates in the United States has decreased by 50%, at a time when computer science became one of the most high-growth job industries."
Stephen Ezell

"It is truly a competition for the best and brightest right now, and we need to do that. If it means stapling a green card to the diploma for people who have a degree in science that we think is valuable, then we should be looking to do it now."
Bill Bates, vice-president, government affairs, Council on Competitiveness, Washington DC

"We need to find ways in this country to get over being so worried about supporting industrial policy and funding, that Valley of Death that exists between our universities and the venture capitalists."
Tobin Smith, associate vice-president for federal relations, Association of American Universities, Washington DC

To hear the full discussion, chaired by our columnist David Goldston, visit www.nature.com/nature/podcast.