

A conversation with Richard Smith, London

# “Why should peer review continue?”

Richard Smith switched from being an editor of the *British Medical Journal* to the board of the Public Library of Science (PLOS). He explains why open access will finally happen and why he is a major critic of traditional peer review.



**T**he open access movement has made good progress in the last year. Are you pleased with these changes?

**Richard Smith:** Yes, since the mid-90s I've been thinking this was bound to happen. The forces that are driving open access are just too strong to resist. Eventually I'm sure all scientific research will be open access in its fullest sense. Not only that you can have access to it for free but also that you can take the material and reproduce it, that you can work with it. Open access has to happen. The fundamental arguments about making publicly funded scientific research available to everyone everywhere are now so strong that in the end they must prevail. Although, I'm not quite so sure about exactly how and in what time frame.

*Who can most efficiently promote the development of open access?*

**Smith:** The people with the most influence are those that fund research. More and more of them are going to say, “If we have paid for your research it has to be made freely available through open access. Why should we be made to pay for the research twice?” It's an absurd situation. The publishers charge for reprints, yet they are not the people adding the value to research. They are simply making profits out of value that has been added by others. But this value is worth much more when it's freely available to everyone. I'd like to explain this with a quote from George Bernard Shaw: “If you have an apple, and I have an apple, and we exchange these apples then you and I will still each have one apple. But if you have an idea, and I have an idea, and we exchange these ideas, then each of us will have two ideas.” Because exchanging ideas is a different kind of commodity.

*This shift in mentality, leading to calls for change, is just happening with funding organisations like the Wellcome Trust and NIH. However, publishers are business people. How will they continue to make money?*

**Smith:** Perhaps they will end up charging quite a lot for actually publishing an article. For example, if you're going to publish in *Nature* or *Science* it might cost you €30,000.

*That's the hybrid model we already have. But currently the fee per article is more like \$3,000. Who could potentially pay ten times as much? Certainly not a researcher who's struggling with a €100,000 grant.*

**Smith:** You're right and I'm not saying this will happen. But when it comes to the publication of clinical trials, €30,000 isn't so much. Such a trial might have cost €20 million.

**“The forces that are driving open access are just too strong to resist.”**



**“Open access has to happen.”**

*Why doesn't open access evolve faster?*

Let me tell you a little story. On the day the Public Library of Science made the announcement that it was going to create open access journals, it just happened I was at the National Institute for Medical Research in Britain. I was meeting with the heads of departments, very distinguished people who published in *Nature*, *Cell* and so on. What did they say? Well, they said that they don't really like the way things are published at the moment. They thought that getting into *Nature* or *Cell* was a very arbitrary, messy process but, by definition, they know how to do it. After all, that's why they're heads of department. They were effectively in power because they had done well with the present system. What worried them was that if there was a different game perhaps they might no longer be so successful. Although they couldn't hide the defects in the present system, in many ways they are nervous about changing it. They want to keep things as they are. Senior people display some sort of instinctive distrust of change.

*Could scientists themselves exert more pressure on major publishers?*

**Smith:** They could by selecting specific journals. Some scientists do so but they are a minority.

*As long as high impact factors are more important for a researcher's career than open access to his publications...*

**Smith:** Certainly I believe they should do more. I've mixed with quite a lot of scientists who are very concerned about this.

What interested me was that in the US there's more anger in the academic community about publishers ripping off academics than there is in Europe.

*How come?*

**Smith:** I'm not sure. People continue to publish in journals where others can't access their work. I don't know why they do it. Scientists – to my surprise – are a very conservative group. When you think how radically the internet has transformed business in finance, music and transport, it's surprising to see how science still tends to go on in much the same old way. A scientific paper now looks remarkably

the same as a scientific paper 50 years ago. Scientists have not begun to use all the possibilities of the internet when it comes to publishing.

*Do scientists lobby for open access?*

**Smith:** Hardly ever. Recently I met a woman in Brussels whose job it is to think about open access. I asked her how often publishers lobby against it. She said they do it all the time. Yet, scientists hardly ever lobby for open access. It seems they're still not motivated enough.

*Publishers are much better organised than scientists.*

**Smith:** Nevertheless, there are clearly some very enthusiastic scientists in favour of open access and their numbers are increasing. However, most scientists still haven't thought much about the issue of open access. These people are just doing their research and trying to publish in the best journal they can get into.

I don't come across many scientists that are fundamentally against open access. A lot of them say, we're going to publish in *Nature* because of its prestige but they're not against the whole idea of open access in the sense that this will destabilise science. There are many that worry about the practicality of open access.

However, publishers lobbying against open access aren't that important. Politicians aren't listening to them. Instead they're listening to people from scientific societies. Many of these societies make a lot of money out of publishing journals and they're saying that if the system changes, they will receive less money and won't be able to fund congresses or young researchers.

*Does that argument have more influence on politicians than the business arguments of the publishers?*

**Smith:** I think so. To my mind there's a tremendous hypocrisy in this. Since I don't want to specifically blame any one society, I'm using the 'British Society of Hypocrisy' as an example. Now, for the 'British Society of Hypocrisy', the prime reason for existing is the promotion of hypocrisy, the understanding of hypocrisy, and research into hypocrisy. Fine, but then how on earth can it justify restricting access to research on hypocrisy in order to make money? So that they can fund more research? Or have more big dinners? This really infuriates me!

*Would you also like to see all raw data on the web?*

**Smith:** Yes. Once again I believe this is public data, collected with public money, and it includes data collected from patients. In a sense this belongs to the community and one advantage is that people can question the findings and conclusions more thoroughly. Certainly within medicine we have this problem all the time. For example, the way pharmaceutical companies present carefully selected data and then come up with conclusions that are not justified by the underlying science. It is much harder to investigate this if you don't have the raw data and it is for that reason that journals like the *Journal of the American Medical Association (JAMA)* will not publish a paper if the statisticians that have contributed to it are employed by a company with vested interests.

*Which has caused a lot of uproar among companies and statisticians?*

**Smith:** For statisticians, because the rule implies that the employed statisticians are biased. Raw data is really valuable stuff. Systematic comparative reviews are very important but these re-

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**“There's little evidence that peer review brings real benefits.”**

views are mostly based on published studies, not on the original data. I think there's evidence showing that studies based on individual patients in systematic reviews are much stronger than studies based on published papers. I saw a very striking number the other day that showed that randomised trials funded by pharmaceutical companies are published several times when they show positive end results. Whereas the negative ones are not published at all. So if you base a review simply on what is published you end up with a false view. Besides, you may think you have three separate studies, but actually they're dealing with the same patients. That's why going back to the original patient's data is scientifically much more meaningful.

*You are a major critic of peer review. However, a lot of scientific stories appear in the mainstream media before they appear in peer-reviewed journals despite publishers' efforts to force scientists not to talk about their data – at least not to journalists - before they are officially published.*

**Smith:** These sort of media reports are irritating for people who want to critically appraise the information. Either it's a university putting out a press release, or it's a scientist talking to a journalist, or something that is presented at a conference. Imagine that you're presenting some complicated data rather fast at a congress and that a journalist comes to discuss it with you. If you decline to talk to the journalist, your story may come out very wrong in the newspaper, whereas if you've already got the full research paper up on the web then those people who are qualified can readily look up and refer to the material they need.

*You even want to completely stop traditional peer review. Aren't you afraid that unreviewed results and papers will spam the community?*

**Smith:** No. I can't see why peer review should continue. It should be stopped because there's little evidence that peer review brings real benefits.

## Richard Smith



... is a member of the board of the Public Library of Science (PLOS). Previously he was editor of the *British Medical Journal (BMJ)* and chief executive of the BMJ Publishing Group. Smith, together with colleagues at *JAMA*, has done much to search for evidence for true value in the cornerstone of medical publishing,

peer review. He reports on the up- and many downsides of medical publication in the book, *The Trouble with Medical Journals*.

Smith is now Executive Director of a programme to counter chronic diseases like cardiovascular disease, cancer, diabetes and obesity in the developing world. This initiative is funded by the National Heart, Lung and Blood Institute (UK) and by Ovations, a subsidiary of the United Health Group, a large health and wellbeing company in the USA.

*That's a provocative demand.*

**Smith:** I've been studying the peer review process for a long time. Peer review wasn't even studied until about 20 years ago. Nobody did any kind of analysis of peer review, nobody collected data. It just kind of went on, because it's at the heart of science, determining what should be published, where it should be published and who should get research funding.

*This process is absolutely fundamental to science.*

**Smith:** It has never been examined. Which itself is a striking observation because scientists are expected to question everything, to turn things over and to somehow be fundamentally radical. However, the nature of this group of people is actually very conservative. I mostly meet clinical scientists and within clinical medicine we've had this whole movement of evidence-based medicine. People are now much more cautious about saying, "we ought not to use this drug or this operation unless there's some kind of evidence to back it up". But when it comes to journals, the same people are saying: we ought to have double blind reviewing, or to have two peer reviewers. They make strong statements about things to be done without any knowledge of the evidence at all.

*Perhaps people think that open access and getting rid of peer review go together?*

**Smith:** They don't need to. It's extremely difficult to get into *PloS Biology* or *PloS Medicine*. We have rejection rates of 90 to 95 percent documenting a rigorous peer review process. Open access doesn't get rid of peer review.

*Then people began to examine the peer review process. Indeed, we're about to have the sixth congress on peer review next year in Canada.*

**Smith:** At a joint meeting of UNECSO and the American Association for the Advancement of Science (AAAS) five or six years ago, there were some 30 editors. I was probably the only editor

from a biomedical journal. I talked about all of this and people just looked blank. These people have been completely unaware of the studies that have been done on peer review. When you go to the congresses on peer review you see lots and lots of evidence about its downsides: it's slow, it's expensive, it's prone to bias, it's a lottery, it's easily abused, it doesn't pick up errors or fraud and you see very little evidence of the upside.

Drummond Rennie, deputy editor from JAMA, said that if peer review was a drug it would never get on the market because we don't have evidence of efficacy and we have lots of evidence of risks and dangers. And yet people continue to cling to it.

*How do scientists respond to the results of research on peer review?*

**Smith:** They respond in different ways. One answer is that somehow the studies that have been done are too crude to pick up the benefit. I think a lot of people believe that because they themselves are so deeply rooted in the peer review system.

A second answer is: Let's try and find a way of improving peer review. Actually we tried double blind reviews but that didn't really produce any benefit. We tried opening it up, in the sense of letting authors know the names of the reviewers but the results of that have never been published. We also tried training the reviewers but none of these things made much difference.

*So peer review is a black box?*

**Smith:** Well, you put in a study or a grant application at one end and, after a mysterious process, a more or less sensible answer comes out at the other end. We need to transform it into an open scientific discourse. This happened originally. In the 16<sup>th</sup> or 17<sup>th</sup> century you didn't publish much in journals. You presented your studies to a group of people and there would be a discussion about the evidence. In some way that continues to happen at big congresses. Potentially it could also happen on the Web.

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