What is peer review?

Peer review in a soundbite:

'Peer review is a form of scientific quality control.'

'Peer review is a form of self regulation for science.'

'Peer review is the process of checking, criticising and improving research.'

'Peer review is where scientists open their research to the scrutiny of other experts in the field.'

Expanding on the soundbite:

'It is a process which is almost unique to science, in which scientists review and criticise each others' work before they make it public.'

'It is there to help journal editors to ensure that the scientific research that they publish is credible, new and interesting.'

'It is a bit like a *Which?* test, where experts look at products before recommending them to the public.'

'It's a fundamental form of crap detection.'

'It's a way of sorting the wheat from the chaff.'

'It's part of a process that starts from your very first research result and never actually ends, where you show your work to colleagues, scientific peers and other experts who can give an assessment of whether it is original and plausible, and who will also look for errors.'

[On funding] 'Peer review pervades science from beginning to end – it determines where the money goes, how it is spent, and whether it was worth it all at the end of the day.

How does the peer review process work?

The process:

'Most journals select two or three independent experts who understand the field that the piece of work covers. They assess the scientific method, factual accuracy, results and conclusions put forward by the authors, and pass their comments anonymously. The comments then go back to the author of the paper and they then have the opportunity to change or improve their research paper before it is published.'

The reviewers:

'The people who review the research are people with equivalent skill, competence and knowledge.'

'They are independent experts in the field.'

'The peers are people who have sufficient expertise in the field to assess the credibility of new research.'

'The reviewers remain anonymous, and cannot be an interested party, such as your father-in-law.'

'The reviewers are unpaid, and often have to do this in their own time.'

What the process enables:

'It is a way of ensuring that the paper tells you how you can go out and do the experiment yourself.'

'Peer review is used to check that people are using appropriate techniques for a particular part of science – are you using a metre rule to measure atoms, for example.'

What the peer review process doesn't do:

'Crucially, it points scientists to work that is credible, but doesn't necessarily tell you if it is right.'

'Peer review doesn't guarantee that a piece of research can be replicated successfully – but it does ensure that all the information is there so that other scientists can actually try it out for themselves.'

'The checking process doesn't end with publication – further criticism can come from the rest of the scientific community in letters to the editor, dialogues at conferences etc.'

'Peer review is only the start for a piece of new research – science stands or falls on the repetition of those experiments.'

'Peer review cannot pick up certain types of misconduct. If someone is deliberately cheating then they can get through the peer review process.'

'Peer review can spot mistakes, but it's not a forensic investigation – these reviewers are not the science police.'

'Peer review is a way of preventing scientific anarchy, but it's not about achieving perfection.'

'Peer review is not about detecting fraud or genius.'

Why is peer review important to science?

'No scientist gives a finding much credence unless it has been peer reviewed.'

'The first question a scientist will ask is whether a piece of research has been published in a peer reviewed journal.'

'Peer review has the confidence of the profession because it sets out to check, criticise and improve.'

'On average, you can trust peer reviewed research more than non-peer reviewed research.'

'Scientists are often grateful for the peer review process, it provides them the opportunity for honing and fine-tuning their research.'

'Without peer review, we would have science published direct to the public and there would be health scares every time someone came up with a new hypothesis.'

'The literature is our body of science, so all scientists feel a duty, and have a vested interest, in keeping that knowledge accurate and as pure as possible.'

'Scientists have faith in the peer review process. They do not read a peer-reviewed journal like they read a newspaper – in general they know that they can believe what they are reading.'

'Peer review tends to improve the quality of scientific papers.'

Work that has not been peer reviewed

The time that peer review is most likely to crop up in an interview is when a piece of research *hasn't* been subject to the peer review process. It is important not to demonise a scientist for making claims that have not been through the peer review process, as it can often create a scenario where the public sees a lone hero fighting the Goliath of the scientific community. Instead, use this as an opportunity to expand on what the actual process of peer review is, why it is important and question why the scientist would opt not to be included in that process.

'Why did they have so little confidence in their methods and results that they would not submit it to their peers?'

'What error detection system did they use?'

'I wouldn't trust a press release, but I would trust a peer reviewed paper.'

'I would be very suspicious of a scientist who bypassed peer review and went straight to the media.'

'These people are setting themselves outside the scientific process – and you have to ask why this is.'

'Should we scare patients to death with every new hypothesis that comes along, or should we check them first?'

'Extraordinary claims require extraordinary scrutiny.'

'The trouble with going direct to the public with your findings is that a press release doesn't provide the necessary details to check and verify the claim.'

'This avoids the scrutiny and balanced assessment of peer review, and often garners publicity by scaremongering.'

'We are inviting people to become part of the scientific community by submitting their work to this process.'

'On an emotive issue, it is even more important to use the scientific quality control mechanism.'

'Scientists would not set out to criticise genuinely innovative knowledge.'

'Peer review is not about suppressing leftfield views. Scientists would give anything to find a cure for cancer, so they're hardly likely to suppress anything they think might lead them to it.'

Where to go for more information

www.parliament.uk/post/pn182.pdf
Briefing on peer review from Parliamentary Office of Science and Technology

www.com.unisa.edu.au/epi-ba6/module9/
'What is peer review?'

ei.cornell.edu/toxicology/peerreview/prtutorial/what.asp
Simple introduction to peer review

www.ama-assn.org/public/peer/7_13_94/pv3089x.htm
'Peer review – crude but indispensable'

www.psa.ac.uk/Publications/psd/1996/collins.htm
Harry Collins on the pros and cons of peer review.

Science Media Centre
where science meets the headlines

peer review in a nutshell

a guide for your news interview

This is a guide for scientists preparing for a news interview about the trustworthiness of a piece of scientific research. This sort of question will often prompt an answer that refers to peer review. But this wrongly assumes that the general public fully understand the process of peer review in scientific research.

This leaflet offers some effective ways to explain peer review in a brief news interview: what it is, how it works, and why scientists rely on it so much. It refers specifically to the peer reviewing of papers for publication, rather than peer review of funding applications. The content of this guide was compiled by a working group of leading scientists, journal editors and journalists.

It forms part of the SMC's How Science Works series, designed to encourage scientists to use the opportunities provided by media interviews to communicate more about the process of science.

Other guides available from the SMC include *Communicating Risk in a Soundbite*, and *When Animal Research Hits the Headlines*.

Peer review **1** a form of scientific quality control. **2** a process where scientists open their research to the scrutiny of other experts in their field. **3** the checking, criticising and improving of research by other scientists of equivalent expertise.

For more details, contact the Science Media Centre:
020 7670 2980
smc@rigb.org
www.ScienceMediaCentre.org

This leaflet is sponsored by Copus
connecting people to science