

Research misconduct and public trust

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The reputation of scientific research, and particularly biomedical research, was dealt a severe blow as 2005 drew to a close, by the very public revelation that papers on the creation of human embryonic stem cells, published in *Science* by Dr Woo Suk Hwang and his colleagues from Seoul National University,^{1, 2} had been withdrawn as fraudulent.³ It has also been asked in the general, as well as the scientific, media why Dr Gerald Schatten, a scientist at Pittsburgh University, was named as a senior author on one of Dr Hwang's papers although he had not performed any of the experiments which were all done in Seoul. The unravelling of these papers has led to the questioning of other papers from the same group. The claim to have created a canine clone ('Snuppy') has proved genuine (Lee B.C. *et al.* 2005; *Nature* 436:641⁴), but the full extent of the scientific scandal may not yet have been uncovered. One may also be forgiven for wondering why Dr Hwang received so much acclaim, not to say adulation, for experimental results no one had confirmed. Furthermore, Dr Hwang's scandal was not the only major episode of research misconduct reported in 2005. Dr Eric Poehlman, a North American scientist, accepted that he had falsified 17 grant applications to the National Institutes of Health for about \$3 million dollars, and fabricated data in 10 publications in what has been called 'the biggest case we have ever had' by the Office of Research Integrity.⁵ Most recently, Dr Jon Sudbø, a Norwegian cancer expert, published a paper in *The Lancet* which has now been withdrawn as the investigating commission of his Institute found it contained fabricated material.⁶ The *New England Journal of Medicine* is also now questioning two publications by the same author in that journal in 2001.⁷ These revelations have led to an oral cancer prevention trial in the USA being postponed.⁸

Unfortunately, we have been here before. Farthing reviewed the problem of research misconduct and its prevention and detection in *The Journal* two years ago,⁹ and Smith reviewed the matter again very recently.¹⁰ Farthing showed that this is a problem worldwide, and described his experience of it as the editor of the frontline gastroenterology/hepatology journal *Gut*, pointing to the

urgent need for the UK to catch up with preventive practices in other countries. The medical Royal Colleges in the UK have long been concerned to prevent research fraud. The Royal College of Physicians of London published a report with recommendations in 1991¹¹ and the Royal College of Physicians of Edinburgh held a Consensus Conference and published the results in 1999.¹² Progress has been slow, but we are happy that a UK Panel for Health and Biomedical Research Integrity will start to function later this year under the guidance of Professor Sir Ian Kennedy, an expert on medical ethics and health policy, and with wide support from UK institutions involved directly and indirectly in research. The panel will develop a code of practice and support whistleblowers, but employing institutions will be responsible for investigating allegations of fraud. Professor Farthing, a Fellow of this College, has been involved in a three-year pilot of this scheme, the function of which will be vital to maintaining the good name of British science.

However, science should not rest too long on laurels such as this. The establishment of National Organisations to detect (and if possible prevent) research fraud is very important but it is not sufficient on its own. A public better informed about the nature of science would perhaps be less credulous about believing startling and unconfirmed new findings and would provide one bulwark against fraud. Wade, writing in the *New York Times*, pointed out the need to distinguish between 'textbook' science which has stood the test of time and repeated experimentation and can largely be relied on, and 'frontier' science which appears for the first time in journals and is much more likely to be wrong.¹³ These 'frontier' papers are now often reported in the general media, not always in context and often in terms of breakthroughs, and the public can easily be misled. Journals and their authors are not unhappy that general media reporting of their papers occurs as this widens dissemination of research reports. However, difficult as it may be, journals should take a greater interest in how their papers are reported. A *New England Journal of Medicine* editorial has addressed this problem, and called for better sources of background

information for the public.¹⁴ Readers will be aware that the Scottish Royal Colleges maintain a website (started in this College) which has attracted steadily increasing attention (behindthemedicalheadlines.com¹⁵) aimed at fulfilling just this need.

Peer review is the standard way in which journals try to ensure the validity of the papers they publish. Needless to say, there have been calls to improve peer review and make it more stringent in the light of the Hwang scandal, yet peer review itself has been under attack.¹⁶ Whatever becomes of this debate, it should be remembered that peer review has not been designed to detect fraud (though it may do so) and proceeds on the basis of trust in the integrity of scientists. Furthermore, making peer review too stringent could stifle exactly the 'frontier' science which should be published. Rather, institutions and journals should be more aware of research fraud and develop separate ways of preventing and detecting it. We do not know how frequently serious research misconduct occurs. Richard Smith, previous editor of the *BMJ*, cites anecdotal evidence that it is not rare, and he quotes Mike Farthing, the founding Chairman of the Committee on Publication Ethics, as estimating that major British institutions have about one case a year.¹⁶ Less serious misdemeanours are probably much more common. Martinson *et al*¹⁷ (See *Medibytes*) found that about 10 percent of the research workers they questioned admitted to dishonest practices, and Papadakis *et al*¹⁸ (see *Medibytes* in our last issue) found that doctors getting into trouble with regulatory authorities often have a history of delinquent behaviour going back to their student days. In

other words, undesirable research practices are not rare, and those eventually caught out may have a long history of dishonesty behind them.

In the long run, we may be able to select university applicants likely to have more desirable attitudes and behaviour using tests such as the UK clinical aptitude test (UKCAT) due to be introduced at some UK medical schools in 2007,¹⁹ though such tests have their own obvious dangers.

Improving professionalism among scientists may also be important in establishing stronger peer pressure to being honest and might even change individual behaviour. In this regard, the Royal College of Physicians of London has very recently published an important report on the future of medical professionalism, the recommendations of which could with advantage be extended to scientists.²⁰ What is sauce for the medical goose may be sauce for the scientific gander. Finally, the penalties for serious research misconduct should leave no-one in any doubt as to the seriousness of the matter. It has been announced that Hwang and his colleagues are to be prosecuted in the South Korean courts, and this is a fate which could await others.

What ever the future holds for the prevention and detection of research misconduct, no-one can now claim ignorance of its occurrence. science has brought inestimable benefits but its continuing support depends on public trust. Support for science cannot be left at the mercy of dishonest researchers.

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