

## why research freedom is crucial to science

Government bodies rely on evidence based science in order to make health-care recommendations to the general public. In turn, members of the public trust that the scientific information that is being given to their doctors is based on evidence, allowing them to feel confident in the treatment they receive. For research institutions, integrity in research is extremely important because poor results of newly developed drugs or surgical procedures or incidences of harm to the public can affect their reputation and funding and ultimately hinder the advancement of science.

### Politics in Science

In recent years, politics has become increasingly merged with science, particularly since the global financial crisis. Profit from the pharmaceutical industry helps cash strapped countries to maintain services and keep businesses open. It is used to sponsor universities and medical schools to train future physicians and to provide the financial backing for research programs. In 1977, pharmaceutical companies invested 1.3 billion dollars into research and development programs. By 2002 this had risen to 32 billion, a 24 fold increase in 25 years and more than the operating budget for the National Institutes of Health. This can color the attitudes of universities towards independent research and freedom in science because they may feel that their funding will be removed if they don't steer their research in a particular direction. The problem is not only limited to individual research institutes but extends into the heart of government, who owe a sizable portion of their budget to the pharmaceutical industry. Ministers or congressmen placed in charge of the economy or business are given the task of deciding upon scientific policy, making conflict of interest likely and shaping science so that it is no longer based on the merits of research but on the political and commercial interests of a particular party.<sup>1</sup>

### Publication Bias

The system of peer review is a cornerstone of science, designed to ensure academic standards are being kept and enabling

researchers to share information, apply that knowledge to current ongoing research and critically review scientific ideas. This has three functions, to push scientific knowledge forward, to create solutions to problems and to ensure that peers of a similar academic background keep a rigorous check on standards of research before it is published in any scientific journal. Unfortunately this system isn't perfect and is open to intellectual bias, particularly if the researcher concerned is receiving grant money from the company manufacturing the drug or attending conferences held by that company. Publication bias may then occur, where only research with favorable results is published so as not to contradict a hypothesis or make public the poor performance of a potential new medicine. Cherry picking data in this way can lead to an over-estimation of the drug's efficacy or safety and put the public at risk of unintended side-effects or ineffectual treatments. Keeping researchers independent is one way to minimize intellectual and publication bias.<sup>2,3</sup>

### Outdated Evidence

One of the consequences of publication bias is to prevent the dissemination of new scientific information. New negative data on drugs can go unnoticed by regulatory authorities when it isn't published or is abbreviated, leading to the approval or continuance of the use of drugs that don't do what they are claimed to. This problem is well documented in stroke research and stroke patients fail to receive the most appropriate treatment because their doctors are prescribing outdated or unproven medications or even being given medication that is dangerous to their health. An example of this is the drug Rofecoxib (Vioxx) – formerly one of the most frequently used drugs in the United States, it nearly doubled the risk of stroke and myocardial infarction but the manufacturer misrepresented trial data and advised its sales staff not to answer direct questions from physicians about cardiovascular events in patients taking the drug. In order to find safer and more effective medications for stroke and other neurodegenerative diseases it is vital that negative studies are published.<sup>4,5</sup>

### Research Fraud

Deliberate research fraud isn't as common as intellectual bias alone, but it is still widespread and occurs among various research specialties and can involve the falsifying of documents or data or ignoring study guidelines. In a survey of study authors in 2005, 17% of the surveyed researchers in clinical drug trials personally knew of fraud in research occurring over the previous decade. John Ioannidis, writing in PLOS Medicine, goes a step further in claiming that most published research findings are false due to weak study design and bias. A finding is less likely to be accurate if there is greater financial interest or other prejudice involved with those conducting it. There is a high rate of non-replication of findings so many new discoveries in medicine cannot be definitively confirmed. Having several independent research teams testing a hypothesis and seeing if a finding can be reproduced would bring a higher degree of accuracy in clinical trials and reduce the incidence of research fraud.<sup>6-8</sup>

### Turning the Tide

The scientific community have begun to address issues of conflict of interest, publication bias, politics and industry sponsorship. Rules are being tightened at medical schools and other organizations to prevent undue influence from pharmaceutical companies. The world's biggest drug company, Pfizer, recently decided to stop funding classes for doctors because drug companies and medical education and research should be separate.

It is vital for the advancement of scientific discovery and for the health and safety of the public, that research institutes support independent study that is free from politics and government agenda and that studies conducted by commercial companies are subject to vigorous scrutiny by independent research teams. In this way the public can have a greater level of assurance that their treatment plan is formulated from evidence based science rather than glorified advertising and spin.

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**References**

1. Responsible Conduct of Research, Conflicts of Interest, accessed June 23, 2014, [http://ccnmtl.columbia.edu/projects/rcr/rcr\\_conflicts/foundation/#sup4](http://ccnmtl.columbia.edu/projects/rcr/rcr_conflicts/foundation/#sup4).
2. Tom R. Eliminating Publication Bias: The Effect of Negative Trial Results. *J Natl Cancer Inst.* 2000; 92 (9): 682.
3. Ulrich D. Fighting publication bias: introducing the Negative Results section. *J Cereb Blood Flow Metab.* 2010; 30(7): 1263–1264.
4. Prasad K. Publication bias perpetuates use of ineffective drugs in stroke. *International Journal of Stroke* 2009; 4(3): 183–184.
5. Living With: a Family Member with Dementia, PsychGuides, accessed June 23, 2014, <http://www.psychguides.com/guides/living-with-a-family-member-with-dementia/>.
6. Ashwaria G. Fraud and misconduct in clinical research: A concern. *Perspect Clin Res.* 2013; 4(2): 144–147.
7. Jerry Avorn, MD; Niteesh K. Choudhry, MD, PhD, Controversies in Cardiovascular Medicine, *Circulation.* 2010; 121: 2228– 2234, accessed June 23, 2014, doi: 10.1161/CIRCULATIONAHA.109.869636, <http://circ.ahajournals.org/content/121/20/2228.full>.
8. John PAI. Why Most Published Research Findings Are False. *PLoS Med.* 2005; 2(8): e124.