

# Call for moratorium on xenotransplants

*Sir*— The Asilomar moratorium on applications of recombinant DNA research, agreed to by molecular biologists in 1974, marked a turning point in the approach of biologists to their responsibilities to the public in developing a technology with unpredictable consequences.

That the worst-case scenarios envisaged at the time did not materialize in no way detracts from the merit of the caution taken. Today, we are once again faced with a similarly perplexing quandary.

Xenotransplantation, the transplantation of animal organs, tissues and cells, promises substantial benefits in the long term<sup>1,2</sup> yet also creates a risk that infectious agents from the donor animal might jump the species barrier to man, not just infecting transplant recipients but also spreading to the general population<sup>3</sup>. We

believe that a decision on whether to proceed at present with clinical trials of xenotransplantation should not be left to the traditional technical-based approaches that regulatory agencies use to evaluate new medical technologies.

Given the potential risk to the public, the issue is first and foremost an ethical one. Before introducing a regulatory framework driven by technical considerations, an informed public debate is needed so that the public can decide whether it wishes to consent to clinical xenotransplantation at all and, if so, under what conditions.

Until such a review is completed in the United States, we advocate a moratorium on all forms of clinical xenotransplantation, a recommendation discussed more fully elsewhere<sup>4</sup>. At the same time, fundamental research in xenotransplantation should be

actively supported, given that it promises not only to advance our understanding of the immune and vascular systems, but also to fill some of the many gaps in our understanding of the problems, benefits and risks of potential clinical application of this technology.

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1. Bach, F. H. *et al. Nature Med.* 3, 944–948 (1997).

2. Isacson, O. & Breakefield, X. O. *Nature Med.* 3, 964–969 (1997).

3. Patience, C., Takeuchi, Y. & Weiss, R. A. *Nature Med.* 3, 282–286 (1997).

4. Bach, F. H. *et al. Nature Med.* 4, 142–145 (1998).

## Equal opportunities in Canada

*Sir*— Prompted by the report of a large difference between award rates for women and men in the postdoctoral fellowships competition of the Swedish Medical Research Council (*Nature* 387, 341; 1997), the Medical Research Council of Canada has assembled data on approval rates in its own programmes.

MRC-Canada expects that women and men should have equal opportunity in competitions for grants and awards. To that end, we advise members of selection committees that, when assessing the scientific achievements of applicants, they should take into account factors such as time devoted to child-bearing and raising.

For the Operating Grants programme, MRC-Canada's principal mechanism for supporting high-quality research projects, the approval rate over a three-year period was 25.4% for applications led by women (297 out of 1,167) and 26.6% for applications led by men (1,160/4,368). A Chi-square test reveals that the difference is not statistically significant.

In competitions for MRC-Canada scholarships, an award that provides five years of salary support for recently trained researchers, there is similarly no statistically significant difference between the approval rates for applications from women (14% or 20/143) and men (16.6% or 64/386).

MRC-Canada fellowships offer personal support for two types of developing researcher: PhD graduates who are pursuing postdoctoral training and health professionals who are undertaking intensive

training in research. For five fellowship competitions, the overall approval rate is 12.9% for applications from women (111/858) and 16.3% for applications from men (222/1,361).

The difference is statistically significant ( $p < 0.05$ ). Nevertheless, in two of the five competitions, the approval rates for applications from women and men are virtually identical.

We should expect to find variation in scientific review processes, not only among agencies around the world, but also among programmes. For example, at MRC-Canada we use classic peer review in the assessment of proposals for operating grants whereas for fellowships we ask a multidisciplinary committee to assess the research potential of candidates. It is reassuring that award rates in operating grants competitions indicate equal opportunity for women and men scientists. For research training programmes, such as fellowships, where candidates are not yet established scientists, we believe that assessment criteria should include not only the candidate's research accomplishments and projects (both of which may have been strongly influenced by past and present research supervisors) but also the candidate's critical ability, independence, perseverance and so forth.

We are working to ensure that none of the criteria involved is systematically influenced by gender.

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## Kuhnian pastiche

*Sir*— Your leading article of 8 January<sup>1</sup> worries about the apparent disregard of biology for Thomas Kuhn's ideas, and seeks an explanation for biology's growing public profile. The latter is an interesting problem for the sociology of science and deserves attention, the former is an empty issue. Might it not be that biology does not fit in simply because of major limitations in the Kuhnian conceptual apparatus itself?

Margaret Masterman<sup>2</sup> once found that, within the confines of his short book, Kuhn had used the term 'paradigm' with about 21 different meanings. Equally obscure is the mechanism called 'Kuhnian revolution', and the 'incommensurateness' version will not do as it begs more questions than it answers. For how is it to be adjudicated upon? If an encompassing frame or universal perspective did already exist to ascertain true 'no derivation' of one paradigm from the other, why not use this very external frame to describe and explain scientific change?

Kuhn's ideas were a bad pastiche of Gaston Bachelard's. The great Frenchman kept well away from facile accounts, particularly from those that 'solved' the problem in abstract and had no regard for the history of the specific sciences.

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1. *Nature* 391, 107 (1998).

2. Masterman, M. in *Criticism and the Growth of Knowledge* (eds Lakatos, I. & Musgrave, A.), 59–89 (Cambridge Univ. Press, 1970).