

No evidence of sexism in peer review

Sir— A recent study of peer-review scores for postdoctoral fellowships at the Swedish Medical Research Council demonstrated that women had to be 2.5-times more productive than their male colleagues to get the same peer-review rating in competitions for personal fellowships¹.

Using the same approach, we have audited recent applications to the Wellcome Trust and the UK Medical Research Council to examine whether there is discrimination in awarding practices^{2,3}.

The table presents the outcomes of grant applications for fellowship awards and project grants in the Wellcome Trust and MRC. There is no *prima facie* evidence that women are discriminated against in the awarding process — the award rates for both sexes are approximately the same.

Neither is there any evidence that women need a more impressive publication record than men to be successful in either organization's competitions. Bibliometric analysis demonstrated that there was no statistically significant (that is, $P \geq 0.05$) difference in the number of papers published by successful men and women. For example, female candidates awarded project grants by the trust published, on average, 11.2 papers in the five years preceding the application, compared to 13.8 papers for men.

As an indirect indicator of quality, the final column in the table shows the average journal impact factor for the journals in which the papers were published⁴. For the Wellcome Trust's project grants and the MRC's Career Development Awards there was no significant difference between men and women. However, in the Senior Research Fellowships in Basic Biomedical Science men reaching the interview stage published in higher impact journals than women ($P < 0.05$).

Another finding is that women do not apply for research funding in the numbers that might be expected from the numbers of women employed in academic positions in medical and biosciences departments in UK universities. For example, for project grants, where the sex of the applicant was known, only 19.6% (268/[1,097+268]) of applicants to the trust and 21.3% (167/[617+167]) of applicants to the MRC were women. Yet across all UK universities, 44% of academic staff (whether research oriented or otherwise) in medicine and biosciences are women^{2,5}.

In conclusion, this study has shown no evidence of discrimination against women in the assessment of applications for Wellcome Trust and MRC personal fellowships or grants. Nevertheless, it is notable that so few

The outcome of biomedical grant applications

	No of applications†	Success rate (%)	Av. No of publications‡ (over a 5-year period)	Expected 5-year impact§ (av. citations/paper)
Wellcome Trust				
<i>Project Grants (1996)¶</i>				
Men	1097	27.5	13.8	11.7
Women	268	26.9	11.2	13.3
Total	1387	27.5	12.5	12.5
<i>Senior Research Fellowships in Basic Biomedical Science (1994–95/96–97)¶¶</i>				
Men	220	5.5	14.3	29.3
Women	105	8.6	11.8	22.7*
Total	354	5.9	13.5	27.0
Medical Research Council				
<i>Project Grants (1996)¶</i>				
Men	617	26.4	–	–
Women	167	29.3	–	–
Total	850	25.6	–	–
<i>Career Development Awards (1993–96)</i>				
Men	169	16.6	5.0	22.3
Women	107	10.3	4.6	28.6
Total	276	14.1	4.9	24.1

* $P < 0.05$

† The sex of some applicants was not recorded.

‡ Papers retrieved from the Science Citation Index (SCI) and Social Science Citation Index (SSCI) were limited to articles, notes and reviews in accordance with normal bibliometric analysis of substantive research outputs.

§ Five-year citation records, taken as the average number of citations received by items published in 1990 and cited in journals processed for the SCI/SSCI in the years 1990–94.

¶ The bibliometric analysis of successful project grant applicants was restricted to a random sample of 25 men and 25 women.

¶¶ To overcome problems with small numbers, the bibliometric analysis of Senior Research Fellowships in Basic Biomedical Science is based on those invited to interview (39 men and 20 women).

female academic staff are applying for research funding, and it is important that the reasons for this are examined further.

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The hole truth

Sir— The assertion by Rolf Müller and eminent others (*Nature* 389, 712; 1997) that the term 'ozone hole' was "coined in the mid-1980s" is in error by at least 50 years.

In his presidential address to the Royal Meteorological Society in 1934 Sydney Chapman (*Q. J. R. Meteorol. Soc.* 60, 127–142; 1934) radically proposed the creation of ozone holes so that astronomers could perform better ultraviolet observations.

Chapman even documented a formal definition: "By 'making a hole in the ozone layer' I mean the removal of all, or most of, the ozone from the column of air resting on some chosen area."

1. Wennerås, C. & Wold, A. *Nature* 387, 341–343 (1997).
2. *PRISM Women and Peer-review: An audit of the Wellcome Trust's decision making process* (Wellcome Trust, December 1997).
3. <http://www.mrc.ac.uk>.
4. *Journal expected citations rates file* (Institute for Scientific Information, Philadelphia, 1990).
5. These data were commissioned from the Higher Education Statistics Agency (HESA). Biomedical science is defined as all full-time academic staff (researchers and other grades, lecturers, senior lecturers and readers, and professors, whether or not tenured) working in the following cost centres: clinical medicine, clinical dentistry, veterinary science, anatomy and physiology, nursing and paramedical studies, health and community studies, psychology and behavioural sciences, pharmacy, pharmacology and biosciences.

Further, he suggested the possibility of inserting gas or fine powder into the stratosphere from aircraft, rockets and balloons and made the notable prediction that a catalytic "deozoniser" would be needed.

No doubt he would have taken great interest in the recent letter from M. N. Ross *et al.* (*Nature* 390, 62; 1997), "Observation of stratospheric ozone depletion in rocket exhaust plumes", and recommended that ultraviolet astronomers should set up camp near a major rocket launching site.

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