

Overview of Biological Sciences (UoA 14) in RAE2001

There were 76 submissions (two comprising a joint submission) to UoA 14. Biochemistry was assessed separately (UoA 12) in 1996, but, following the wishes of the community, it was included within the remit of UoA 14 in 2001. The Panel considers that combining UoAs 12 and 14 was very much an improvement, both facilitating comparability and reducing duplication of work in cross-referral.

Submissions were made from 61 institutions, 10 of which made multiple submissions, typically one in the broad area of biochemistry/molecular biology and one or more in other aspects of biology, such as animal or plant biology. Work of 2592 staff (A, A* and C) was assessed; and the total FTE of staff in post at the census date (A + A*) was 2417. In 1996 there were 17 submissions to UoA 12 totalling 425 FTE staff and 82 to UoA 14 totalling 2076 FTE staff. Several institutions that submitted to UoA 12 or 14 in 1996 did not submit to UoA 14 in 2001, and overall there was a slight reduction in the number of staff submitted.

The Panel was large (19) and constituted broadly. It did not use sub-panels, but divided up the reading of outputs, usually by research groups, to relevant ad hoc pairs of panel members. It was thereby able to accommodate the breadth of submissions, taking advice where necessary on parts of submissions by cross referral to other Panels or to expert advisors. The Panel applied the criteria and working methods as set out in its published statement. Overall at least 25% of outputs, comprising one per staff submitted, were examined in detail, and in many cases, typically borderlines, considerably more. All members participated in assignment of grade, based on this detailed reading, numerical indicators such as external income, information on departmental structure and policy, indicators of esteem, and their individual views of the strength of research indicated by the submission as a whole.

Overall there was a substantial rise from 1996 to 2001 in the number of departments rated 5 (now the modal grade) or 5*, as in other Panels in the umbrella group comprising the biological, medical and related sciences and professions. Several members of the Panel had served on either the UoA 12 or 14 Panels in 1996, and fully agreed that standards had clearly risen over the five-year period and the change was not just grade drift. There was both an increase in the proportion of research judged to be of international standard and a reduction in that deemed to be below national standard. The increase in internationally rated work was in part associated with the very many new appointments of staff of high research quality made to departments over the five-year period and, presumably, to rising expectations by Universities of their academic staff. The rather small amount of work submitted that the Panel scored as below national level usually occurred in substantial quantity only in departments which had either submitted all or almost all of their staff as research active or were overall weak departments. Institutions appear to have 'tailored' their submissions to particular grades, and included staff accordingly. Therefore, while the Panel gave most weight to the quality of publications, it used all indicators of a department's vitality in grading the submission.

There was, furthermore, a positive relationship between the number of staff submitted as research active from an institution (summing over multiple submissions), numerical indicators (standardised per staff member), subjective measures of the

quality of assessed outputs, and, consequently, assigned rating. Thus almost 73% of staff were in the 54% of submissions rated 5 or 5*. This implies a positive response by institutions to the RAE whereby the resources provided by the Funding Councils have enabled successful departments to develop.

A number of submissions that the Panel had provisionally rated very highly were sent to international advisors. They substantiated the Panel's opinion that the majority of the work submitted was of international standard. This helps to confirm the relatively high standing of UK biology in the world shown from citation-based analyses conducted outside the RAE.

A major contribution to the perceived improvement in biological sciences has been through the increasing in funding for staff, other recurrent expenditure and infrastructure provided by the Wellcome Trust. Of funding received for all departments submitted to UoA 14 over the five year assessment period, charities, primarily the Wellcome Trust, provided £334M of research income, a figure nearly 80% of that provided by OST sources including the Research Councils.

The Panel received rather few submissions from post-1992 universities. Most of these submissions were of a small number of staff, and showed little evidence of research of international quality or of external funding for research. Some, however, were making commendable use of their own resources to maintain an active national level programme, for example by institutional funding of research studentships.

The Panel was constituted to deal with inter-disciplinary work within the broad area of biological sciences, and was not conscious of any discrimination against it. There was an increase in interdisciplinary research within biology, for example in the use of molecular genetic methods to study population processes and in the expansion in cell biology which interacted with levels both above and below and, for example, in the interface between chemistry and molecular biology. There was, as expected, extensive amounts of research, from genetics to cell biology, which was related to medicine, and work in ecology related to environmental science. There was, however, little work submitted that could be regarded as fully interdisciplinary, for example on interfaces with physics or engineering.

It is the Panel's impression that the largest expansion in work submitted to UoA 14 (including UoA 12 in 1996) was in cell biology. Important new areas, but which were not yet represented in great volume, include genomics and bioinformatics. There was a reduction in metabolic biochemistry and in organismal and population biology that was conducted using neither molecular nor cellular methods; indeed, expertise in classical botany and zoology seems to be disappearing. There was not, however, any general impression by the Panel that quality of research in different areas had changed at very different rates.

The Panel membership included user representation and took note of the amount of interaction with industry of the department. It did not receive a substantial amount of work of immediate application to industry or to public bodies, but much fundamental research that could be developed, with provision of sufficient insight and resources, to application in healthcare or technology. Although biotechnology was identified as an

area covered by the Panel, there were rather few submissions containing appreciable amounts of quality work.

There is a great diversity among institutions in the departmental structures in which modern research in areas of the life sciences is conducted. For example, some are increasingly integrated with medical schools, others with environmental sciences. The structure of Units of Assessment in the life sciences does not reflect this, for work in many disciplines, such as cell biology, is practised in many departments and can be submitted, according to the institution's structure and choice, to several different UoAs. Further, the many 5 rated submissions spanned a wide range in structure and overall quality, albeit meeting the criteria. The Panel considers that consideration should be given to defining some subdivision of the grade in any future RAE. Furthermore, the rating descriptors often do not fit well with the subdivision of activity judged international, national or sub-national. The Panel considers the situation whereby not all staff must be submitted devalues the process and recommends that other systems be sought.

The Panel recognises that the RAE exercise was laborious for both institutions and Panel members, and therefore costly. Nevertheless it believes that the process has properly found that research in biological sciences is strong in the UK and has identified the institutions in which quality work is conducted.

William G Hill
Chair, on behalf of Panel 14
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