

## Genetic engineering

# RAC stakes its claim

Washington

IN the face of proposals to create a new layer of bureaucracy to oversee genetic engineering, the Recombinant DNA Advisory Committee (RAC) of the National Institutes of Health (NIH) has begun to assert itself with a new vigour. At the meeting of the committee on 2 May, members voiced concern that other agencies moving to assert jurisdiction over recombinant DNA — in particular the Environmental Protection Agency (EPA) — lack the expertise that RAC has accumulated in its 10-year existence and that basic research could suffer as a consequence.

The focus of concern is the lengthy proposal of the Office of Science and Technology Policy (OSTP) for the establishment of a "coordinated framework" for regulating biotechnology (see *Nature* 313, 85; 1985). Under that proposal, a Biotechnology Science Board, a sort of "super-RAC", would be created to address generic issues and to settle inter-agency disputes; in addition, each agency that deals with biotechnology (US Department of Agriculture, National Science Foundation, EPA, Food and Drug Administration and NIH) would have its own RAC to provide advice within the agency.

Although most of this proposed bureaucracy would address only applications for marketing or development of commercial products and would not involve any new statutory authority, EPA has indicated its intention to claim some authority over research. The agency has already said that field tests of microbial pesticides produced by genetic engineering come under the Federal Insecticide, Fungicide, and Rodenticide Act (nothing new), and (a definite departure) that the usual 10-acre exemption would not apply. Under interim rules announced by the agency, anyone who wants to field-test a genetically engineered microbial pesticide on a plot of any size must notify EPA; the agency can then demand a formal application for an "Experimental Use Permit".

EPA also intends to view the DNA in novel microbes as "new chemical substances", subject to the notification and safety-testing requirements of the Toxic Substances Control Act (TSCA). Under that act, EPA must be notified 90 days before the manufacture of such a new substance commences; EPA can demand additional data and with cause can restrict or even ban the product.

In a letter from RAC chairman Robert Mitchell to OSTP, the concern of RAC about the proposal was spelled out; RAC members say that EPA and other agencies appear to be reinventing the wheel, raising questions that RAC was able to lay to rest years ago. And there is strong feeling within RAC that all laboratory research at

least must remain the business of RAC alone.

In discussion at this month's meeting, members made it clear that a major function of the committee since its inception — in the committee's own view, that is — has been protecting basic research from over-regulation, a feat accomplished largely by providing a forum for defusing public concern and heading off demands for regulation *per se* through a demonstration of cautious self-regulation.

Although EPA's TSCA proposal raises the possibility of EPA's regulating even the laboratory research phase of certain commercial biotechnology products, RAC in fact faces little challenge to its claim to having exclusive oversight over laboratory experiments. The major grey area at this point is environmental testing. The RAC staff, still staggering under the paperwork and legal burdens of the Lindow-Panopoulos proposal for field-testing genetically altered ice-nucleating bacteria,

would like to turn it all over to EPA. A proposal by the staff, on which RAC decided to defer action at the last meeting, would allow RAC at its discretion to accept the review of a proposal by other agencies as meeting RAC's requirements. The partial victory by anti-genetic-engineering activist Jeremy Rifkin in the Court of Appeals (see *Nature* 7 March, p.6) has opened the way for continual court challenges of the adequacy of RAC's approval of Lindow's experiment and other environmental-release experiments, another headache that the staff would as soon avoid.

At least a part of the RAC membership, however, is less ready to concede that jurisdiction to EPA. RAC has adopted an informal document to guide those submitting proposals for environmental-release experiments (*Points to Consider for Submissions Involving Testing in the Environment of Microorganisms Derived by Recombinant DNA Techniques*); it was noted at the recent meeting that RAC enjoys the flexibility easily to amend this document with experience; the regulatory agencies face a much more ponderous process.

Stephen Budiansky

## US education

# More engineers needed

Washington

THE chronic shortage of engineering faculty at US universities has arisen largely because engineering professors are paid \$10-12,000 a year less than their counterparts in industry, according to a \$900,000 study of engineering education\* published last week by the National Research Council (NRC). And although the number of engineering PhDs awarded each year will increase over the next few years to 4,000 in 1988 (from 2,800 in 1983), this will still not be enough to meet the increased demand from industry and academic institutions.

According to NRC, 8.5 per cent of engineering faculty positions are unfilled, and 6,700 new appointments would have to be made to restore student/staff ratios to the levels common in the mid-1970s. The situation is unlikely to improve greatly unless a university career is made more attractive for talented researchers. An associate professor in his 30s, for example, will typically earn less than \$38,000 a year.

NRC calculates that as many as 30 per cent of all US engineers work for the government either directly or indirectly, and uses this statistic to argue that both government and industry would be working for their own benefit in making advanced engineering studies more attractive. Legislation should be introduced that would "facilitate" gifts of laboratory equipment to engineering colleges. And the federal government should be prepared to match dollar for dollar funds raised for new buildings.

NRC makes surprisingly little attempt to

analyse future demands for different engineering skills, but does predict that the number of engineers needed will increase. The lack of hard numbers is blamed on the poor quality of existing databases, and NRC asks in passing that the National Science Foundation (NSF) should do something about it. One somewhat sensitive problem, however, is that more than 40 per cent of graduate students studying engineering in the United States are foreigners on temporary visas, many of whom will return to their own countries after graduating. NRC wants to see more US citizens in the pool.

The NRC study is critical of the way that most federal support for engineering is channelled into a relatively small group of "first tier" colleges specializing in graduate education. More than half of engineering graduates with bachelor of science degrees graduate from the disadvantaged second tier colleges, however.

NRC is laconic when it comes to what exactly should be taught, however. The study concludes, on the basis of verbal arguments, that it might be advantageous to delay specialization in some arcane fields in order to improve management and communications skills, apparently often lacking in engineering graduates; again, NSF is asked to experiment with novel courses.

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Tim Beardsley

\*Engineering education and practice in the United States: foundations of our techno-economic future. National Academy Press, 1985.