Nucleotide Sequence Database Policies

THE INTERNATIONAL NUCLEOTIDE SEQUENCE Databases (INSD) has been an international collaboration between DDBJ, EMBL, and GenBank for over 14 years. Its advisory board, the International Advisory Committee, is made up of members of each of the databases' advisory bodies. At their last meeting, members of this committee unanimously endorsed and reaffirmed the existing data-sharing policy of the three databases that make up the INSD, which is stated below.

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Individuals submitting data to the international sequence databases managed collaboratively by DDBJ, EMBL, and GenBank should be aware of the following:

1) The INSD has a uniform policy of free and unrestricted access to all of the data records their databases contain. Scientists worldwide can access these records to plan experiments or publish any analysis or critique. Appropriate credit is given by citing the original submission, following the practices of scientists utilizing published scientific literature.

2) The INSD will not attach statements to records that restrict access to the data, limit the use of the information in these records, or prohibit certain types of publications based on these records. Specifically, no use restrictions or licensing requirements will be included in any sequence data records, and no restrictions or licensing fees will be placed on the redistribution or use of the database by any party.

3) All database records submitted to the INSD will remain permanently accessible as part of the scientific record. Corrections of errors and update of the records by authors are welcome and erroneous records may be removed from the next database release, but all will remain permanently accessible by accession number.

4) Submitters are advised that the information displayed on the Web sites maintained by the INSD is fully disclosed to the public. It is the responsibility of the submitters to ascertain that they have the right to submit the data.

5) Beyond limited editorial control and some internal integrity checks (for example, proper use of INSD formats and translation of coding regions specified in CDS entries are verified), the quality and accuracy of the record are the responsibility of the submitting author, not of the database. The databases will work with submitters and users of the database to achieve the best quality resource possible.

The INSD is an outstanding example of success in building an immensely valuable, widely used public resource through voluntary cooperation across the international scientific community. This success has been achieved by following the guidelines and principles outlined above.

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Looking at the Future of Radioecology

IN RICHARD STONE'S ARTICLE ON THE FUTURE of radioecology ("Radioecology's coming of age—or its last gasp?", News Focus, 13 Sept., p. 1800), some scientists portray recent attempts to develop a systematic approach to assessing effects of radiation on the biotic environment (*1*, *2*) as merely a device to breathe new life into an aging branch of environmental science. The truth is very different, and the underlying scepticism both shortsighted and potentially damaging.

The development of the International Commission on Radiological Protection (ICRP) system (*3*) for human protection has arisen largely from the need to control radiation exposures within the context of the workplace and in medical practice. With the advent of nuclear power, and hence radioactive waste, it has since been extended to protection of the general public in an environmental context. This historic development has also led to an emphasis being placed on the need to interpret our knowledge of the complex biological effects of radiation primarily in terms of its consequences for humans. The unintended side-effect is that we are now left with no general understanding of the effects of radiation across the whole spectrum of living things, nor any framework for evaluating the actual or potential consequences of radioactive waste disposal into the environment in the absence of human beings.

In some countries, this deficiency already has legal implications, because protection of the environment has to be demonstrated explicitly (*4*), irrespective of the presence or absence of humans. With a greater emphasis now being placed on concepts such as the need to maintain biological diversity and to protect all natural habitats on a large scale, in relation to any

Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 6 months or issues of general interest. They can be submitted by e-mail (science_letters@aaas.org), the Web (www.letter2science.org), or regular mail (1200 New York Ave., NW, Washington, DC 20005, USA). Letters are not acknowledged upon receipt, nor are authors generally consulted before publication. Whether published in full or in part, letters are subject to editing for clarity and space.

regulated pollution control activity, such legislative demands are increasing, particularly in Europe.

The more general concern, however, is that because of the lack of any agreed set of criteria, objectives, or biological end points that can be measured to any specified degree of accuracy and precision, it is difficult to demonstrate whether the environment is protected from ionizing radiation to a level deemed legally, socially, or economically acceptable under different circumstances. These circumstances extend beyond the trivial routine discharges from nuclear power stations, into the realms of evaluating waste disposal options in general, preparing for the consequences of accidents, and working to remediate contaminated environments.

We have a fair amount of knowledge on the effects of radiation on creatures other than man and on the behavior of radionuclides in the environment, but most of this has been derived or interpreted in the context of human radiation exposure. It needs to be reevaluated within a different framework: potential effects on and consequences for the environment. Yawning gaps will be found, and further research work will be needed. Not to address this deficiency is shortsighted; the legislative need is already creating different approaches from one country to another. What we desperately need is a sensible global debate about the relative merits of energy production from different sources. This must be done on a quantitative basis to produce something like a "human and environmental impact index" per GW(e). The proposed new systematic approach, combined with the existing ICRP one for humans, would enable this to be done for nuclear power.

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THE CENTRAL ISSUE IN THE DEBATE ON environmental radiation protection, recently covered by Richard Stone in his article "Radioecology's coming of age—or its last gasp?" (News Focus, 13 Sept., p. 1800), is whether the current anthropocentric system of protection is also adequate to protect the environment.

Much of the groundwork for the Monte Carlo meeting mentioned in the article was laid at a consensus conference in Oslo in October 2001 (*1*). The conference was arranged by the Norwegian Radiation Protection Authority and the Agricultural University of Norway in cooperation with the International Union of Radioecology to explore ethical, philosophical, and environmental issues regarding environmental protection. Key conference conclusions include the following: (i) There is a need to address environmental protection as part of the effort to revise and simplify the current system of protection for humans. (ii) Ethical values, sustainable development, conservation, and biodiversity are reasons for specifically protecting the environment. (iii) The best available technology, including consideration of economic costs and environmental benefits, should be applied to the control of environmental releases of radionuclides in a balanced manner with respect to other environmental insults. (iv) Precautionary measures to reduce the potential risks within reasonable cost constraints should be applied when a product or activity may cause serious harm to humans or the environment and significant uncertainties exist about the probability of harm.

The United States is the only country that has developed or proposed guidance for environmental radiation protection. Limits range from 1 to 10 mGy/day for aquatic and terrestrial biota (*2*). By comparison, exposures to the general public are limited to 1 mGy/year (assuming exposures are from x and gamma radiation sources).

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Keeping Meetings Under Wraps

SEVERAL FACTORS HAVE CONTRIBUTED TO THE unhappiness with the current operating mode of the U.S. National Science Board. In addition to the factors mentioned in Jeffrey Mervis's article "Congress puts the squeeze on NSF's oversight board" (News Focus, 4 Oct., p. 42), the board's narrow interpretation of the 1978 Government in the Sunshine Act has made too many of its policy deliberations opaque.

Specifically, the board, beginning in December 1979, elected to close all its committee meetings to public observation and to increasingly conduct detailed policy deliberations in those committees. As a result, too often, the two full days of board meetings held five or six times annually included public sessions of only 1 or 2 hours, which were devoted to routine personnel and other announcements. One result has been that most of the science press, congressional staff, and members of the public stopped attending board meetings as observers.

At the October 2002 board meeting, the search for a new and less narrow approach to open meetings appeared to have begun. Most significantly, there was evidence of a new and different attitude toward public access to the board's activities. But much remains to be done. A good model of openness might well be the Director's Advisory Committee at the NIH.

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Advice Without Dissent at the DOD

THE BUSH ADMINISTRATION HAS MOVED unwisely to assure scientific advice without dissent in the Department of Defense (DOD), a situation that may be more serious than the instance at the Department of