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**COVER** Iontophoretic injection of the fluorescent dye, Lucifer yellow, into retinal neurons labeled with a serotonin analog reveals their dendritic morphology. There are two types of serotonin-accumulating interneurons in the rabbit retina, termed S1 (lower) and S2 (upper) amacrine cells that can be distinguished by the extent and branching pattern of their processes. See page 444. [David I. Vaney, National Vision Research Institute of Australia, Carlton, Victoria 3053]

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## Microbiological Resource Centers

The Microbiological Resource Centers (MIRCEN's) established in 1975 are carrying out highly cost-effective international programs. The MIRCEN's provide an infrastructure for a world network incorporating regional and interregional laboratories geared to the management, distribution, and use of microbial gene pools. The MIRCEN network supports workshops, training courses, and research projects. The centers reinforce conservation of microorganisms, emphasizing *Rhizobium* gene pools in developing countries with an agrarian base. The MIRCEN's have been active in fostering development of new and extensive technologies native to specific regions and have promoted the application of microbiology to strengthen world economies. They conduct programs throughout the world to investigate diverse capabilities of microorganisms for economic usefulness in helping the United States and developing nations meet both their present and future agriculture, chemical, energy, food, health, and waste-management needs. But despite a history of growing success, the U.S. share of support previously provided through U.S. membership in Unesco will be sharply reduced in the fiscal year 1987 budget.

The MIRCEN's working effectively on the rhizobia include Pôrto Alegre, Brazil; the University of Nairobi, Kenya; Bambey, Senegal; the NifTAL project at the College of Tropical Agriculture and Human Resources at the University of Hawaii; and the Nitrogen Fixation Laboratory at Beltsville, Maryland. A fermentation, food, and waste-recycling MIRCEN has been very active at the Thailand Institute of Scientific and Technological Research in Bangkok.

Several MIRCEN's are strongly biotechnology-oriented, including the Faculty of Agriculture in Cairo; Karolinska Institute in Sweden; the Central American Research Institute for Industry in Guatemala; the Tucumán MIRCEN in Argentina; Waterloo, Canada; Osaka, Japan; the Polytechnic of Central London, the University of Kent in the United Kingdom; and the University of Maryland, in marine biotechnology.

To optimize benefits of biological nitrogen fixation, the Nairobi *Rhizobium* MIRCEN is engaged in research on collection and preservation of cultures, isolation, selection, and testing of *Rhizobium* strains, and determination of parameters affecting survival of rhizobia in soil. They have evaluated locally available materials as carriers for inoculants and have quantified biological nitrogen fixation, using the nitrogen-15 technique. The University of Nairobi collection holds more than 200 bacterial cultures, and approximately 1984 requests for cultures have been met since 1975. More than 10,000 farmers have used the cultures. The Nairobi MIRCEN is clearly mission-oriented, like the others, delivering scientific knowledge needed for research and application. It represents an excellent example of successful technology transfer.

Overall, the network provides a knowledge base in microbiology and biotechnology that is needed throughout the world in both developed and developing countries to support the new biotechnology industries. The MIRCEN's offer a working network beneficial to the United States by providing access to unusual and important genetic material of potential application in industrial processes and to developing countries in providing applications of biotechnology appropriate to their needs, especially in enhancing their economy. The scope for the MIRCEN's includes soil fertility, rehabilitation of arid lands, bioconversion of waste, feed, fuel, and fodder, and production of microbial insecticides through biotechnology.

The amount of funding expected for the MIRCEN's from the fiscal year 1987 budget is only \$20,000, to be awarded to the American Society for Microbiology for allocation to the MIRCEN's in accordance with an approved work plan. The funds available will assist with communication and research interaction among the centers. However, the allocation is tiny in comparison with the original budget submission of \$175,000. Investment by the United States has already yielded significant return for this country by making available a source of genetic material for biotechnology applications. The MIRCEN's are a bargain: high productivity, low cost, and enormous potential. Here is where the United States may be penny-wise and pound-foolish in its foreign aid allocations.—RITA R. COLWELL, Vice President for Academic Affairs and Professor of Microbiology, University of Maryland, College Park, MD 20783.