FISHING FOR MICROBES

B iotechnology is never about one thing. But if it was, that one thing would be people—preferably many people. Those many people should have different skills and outlooks, but a common aim. And they should be in a network—loosely organized enough to let innovation thrive but sufficiently close to share scarce resources and precious information, and close enough to communicate. This, more or less, is how MIRCEN (Microbiological Resources Centers) network operates.

MIRCENs are units associated with academic or governmental institutions whose role it is to encourage and develop in cooperation with other national, regional or international organizations, novel technology development and natural resource management. In 1984, funding from UNESCO (Paris), the UN Environmental Program (UNEP, Nairobi, Kenya) and the International

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Cell Research Organization (ICRO, Paris) established six pilot MIRCENs—in Brazil, Egypt, Guatemala, Kenya, Senegal and Thailand. The MIRCEN network now comprises 23 units in 19 countries, each of the units having focussing on agriculture, biotechnology or informatics and is funded by the UN and the U.S. State Department at around \$250-300,000 per annum.

MICROBIOLOGICAL

Each MIRCEN has a central responsibility for preservation of microbial germplasm. Each maintains reference cultures of microbes, some from ATCC or comparable collections, some fresh isolates from scientists working at or with the MIRCEN.

RESOURCES

Molecular biology is increasingly becoming part of the MIRCENs' armory. The units facilitate access of research materials such as DNA sequences, gene probes, hybridomas and genetically engineered organisms. They also perform contract research and organize training in molecular biology.

CENTERS

MIRCENs serve as regional centers for technology transfer. They distribute on request—to academic, governmental and industrial laboratories—those cultures, techniques, and training relevant to food production, environmental management and commercial biotechnology.

The MIRCEN network is not without its critics. Its scientific achievements are more practical than spectacular. That pragmatism is seen also in its geographical focus—the network is most active in the better developed of the developing nations. But as a mechanism for widespread international collaboration, the MIRCEN network can provide many lessons on the ways in which the international scientific community can assist less industrialized and disadvantaged national and regional economies to use microbiology and biotechnology.

For more information on the MIRCENs, contact Edgar Da Silva, UNESCO, Division of Basic Sciences, Paris 75015, France.

The MIRCEN network

Key: Biotechnology; Informatics Agriculture

HAWAII, US
WATERLOO, CANADA
BELTSVILLE, US
MARYLAND, US
GUATEMALA
PORT OF SPAIN, TRINIDAD AND TOBAGO
PORTO ALEGRE, BRAZIL
TUCUMAN, ARGENTINA

LONDON, UK
LONDON, UK
STOCKHOLM, SWEDEN
BRAUNSCHWEIG, FRG
BUDAPEST, HUNGARY
TOULOUSE, FRANCE
LJUBLJANA, YUGOSLAVIA
CAIRO, EGYPT

DAKAR, SENEGAL

NAIROBI, KENYA
BEIJING, PRC
OSAKA, JAPAN
SAITAMA, JAPAN
BANGKOK, THAILAND
BRISBANE, AUSTRALIA

Rhizobium;
biotechnology and agriculture
agriculture
marine biotechnology; Rhizobium;
biotechnology; Rhizobium;
microbial biotechnology; economics of *Rhizobium speciosum* as export crop; passion fruit research
Rhizobium; field testing of *Bradyrhizobium japonicum*; soybean;
biotechnology; ethanol fermentation with *Zymomonas mobilis*; genetic manipulation of *Saccharomyces cerevisiae*; screening for lignocellulolytic fungi, osmotolerant yeast,
biotechnology
mycology culture collections;
computer conferencing;
culture collections and patents
culture collections
biotechnology;
informatics
biotechnology; diagnostics for *Yersinia*, *Acinetobacter* and *Listeria* in local food; carcinogenicity and mutagenesis testing;
Rhizobium; biological nitrogen fixation with *Vigna unguiculata*, *Arachis hypogaea*, and *Voandzeia subterranea*
Rhizobium for soybean, legumes
microbial technology
fermentation technology;
culture collection database;
fermentation, food and waste recycling; cassava bioethanol, cassava waste processing
biotechnology; algal biomass production; solid state fermentation of cassava and sago into feed;