EGYPTIAN SCIENCE

A Biotech Gambit In the Desert

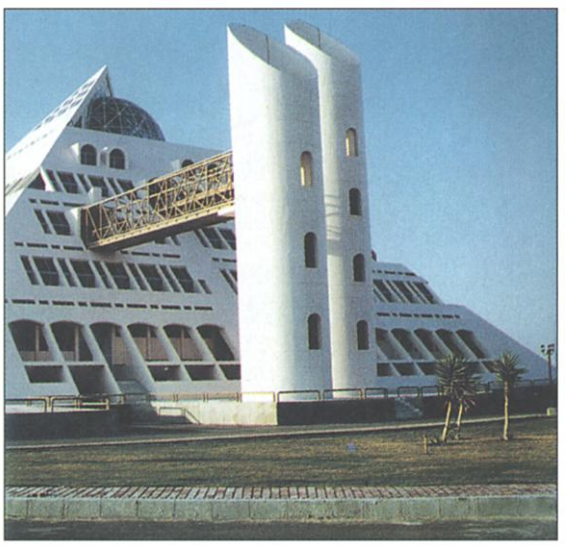
To create a homegrown biotechnology industry from scratch, Egypt must reverse a decades-long scientific exodus

ALEXANDRIA—Ringed by oil refineries and factories, three glass and concrete pyramids rise like a fata morgana from the sand 20 kilometers south of this ancient Mediterranean harbor. This pharaonic vision, the Mubarak City for Scientific Research and Technological Applications (MUCSAT), is buzzing with scores of scientists who have flocked here hoping to put their country on the biotech map. "Mubarak City is a tremendous step for Egypt," insists immunologist Malak Kotb of the University of Tennessee, Memphis. So predicts the country's minister of higher education and scientific research, Moufid Shehab, "MUCSAT will propel Egypt into the world of advanced technology."

President Hosni Mubarak issued a decree to create MUCSAT in 1993 and handed the project to then–research minister Venice Kamal Gouda, an ardent believer in Egypt's potential to develop a biotech industry from scratch. (The country does not yet have a single biotech company.) Gouda put together a network of expatriate molecular biologists to help come up with a winning formula. Various snags strung out the construction of the main labs—housed in the pyramids—for 7 years, but the $24 million center finally opened last August with two of 10 planned institutes—one devoted to informatics, the other to genetic engineering—up and running. Institutes on everything from lasers to desert research are slated for launch over the next 7 years.

Part of the rationale for this postmodern Giza is to try to stanch a decades-long brain drain that has seen the exodus of many of Egypt's finest minds, including Nobel laureate chemist Ahmed Zewail, who was born in Alexandria and now works at the California Institute of Technology in Pasadena. "Many [expatriates] choose not to return because conditions for doing research are difficult," says geneticist Samia El-Temtamy of the National Research Center in Cairo. Hardships include salaries of about $200 per month, aging equipment, and red tape that can delay orders for months. "If [politicians] seriously want this project to succeed," says molecular biologist Hisham Moharram, "they need to face the hornet's nest of dealing with bureaucracy."

Another challenge is the country's economy, now in the third year of a serious recession triggered by a soaring budget deficit and declining exports. Mubarak City scientists are banking on promises of steady funding from the government and on the continued commitment of Mubarak, who in speeches often cites investment in science and technology as a key to economic recovery. However, MUCSAT is supposed to set up a technology incubator and eventually attract a large share of its funding from industry.



Postmodern Giza. Biotech takes root in Egypt.

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Niggling setbacks have taken some of the gloss off the venture. The uneven pace in finishing the labs, for example, has left researchers in an odd bind: Although MUCSAT has outfitted the pyramids with big-ticket items such as DNA sequencing machines, a shortage of less expensive but vital pieces of equipment, such as freezers and centrifuges, has slowed many experiments. Such poor planning has given some researchers misgivings about MUCSAT's management. "Our administration is not up to the task," asserts Moharram, whose group is waiting for the installation of a tissue culture lab, now months overdue. And although the government has promised $31 million over the next 5 years for salaries and overhead, Mubarak City lacks such essentials as journal subscriptions and a travel budget for sending scientists to conferences abroad.

Although far from ideal, MUCSAT's facilities have sparked collaborations with more impoverished, but experienced, colleagues in academia. "In universities, equipment is typically scattered and often not working," explains physicist Salah Arafa of the American University in Cairo. MUCSAT —which does not grant degrees—and the universities have jointly enrolled about 100 master's and Ph.D. students to date.

Without the lure of MUCSAT's budding science mecca, some of these students might have pursued degrees abroad. "Egypt needs to create distinguished universities and a mechanism for selecting the truly talented," says Zewail, who is helping establish a technical university near Cairo. So far, Mubarak City has managed to retain some fine young minds, says Osman Shinaishin of the U.S. National Science Foundation, who has visited MUCSAT twice under the auspices of the Gore-Mubarak initiative, which funds joint projects. That program and one run by the United Nations pay for Egyptian scientists in foreign labs to set up collaborations with colleagues back home. "We cannot force scientists to return," says Abdul Latif El Sharkawy, secretary-general of Egypt's Supreme Council for Research Centers and Institutes. Instead, he says, "we try to make use of those who elect to stay abroad."

Much of Mubarak City's research is geared toward projects with an imminent payoff: culturing bacterial strains that are more efficient at processing sewage, for example, or developing cheap diagnostic tests for human diseases. "Mubarak City is really the only place to go" to set up a biotech lab in Egypt, says U.S.-trained immunologist Maha El Demellawy, now at MUCSAT. She's collaborating with her mentor, Kotb, on a project to look for genetic susceptibility to hepatitis C, now rampant in Egypt. Scientists are free to pursue basic research, if they can find funding. "We strongly encourage researchers to apply for grants," says MUCSAT director Ahmed El-Diwan.

Of Mubarak City's 160 scientists, half have worked abroad. Some cite patriotism as a key factor in their decision to come home. "Many of us sense a responsibility to help boost the country's socioeconomic development," says MUCSAT biochemist Hesham El-Enshasy, who trained in Germany. He and others are hoping that their dreams of a biotech industry, like so many other desert visions, do not evaporate before their eyes.

–LONE FRANK

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