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Despite Embargo, Biotechnology in Cuba Thrives FREE

Judith Randal

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This is the second in a two-part series.

If one thing can be said of scientists in Cuba, it is that at salaries of US \$25 to \$30 a month plus an annual bonus of \$70 to \$90, their life's work is a labor of love. Yet they seem to thrive on it.

When pressed about their meager earnings, they speak of such things as the food subsidies the government provides, the pennies-a-month residential electricity rates, and the "perks" that come with their jobs: premium housing with little or no rent, for example, and sometimes even a car. And not the least of it, they say, is that they derive considerable satisfaction from their accomplishments.

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Among those accomplishments is an extensive array of recombinant proteins, synthetic peptides, monoclonal antibodies (MAbs) and antigens that have enabled their country to routinely screen its blood and blood products for AIDS and viral hepatitis, its pregnant women for neural tube defects in the fetus, and its newborns for certain biochemical birth defects.

On the list of home-grown recombinants, too, are interleukin-2 (for cancer treatment), alpha and gamma interferon, streptokinase, erythropoietin, and several livestock and human vaccines, including a hepatitis B vaccine that has virtually eliminated the disease in Cuba.

Also in the Cuban “biotech” pipeline, although strictly investigational to date, are recombinant vaccines against AIDS, hepatitis C, and dengue fever. (Dengue, common in much of the tropics, is a debilitating mosquito-borne illness for which there is only supportive treatment. Dengue fever can be life-threatening and even fatal.)

And while Cuba has yet to clone animals, Havana’s Center for Genetic Engineering and Biotechnology (Spanish acronym CIGB) is proud of the tilapia (an edible freshwater fish) that it has fitted with extra growth hormone genes. Indeed, the CIGB’s Jorge Gaviñondo, Ph.D., and his colleagues there envision a day when transgenic plants, or more specifically, their seeds, will be the repositories of key antibodies and are working toward making that a reality.

Clinical Research

Moreover, to talk with Pedro Lopez Saura, M.D., Ph.D., is to learn how clinical research is done in Cuba. As vice-director for regulatory issues and clinical trials at CIGB, he speaks knowledgeably of such matters as hospital institutional review boards, peer review, informed consent for patients participating in trials, and other regulatory hoops that candidate therapies must jump through in his country just as they do in larger countries with a modern research enterprise. And when multicenter trials are called for, Cuba has a coordinating center that sets them up and manages them. “It’s the equivalent of a CRO (contract research organization) in the United States,” Lopez Saura explained.

Meanwhile, together with seeking tourists—mainly from Canada and Europe—Cuba has been turning to biotechnology to earn foreign exchange. A part of its R&D effort, for example, is to develop generic versions of prescription drugs that can be sold to “niche markets”—principally poor countries—as soon as the patents on them expire. (Cuba, unlike China, honors foreign patents and has its own Office for Intellectual Property.) The government plows the profits from this and other overseas sales of its biotechnology back into the R&D centers.

But by no means can every product of Cuban R&D be called “me-too,” as a vaccine from the Finlay Institute in Havana illustrates. It is the world’s only type B bacterial—i.e., meningococcal—meningitis vaccine, and since its introduction in 1989 (originally for domestic use), it has earned Cuba about US \$40 million from sales to other countries, principally Brazil. Last year, this vaccine was licensed to SmithKline Beecham, which means that it may eventually also be available in the United States.

The license, however, required special dispensations from the U.S. government, which are hard to get. At one point, for example, Merck & Co. officials met with President Fidel Castro to discuss AIDS research collaborations with Cuban scientists but dropped the idea when they found too many U.S. legal complications in the way.

The effect of U.S. sanctions on Cuban biotechnology, in fact, can be more than bilateral. The country’s inability to buy directly from U.S. suppliers, for example, has driven some of its investigators to spend time in the better-equipped labs of European colleagues or to collaborate with them from afar, creating considerable sympathy for the Cubans’ plight in the process.

Another example is the Center for Molecular Immunology (Spanish acronym CIM), a part of Havana’s Western Scientific Pole and York Medical Inc. of Mississauga, Ontario, its joint venture partner. The center specializes in oncology and is headed by Augustin Lage, M.D., Ph.D., whose brother Carlos Lage is President Castro’s finance minister. CIM has in its R&D portfolio (among other things): MABs—some radioactively labeled—that target one type of cancer or another for purposes of diagnosis or therapy; and a doubly recombinant vaccine that has shown promise for controlling advanced non-small cell lung cancer and may be useful for certain other cancers as well. (See story below.) Under York Medical’s aegis, the vaccine and three versions of a CIM MAB are in clinical trials in Canada.

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David Allan, York Medical's chief executive officer, is upbeat about these products—not least because Canadian regulatory authorities were sufficiently impressed by their performance in Cuba to issue the approvals that were a prerequisite for the trials. But Allan also worries about the effect of the U.S. embargo on things Cuban no matter their benefits. He fears that “no drug firm doing business in the United States—and that includes multinationals—will risk trying to commercialize products that originated in Havana.”

In sum, for all the prestige that scientists in Cuba enjoy at home, it is difficult for them to find a place in the international sun.



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A scientist at Cuba's Center for Genetic Engineering and Biotechnology injects DNA into a fertilized egg in a transgenic experiment.

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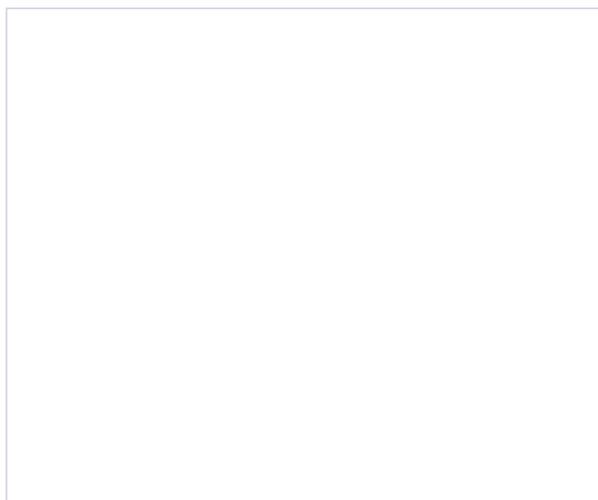
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