Realities for Latin American and Caribbean biotech

To the editor:

Last summer, a meeting of the United Nations Organization for Industrial Development (UNIDO, Vienna, Austria)[1] stated that biotechnology can bring to the Latin American and Caribbean region "…sustainable food production and a secure economic system…creating a competitive agrifood sector and generating additional rural incomes." There are several reasons why this assessment remains far from reality in 2004 or, for that matter, many years beyond.

Many developing countries in the Americas have yet to benefit from biotechnology not because of inherent problems with either the science or technology, but rather because most nations lack a system for integrating the different participants in the research, development and manufacturing chain. Thus, the relative strength in trained personnel and laboratory facilities present in some countries in no way guarantees a successful capability for biotechnological applications of economic value or impact on development.

The present agriculture infrastructure in the South American and Caribbean region, for instance, could be a lot more competitive if the markets were not as economically and politically distorted as they are today. Among many wrong-headed measures, government policies in Bolivia, Columbia and other Andean nations appear directed to subsidize the rich and provide fixed prices for less efficient farmers, rather than benefiting product development or meeting the needs of the final consumer. Unless these distortions are fixed or at least acknowledged, the region is far from being in a "unique position to take advantage of the new technologies" because the technologies will not stand a chance of being implemented after their transfer or development.

There are also reasons to doubt that, as stated by the UNIDO conference, there are "great opportunities [for a biodiversity-rich region], in that it provides a great range of potential applications for the new technologies, including their utilization for further expanding the possibilities of creating value from biodiversity." The skepticism arises from the weak links between governments and academia, where each follows its own divergent course, despite their obvious complementarities. The lack of sound scientific advice to government regulators is widespread throughout Latin America (with a few exceptions, *e.g.*, Argentina and Mexico). This was eloquently manifested in the negotiations for the United Nations Cartagena Protocol on Biosafety, which not only produced very few results, but has been poorly implemented in most countries[2].

Biodiversity will indeed become an opportunity if there is a technology exchange program that links both academic and governmental institutions within the region as well as with centers of excellence and private companies from more advanced countries. Access to markets is as important as developing the products from the long-promised and promoted biodiversity cornucopia.

These difficulties do not mean that biotechnology, even as complex as it is now, cannot be exploited by the region, but it is necessary to be aware of the realities (some of which are outlined here) and to understand that solutions will need to be flexible and adapted to each region and its problems. In the few cases where biotech has made any significant difference in the region, it has been successfully implemented by focusing on technology transfer rather than technology development.

Several cases are worthy of note. One is the concerted effort of Brazilian scientists to sequence the genome of *Xillela fastidiosa*[3], a plant pathogen that affects citrus fruits, an important export of that country. The genome consortium has had an enormous impact on Brazilian science by both attracting worldwide recognition and further support for genomics and encouraging technology transfer—but in the opposite direction, namely, from Brazil to the US Department of Agriculture (Washington, DC, USA) to sequence another strain of *X. fastidiosa* that affects vineyards in southern California[3]. This project led to the eventual formation of Allelyx (Campinas, Brasil), a venture focused on other plant genomes and seeds of economic importance. A second success is BioSidus (Buenos Aires, Argentina), a startup that leads the regional Latin American biopharmaceutical markets with an ample distribution network extended to Asia. And a final example is CYTED (Ciencia y Tecnología para el Desarrollo), the Ibero-American biotech academic network that partnered with US biotech company Chembio Diagnostic Systems (Medford, NY) to produce a commercially available diagnostic kit made with recombinant antigens for the rapid detection of Chagas disease[4].

The new biotechnologies could have a positive impact on regional development, but only if regional scientific expertise were combined with clear business objectives addressed to national and international markets. This would create a demand for knowledge to match human capital able to meet the new biotechnology's heavy intellectual requirements with others equally sophisticated in negotiating the kinds of partnerships that actually bring benefit.

Rafael Rangel-Aldao

Empresas Polar, 4ta Los Cortijos de Lourdes, Caracas, 1071A Venezuela.
e-mail: rafael.rangel@empresas-polar.com

1. Regional Biotechnology Consultative Meeting for Latin America and Caribbean Region, Brasilia, July 22–25, 2003. Sponsored by UNIDO and the Government of Brazil (http://binas.unido.org/global_forum/).
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