SOLVING REGIONAL DEVELOPMENT PROBLEMS WITH BIOTECH: ESSENTIAL ISSUES

City, state, county, and national programs to revitalize economies through biotechnology development have sprung up throughout the world over the past few years. Experience with these programs has revealed that governments are rarely well equipped to understand the complexity of sponsoring biotechnology's development. Basic estimates of costs, required technologies, areas for project development, timing of commercialization of research, and incentives for industry and scientific personnel are often poorly estimated by government administrators with impressive credentials but little understanding of biotechnology. This dilemma was illustrated at a recent problem-solving session with high government officials involved with a multi-million-dollar regional development program. These officials were ready to commit the program's funds to a research establishment that had little experience in using the most elementary gene manipulation techniques. They had failed to develop an administrative organization that would shape areas of basic research according to practical application; instead, they trusted that university administrators associated with the project would eventually commercialize the technology through traditional patent licensing channels. Had the government planners acted upon their original plans, they would have failed in the worst way, combining the non-profit research foundations's lack of experience in commerce with the government bureaucracy's lack of experience in assessing the impacts of molecular biology.

Regional development programs in biotechnology face two essential problems: even the best administrators rarely know anything about biotechnology beyond the pages of news magazines, and planners lack expertise in developing programs that appeal equally to good scientists, manufacturers, and financial institutions. If biotechnology is as important to the future economy as governments are beginning to claim, there is a crying need for biotechnology generalist-specialists who understand the basic links in the chain of commercialization and can design programs that satisfy long-term objectives. Generalist-specialists would function as integrators for experts and institutions, understanding enough about science, government, and business to enable all the necessary institutions to work together.

In addition to the need for generalist-specialists in biotechnology regional planning, there is a need for central institutions that can organize the basic tasks of regional development—institutions that stand outside government funding agencies but answer to these agencies for the success or failure of their programs. The greatest blunders in regional planning occur when permanent agencies take on the whole responsibility for commercialization or delegate the responsibility to universities. A strong regional development program is one designed to include the best aspects of basic research institutions with the best aspects of new ventures for commercialization. In order to understand how to achieve

this organizational mix, it is important to examine how new ventures and research institutions do what they do best.

Regional planning groups require insulation from the daily machinations of government bureaucracies if they are to function in a market-driven way. They must think and act like new ventures. It is difficult for regional biotechnology programs to act quickly, with an instinct for product development, if their administration is tied to the seemingly arbitrary budget and task adjustments government boards often face. Leaders of regional development programs must be free to pursue the development program as a business that responds more to the timing of the marketplace than the timing of government. Finally, these administrators must understand the technical and commercial complexity of biotechnology R&D, including its financial dimensions. The capacity to analyze these types of issues and act in an entrepreneurial way for the sake of the program is very different from the capacity to serve in a government administrative position.

The regional program must create a context for research that allows scientists freedom to pursue basic research with industrial implications in mind. Depending upon the talent available in the region, established university laboratories may be the best places to conduct the program's research. But the administration of the research cannot become captive to university politics, nor can the goals of stimulating the economy be lost in the university's interest in pursuing knowledge for its own sake.

The solution to the problem of blending the best of the university with the best of industrial relations is to create an organizational structure that contains the character of both institutions. Regional development programs in biotechnology should create intermediary institutions that sponsor research at established institutions, or create new ones if necessary; but these intermediaries should also be able to interface well with venture capitalists, banks, and marketing arms of large corporations to ensure commercialization of the research. Seated at the crossroads of government, industry, and the university, these control centers can plan, regulate, and integrate the program's components for the program's long-term objectives in a more efficient way than any other type of institution in society.

The need for these control centers for biotechnology regional development programs, and the generalist-specialists who can run such programs, requires training programs that prepare personnel to man these centers. University administrators who have undertaken seminars to educate themselves about how to interface with government and industry to properly patent and license technologies have contributed to the long-term development of their university programs; administrators of regional development programs in biotechnology should be given the same opportunity for training.

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