

editorial

Research, economic development, and the role of the University of Puerto Rico

To engage in cutting-edge scientific research, to seek discoveries for the improvement of the health and well being of mankind, is a goal that the University of Puerto Rico shares with the community of research universities in the world. For the University of Puerto Rico, however, cutting-edge research has added significance: simply said, to support upper-level scientific research is vital to the future economic development of Puerto Rico. Indeed, growth in Puerto Rico is closely tied to UPR's research agenda. Why is this so?

One third of our GNP is produced by the pharmaceutical industry operating in Puerto Rico. Over the past few decades, Puerto Ricans have developed high-quality skills in drug manufacturing. Those skills have allowed us to host a pharmaceutical industry of a density unrivaled in the world. More than 40 companies operate in the commonwealth, creating over 26,000 high-paying direct jobs and contributing another 50,000 indirect jobs. As a result, three-quarters of the 20 top-selling prescription drugs sold in the United States are manufactured here. These include Lipitor, Viagra, Zoloft, Zocor, Nexium and Propecia, and other household names in contemporary medicine.

But manufacturing alone will not secure our future economic success. In the coming years, we will face increasing competition from Asia and Latin America. China and India will be capable of manufacturing drugs with our same level of proficiency and at lower costs.

Hence, we need to move into the value line of our industrial base. Puerto Rico must use its trained people not only to manufacture, but to research, design, develop and test products. Through clinical trials for cancer medicines, complex cell analysis and clinical diagnostic projects – just to mention some examples – we should play a role in creating the next generation of scientific discoveries. That is, as I see it, one of the most pressing challenges that Puerto Rico now faces.

Are we in a position to undertake such task? Is Puerto Rico offering the environment that R&D needs? Can we generate and attract R&D to Puerto Rico?

The US National Academies have sponsored a study that sheds light on these questions. The survey examines, specifically, the factors that lead companies to decide where to locate their R&D activities.

The survey concludes that for companies locating R&D in emerging economies, the rank of attractions are: market growth potential, quality of R&D personnel, costs, the expertise of university faculty and the ease of collaborating with universities. For companies locating in developed economies, the attractions are: quality of R&D personnel, quality of intellectual property protection, the expertise of university faculty and the ease of working with universities.

The National Academies conclude “that one of the most novel results to come out of the survey is the important role of universities in the global innovation system... university factors are as important as costs in emerging economies and more important in developed economies”.

The challenge coming from the survey is clear: we must revitalize efforts to strengthen our university research culture in order to make Puerto Rico ever more attractive to R&D investments. The good news is that, limitations notwithstanding, companies will find in the University of Puerto Rico the support they need to establish in Puerto Rico a higher level of R&D activity in the life sciences.

Indeed, research at the UPR, measured in terms of external funds, has grown exponentially since 1985, doubling every five years. In 2005-2006, the University received over \$94 million in external funds for research. The UPR faculty is responsible for fully 95 percent of all scientific paper published from Puerto Rico and indexed in the Science Citation Index. Not surprisingly, Río Piedras is considered a “High Research Campus” by the Carnegie Foundation and the Medical Sciences Campus a “Special Focus Institution”, the only such campuses in Puerto Rico. The School of Engineering in Mayagüez, on the other hand, participates in five Engineering Research Centers, funded by the National Science Foundation, that includes pharmaceutical product development.

Steps have been taken to develop the infrastructure needed to house and support complex research at the molecular level. The Molecular Science Building is our flagship in this effort. The design of the Molecular Science Building carries with it a communal effort to create a landmark for science, technology and urban renewal in 21st Century Puerto Rico. The complex will serve as the first of a series of buildings that will form a new science park across the Botanical Gardens. The project is geared at promoting a contemporary vision for grant-based research programs at the University by fostering interdisciplinary and collaborative research in a state-of-the-art environment, and by enabling new, thematic research programs focused on molecular biology among the several campuses.

Another example is the pilot Plant for Biotechnology Processes being built in Mayagüez. When fully operational, it will combine research and training components to serve both the needs of academy and industry.

But facilities do not undertake research; only researchers do. New knowledge and innovation are non-linear, complex processes are best achieved when and where creative people come together. Creative people attract each other and the benefits that flow from these creative interactions spill over the society as a whole.

This is why we have made every effort to attract world renowned researchers to lead to the further recruitment of world-class talent. Let me mention but two: Dr. Walter Frontera, a world authority on physiology and sports medicine, former Department Chair at the Harvard Medical School, is the new Dean of the School of Medicine. Dr. José F. Cordero, formerly the director of the Institute for Birth Defects and Developmental Disabilities and the Director of the National Immunization Program of the Centers for Disease Control in Atlanta, is the new Dean of the School of Public Health.

This is why we have launched initiatives like the University of Puerto Rico Comprehensive Cancer Research Center, an example of institutional innovation geared to research. A joint initiative with the MD Anderson Center of the University of Texas, it will involve research on this dreaded disease at the molecular level, treatment research and epidemiological studies. Not only will Puerto Rican patients receive the best

available treatment, but Puerto Rican professionals and paraprofessionals will be trained in and help develop advanced techniques in the field.

Indeed, Puerto Rico is creating a scientific environment that can nurture well R&D activities. It is now up to us to engage in the promotion of R&D with the same collective enthusiasm that we have put behind manufacturing.

Such scientific environment can and should be coupled with other incentives, retailored to serve our new realities, in order to make Puerto Rico as competitive as possible in terms of costs. How can we revamp our incentive structures to support the new R&D agenda?

Puerto Rico's incentive structures were designed to attract manufacturing. They were geared at creating in Puerto Rico a world class manufacturing center. And they achieved their goal. Manufacturing centers are, of course, profit centers. Manufacturing comes at the end tail of the creation line, at the point where profits are realized. That is why, to attract manufacturing, Puerto Rico exempts such profits from taxation.

But the case for R&D is different. R&D, by itself, does not generate profits. Indeed, R&D centers are not profit centers; R&D centers are cost centers or investment centers. Accordingly, the tax incentives that we now offer – corporate income tax incentives – can be irrelevant to attract R&D to Puerto Rico.

To attract R&D we must strengthen our appeal to researchers. Puerto Rico must make itself more attractive for cutting edge investigators to locate on the island. In forming attracting and retaining cutting-edge researchers, Puerto Rico should be as bold as we once were in our efforts to attract manufacturing. It is time to direct our tax incentives to this area: it is time to grant tax exemptions to the personal income of highly competitive researchers working in Puerto Rico. Now that Puerto Rico has moved its state income base to the taxation of consumption, this makes even more sense.

Back in the 1960s and 1970s, we heard so much about Puerto Rico becoming “the bridge” or the “juncture point” between the two Americas. We were talking then, of course, about orienting our economy to the service sector. That opportunity was lost. Instead, Florida has become the provider of financial, health, educational, entertainment, and many other services to the region.

Now again we have a great opportunity, this time in the life sciences. That opportunity will not last forever. At some point, this train will depart from our station. It is time to secure our seats.

ANTONIO GARCÍA-PADILLA
President, University of Puerto Rico

Note from the Editor: The Puerto Rico Health Sciences Journal welcomes submissions pertaining to research in drug development and clinical trials. A special category, Clinical Trials, provides rapid publications and is meant to be a succinct presentation with minimum of graphs and tables to facilitate the work of researchers.

The PRHSJ will begin the process of electronic submission (open journal system) in early 2008.
