EDITORIAL

Academic–Industrial Partnering – The Changing Climate

We are living through a technology explosion, an explosion in new scientific knowledge and technology that is the fruit of basic research programs sown by a quarter of a century of government-sponsored basic research. There is enormous opportunity to exploit this science and technology for the betterment of mankind—for improving the quality of life with novel treatments for disease, and for economic growth from new products. To reap the harvest and secure our return on investment, we face unprecedented challenges. We need highly skilled scientists who understand how to bring this technology to the marketplace. We need to continue doing the kinds of basic science that gave us the new technologies of today. Where will these scientists come from? Where will the basic research of the future be done? Government funding for basic science is in short supply, and more and more university scientists must turn to industry for support. Industry, under pressure from stockholders, has become even more focused on short-term research that leads to quick payoff on the bottom line. The net result is that less and less true exploratory science is being done. If we are to reverse the trend and ensure our future, both academia and industry need to step back and refocus on what we each do best and to form new partnerships to meet the new economic challenge.

One need only look through the pages of *Protein Science* to see that scientists in industry continue to produce high-quality scientific results worthy of publication in excellent scientific journals. One need only look through the latest *Patent Alert* journals, or read the pages of the *Wall Street Journal*, to see that our academic colleagues and their universities are actively pursuing applied research, protecting their intellectual property with patents, and starting, or becoming active members of, both large and small technology-based companies. In fact, during the 1980s and early 1990s the line between academic and corporate science has blurred considerably: universities have offices of corporate relations, and companies are creating offices of extramural affairs. In some of our high-technology universities, success is measured not only by scientific publications but by the number of companies started or corporate advisory boards on which one serves.

With limited federal funding, more and more academic researchers are relying on corporate funding to run their labs. Corporate sponsorship of academic research nearly doubled to \$1.2 billion between 1988 and 1991. Compa-

nies have created a variety of “megadeals” with universities. In the pharmaceutical industry, few of these have been mutually beneficial. Why? We have learned that successful collaborations involve more than a one-way flow of dollars; technology transfer requires not only a donor but also a receptor. In fact, technology transfer is often best accomplished by people transfer. There must be scientists on both sides committed to the shared project, reviewing the data, and plotting the strategy. Research partnerships, not research grants, provide the maximum benefit, and such partnerships represent the best way for industry to gain access to novel technology and basic research.

Now, with a new administration in Washington, the pharmaceutical industry is under renewed pressures and the business climate is changing. Budget constraints in Washington are not likely to ease, and federal funding for basic research will remain insufficient to meet demands. At the same time, the uncertain prospects of health-care reform have depressed values of pharmaceutical and biotechnology companies, reducing research budgets and investments. At a time when the technology is most promising in providing solutions to important health-care problems, the funds to train scientists and exploit these advances are diminishing.

It is clear that success in the new health-care climate will require some significant changes. Business as usual won't do. Success will be dependent on bringing to the marketplace novel therapies for unmet medical needs. So-called “me too” drugs will not find a place in the formularies of major health maintenance organizations. True innovation comes from intellectual leaps in scientific understanding, from the melding of molecular understanding of the pathophysiology of disease with novel chemistry and cutting-edge biology. It comes from knowing the molecular targets that underlie disease; from probing their structure, mechanism, and regulation; and from discovering and/or designing and optimizing drug candidates that not only bind to their targets with high affinity but are safe and bioavailable and have an efficacy that can be measured in the clinic. To accomplish this, a partnership between industry and academia is critical. Both partners must understand how critical and interdependent their unique contributions are in understanding the molecular basis of disease and in drug discovery. Basic research finds targets for drugs; drug discovery finds drugs for targets. Often

the drugs then serve as critical tools to further illuminate our understanding of biological processes.

The new era will bring with it consolidation and mergers in industry. It may be harder than ever for small companies to make it alone, and it will be less and less attractive to try to create your own "start-up" because success will be in the hands of the larger consolidated companies that can effectively cater to the new, larger health-care ventures that will buy for masses of consumers. Industrial scientists will need to work hand in hand with their academic colleagues in new kinds of partnerships that tap into the applied science expertise of industry and the questioning, probing, longer-term view traditionally found in academia. In an era when technology is growing exponentially, companies will have to fund more research outside their own labs to assure rapid access to critical expertise and reagents. They will have to resist the temptation to take the easy way out and only fund the short-term, easy-to-measure-success projects with clear-cut mileposts that lead to the quick fix. If that is all we do, we will fail.

We need to keep our industrial scientists up-to-date, vital, and contributing members of our profession. We need to expose both our younger and our more established academicians to industry. One way to achieve this is by sabbaticals—in academia *and* industry. Another is to create and foster true postdoctoral programs in industry that allow young scientists to experience an industrial environment, sending them away with a broader appre-

ciation of the interface between academia and industry, and in the process enhancing the scientific productivity of the corporate staff and challenging them with the latest ideas and technologies. We need to open the doors of both academia and industry to a flow of talented people, bright ideas, and new technologies. We need to find a better balance between what is "proprietary" and the needs to be competitive as a nation in doing science. We need to use forums such as *Protein Science* to continue to share the latest, most exciting scientific results, both to ensure the continuation and success of our academic institutions and to guarantee our global competitiveness as an industrial power.

It is time to get back to basics. University scientists need to focus all the more on fundamental understanding and aggressively advance the frontiers of science, and industrial scientists need to find ways to apply that new knowledge to help create products and drugs to increase the quality of life for all. The challenge of the '90s will be to find creative new ways of partnership to assure the success of all of us who call science our profession.

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