

Ethical Issues in the Transfer of Technology to Industry

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Interactions between university faculty, government laboratory research staffs, and industry have increased markedly over the past two decades. Congress has seen this as a means of strengthening this country's competitive position relative to the rest of the world and has provided legislative encouragement. Today, we find research staff members acting as consultants to industry, as officers and stockholders in startup companies, and as recipients of sizeable royalty payments when their inventions are patented and licensed.

As with all programs that involve financial incentives, there is potential for abuse. The *Wall Street Journal* published an article on January 26, 1989, which discussed the concealment, by a university researcher, of negative results on a product being exploited by a company in which he held stock. The March 2, 1990 issue of *Science* discussed a suit filed by Pennsylvania State University against one of its faculty for owning and licensing a patent in which the university should have had rights. Such incidents, taken together with the moral outrage at recent Wall Street scandals, have led universities, federal agencies, and their laboratories to devote considerable effort to framing conflict-of-interest policies.

The National Institutes of Health have been in the eye of this particular hurricane because their laboratories have developed important drugs which have been licensed to pharmaceutical companies. The resulting royalty feedback to the NIH researchers has been considerable—in a few cases reaching the \$100,000/year statutory limit. NIH issued conflict-of-interest guidelines in September 1989, but they were withdrawn in December following an outcry by NIH and university scientists. New guidelines have yet to be issued. This underlines one of the most difficult aspects of the problem—how to draw an acceptable line between academic and individual freedom on the one hand and financial reward for

supporting commercial activities on the other.

It is, perhaps, easiest to illustrate the institutional approach to these problems through our experience at Argonne National Laboratory, which is operated for the Department of Energy by the University of Chicago. In the past five years, Argonne scientists have created 25 companies; sometimes the scientists left the laboratory but some remained on the staff. The Bayh-Dole Bill gave the university rights to Argonne intellectual property, and this right was exercised by the creation of the ARCH Development Corporation, a not-for-profit affiliate of the university. Initially, ARCH acted as a licensing office and has licensed 24 Argonne inventions, resulting in initial awards to inventors totaling \$68,000. In 1989, it formed a venture fund to create new firms and has created eight so far. The first to be based on Argonne inventions—the Illinois Superconductor Corporation—raised for the first time serious questions concerning allowable and nonallowable roles for scientists and caused us to overhaul our consulting and conflict-of-interest policies.

To address this problem, Argonne established an Intellectual Property Committee chaired by a senior manager, with a majority membership of senior research scientists and engineers plus membership of legal and technology transfer representatives. New policies on conflicts-of-interest, consulting and equity ownership were developed and implemented. We gathered as much information as possible on policies at other research institutions. We concluded that full disclosure of all financial interests to all parties is a prerequisite. This is filed at the beginning of all outside activities and is updated annually.

Consulting with firms is nonexclusive. It is legitimate to consult exclusively within a clearly defined scope, such as the transfer of know-how associated with specific pat-

ents licensed to the firm, but the firm cannot "own" the consultant. He or she is free to consult in other clearly defined areas with other firms and must disclose all such agreements to all parties. Approval of consulting is given by line management, the Technology Transfer Center, and the Human Resources Department.

Equity or stock ownership is reviewed on a case-by-case basis. When a scientist is working in a field where many companies wish to collaborate with him or her, equity ownership in a company in his/her field would give the appearance of conflict-of-interest and permission would be refused. However, in a less popular field, it could be allowed.

It was mentioned above that inventors can now share in royalties or other income resulting from commercialization of their inventions. This is straightforward when the income is in the form of cash but complicated when the income is in the form of equity, if only because it is difficult to put a value on the equity. It is also possible that a scientist could become an unwitting owner of stock and could have a conflict-of-interest without realizing it.

How does one know when one has been engaging in unethical scientific behavior?

A final issue in potential conflicts-of-interest is generally categorized as "steering" of research to maximize financial return. This is a particularly sticky issue. How does one evaluate a situation where a scientist is encouraged to engage in the transfer of his/her work to industry, yet must not be seen to be steering it to maximize personal gain? It makes a research manager's life very difficult and raises the hackles of the scientist who believes that he/she is being accused of unprofessional behavior. Of course, this is but one of the difficulties of engaging in technology transfer: it also means greater care in the recording of data in specific notebooks tied to specific projects, restrictions on publication until a patent is filed, and nondisclosure of the proprietary information of an industrial partner which may hamper free-flowing scientific discussions. This is to be balanced against modest financial gains and, perhaps more important, a feeling of having contributed to the nation's economic well-being.

How does one know when one has been engaging in unethical scientific behavior? Obviously, when the lawyers show up—and the number of cases has been steadily increasing.

It was recently reported that scientists at the University of Utah who had been asked to monitor the cold fusion experiments there, and found no effects, received a demand from Dr. Pons' lawyer to retract their findings or face legal action. Research institutions and their scientists are also open to investigation by congressional committees, the Securities and Exchange Commission, and reporters. The ensuing publicity often lasts a long time and is clearly to be avoided. Openness, full disclosure of interests, and an awareness of potential pitfalls go a long way toward avoiding problems.

One must try to maintain a balanced picture. Ninety-nine percent of scientists are dedicated and honest. Professional soci-

eties, such as MRS, help to maintain the democratic and effective process of peer evaluation. The institutions in which the scientists work must not be bullied into excessive bureaucratic control nor must they be named in banner headlines in the *Wall Street Journal* or summoned to a congressional hearing to explain their actions. We will learn how to manage the process just as the process of scientific inquiry has been managed for over a century—professionally and democratically.

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