

FINAL WORD

By Robert F. Johnston

HOW SMALL COMPANIES CAN SPEED TECH TRANSFER

In high technology areas such as biotechnology, there is increasing pressure for innovations to move rapidly from the academic arena into commercial production. For this reason, effective means of communication should be established between the university and corporate researchers. There are inherent problems, however, in this line of communication. The academic researcher, pursuing knowledge for knowledge's sake and freely publishing his findings, has relatively little patience to focus on one particular concept and see that it becomes commercialized. Alternatively, the corporate researcher is strongly motivated to keep the information he discovers confidential, to file patents, and to establish a proprietary position for his own company. The small entrepreneurial company can serve to span this gap in ideology, as it employs people trained to recognize market opportunities in their early stages and to develop them into marketable products. As a venture capitalist, I will endeavor to describe the interrelationships, as I see them, between these three parties: the university, the small innovative company, and the large corporation.

In my opinion, certain assumptions can be made concerning these three participants and the transfer of technology. First, a significant portion of the innovative research talent is situated within the universities and will continue to be there for the near future. Most university researchers, viewing the small, independent company as operating in an atmosphere more similar to the structure of the university, therefore prefer the smaller company over a larger corporation. Second, the large company, although having the means to oversee the manufacturing, packaging, marketing, government regulatory clearances, etc., has not been able to either interact effectively with the universities on specific programs, or to react to market opportunities as rapidly as the small company. Thus, many of the larger corporations have invested in the smaller companies and have collaborated with them on contracts and joint ventures.

There have been several major research agreements between large companies and universities. The \$23 million, five-year research agreement between Washington University and Monsanto, which they characterize as an "Institution to Institution agreement," is one example. Unfortunately, there is ample room for conflict in many of these agreements. Many professors have individual contractual relationships with other companies and, in some cases, are consultants and shareholders with other firms. The major research agreement does give the corporation access to the technology, but only in an extremely broad sense.

Koppers Company is involved in approximately 16 agreements with various universities. William Maclay, the director of research, wrote an article entitled "Koppers—University Collaboration," published in *Les Nouvelles* (March 1981), the journal of the Licensing Executives

Society, which outlined the company's policy. Koppers likes to acquire ownership of the patent, as they feel that they have more expertise in determining how the patent should be written because they will be commercializing the product. The capital required for commercialization is frequently 100 to 1,000 times the cost of the initial research, and therefore, the company has the greater incentive to continue the commitment. The Koppers Company identifies specific time frames in which they must file for the patent and commercialize it, or the rights revert to the university. I agree with this concept completely. Exclusivity and confidentiality of information are very sensitive areas, and agreements are generally reached that enable the researcher to publish within a certain time period.

In areas such as biotechnology, where there is a high rate of technological change and the competition is keen, there is great pressure for the small company to identify niches in the marketplace and to move very rapidly to capitalize on these. The entrepreneurial companies have the resources and ability to do this. In my experience, they do, in fact, recognize the opportunities, structure contracts and research relationships with outstanding members of the academic community able to support them on the project, and then select a larger corporation with the marketing skills to distribute the product.

Ideally, the university researcher continues to do the same type of research, the main difference being that his funding now comes from the small company rather than the government. For example, one of the companies I am associated with is funding studies at the University of Pennsylvania focusing on T-cells, research which the university was doing prior to our arrangement with them. Obviously, the recent decreases in federal funding create additional incentives for the university researcher to enter into these types of relationships.

A venture company is particularly interested in developing relationships with universities, because it survives by being able to accomplish things faster. Having fewer resources than a larger company, it has to recognize the market sooner and move to take advantage of opportunities. Therefore, the venture company should endeavor to collaborate with universities at which marketable research has already been performed, and push for commercialization.

The small company must maintain a very tight focus as it has limited resources and must generate results within a constrained time frame. Furthermore, to obtain the initial capital, most small companies must have a very specific business plan. Frequently, the small company will establish itself in a particular area of research; there have been many examples of this. Probably the most public at the current time is the relationship of Genentech with Eli Lilly for the distribution of insulin. Cytogen, a venture company with which I am closely associated, is involved in monoclonal antibody technology and has several collaborators in the area of sexually transmitted disease. Cytogen has screened and selected the appropriate antibodies and

Continued on page 621

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PULP

TITLE: A Method for the Delignification of Wood and Other Ligno-Cellulosic Products

INVENTORS: Hervé Tournier, Valleiry, FR, Ake Allan Johansson, Meyrin, SW, Jean-Pierre Sachetto, Saint-Julien en Genevois, FR, Jean-Michael Armanet, Onex, SW, Jean-Pierre Michel, Colognes sous Salève, FR, Alain Roman, Bossey, FR.

ASSIGNEE: Battelle Memorial Institute, Carouge/Geneva, SW

FILING & ISSUING DATA:

PCT Publication No.: WO 83/02125

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Priority Country: U.S.

Priority Date: December 10, 1981

The patent describes a pulping process using a mixture of phenol and dilute sulphuric acid to yield purified cellulose, lignin fraction, and pentoses. The solution contains 0.4 parts phenol by weight, with an acid concentration of 3-6% and a liquid to solid ratio of 2:1 to 4:1 at a temperature equivalent to the boiling point of the phenol solution.

MOLD

TITLE: Method for Obtaining Mold Spore Material

INVENTORS: Peter Paul Kozak, Jr., Santa Ana, and Janet M. Gallup, Garden Grove, CA, U.S.

ASSIGNEES: Peter P. Kozak, Jr., Janet M. Gallup, Leo H. Cummins, Sherwin A. Gillman, Orange, CA, U.S.

FILING & ISSUING DATA:

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Priority Country: U.S.

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The patent protects a method for obtaining mold spore material that can be used for developing allergy immunizations. The spores are neither structurally damaged nor broken open during harvesting or preparation of an extract. The method yields a higher ratio of spores to mycelia than current methods and is applicable to practically any mold with spores and mycelia, including *Alternaria*, *Cladosporium*, *Penicillium*, *Aspergillus*, *Drechslera*, and *Epicoccum*. The method also permits use of media that are less pure and would otherwise contaminate the mold.

***Country Codes:**

FR = France

SE = Sweden

SW = Switzerland

U.S. = United States

Patent information in this department was compiled from the *Official Gazette of the United States Patent and Trademark Office*, the *European Patent Bulletin*, and the *PCT Gazette*.

Printed copies of patents issued in the United States may be obtained for \$1 from the Commissioner of Patents and Trademarks, U.S. Patent Office, Box 9, Washington, DC 20231. Patent number, title, and inventor should be specified.

Copies of patents and patent applications listed in the *PCT Gazette* and the *European Patent Bulletin* can be obtained for \$.30/page from the Foreign Patents Section, U.S. Patent Office, Box 9, Washington, DC 20231.

COMMENTARY (Continued from page 579)

hyde (a blocker of binding sites) and sodium azide (which would have impaired active uptake). In the experiments with chitin, cellulose, and modified celluloses, all removed uranium from solution.

As Mary Ellen Curtin remarked in her article, metals markets are notoriously fickle. On a long-term basis, however, such instability can only enhance interest in novel developments such as these spawned in the land of Chaim Weizmann. ■

FINAL WORD (Continued from page 630)

has entered into a marketing arrangement with Becton Dickinson, the largest marketing force to laboratories performing infectious disease testing.

Under the scenario that I have outlined, the university retains its talent pool, the small company cultivates the resources of the university, and the larger corporation maximizes on its established position in the marketplace to manufacture and obtain regulatory approval of the product. I believe that this differentiation of skills will continue and will optimize the strengths of each of the three participants.

To summarize, all three parties should benefit from this collaboration. The university receives additional research funding, the small company speeds the commercialization of the new technology, and the large company has a new product to manufacture and market. I see this relationship continuing very effectively in today's environment. ■

INDEX TO ADVERTISERS

American Bionuclear	571
Baker Co.	560
Becton Dickinson Labware	546
Bio/Technology Subscription	623
Brownlee Labs	528
Chemapec	569
Digital Equipment Corp.	531
Drummond Scientific	574
EIC/Intelligence	576
Enzyme Center	556
Evans & Sutherland	553
FMC Marine Colloids	572
Genzyme	580
IRL Press	530
LSL Biolafitte	578
Manostat Corp.	563
Millipore	Cover 3
New England Enzyme	622
Ohaus Scale Corp.	549
Peninsula Laboratories	620
P-L Biochemical	532
Pharmacia	Cover 4
Practical Biotechnology	570
Queue Systems	566 & 567
Saunders Valve	542
Spectrum Medical	Cover 2 & 527
Sybron Laboratories	620
Vega Biotechnologies	623
L. William Teweles	610
Whorthington Diagnostics	535
Carl Zeiss	539
Zymark Corp.	564

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