INTRODUCTION

Some of the patent licensing done by universities relates to inventions in which the university acquired ownership under the terms of employee patent agreements or by assignment from individuals who elect to have the university develop and market inventions on their behalf. University research administrators, however, are primarily concerned with patent licensing which relates to university owned inventions which resulted from research programs sponsored by the Federal government or by industrial organizations. The purpose of this paper is to provide an introduction to the principal features of such licensing agreements. The sample licensing agreement included in this paper is a royalty-bearing, limited term, exclusive license, which is preceded by a brief commentary on each of its provisions.

Those interested in pursuing patent licensing further should seek guidance from professional groups such as the Society of University Patent Administrators, the Licensing Executives Society and from publications such as the following:

1. Les Nouvelles - The Journal of the Licensing Executives Society, a worldwide federation of business-oriented professional societies of individuals involved in the transfer of technology and industrial or intellectual property rights. (Les Nouvelles, 1225 Elbur Avenue, Cleveland, Ohio 44107).

2. The Law and Business of Licensing - Licensing in the 1980's, - A looseleaf reference series with new material added on an annual basis in the form of supplementary pages and new binders. Published by Clark Boardman Company, Ltd., 435 Hudson Street, New York, N. Y. 10014, this series, the first volume of which was issued on October 15, 1981, is the follow-on to the four-volume series, The Law and Business of Licensing, which was closed out in 1980. Both series feature reprints of selected articles from Les Nouvelles.

3. The Licensing Law Handbook, Clark Boardman Company, Ltd., - An annual series, starting with 1979, designed to assist practitioners and licensing professionals to cope with new developments in the law and business of licensing. The 1982 volume, fourth in the series, covers the pricing of technology, joint ventures, R&D limited partnerships, and international operations.

LICENSING AGREEMENT

Commentary

The attached sample agreement, which is presently in use at MIT, illustrates the essential provisions of an exclusive patent license to a research sponsor. It includes, in certain clauses, language which must be used where government funding was involved, as discussed in Unit 2 of this series, "Patent Rights under Government Contracts".

Other universities may add clauses which are not included in the sample agreement, omit some of the clauses which are, or state them in a different manner. Nonetheless, the sample agreement suggests the subject matter which must be dealt with and the type of clauses which are used. It is set forth solely as an example, and is not recommended for use by other institutions unless appropriately modified and adapted by a qualified patent attorney.

The following comments refer to the corresponding provisions of the sample agreement.

PARTIES

The parties must be identified by name and place of business and by their "hereafter referred to as..." designation, such as licensor, university, licensee or a combination thereof.

RECITALS

The recitals (i.e., Whereases) help to identify and characterize the type of license and the general nature of the agreement at the outset. The royalty-free license to the U.S. government (in the first Whereas of the sample license) is used, of course, only where the invention was developed using government funds.

ARTICLES

I. Definitions

It is important in this section to define certain of the essential elements to be covered by the license. For example, it should be clear whether "licensee" includes any subsidiary and how subsidiary is defined. Similarly, the actual patent rights which are the subject of the license should be clearly defined. Other areas which should be defined from the outset include the licensed product and/or licenses process. Other

IV. Royalties - Licensing fees

It is customary in an exclusive license to require a license issue fee upon execution of the license agreement. This fee serves to return immediately to the university the costs of patent filing and is also an indication that the exclusive licensee has a serious intent to commercialize the invention. The license issue fee may, or may not, be used by the licensee as a credit against future royalties, and where the licensee is the sponsor of the research, the license fee is often waived.

Perhaps the fairest measure of royalties and that used most often is the running royalty based on the net sales price of the licensed product. The rate is usually set higher during the period of exclusivity and lower during the period of non-exclusivity. It is important also to set an annual minimum royalty as a useful method to ensure performance by the licensee.

The procedure for making royalty payments is also included in this section.

V. Reports and records

It is important that a clear understanding be reached by the parties as to the type of records which must be maintained and the type of inspection permitted. An adequate reporting procedure from the licensee to the university is essential, as is the university's right to retain an accountant for inspection of licensee's royalty records. For purposes of economy a university might retain the right to use its own internal auditing divison for such inspection. The licensee, however, may insist that an independent certified accountant be retained, and this latter provision is more common, although obviously more costly. The royalty statement should specify sales to the U.S. government only in those license agreements where the government has a royalty-free license by virtue of funding the invention.

VI. Patent prosecution

This section sets forth the obligations of the parties to apply for and maintain the licensed patent rights. In the sample agreement this burden is assumed by the university; however, it may well be assumed by the licensee or by both parties as discussed in Part IV covering research contract patent clauses.

VII. Termination

A termination provision is essential in an exclusive license. The provision should state clearly the cause for termination, the notice period requirement, and the university's right to terminate based on a breach of the agreement.

XIII. Export control regulations

This clause warns the licensee that it is the responsibility of the licensee to comply with all of the export control regulations of the U.S. Government in any export of technical data or products under the license agreement. This clause provides valuable protection for the university and should always be included.

OTHER CLAUSES (XIV - XV)

The remaining clauses are for housekeeping and administrative purposes and parallel those normally contained in any research contract under such headings as:

A. Payments and notices

B. Governing law

C. Severability

D. Entire agreement

1.3 "Patent Rights" shall mean the United States and Foreign pending patent applications set forth in Appendix <appendix> attached hereto and made a part hereof (hereinafter referred to as the "Patent Rights Patent Application(s)"), and the United States patents and Foreign patents issuing from said pending United States and Foreign patent applications or later-filed foreign applications based upon any of said United States patents and applications (hereinafter referred to as the "Patent Rights Patent(s)") and any continuations, continuations-in-part, divisions, reissues or extensions of any of the foregoing.

1.4 "Licensed Product(s)" shall mean <product description> which:

(a) is covered in whole or in part by (i) a pending claim contained in a Patent Rights Patent Application in the country in which the Licensed Product(s) is made, used or sold or (ii) a valid and unexpired claim contained in a Patent Rights Patent in the country in which the Licensed Product(s) is made, used or sold.

(b) is manufactured by using a process which is covered in whole or in part by (i) a pending claim contained in a Patent Rights Patent Application in the country in which the Licensed Process(es) is used or (ii) a valid or unexpired claim contained in a Patent Rights Patent in the country in which the Licensed Process(es) is used.

1.5 "Licensed Process(es)" shall mean a process for making <process description> which is covered in whole or in part by (i) a pending claim contained in a Patent Rights Patent Application or (ii) a valid and unexpired claim contained in a Patent Rights Patent.

ARTICLE II - GRANT

2.1 M.I.T. hereby grants to LICENSEE a worldwide right and license to make, have made, use, lease and sell the Licensed Product(s) under the Patent Rights, and to practice the Licensed Process(es) to the full end of the term for which the Patent Rights are granted unless sooner terminated as hereinafter provided.

2.2 In order to establish a period of exclusivity for LICENSEE, M.I.T. hereby agrees that it shall not grant any other license to make, have made, use, lease and sell the Licensed Product(s) or to utilize the Licensed Process(es) during the period of time commencing with the Effective Date of this Agreement and terminating with the first to occur of:

(a) The expiration of <year A> years after the first commercial sale of a Licensed Product or first commercial use of a Licensed Process; or,

(b) The expiration of <year B> years after the Effective Date of this Agreement.

(c) Make a first commercial sale of a Licensed Product and/or a first commercial use of a Licensed Process within <months E> months from the Effective Date of this Agreement

<(d) Other milestones depending on invention being licensed.>

3.3 LICENSEE's failure to perform in accordance with Paragraphs 3.1 and 3.2 above shall be grounds for M.I.T. to terminate this Agreement pursuant to Paragraph 7.3 hereof.

ARTICLE IV - ROYALTIES

4.1 For the rights, privileges and license granted hereunder, LICENSEE shall pay to M.I.T. in the manner hereinafter provided to the end of the term of the Patent Rights or until this Agreement shall be terminated as hereinafter provided:

(a) A license issue fee of <license issue fee> Dollars, which said license issue fee shall be deemed earned and due immediately upon the execution of this Agreement.

(b) During the period of exclusivity, a royalty in an amount equal to <royalty percent> percent of the Net Sales Price of the Licensed Product(s) used, leased or sold by or for LICENSEE or its sublicensees.

(c) During the period of nonexclusivity, a royalty in an amount equal to <second royalty percent> percent of the Net Sales Price of the Licensed Product(s) used, leased or sold by or for LICENSEE or its sublicensees.

(d) In the event that LICENSEE's royalty payment to M.I.T. hereunder for licensed operation during the calendar year <calendar year> and each year thereafter during the exclusive period falls below <annual minimum amount> Dollars, LICENSEE shall, with its last report for said years, pay to M.I.T., in addition to the royalty payments provided in the foregoing paragraphs, an amount sufficient to the above annual amounts.

<(e) Royalty rates for the Licensed Process(es) shall be as negotiated.>

4.2 As used herein, the phrase "Net Sales Price" shall mean LICENSEE's billings for the Licensed Product(s) produced hereunder less the sum of the following:

(a) Discounts allowed in amounts customary in the trade;

(b) Total billings for Licensed Product sold.

(c) Accounting for all the Licensed Process(es) used or sold.

(d) Deductions applicable as provided in Paragraph 4.2.

(e) Total royalties due.

(f) Names and addresses of all sublicensees of LICENSEE.

(g) Licensed Products manufactured and sold to the United States Government. (No royalty obligations shall arise due to use by, for or on behalf of the United States Government in view of the royalty-free, nonexclusive license heretofore granted to the United States Government).

(h) Annually, the LICENSEE's certified financial statements for the preceding twelve (12) months including, at a minimum, a Balance Sheet and an Operating Statement.

5.3 With each such report submitted, LICENSEE shall pay to M.I.T. the royalties due and payable under this Agreement. If no royalties shall be due, LICENSEE shall so report.

ARTICLE VI - PATENT PROSECUTION

6.1 M.I.T. shall apply for, shall seek prompt issuance of, and maintain during the term of this Agreement the Patent Rights set forth in Appendix A. The prosecution and maintenance of all Patent Rights Patents and Applications shall be the primary responsibility of M.I.T.; provided, however, LICENSEE shall have reasonable opportunities to advise M.I.T. and shall cooperate with M.I.T. in such prosecution and/or maintenance.

<6.2 Payment of all fees and costs relating to the prosecution and maintenance of the existing Patent Rights set forth in Appendix A or additional foreign or domestic filings under the Patent Rights shall be as negotiated by the parties.>

ARTICLE VII - TERMINATION

7.1 If LICENSEE shall become bankrupt or insolvent, or shall file a petition in bankruptcy, or if the business of LICENSEE shall be placed in the hands of a receiver, assignee or trustee for the benefit of creditors, whether by the voluntary act of LICENSEE or otherwise, this Agreement shall automatically terminate.

7.2 Should LICENSEE fail in its payment to M.I.T. of royalties due in accordance with the terms of this Agreement, M.I.T. shall have the right to serve notice upon LICENSEE by certified mail at the address designated in Article XIV hereof, of its intention to terminate this Agreement within thirty (30) days after receipt of said notice of termination unless LICENSEE shall pay to M.I.T., within the thirty (30) day period, all such

either party to obtain judicial resolution of such issue, unless an order staying such arbitratio n proceeding shall be entered by a court of competent jurisdiction. Neither party shall raise any issue concerning the validity, construction or effect of any patent licensed hereunder in any proceeding to enforce any arbitration award hereunder or in any proceeding otherwise arising out of any such arbitration award.

ARTICLE IX - INFRINGEMENT

9.1 LICENSEE and M.I.T. shall promptly inform the other in writing of any alleged infringement of which it shall have notice by a third party of any patents within the Patent Rights and provide such other with any available evidence of infringement.

9.2 During the term of this Agreement, M.I.T. shall have the right, but shall not be obligated, to prosecute at its own expense any such infringements of the Patent Rights and, in furtherance of such right, LICENSEE hereby agrees that M.I.T. may join LICENSEE as a party plaintiff in any such suit, without expense to LICENSEE. The total cost of any such infringement action commenced or defended solely by M.I.T. shall be borne by M.I.T., and M.I.T. shall keep any recovery or damages for past infringement derived therefrom.

9.3 If within six (6) months after having been notified of any alleged infringement, M.I.T. shall have been unsuccessful in persuading the alleged infringer to desist and shall not have brought and shall not be diligently prosecuting an infringement action, or if M.I.T. shall notify LICENSEE at any time prior thereto of its intention not to bring suit against any alleged infringer, then, and in those events only, LICENSEE shall have the right, but shall not be obligated, to prosecute at its own expense any infringement of the Patent Rights, and LICENSEE may, for such purposes, use the name of M.I.T. as party plaintiff; provided, however, that such right to bring an infringement action shall remain in effect only for so long as the license granted herein remains exclusive. No settlement, consent judgement or other voluntary final disposition of the suit may be entered into without the consent of M.I.T., which consent shall not unreasonably be withheld. LICENSEE shall indemnify M.I.T. against any order for costs that may be made against M.I.T. in such proceedings.

9.4 In the event that LICENSEE shall undertake the enforcement and/or defense of the Patent Rights by litigation, LICENSEE may withhold up to fifty percent (50%) of the royalties otherwise thereafter due M.I.T. hereunder and apply the same toward reimbursement of its expenses, including reasonable attorneys' fees, in connection therewith. Any recovery of damages by LICENSEE for any such suit shall be applied first in satisfaction of any unreimbursed expenses and legal fees of LICENSEE relating to the suit, and next toward reimbursement of M.I.T. for any royalties past due or withheld and applied pursuant to this Article IX. The balance remaining from any such recovery shall be divided equally between LICENSEE and M.I.T.

9.5 In the event that a declaratory judgement action alleging invalidity or non-infringement of any of the Patent Rights shall be brought

ARTICLE XII - NON-USE OF NAMES

LICENSEE shall not use the names of Massachusetts Institute of Technology nor of <inventors> nor any adaptation thereof in any advertising, promotional or sales literature without prior written consent obtained from M.I.T. in each case, except that LICENSEE may state that it is licensed by M.I.T. under one or more of the patents and/or applications comprising the Patent Rights.

ARTICLE XIII - EXPORT CONTROLS

It is understood that M.I.T. is subject to United States laws and regulations controlling the export of technical data, computer software, laboratory prototypes and other commodities (including the Arms Export Control Act, as amended, and the Export Administration Act of 1979), and that its obligations hereunder are contingent on compliance with applicable United States export laws and regulations. The transfer of certain technical data and commodities may require a license from the cognizant agency of the United States Government and/or written assurances by LICENSEE that LICENSEE shall not export data or commodities to certain foreign countries without prior approval of such agency. M.I.T. neither represents that a license shall not be required nor that, if required, it shall be issued.

ARTICLE XIV - PAYMENTS, NOTICES AND OTHER COMMUNICATIONS

Any payment, notice or other communication pursuant to this Agreement shall be sufficiently made or given on the date of mailing if sent to such party by certified first class mail, postage prepaid, addressed to it at its address below or as it shall designate by written notice given to the other party:

In the case of M.I.T.:

Patent, Copyright and Licensing Office
Massachusetts Institute of Technology
77 Massachusetts Avenue, Room E19-722
Cambridge, Massachusetts 02139

In the case of LICENSEE:

<company>
<address>

WASHINGTON UNIVERSITY

ST. LOUIS, MISSOURI 63130

OFFICE OF THE ASSOCIATE VICE CHANCELLOR FOR RESEARCH

(314) 889-5889

EDWARD L. MACCORDY

ASSOCIATE VICE CHANCELLOR FOR RESEARCH

H.S. LEAHEY

DIRECTOR, RESEARCH CONTRACT AND LICENSING ADMINISTRATION

September 30, 1985

R. File w/ Cooperative Agreements

Norman Latker
OPTI
Room 4837
Department of Commerce
14th and Constitution, N.W.
Washington, D.C. 20230

Dear Norman:

Enclosed is a copy of the Washington University-Monsanto Biomedical Agreement which you requested.

Please note that we wish to restrict distribution of this Agreement and request that you inform us and receive permission from the University prior to further dissemination of the Agreement by your organization.

Please do not hesitate to contact me to discuss the Agreement in detail.

Very truly yours,

H. S. Leahey
Director
Industrial Contracts & Licensing

Enclosure

Signed Original

MONSANTO-WASHINGTON UNIVERSITY

BIOMEDICAL RESEARCH AGREEMENT

INDEX

WHEREAS, Monsanto has personnel and facilities for the conduct of research, for the development of new products and processes based on scientific research, and for efficient large scale manufacture and distribution;

WHEREAS, Monsanto seeks to utilize the fruits of scientific research as a source for the development, manufacture and distribution of new products, especially products for meeting human needs;

WHEREAS, the University and Monsanto recognize that each can benefit from a relationship in biomedical research extending over a span of years that will provide present and potential financial support for the University, potential benefit to health care consumers and potential commercial benefit for Monsanto, while enhancing the understanding and work of their respective scientists by close interaction among them;

WHEREAS, the University and Monsanto believe that industrial support of biomedical research can lead to enhancement of their respective capabilities and render important long range benefits to the University, to Monsanto and to society;

WHEREAS, the University and Monsanto believe that biomedical inventions are likely to be brought into public use for public benefit through the incentive of the protection of the Patent System utilized by the parties to make available

NOW, THEREFORE, the parties hereto agree as follows:

ARTICLE I

PURPOSE AND SCOPE OF THIS AGREEMENT

The purpose of the present Agreement is to provide a contractual framework to govern conduct of this collaborative effort under which multiple research Projects (as hereinafter defined) can be undertaken. This Agreement is designed to recite the contractual provisions which would apply to all Projects authorized by the Advisory Committee under the Program (as hereinafter defined).

ARTICLE II - DEFINITIONS

2.1 "Program" means all research activities performed by or for the University under this Agreement which are authorized and funded by the Advisory Committee (as hereinafter defined) and Program Director from financial support provided by Monsanto.

2.2 "Project" means a specific research activity which has been authorized and funded by the Advisory Committee from financial support provided by Monsanto under the Program. Projects shall be of three types:

2.4 "Project Investigator" means the scientist in charge of a Project and responsible for its conduct in accordance with the terms of the Project award and the accepted operating policies and procedures of the University. A Project Investigator shall be a faculty member qualified to be a principal investigator on research projects sponsored by government and nationally reputable agencies.

2.5 "Technical Developments" means any and all inventions, discoveries, advances, know-how, processes, devices, machines, materials, software and other information arising from the Program, whether or not the same are patentable, copyrightable or otherwise protectable by law.

2.6 "Patent" means any patent, certificate of invention, inventors certificate, utility model or similar form of protection, or plant patent or other form of protection of plant material, granted anywhere in the world covering an invention which is a Technical Development, and owned by the University or in which the University has licensing rights.

2.7 "Licensed Product" means any product covered by a claim or made by or used in a process covered by a claim of an unexpired Patent at the time and in the country wherein the product is manufactured, used or sold, which claim has not been adjudicated invalid in a final adjudication from which there can no longer be an appeal, and which Patent is licensed to Monsanto

such elections and the parties shall negotiate in good faith mutually acceptable financial terms and time extensions, not to exceed two (2) years in duration, prior to the expiration of this Agreement. All other relevant terms of this Agreement shall apply to such terminal Project continuations.

ARTICLE IV - PROGRAM ADMINISTRATION

4.1 The Program shall be under the direction of the Advisory Committee chaired by the Program Director, Dr. David M. Kipnis, who shall be assisted by seven (7) other Committee members including three (3) members, namely, Dr. Luis Glaser, Dr. Paul Lacy, and Dr. Joseph Davie, appointed by the University and four (4) members, namely, Dr. Howard A. Schneiderman, Dr. G. Edward Paget, Dr. Louis Fernandez and Dr. David C. Tiemeier, appointed by Monsanto. The University and Monsanto representatives on the Advisory Committee, other than the Program Director, may be changed at appropriate intervals by either of the parties with timely notice to the other party.

4.2 All actions to approve, defer or disapprove Program activities and to fund new Projects, to provide supplemental or continuation support to previously approved Projects or activities, and to discontinue previously approved Projects or activities shall be taken in convened meetings of the Advisory Committee. Any such action shall require approval of a majority of the members of the Advisory Committee, i.e., at least five (5)

may have any matter related to the conduct of the Program placed on the Advisory Committee agenda for the next or forthcoming meeting by making such a request in writing to the Program Director sufficiently in advance of the meeting to allow adequate preparation for a productive discussion of the matter.

4.5 The Program Director shall, after each meeting of the Advisory Committee, distribute to all Committee members, whether present at the meeting or not, a written summary of matters considered and actions taken.

4.6 Should a member of the Advisory Committee not be able to attend a given meeting, an alternate representative may be designated by so notifying the Program Director on a meeting by meeting basis. If the Program Director is unable to attend a meeting of the Advisory Committee, he may designate another University member of the Advisory Committee to chair the meeting and perform the functions of the Program Director at that meeting. However, it is understood by the parties that the effectiveness of the Advisory Committee will be promoted by continuity of membership and regular attendance at meetings by members.

ARTICLE V - PROJECT SELECTION AND IMPLEMENTATION

5.1 The Advisory Committee shall decide on both the Exploratory and Specialty Projects which are to be supported

members of the Advisory Committee at least one (1) month prior to the Committee meeting at which such requests are to be considered.

5.5 Whenever the Advisory Committee has identified a field of research of mutual interest, and has received an acceptable Project proposal, a Project may be created by the authorization of the Advisory Committee in writing. The Project authorization shall identify the Project Investigator, define the research activities to be pursued, the level of effort to be devoted to the Project by the Project Investigator, include a budget covering all costs of such research, define the time duration and such other terms and conditions as may be agreed to and be approved by the Project Investigator consistent with the purposes and conditions of this Agreement.

5.6 With concurrence of the Advisory Committee, and in furtherance of productive interaction between scientists of Monsanto and those of the University, Monsanto representatives on the Committee shall designate a Monsanto Project Scientist who shall act as the primary contact with each Project Investigator during the conduct of a given Project.

5.7 The Program Director shall submit to Monsanto in writing summary reports of all important findings and results as soon as available and detailed annual Program reports on each anniversary of this Agreement. The annual reports shall include

6.3 It is anticipated that interaction between the Project Investigators and Monsanto Project Scientists will identify facilities and capabilities of Monsanto which may be used by University scientists to enhance the progress of Projects. Moreover, it is appropriate that evaluation of the commercial potential of research leads and products be addressed through the interaction of the Project Investigators and the Monsanto Project Scientists.

ARTICLE VII - SCIENTIFIC REVIEW PANEL

7.1 To assess the scientific merit and cost effectiveness of Projects supported by the Program, the parties hereto recognize the need for periodic review by an independent panel of scientists.

7.2 During the third year of the initial term of this Agreement and every two (2) years thereafter, the Advisory Committee shall commission a scientific review panel comprising at least four (4) distinguished scientists, not employees of Monsanto or members of the University staff, to review all then-current Project work and to appraise the direction of the Program, both qualitatively and quantitatively. Composition of the review panel should be designed to include scientists having clinical and pharmaceutical orientation as well as academic orientation.

in accordance with Paragraph 8.9. The parties hereto believe the following expenditure schedule reflects the appropriate allocation of funds:

Contract Year	Exploratory Projects	Specialty Projects	Construction and Renovation Projects	Contract Year Budget
82/83	$ 1,500,000	$ 1,500,000	$ (See Para.8.4)	$ 3,000,000
83/84	$ 1,600,000	$ 2,200,000	$	$ 3,800,000
84/85	$ 1,700,000	$ 3,000,000	$	$ 4,700,000
85/86	$ 1,800,000	$ 3,800,000	$	$ 5,600,000
86/87	$ 1,900,000	$ 4,500,000	$	$ 6,400,000
Total	$ 8,500,000	$ 15,000,000	$	$ 23,500,000

The initial contract year shall run from the effective date of this Agreement through June 30, 1983. Subsequent contract years shall run from July 1 through June 30.

The contract year budgets above recited, commencing with the second contract year (July 1, 1983 through June 30, 1984), shall be adjusted using the GNP Deflator Index in the following manner:

(a) A base index will consist of an average of the GNP Deflator Index figures for the four

after it is first published, calculations herein shall be based on the final index for a quarter, if available, and otherwise on the most recent revision available on June 1 immediately preceding the start of the contract year for which calculations are made.

8.3 It is recognized that the occurrence of expenditures during a contract year is primarily dependent on Project spending plans authorized by the Advisory Committee during the current and any prior years. Nevertheless, Monsanto is not obligated to reimburse the University for expenditures incurred during, or carried forward into, any contract year in excess of the total amount of the contract year budget shown on the expenditure schedule in Paragraph 8.2, as it may have been adjusted under the provisions of Paragraph 8.2 and 8.9, unless the parties mutually agree to modify said total amount by formal amendment to this Agreement.

8.4 All Program funds shall be administered by the Program Director who shall allot funds, with the approval of the Advisory Committee as specified in Article IV, to Project participants. By unanimous consent the Advisory Committee may reallocate among Project types up to 10% of the total funds for any contract year specified in the schedule of Paragraph 8.2, as such annual total may have previously been modified by Monsanto under Paragraph 8.3 or by the Advisory Committee under Paragraph 8.9. Such reallocation of contract year funds may be among the

supporting details to Monsanto showing actual spending by University expense category for each Project for which reimbursement of expenditures is being requested. Each invoice shall also show cumulative expenditures to date for each such Project against the approved Project budget and cumulative total Program expenditures for the contract year against the current contract year budget shown on the expenditure schedule in Paragraph 8.2 as it may have been previously adjusted under the provisions of Paragraphs 8.2 and 8.9.

8.8 Monsanto agrees to pay the University promptly upon receipt and approval of the University's invoices provided under Paragraph 8.7 up to the level of the contract year budget set forth in Paragraph 8.2, as such contract year budget may have been adjusted under the provisions of Paragraphs 8.2 and 8.9.

8.9 If in any contract year there is an overrun of the contract year budget the excess expenditures shall be carried forward and be paid from the following contract year budget. If in any contract year there is an underrun of the contract year budget (hereinafter in this paragraph "the current contract year budget"), then with the unanimous consent of the Advisory Committee the underrun amount may be carried over as an addition to the following contract year budget. The approved amount from the current contract year budget which is to be carried over shall be adjusted by a multiplier calculated by dividing the multiplier from Paragraph 8.2 for the following contract year

sideration relevant factors, including relative increases in indirect costs made in other research agreements, including government agreements.

ARTICLE IX - PUBLICATIONS AND REVIEW OF TECHNICAL DEVELOPMENTS

9.1 The University faculty members participating in Projects are at liberty to publish the results of their research subject to the provisions of Paragraphs 9.1, 9.2, 9.3, 9.4 and 9.5. Project awards will require that participants provide copies of all abstracts and articles, in the best form then available, proposed to be submitted for publication in sufficient time to permit the Program Director to provide same to a Monsanto member of the Advisory Committee at least one (1) month prior to submission to a publisher or other third party. The Program Director shall immediately determine that a Monsanto member has received a copy of each such proposed abstract and article. The Program Director shall also promptly provide to a Monsanto member a final copy of each abstract and article as submitted for publication.

9.2 Monsanto shall promptly review such proposed abstracts and articles to determine if potentially patentable Technical Developments are disclosed and shall promptly thereafter inform the University whether delay of submission for publication or other public disclosure for a reasonable time will be required to establish Patent rights of reasonable scope. Disputes concerning such delays shall be referred to the Advisory

results from Program activities shall acknowledge that support for such research was provided by Monsanto.

9.6 Upon written request to the Advisory Committee, Monsanto shall receive adequate samples of all available scientific materials isolated or developed in the Program, and shall have the right to use the same for research and/or commercial purposes, but subject to the provisions herein with respect to confidentiality, Patents and licenses. Monsanto's rights to receive and use samples as provided in this Paragraph 9.6 shall not be denied but shall be subject to reasonable modification for good reason as deemed necessary by the Advisory Committee.

ARTICLE X - CONFIDENTIALITY

10.1 Technical Developments and Patents shall be the sole and exclusive property of the University subject to the license rights provided under Article XI.

10.2 Monsanto shall take reasonable precautions to safeguard, in a manner comparable to that used to protect its own confidential technical information, unpublished Technical Developments and not disclose the same to others for a period of two (2) years after receipt; provided, however, that Monsanto shall not be liable for unauthorized disclosure of Technical Developments in spite of such precautions. With respect to any

applications.

10.4 Close cooperation between Monsanto personnel and University personnel in the conduct of activities required by or contributing to the purposes of this Agreement may involve the disclosure of Monsanto confidential information to such University personnel. Since, as a practical matter the University is not able to make commitments of confidentiality on behalf of its faculty nor control the confidential information disclosed to them, it shall advise all Program and Project participants that they will be required to sign in advance of receiving Monsanto confidential information personal commitments of confidentiality as Monsanto deems necessary in the circumstances.

ARTICLE XI - PATENTS AND LICENSING

11.1 Whenever the University reasonably feels a need therefor it may request Monsanto to provide in writing a preliminary indication of its current interest in commercializing Technical Developments resulting from a Project. However, Monsanto shall not be obligated to carry out commercialization.

11.2 Monsanto shall have the right and obligation to monitor progress of each Project through its representatives on the Advisory Committee and through access to University Program participants and reports, or by such other arrangements as may be

11.5 When Monsanto has indicated its interest in a license under prospective Patent rights to an invention it shall promptly cause its patent attorneys to file and prosecute in good faith a United States Patent application on such invention. Monsanto shall also effect the filing and good faith prosecution of foreign Patent applications corresponding to the United States application in whatever countries Monsanto by written notice to the University indicates its interest in a license under prospective Patent rights.

11.6 Until such time as Monsanto notifies the University in writing that it no longer has an interest in a license, or until the expiration of the time specified in Paragraph 11.14 during which time Monsanto has not given notice of its election to take a license, Monsanto agrees to bear the cost for filing and prosecution of Patent applications under Paragraph 11.5 and the issuance and maintenance of Patents thereon. Monsanto shall not be required to prosecute any such Patent application beyond the point of final rejection by the assigned Primary Examiner in the United States Patent and Trademark Office or the equivalent stage of prosecution if a foreign application. The University, at no cost or obligation or liability to Monsanto, may take action to file or prosecute any Patent application or have issued or maintain any Patent on which Monsanto elects not to take such action. Any such election by Monsanto shall be promptly communicated to the University and in adequate time to allow the University to take such action if it so desires. Monsanto's

right to a license thereunder shall not thereby be diminished.

11.7 With respect to Patent applications filed and prosecuted and Patents issued or maintained by Monsanto under Paragraphs 11.5 and 11.6, the University at its own expense may designate and retain patent counsel of its own who shall be permitted to review such Patent applications and proposed responses to Patent Office actions thereon and issuance and maintenance of Patents and to consult with Monsanto's patent attorneys before Monsanto takes action thereon. However, the control of such filings, prosecutions, issuances and maintenances shall rest with Monsanto unless it elects to relinquish such control to the University under Paragraph 11.6 by timely written notice. The University may at any time elect by notice in writing to Monsanto to assume at University's cost those activities undertaken by Monsanto under Paragraphs 11.5, 11.6 and 11.7 on behalf of the University in regard to any Patent application or Patent, and Monsanto's right to a license thereunder shall not thereby be diminished.

11.8 Title to all Patent applications and Patents issuing thereon covering Technical Developments made only by University or non-Monsanto personnel or jointly with Monsanto personnel shall be in the University. Any royalties payable with respect to the latter shall take into consideration the relative contributions of the University and Monsanto coinventors.

claim it may have against Monsanto or its employees for injury, loss or damage resulting from acts of omission or commission by Monsanto, its employees or agents, in connection with the preparation, filing and prosecution of Patent applications and the obtaining and maintaining of Patents covering Technical Developments.

11.12 Each inventor of a potentially patentable Technical Development, no later than the time of signing a Patent application thereon, shall be requested to agree, for the considerations recited in Paragraph 11.11, to make no claims against and to waive any claims he or she may have against Monsanto or its employees for injury, loss or damage resulting from acts of omission or commission by Monsanto, its employees or agents, in connection with the preparation, filing and prosecution of Patent applications and the obtaining and maintaining of Patents covering Technical Developments. Should any inventor decline to so agree, any Patent application on such Technical Development shall be filed and prosecuted and Patents obtained and maintained by the University, at its own cost, and Monsanto's right to a license thereunder shall not thereby be diminished.

11.13 Notwithstanding any other provision of this Agreement, the University agrees to hold harmless, indemnify and defend Monsanto and its employees from all liabilities, damages, costs, expenses (including attorneys fees) and losses resulting

under this Agreement the parties shall consider the benefits relative to licensing as distinguished from transfer of title.

11.16 The University agrees to grant and hereby grants to Monsanto an irrevocable, world-wide, paid-up, non-exclusive license, to make, have made, use and sell, including the right to grant sublicenses, on all Technical Developments which are not covered by Patents. Monsanto agrees to indemnify the University for liability arising from use of Technical Developments licensed under this Paragraph 11.16, and from use, sale or other disposition of products made by use of the said Technical Developments, by Monsanto, its affiliates, sublicensees or any party acting on behalf of same. This provision shall survive termination of this Agreement.

11.17 The University agrees to grant to Monsanto licenses on patents secured outside the Program to the extent the University has the right to so license and to the extent necessary for Monsanto to practice Technical Developments. For such patents the grant shall be on terms and conditions reasonable in the circumstances and shall include the right to grant sublicenses. Monsanto agrees to indemnify the University for liability arising from use of such patents licensed under this Paragraph 11.17 and from use, sale or other disposition of products made by use of such patents, by Monsanto, its affiliates, sublicensees or any party acting on behalf of same; this provision shall survive termination of this Agreement.

a) above is not met.

c) requirement that during the period of exclusivity Monsanto submit a product development plan specifying its reasonable estimate of the schedule of key events to market entry and provide periodic reports of significant modifications to the plan and progress against the plan to the University until market entry is achieved, and requirement that the University retain in confidence the information in said plan and reports and use only for purposes of the license.

d) right of Monsanto to sublicense others provided the University is notified to whom the sublicense was granted.

e) a royalty schedule based on net selling price of Licensed Product sold by Monsanto or its sublicensees. The University and Monsanto recognize that patent protection is only one factor contributing to commercial success of a product or process and that other factors, for example other patented

rules of conciliation and arbitration of the American Arbitration Association. Any such arbitration shall take place in St. Louis County, Missouri, before three (3) arbitrators, one of whom shall be designated by Monsanto, one by the University and the third by the two so designated. If one party fails to designate an arbitrator within thirty (30) days after the designation of an arbitrator by the other party, the arbitrator who should have been chosen by the other party shall be appointed by the American Arbitration Association as soon as possible. In the event that the said two arbitrators designated by the parties are unable to agree upon a third arbitrator within thirty (30) days after the nomination of the last of the said two arbitrators, the third arbitrator shall be appointed by the American Arbitration Association as soon as possible. None of the arbitrators need be designated from any panel published by the American Arbitration Association or any other arbitration association. The arbitrators shall apply the laws of the

against one-half of the royalties due the University hereunder from sales of the same Licensed Product.

h) right of annual audit to confirm royalties on behalf of the University by a firm of accountants to which Monsanto has no reasonable objection.

i) indemnification of the University by Monsanto for liability arising from the manufacture, use, sale or other disposition of Licensed Products, by Monsanto or its affiliates, sublicensees or any party acting on behalf of same. This provision is to survive termination of the license agreement.

j) law of Missouri shall apply.

k) such other provisions as the parties may mutually desire, and, in the case of an exclusive license of an invention jointly supported by the government, such provisions as the government may have validly required the University to include.

bringing the suit, then the expenses of the other party hereto if represented by counsel, and the balance shall be divided two-thirds to the party bringing the suit and one-third to the other party, unless the parties agree otherwise.

(3) Before bringing suit Monsanto shall fully inform the University, and give careful consideration to the views of the University in making its decision whether or not to sue.

(4) If Monsanto decides to sue and University is a legally indispensble party, the University shall have the right to assign to Monsanto all of the University's rights, title and interest in the Patent or Patents concerned, in which event suit by Monsanto on such Patent or Patents shall thereafter be brought or continued solely in its name if the University is no longer an indispensable party. Patents so assigned by the University to

11.21 Upon the indication by Monsanto of an interest in any Technical Developments and that Monsanto desires to commence activities directed at transferring such technology to its laboratories, then the Program Director shall participate with Monsanto representatives, the Project Investigators and others as may be appropriate to work out mutually acceptable actions to be taken to effect such technology transfer, including activities contemplated under Paragraphs 6.2 and 9.6, all at no added cost to Monsanto.

ARTICLE XII - TERMINATION

12.1 This Agreement shall terminate on June 30, 1987 unless extended by mutual agreement of the parties under the provisions of Paragraph 3.2; or unless earlier terminated under the provisions of Paragraphs 4.3, 12.2 or 12.3.

12.2 In the event that either party to this Agreement defaults or breaches any of the provisions hereof, the other party reserves the right to terminate this Agreement upon ninety (90) days written notice to the defaulting party; provided that if the defaulting party, within said ninety (90) day period cures the said default or breach, this Agreement shall continue in full force and effect.

12.3 If either party shall become insolvent, or shall make any assignment for the benefit of creditors, or shall be

13.2 The University warrants that it carries sufficient Worker's Compensation insurance to comply with the laws of Missouri and any other state where any of the work pursuant to this Agreement is performed with respect to the University's personnel. Except as provided under Paragraph 13.3 it is expressly understood and agreed that Monsanto shall not be responsible for or obligated in any manner to reimburse the University or to pay any compensatory, special, exemplary or consequential or other direct or indirect damages in respect of any loss, property damage, personal injuries or loss of life incurred in performance of the research work under this Agreement other than that attributable in whole or in part to Monsanto's fault or negligence, and the University shall defend, indemnify and hold Monsanto harmless (using funds other than those paid to University pursuant to the provisions of Article VIII hereof) from any and all claims, costs or liability for any such loss, damage, injuries or loss of life, other than that attributable in whole or in part to Monsanto's fault or negligence.

13.3 Monsanto agrees to defend, indemnify and hold the University harmless from any and all claims, costs or liability for any loss, damage, injury or loss of life, other than that attributable in whole or in part to the University's fault or negligence, arising as a result of any Monsanto Employee working in the laboratories of the University as provided under Paragraph 6.2.

a) If to Monsanto, to:

G. Edward Paget, M.D.
Director, Health Care Development
Monsanto Company, 02F
800 North Lindbergh Boulevard
St. Louis, Missouri 63167

with a copy to:

Mr. John E. Maurer
General Patent Counsel
Monsanto Company, E2NA
800 North Lindbergh Boulevard
St. Louis, Missouri 63167

b) If to the University, to:

David M. Kipnis, M.D.
Chairman, Department of Medicine
Washington University School of Medicine
660 South Euclid Avenue
St. Louis, Missouri 63110

with a copy to:

16.4 The Article headings used in this Agreement are for convenience only and form no part of the Agreement.

16.5 This writing constitutes the entire Agreement between the parties hereto relating to the subject matter of this Agreement and there are no understandings, representations or warranties of any kind except as expressly provided herein. Neither this Agreement, nor any term or provision thereof, may be discharged, waived, released, abandoned, changed or modified except by an instrument in writing signed by a duly authorized representative of each of the parties to this Agreement. If either party desires a modification or change of any kind in this Agreement, the parties shall, upon reasonable notice of the proposed modification or change by the party desiring the change, confer in good faith to determine the desirability of such modification or change.

16.6 The parties agree that it is the intention of neither party to violate any valid federal, state and local laws and regulations; that if any sentence, paragraph, clause, or combination of the same in this Agreement is in violation of any applicable law or regulation, or is unenforceable or void for any reason whatsoever, such sentence, paragraph, clause or combinations of the same shall be inoperative and the remainder of the Agreement shall remain binding upon the parties.

EXHIBIT A

AGREEMENT OF PROGRAM PARTICIPANTS

The purpose of the following agreement is to describe the responsibilities of and to enlist the support and cooperation of research participants and to insure compliance with relevant University policies.

Therefore, as a participant in a research project under the Biomedical Research Program sponsored and funded by Monsanto Company, I agree to abide by the following terms and conditions:

1. PATENTABLE INVENTIONS:

(a) Participants will promptly disclose to the University's Program Director any potentially patentable invention or novel scientific development they produce in any research Project funded by Monsanto. Such disclosure will occur prior to disclosure to any other non-Program participant.

(b) Participants will, upon request, assign rights to patentable inventions to the University so that it may grant required licenses to the sponsor.

(c) Participant inventors will cooperate with Monsanto and

be made available to Monsanto for its evaluation and general use.

(b) Such research products may be made available to other research scientists at non-profit institutions according to normal academic practice. However, recipient scientists should agree not to further distribute such research products and not to use them for the benefit of another commercial firm. Distribution of potentially patentable research products should not be made until Monsanto has evaluated patentability and, if appropriate, filed a patent application.

3. PUBLICATIONS:

(a) Scientific advances made under this research program will be freely reported in the scientific literature.

(b) Two (2) copies of each proposed publication, including abstracts, in the best form then available will be provided to the Program Director at least one (1) month before being submitted for publication.

(c) Based on a review by Monsanto patent attorneys of the proposed article, a brief delay in its submission for publication may be necessary to allow the filing of adequate patent applications. Such brief delay may

(b) These University and Monsanto scientists will, as necessary, identify Monsanto special facilities and capabilities which may be used by the Project Investigator to enhance the progress of his/her project.

(c) Project Investigators will, upon request by Monsanto, provide reasonable opportunities for individual Monsanto scientists and technicians to spend time in the research laboratories to learn newly developed techniques, to participate in the research if this is mutually desirable, and to assist in the transfer of newly developed technology to Monsanto.

(d) The cooperative nature of this research program is expected to necessitate the exposure of University participants to Monsanto confidential technical information. For participants who may be so exposed Monsanto will require in advance the signing of a personal agreement indicating the partcipants willingness not to disclose such Monsanto confidential information to others.

5. AVOIDING CONFLICT SITUATIONS:

(a) Participants in research projects under this program must consider all other activities in which they are engaged, or have a personal interest, or in which they

Project Investigators, as will more detailed annual progress reports which include summaries and conclusions.

The above terms and conditions are understood and agreed to:

P.I. Typed Name _____ Other Project Personnel:

Signature _____ Sig. _____

Date _____ Sig. _____

Phone No. _____ Sig. _____

MAKING COOPERATIVE RESEARCH RELATIONSHIPS WORK

Seven case studies suggest guidelines for negotiating and implementing successful agreements between universities and industry.

David W. McDonald and Scott M. Gieser

University-industry cooperative research is being called upon to play an increasingly important role in research and development (*1,2,3*). At the same time, criticisms and controversies have arisen concerning these relationships and the effects they may have on the institutions and individuals involved (*4,5*). In spite of these concerns, the keystone for the promotion of these joint research relationships has been the belief that the benefits received by the participants outweigh the drawbacks. As the academic community and business firms have become more familiar with this form of interaction, much of the controversy which initially surrounded these relationships has subsided (*6*). However, many unanswered questions remain about the implementation and workings of these agreements.

An important question is whether or not there are characteristics of these cooperative relationships that particularly influence their effectiveness. If so, can these characteristics be generalized and transplanted to other agreements? In an effort to answer these questions, an investigation of several university-industry cooperative research relationships was conducted in 1984–85 to determine if there were significant common factors that could be related to their degree of success. The approach used was a study of both current and completed relationships in several unrelated research disciplines and involving both large and small firms. The information was obtained by having key people from both industry and the academic institutions complete a questionnaire in conjunction with personal interviews. After review of the fields data obtained, seven detailed case histories were developed.

The relationships covered a variety of research areas: Composite Materials, Computer Imaging, Fermentation Technology, Fiber Optics, Hybridoma Biotechnology, Magnetic Materials, and Medical Tracers. The universities were respected research institutions in the midwestern United States. The collaborating industry partners ranged from small single-location firms to large, transnational corporations. The agreements were similarly varied, ranging from several months to several years in duration and thousands to millions of dollars in funding. Two of the relationships had some form of government involvement as well. A summary of the relationships is presented in the table on page 39.

Despite the variability in the relationships considered, all had three common stages that were the framework for our evaluation: project formulation, project execution, and project accomplishments. Topics considered under the formulation stage included contract negotiations and project initiation, while project implementation and management were examined in the execution stage. Lastly, both the measurable and qualitative results of the research projects were covered in the accomplishments section.

Project Formulation

Of the seven cases developed, three were initiated by the academic side of the relationship, two began with the corporate sponsor seeking out the university participant, and two resulted from federal government programs designed to bring academic and industrial participants together.

Regardless of how the project began, this study showed that the more thought given in negotiating the contract or agreement, the less the chance of unexpected or unmanageable difficulties occurring once the project begins. Key factors, such as the scope and objectives of the project, the resources to be contributed by each party, patent and publication policies and the project management system to be used, must be thoroughly discussed and clearly dealt with in the contract. If a conflict or disagreement did arise at a later time, the more carefully negotiated agreements were likely to contain provisions for dealing with the situation in a constructive manner.

The value of foresight in these relationships was seen in the Fermentation Technology agreement. In the middle of this collaboration, the principal university investigator (PI) left the institution to take another position. Anticipating this possibility, the participants had inserted a clause into the contract covering situations in which the PI would not be available for two or more months. Because of this foresight, hostilities between the participants were avoided.

Due to the complexity of issues involved in contract negotiations, it was found to be helpful if the

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Collaborative Research Agreements Studied

Field	Time Frame of Agreement	Approximate Amount of Funding ($Millions)	Source of Funding
Composites	1965–72	5.0	Government (ARPA)
Hybridomas	1981–85	4.5	Company
Fermentation Technology	1983–85	0.5	Company
Fiber Optics	1984–86	0.3	Government (SBIR)
Medical Tracers	1984–86	0.3	Company
Computer Imaging	1983–84	0.2	Company
Magnetic Materials	1978–85	0.1	Company

negotiators were knowledgeable both in the technology under consideration and in the intricacies of contractual law. Again, the Fermentation Technology agreement serves as a good example. In this case, the PI from the university and the project manager from the participating company had developed a strong working relationship from the earliest stages of interaction, based on the mutual understanding of the technology involved and the goals which they hoped to accomplish. Translating this cooperation into a formal agreement proved to be difficult, however, because of communication problems encountered when the technologists, attorneys and contract officers met to formulate the actual agreement. As a consequence, initiation of the research was delayed for several months while these difficulties were resolved.

The involvement of representatives of all interested elements of their respective organizations early in the contract negotiations can decrease the chances of unexpected difficulties later. The Computer Imaging project made this point very clear. This agreement was initially part of the involved professor's consulting work, which was permitted by the university by-laws. When the participants decided to enlarge the scope of the relationship, however, the university's research office became the contact with which the company interacted. This required that many more requirements and responsibilities be met. These changes almost jeopardized the relationship because the company was small and not well-equipped to handle the increased requirements. By changing the nature of the relationship, the initially successful interaction nearly collapsed.

The advantages of prior familiarity between the participants were clearly evident in several of the cases studied. The Composite Materials agreement is a good illustration. The parties entered into the relationship with considerable knowledge of each other's capabilities and expectations. This understanding helped during both the negotiating process and the implementation of the agreement. The result of this association was a successful, long-term relationship which integrated basic and applied research in composite materals, and led to the first interdisciplinary education program in composite materials technology in the country.

These instances point out the need to develop a close-working relationship between the parties from the earliest stages of an agreement. The more care that is taken by the participants during the negotiations of an agreement, the more likely an effective, fair contract will result. The negotiators, however, should guard against being too restrictive in formulating the agreement. If their striving for the "perfect" agreement causes undue delay in starting the project, some advantage gained by the joint effort may be lost or enthusiasm for the research may wane on the part of the investigators. Further, if the contract is made too detailed and specific, the flexibility that may be needed later could be jeopardized. Ideally what is sought in an agreement is a contract that clearly defines the project focus and the responsibilities and commitments of the participants, while remaining general enough to permit making adjustments later.

Project Execution

A second area of the study in which useful observations were revealed was the execution of the agreements, including project implementation and management. Two major points were evident here: the need for an effective program management mechanism and the advantage of geographic proximity.

The importance of a suitable project management system was especially evident in the large Composite Materials project. Here the participants recognized early in the program that the committee management approach being used was not producing decisions in a timely manner. Consequently, a switch was made to a single program manager to handle the day-to-day decisions, and an advisory committee representing both parties to deal with major policy issues.

Project Accomplishments

Four key conclusions resulted from a study of the accomplishments of the cooperative research projects:

- All of the projects gave excellent technical results which met the expectations of the project leaders;
- Factors external to the research effort can have dramatic effects on the utilization of the information developed;
- Cooperative projects are an effective means for enhancing student education, training and employment opportunities;
- Involvement in cooperative research can lead to increased academic-private sector cooperation for the participants.

The first two points are related to the overall success of cooperative research agreements. Combining the expertise and resources of the participants facilitates the undertaking of challenging projects neither partner would tackle separately because of economic or technological constraints. Of course, not all cooperative projects are successful in achieving the technical goals of an investigation. This limited examination suggests, however, that the findings from, or discoveries made, in a cooperative research project have a good probability of meeting or exceeding the expectations of the participants. In none of the seven cases studied was there any reservation by the key participants about the quality of the results.

This study also found that when cooperative research efforts encounter difficulties, factors external to the research stand a good chance of being at fault; two cases in particular pointed this out. The Hybridoma Biotechnology agreement was enormously successful from a technical standpoint, producing over 60 antibodies with commercialization possibilities; but midway through the agreement the company was acquired by a larger firm. A subsequent reorganization of the company's business activities resulted in severely reduced hybridoma research. Despite the encouraging results of the cooperative project, little significant follow-up of the discoveries occurred.

In the second instance, the Medical Tracers project, again good results were produced from the basic research. But, because of problems in communication and differing expectations of the participants over the amount of product development research provided by the agreement, this project faltered. In this case, the success achieved in the basic research stage was not continued in the development aspects of the agreement.

Several of the participants stated that because of involvement in these cooperative research programs, they either have started or are more likely to enter into subsequent collaborations. These statements suggest that once the initial barriers or reservations are overcome, a joint relationship can be both stimulating and productive. Participants from academia cited alternative source of research funds, an additional

Close geographic proximity can greatly enhance the productivity of joint university-industry R&D projects.

opportunity to work on relevant, challenging research, and the possibility of the university and/or themselves receiving royalties from their discoveries as reasons for continuing and expanding cooperative relationships. For the business participants, access to high-quality "state-of-the-art" research, the opportunity to upgrade the technical skills of their staffs, and the contributions to student education were the most important factors in reaching a similar conclusion on the value of close corporate-academic interactions.

The benefits to students in the seven cases studied were substantial. Some of the projects provided financial support for numerous students; e.g., over the seven-year lifetime of the Composites project, 50 participating students earned advanced degrees. In addition to receiving financial assistance, the students were able to work on projects having practical relevance, and they often had access to corporate facilities and equipment not available on the university campus. Additionally, such contacts with industry apparently were very beneficial for the students when they sought employment. Several of the graduate students were hired by the firms with which they were associated and some now hold positions of high responsibility.

Finally, these cases showed that governmental involvement in cooperative research does not appear to be detrimental and can even be beneficial. Programs funded by agencies such as the Advanced Research Projects Agency (ARPA, now DARPA), or the Small Business Innovation Research (SBIR) Program can be effective in bringing potential partners together and allowing them to collaborate with a minimum of red tape or oversight.

Future Research Arrangements

The significant conclusions from this study have been formulated into the following guidelines for future university-industry cooperative research:

1. Include key administrators, managers and investigators from the participating organizations in the contract negotiations from the earliest stages to final agreement.

2. Attempt to negotiate an agreement that is comprehensive, yet not overly restrictive or detailed. For those situations and conditions which are impossible to predict accurately, include mechanisms that can effectively deal with them if they occur.

3. Previous contacts between the research participants increase the likelihood of success for a particular agreement when it is undertaken.

4. Although close geographic proximity between project participants, is not essential, it can greatly enhance the productivity and effectiveness of an agreement.

5. Factors other than an agreement's measurable results may strongly affect the overall success of a project.

6. University-industry relationships are excellent for training students as well as providing attractive employment opportunities.

While the limited number of agreements studied is not a statistically valid sample, these conclusions are in general agreement with those developed individually in other studies (*7,8,9,10*). The participants in these seven projects believed that the benefits outweighed the risks entailed in entering into a cooperative arrangement (e.g., loss of proprietary information or a diminution of academic freedom, neither of which was considered as a significant problem by any of the participants interviewed). Even in the projects that encountered major difficulties, the participants concluded that benefits outweighed the drawbacks.

For cooperative university-industry research to succeed, then, the parties involved should seek a combination of open communications, mutual dedication and interdependence, respect and trust, an effective program management system, and a willingness on the part of all participants to compromise. The attainment of these conditions holds the greatest potential for promoting successful interactions. ◆

Previous contacts between the research participants increase the likelihood of success.

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8. Lepkowski, Wil, "Corporate University Ties Grow Stronger," *Chemical and Engineering News*, 61(1), January 3, 1983, pp. 32–33.
9. Varrin, Robert D. and Kukich, Diane S., "Guidelines for Industry-Sponsored Research at Universities," *Science*, 227, January 25, 1985, pp. 385–388.
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The Fermentation Technology agreement was managed jointly by the PI from the university and the key manager from the company. Because of their ability to work together, this dual management system worked well. A joint advisory committee, which met on a quarterly basis, reviewed the status of the program and dealt effectively with major issues. The close geographic proximity of the two organizations allowed frequent contacts at the "working level," greatly facilitating the project.

The Hybridoma Biotechnology project was executed with a minimum of formal management control and direction. An advisory committee met quarterly and functioned primarily as the solicitor and evaluator of research proposals submitted by university faculty. After a proposal was funded, the project was reviewed each year to determine if it merited continuing support. Day-to-day decisions were handled by the company's liaison scientist and the appropriate PI or administrative officer at the university. The participants felt that this system had an important role in the success of the agreement.

Thus, successful projects had widely differing management systems, with no particular approach being preferable. Rather, the selected management approach should both recognize the participant's capabilities and culture and be effective in furthering the project's execution. Should problems with a project's management system occur, it is advantageous for the contractual agreement to be formulated in such a way that adaptation can take place.

Probably the point most strongly emphasized by the participants in the study was the advisability of geographic proximity of the participants. In the Fermentation Technology, Hybridoma Biotechnology, Composite Materials, and Computer Imaging projects, the participants were located in the same city. This made it easier to schedule meetings, have informal exchanges between researchers, and deal with unexpected developments in the course of the research. Likewise, cooperative efforts are enhanced by the opportunity for the participants to visit one another on short notice, or to work for extended periods in the other's facilities.

For example, in the Computer Imaging project, formal weekly meetings were held and frequent progress reports were written for internal use. In addition, because the firm was only about a mile from the university, there were frequent informal meetings to discuss new ideas and alternate approaches to problems. The Hybridoma Biotechnology project covered approximately 15 individual projects, each having a faculty member as the PI. After the first year, the company assigned a senior scientist to serve as a liaison between the research staffs of the firm and the university. This person visited the university frequently and also arranged for informal visits between the scientists of the two organizations. Being in the same metropolitan area allowed these interchanges to occur much more readily than if the staffs had been far apart.

Negotiators should guard against being too restrictive in formulating the agreement.

The Composites project involved over 30 persons from the company and almost 40 from the university plus two from the sponsoring agency (Office of Naval Research). A project of this magnitude required considerable coordination from a management viewpoint but also frequent contacts between technical personnel at several levels. Visits back and forth to each organization's laboratories and frequent seminars resulted in a degree of communication and cooperation that would be essentially unachieveable if there had not been close geographic proximity.

The Fermentation Technology project also had the advantage of both parties being in the same metropolitan area, but the principals found that a formal communications strategy was needed to ensure that the level and type of communication between various personnel from each laboratory were appropriate. This strategy was implemented to ease scheduling problems and to handle detailed day-to-day problems such as equipment maintenance without involving the project leaders or others not directly affected.

The participants in the Medical Tracers project did not enjoy the advantage of close geographic proximity. The research director of the company visited the university periodically and there was the usual exchange of quarterly and annual reports supplemented with phone calls and informal written communications. However, the spirit of cooperation was not as high as in the projects discussed above; friction developed over the time required to clear papers for publication as well as over what the company expected the university to do in follow-up work on some of the basic findings. While factors such as the personalities of the key personnel involved may, in any project, significantly enhance or reduce communications, we believe that the communication problems would have been minimized if the two organizations had been close to each other geographically.

In summary, close geographic proximity can greatly enhance the productivity of joint university-industry R&D projects, especially when a relatively large number (e.g., over ten) of research personnel are involved. On the other hand, it was clear that proximity to the research partner is not essential, since some projects were successful without it. In such cases, extra effort must be made to ensure good communications between the people actively engaged in the project.

Radioisotopes.—In the chemical field, specialties are likely to have less elasticity than commodities. This is illustrated here by the case of radioisotopes which require special methods for production, are expensive, and are sold in very small quantities (except for reactor fuels). Data for them, collected by J. Yardley (*4*) are presented in Figure 7. The slope of the regression line is quite close to minus one which corresponds to neutral elasticity. This small elasticity is comparable to the low elasticity for the inorganic chemicals that constitute raw material for electronic ceramics.

Structural Metals.—In this case prices and consumption levels are unusually closely correlated as may be seen in Figures 8 and 9. In the former the units for P and Q are in terms of pounds, while in the latter they are in terms of cubic inches. In both cases the correlation coefficients are -0.99 for the log–log linear regression lines. Thus the exclusionary boundary is very sharply defined, as is the amount of market elasticity.

For comparison, the regression line for engineering polymers from Figure 5 is overlaid on Figure 9. The large price differential between the two correlations accounts for the rapid penetration of traditional metals applications by engineering polymers. For applications in which elastic stiffness is important, the price differential may be markedly reduced (or reversed). Nevertheless, the nature of the competition is clearly stated by Figure 9.

Elasticity of Markets

For the various examples that have been presented here, the elasticity parameters are summarized in Figure 10. In addition, an estimate for automobiles is included for comparison. Notice that none of the values lies less than unity, so none of these markets is inelastic. Only highly specialized, or "vanity," markets are likely to be inelastic. This emphasizes the need for caution in approaching markets that are unfamiliar. The objective evidence as presented here is that there is no reason to expect volumes greater than indicated by a demand curve for a given price level. In other words, wishful thinking will not prevail.

The average elasticity is 2.3, while the spread ranges from 1.0 to 6.1. Since the elasticity is a logarithmic derivative, the observed average for this elasticity means that decreasing the price by a factor of 3 corresponds (roughly) to increasing the quantity consumed by a factor of 10. For engineering polymer resins the effect is much larger than this, while for raw ceramics for electronics it is three times smaller.

MARKET	ε
Chemicals	
major organics	1.8
candidates for biotechnology	2.8
engineering polymer resins	6.1
radioisotopes	1.0
Metals	
structural	2.5
soft magnetic	2.0
Ceramics	
overall raw materials	1.9
raw materials for electronics	1.0
refractory bricks	2.2
Devices	
batteries (portable electricity)	1.3
automobiles (approx.)	3.0

Figure 10.—Elasticity coefficients for various markets.

In closing, demand charts are very useful for the guidance of planning as this article has already indicated. However, they are not a panacea. One reason is that they describe the past, or at best the present. Another is that the data available for their construction are not always reliable. Also, in some cases the data show considerable scatter which creates uncertainty about the correlation of the data. Furthermore, it is often not clear as to which market a new, perhaps hypothetical, product belongs.

Acknowledgment

This work was supported by the AMOCO Corporation and by the U.S. Department of Energy under contract No. DE-AC03-76SF00098.

References

1. P. A. Samuelson. *Economics*, 10th Ed., McGraw-Hill Book Co., New York (1976).
2. C. E. Agnew. "The Concept of Equilibrium and Its Use in Demand Forecasting," *Tech. Forecasting and Social Change 8*, 23 (1975).
3. J. J. Gilman. "Materials Processing: Opportunities and Challenges," *Jour. Metals 51*, Feb. 1972.
4. Data collected by James Yardley, presented by M. Berry in *Future Sources of Organic Raw Materials*, Pergamon Press (1979).

may become involved during the term of their project so that they reasonably avoid conflicting obligations. Of special concern are obligations to other companies in the same scientific areas or closely related to their research work supported by Monsanto. This project should not overlap the research they are performing or plan to perform under the sponsorship of any other organization, including government agencies and foundations, unless the situation is known to and approved by the Program Director.

(b) Any potential conflict of obligations or interests faced by a participant involving a proposed or approved project under this program must be promptly disclosed to the Program Director.

(c) The Program Director may request disclosure by project personnel of their past, current or anticipated relationships with other organizations in order to assure the absence of possible conflicts.

6. PROGRESS REPORTS:

In order for Monsanto to be fully informed about research results and to be able to identify potentially patentable inventions as early as possible, occasional brief summary reports of important findings and results will be required of

occasionally be necessary to avoid the loss of patent rights.

(d) Two (2) copies of the final abstract and article as submitted to the publisher shall be simultaneously provided to the Program Director.

(e) Each publication will acknowledge Monsanto Company support of the research being reported.

(f) Prior to the evaluation of research results for potentially patentable inventions, participants will use caution in public or other outside presentations and discussions not to prematurely disclose critical technical information which could result in the loss patent rights.

4. COOPERATION WITH MONSANTO:

(a) It is intended that there be mutually productive and continual interchange between the University and Monsanto scientists. For this purpose a Monsanto Project Scientist will be appointed as the primary company contact with each Project Investigator. Each Project Investigator will be available for consultation with the Monsanto Project Scientist on matters concerning the project.

University patent attorneys in the filing and prosecution of patent applications. Due to the major expense and specialized professional assistance required to pursue patent rights in a research program of this magnitude, Monsanto has assumed this responsibility. The University will monitor these efforts and at its option may assume such responsibility on a case by case basis.

(d) In consideration of Monsanto's willingness to file and prosecute patent applications at its own expense, participant inventors will be requested to waive any claim of liability by Monsanto in these efforts. Otherwise, the University must assume this responsibility and its expense.

(e) Any royalties from licensed inventions received by the University will be distributed as follows: 40% to the research laboratory(ies) in which the invention was made, 40% to the cognizant department(s), and 20% to the School of Medicine.

2. PRODUCTS OF RESEARCH:

(a) New materials, processes, devices, scientific information, and any other research products isolated or developed in a project, whether patentable or not, will

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed in duplicate by their duly qualified officers.

THIS CONTRACT CONTAINS A BINDING ARBITRATION PROVISION WHICH MAY BE ENFORCED BY THE PARTIES.

WASHINGTON UNIVERSITY

By Wm Danforth

William H. Danforth
Chancellor

Date 6/1/82

MONSANTO COMPANY

By John W Hanley

John W. Hanley
Chairman of the Board

Date 6/3/82

Mr. Edward L. MacCordy
Associate Vice Chancellor for Research
Washington University
Lindell & Skinker Boulevards
St. Louis, Missouri 63130

15.2 Either party may change the address or the person(s) designated to receive notice by notifying the other in writing of the change.

ARTICLE XVI - GENERAL PROVISIONS

16.1 Except as provided in Paragraph 9.5, neither party shall use the name of the other party, its affiliated organizations or its personnel in advertising or promotional materials or news or press releases pertaining to the subject matter of this Agreement without prior written consent of such other party.

16.2 This Agreement shall be construed under the laws of the State of Missouri.

16.3 No waiver of any default, condition, provisions or breach of this Agreement shall be deemed to imply or constitute a waiver of any other like default, condition, provision or breach of this Agreement.

ARTICLE XIV - TRANSFER OF INTEREST

14.1 Neither this Agreement, nor any of the rights and obligations stated herein or resulting therefrom, may be assigned, transferred or otherwise disposed of by either party without the prior written consent of the other unless such assignment, transfer or disposition is to a successor to all the business of the transferor which pertain to the subject matter of this Agreement, and provided that such successor shall agree in writing with the other party to assume all the obligations of the transferor to the other party.

14.2 Should it become necessary or desirable for the University to subcontract any of the Program research to others, such research shall be performed under a formal subcontract satisfactory to Monsanto by which the subcontractor accepts all appropriate provisions of this Agreement and other such provisions as are necessary.

ARTICLE XV - NOTICE

15.1 Any notice or report required or permitted to be given under provisions of this Agreement shall be in writing and be sent by first class mail or hand delivered:

adjudged bankrupt, or if a receiver or trustee of the property of either party is appointed, the other party on thirty (30) days written notice may terminate this Agreement.

12.4 Notwithstanding the termination of this Agreement for any reason, the provisions of Articles X, XI and XIII shall remain in effect subject to Paragraph 12.5.

12.5 If the University exercises its rights under Paragraphs 12.2 or 12.3 and validly effects the termination of this Agreement it shall be under no further obligation to grant further licenses to Monsanto and Monsanto shall promptly transfer to the University the prosecution of all pending Patent applications and the maintenance of all Patents not yet licensed to Monsanto and which Monsanto is prosecuting or maintaining hereunder.

ARTICLE XIII - INDEMNIFICATION

13.1 Monsanto agrees to hold harmless, indemnify and defend the University from all liabilities, demands, damages, expenses and losses arising out of use by Monsanto or by any third party acting on behalf of or under authorization from Monsanto, of information or materials received from University or out of any use, sale or other disposition by Monsanto or by any third party acting on behalf of or under authorization from Monsanto of products made by use of information or materials received from University.

Monsanto shall remain subject to the same royalty and all other terms and conditions of this Agreement.

11.19 Commencing with the fourth and subsequent years in which royalties are due to the University pursuant to licenses contemplated under this agreement, Monsanto shall be entitled to a credit, not to exceed 25% of the gross royalties due for the commercialization of Licensed Products in each year, (a) of Monsanto's cumulative out-of-pocket costs (excluding the costs of Monsanto's employees) for patent activities under Paragraphs 11.5 and 11.6 and (b) 50% of all payments made prior to the date of crediting by Monsanto to the University under Article VIII hereof, which payments can be related to the cost of development of those commercialized Licensed Products.

11.20 Should Monsanto not indicate interest to take a particular license from the University, or subsequently decide not to enter into the license agreement, or terminate the license agreement, or should such agreement be justifiably terminated by the University without challenge or objection by Monsanto, then the University shall be free to license to others the subject matter so released, without further obligation to Monsanto. However, such licenses to others shall exclude Licensed Products directly competitive with or substantially equivalent to those Monsanto has licensed.

1) Patent Infringement procedures:

(1) If at any time a third party shall infringe a Patent licensed to Monsanto hereunder, then Monsanto may either (i) obtain a discontinuance of such infringing operations; (ii) bring suit at Monsanto's expense against such infringer in the name of Monsanto, or in the name of the University and Monsanto if the University is a legally indispensable party; or (iii) permit the University at its option to bring such suit at its own expense. The party who brings suit shall control the prosecution and any settlements therof, and the other party shall be entitled to be represented therein by counsel of its own selection at its own expense.

(2) From any recovery from such suit or settlement thereof there shall first be paid the expenses of the party

State of Missouri. The decision by the arbitrators shall be binding and conclusive upon the parties, their successors and assigns and they shall comply with such decision in good faith. The University and Monsanto each shall pay its own costs and one-half of the costs of the arbitration.

f) provision that when a Licensed Product is sold but not as such and constitutes significantly less than all of the thing sold, an equitable adjustment shall be made in the net selling price of the thing sold to arrive at the net selling price for royalty calculations. When a Licensed Product is manufactured by or used in a process and the process is only a minor factor in the manufacture or use, an equitable adjustment shall be made in the net selling price.

g) provision that Monsanto payments required to be made to a third party for the right under a third-party dominating patent to make, use or sell a Licensed Product licensed hereunder shall be credited

inventions, unpatented know-how, technical and marketing skills, financial contribution and risk, nature and extent of market, nature and extent of competition, normal trade practices, and condition of the economy also play an important part. Accordingly, rather than attempt at this time to establish royalty rates, the University and Monsanto declare their intentions to negotiate in good faith at the time of licensing, reasonable and fair royalties payable to the University by Monsanto on the commercial practice by Monsanto and its sublicensees of each Technical Development covered by a Patent licensed under this Article XI, taking into account the various factors contributing to the commercialization. If the University and Monsanto are unable to agree on royalty rates within six (6) months of the commencement of negotiation, the matter may be submitted to arbitration by either party and if so submitted by either party, shall be finally settled by arbitration conducted in accordance with the then-existing

11.18 License grants to Monsanto under Paragraphs 11.14 and 11.15 shall contain at least the following terms and conditions:

a) requirement that Monsanto by its own efforts or through sublicensees during the period of exclusivity make reasonable efforts to effect the lawful introduction of Licensed Products into the marketplace as early as practicable, consistent with Monsanto's sound and reasonable business practice and judgment. The requirement for introduction of a Licensed Product into the marketplace shall be deemed met if, in the exercise of Monsanto's sound and reasonable business practice and judgment, an alternative product serving essentially the same function has been introduced into the marketplace by Monsanto and with essentially the same benefits to the consuming public.

b) the right of the University to require Monsanto to grant a non-exclusive sublicense to a responsible party on fair and reasonable terms and conditions in the event the requirement of subparagraph

from any claim or any lawsuit or any settlement thereof made by the University or by Monsanto with the University's consent, by the University's employees or third party having an interest through the University or its employees, and arising out of acts of omission or commission in regard to the obligations undertaken by Monsanto or its employees under Paragraphs 11.5, 11.6 and 11.7.

11.14 The University hereby agrees to grant to Monsanto licenses to make, have made, use and sell under Patents, including the right to grant sublicenses, in such countries as Monsanto may elect. Such election for any Patent shall be made within two (2) years after the filing of a Patent application in the affected country, provided, however, that Monsanto shall not be required to negotiate the terms of a license agreement until after the relevant Patent has issued.

11.15 License grants to Monsanto of rights to Patent applications and Patents issuing thereon for inventions made solely with Monsanto support shall be exclusive for the life of such Patents. For any invention made with the joint support of Monsanto and funds provided by another sponsor, or in which there is a third party inventor, such license shall, whenever legally possible, be exclusive for the life of the Patents. However, if the University is unable to grant a license which shall be exclusive for the life of the Patent, then the University shall provide Monsanto with the maximum rights permitted by law. In connection with the transfer of Patent rights to be negotiated

11.9 The parties, including the inventors, Project Investigators and Program Director, shall do all acts necessary or desirable to provide Monsanto patent attorneys with all information and records and execution of all documents necessary or desirable in the evaluation of Technical Developments, and in the filing and prosecution of Patent applications thereon, and in obtaining the issuance and maintenance of any Patents issuing from such Patent applications.

11.10 The University shall take all necessary and desirable actions, including the signing of Agreements of Program Participants (Exhibit A) by each of the persons participating in the Program, including the Program Director, all Project Investigators, and all other persons involved in the research, to assure that it acquires sufficient title to all Technical Developments, Patent applications and Patents from those of its personnel making such so as to be entitled to grant licenses to Monsanto as specified in this Agreement. The Program Director shall maintain a file of such signed Agreements of Program Participants which shall at all times be available to Monsanto representatives and upon request the Program Director shall provide Monsanto copies of specified Agreements.

11.11 In consideration of Monsanto's financial and other support of the Program and of the Patent work and cost thereof to be undertaken by Monsanto under this Article XI, the University agrees that it will make no claims against and hereby waives any

mutually acceptable to Monsanto, the Program Director, and the Project Investigators as appropriate. The primary purpose of such monitoring is to detect potentially patentable inventions as early as possible. The University shall have the obligation to disclose promptly to Monsanto all potentially patentable or scientifically novel Technical Developments.

11.3 When in the judgment of Monsanto potentially patentable inventions are developed within a Project, Monsanto shall make a report of such to the University, with its views of further research that may be necessary to establish the nature and scope of these inventions, and to the extent then possible its opinion of the potential importance of such inventions to commercialization prospects, and its interests concerning the licensing by Monsanto under any Patents that may be obtained covering such inventions. The information in said report shall be retained in confidence by the University and used only for purposes of this Agreement.

11.4 When in the judgment of the University potentially patentable inventions are developed which have not yet been identified by Monsanto through the processes described in Paragraphs 11.2 and 11.3 the University shall make a report of such to Monsanto, including all available results and conclusions. Thereupon, Monsanto shall prepare and make its report to the University as specified in Paragraph 11.3.

particular identified Technical Development for which good cause can be shown, the University may extend the two (2) year period for an additional period of two (2) years by notice in writing to Monsanto stating reasonable justification therefor and that to the University's knowledge none of the exceptions of Paragraph 10.3 is applicable. After said initial two (2) year period or extension thereof Monsanto shall be under no restrictions as to revelation of any Technical Developments. Subject to the provisions herein with respect to Patents and licenses, Monsanto shall at all times be free to use Technical Developments.

10.3 The Monsanto obligation specified in Paragraph 10.2 shall not extend to Technical Developments which:

a) become a part of the public domain or of the public knowledge through no fault of Monsanto; or

b) were in the possession of Monsanto prior to disclosure by the University, and such possession by Monsanto is documented; or

c) are received by Monsanto lawfully and properly from a third party; or

d) have been revealed in patent

Committee.

9.3 As to verbal presentations and discussions, the parties recognize that it is impractical to provide a complete review system for Patent purposes and that considerable discretion must be left in the investigator. It is the intent of the University and Monsanto to provide the investigators guidance sufficient to avoid any divulgations that would compromise the establishment of the best possible Patent position.

9.4 The reporting and evaluation as provided for in Paragraphs 9.1 and 9.2 notwithstanding, the Monsanto representatives on the Advisory Committee are exposed to all Program and Project plans before commencement and such representatives have full opportunity and right to follow the progress of any and all Projects. Through this mechanism the assigned Monsanto Project Scientists and Monsanto shall determine as early as practicable the potential for establishing Patent rights and its interest in obtaining a license of such rights. As soon as such potential is determined by Monsanto the parties shall cooperate on immediate actions necessary to the establishment of such rights, including, if necessary delay of publication for a reasonably brief period of time to conduct any further research or take other actions that may be necessary to file appropriate and adequate Patent applications.

9.5 All scientific publications reporting research

budget by the multiplier for the current contract year budget. The thus adjusted amount to be carried over shall then be added to the following contract year budget after the following contract year budget has been adjusted in the usual manner.

8.10 Title to all items of equipment purchased with Program funds shall vest in the University at the time of purchase.

8.11 Upon termination of this Agreement for any reason the University shall provide a final accounting of Program funds to Monsanto within ninety (90) days following such termination. During said ninety (90) days the University shall liquidate all outstanding obligations incurred prior to termination but shall not incur additional obligations. The balance of funds remaining shall thereupon be returned to Monsanto unless required for completion of Projects in accordance with Paragraph 3.3.

8.12 Indirect costs invoiced under Paragraph 8.7 shall, through June 30, 1987, be at a fixed rate of fifty percent (50%) of invoiced direct costs. Indirect costs invoiced by the University for any activity performed in whole or in part by any contractor shall not exceed the indirect costs which would have been invoiced had such activity been performed wholly by the University. If the University's indirect costs rise by ten percent (10%), i.e., to fifty five percent (55%) or more, then upon the University's request Monsanto agrees that it will negotiate the University's request to increase the rate of indirect costs from fifty percent (50%) under this Agreement, taking into con-

Exploratory Project type, the Specialty Project type and the Construction and Renovation Project type. The Program Director shall monitor spending of funds budgeted for individual Projects and may make adjustments among expense categories of an approved Project budget upon justified requests of Project Investigators. The Program Director shall keep the Advisory Committee informed of financial matters which might indicate a significant departure from Project plans previously approved by the Committee. The Program Director's financial records on all segments of the Program and Projects shall be available for review by any member of the Advisory Committee.

8.5 Approved funds for individual Projects or for support of the Program shall be maintained by the University's Accounting Services Department in separate accounts for each such activity. Spending for each account shall be under the direct control of the Program Director or his delegated Project Investigator, respectively, who shall be furnished with the Accounting Services standard monthly statements of spending against their accounts.

8.6 The accounting records of Program activity shall be available for audit by Monsanto, using its own internal or outside auditors, during the normal business hours of the University.

8.7 The University shall submit monthly invoices with

(4) quarters from April 1981 through March 1982.

(b) An index for each contract year, commencing with the second contract year, will consist of an average of the four (4) quarterly GNP Deflator Index figures covering the period April through the following March immediately preceding the start of each contract year. (For example the index for the second contract year will be the average of the GNP Deflator Index figures for the four (4) quarters covering April 1982 through March 1983.)

(c) Each contract year budget as stated above shall be adjusted prior to the commencement of the relevant contract year by applying a multiplier derived as follows:

$$\text{multiplier} = 1 + \frac{\text{contract yr. index} - \text{base index}}{\text{base index}}$$

For purposes of this Agreement the "GNP Deflator Index" shall mean the quarterly revised Implicit Price Deflator for the Gross National Product as reported by The United States Department of Commerce, Bureau of Economic Analysis. Since it is normal for a quarterly GNP Deflator Index to be revised shortly

7.3 The review panel shall be required to issue a confidential report to the Advisory Committee and to the Chancellor of the University and the Chief Executive Officer of Monsanto stating its views, conclusions and recommendations regarding the scientific merit and cost effectiveness of the Program and Projects and the impact of the Program on the respective institutions involved.

7.4 Costs of the scientific review shall be paid from Program funds.

VIII - PROGRAM FINANCES

8.1 Monsanto hereby agrees to provide to the University for the total support of the Program during the five (5) year term of this Agreement, the total amount of Twenty-Three Million, Five Hundred Thousand Dollars ($23,500,000), to be adjusted according to Paragraph 8.2, which shall cover both direct and indirect expenses of the University. The University agrees that this funding shall be disbursed solely in support of the Program.

8.2 Payment by Monsanto to the University of the amount specified in Paragraph 8.1 shall be limited to contract year budget amounts recited in the following schedule which are subject to (i) annual adjustment for inflation in accordance with this Paragraph 8.2, and (ii) budget underruns carried forward from one year to the next with approval of the Advisory Committee

summaries and conclusions for each active Project.

ARTICLE VI

INTERACTION BETWEEN MONSANTO AND THE UNIVERSITY

6.1 To optimize the mutual benefit and collaboration intended by this Program, the parties desire that there be mutually productive and continuing interchanges between University and Monsanto scientists. Accordingly, the University will ensure that all University scientists engaged in the Program are available to appropriate Monsanto scientists for consultation in the area of their respective Projects. Temporary office space at the University shall be made available to collaborating Monsanto scientists.

6.2 The University agrees to permit individual scientists and technicians from Monsanto, with the consent of the Program Director and Project Investigator and at Monsanto's expense, to spend appropriate periods of time in University laboratories where Project research is being conducted to learn techniques developed therein, to participate if mutually desirable, and to facilitate the transfer of Technical Developments to Monsanto. Monsanto agrees that its employees who are permitted to train and function in the laboratories of the University pursuant to this paragraph shall be required to observe the applicable policies of the University.

under the Program. The Advisory Committee shall strive to identify and fund Projects in which the University enjoys scientific leadership and in which Monsanto has a meaningful interest.

5.2 The Advisory Committee has ultimate responsibility for identification and selection of all Projects as well as for overall and ongoing direction of the Program. As a general guide, the parties to this Agreement intend for the Program to embrace two (2) types of Projects, namely, Exploratory Projects and Specialty Projects. Ultimately during the term of this Agreement, it is expected that approximately thirty percent (30%) of the research effort would be directed toward fundamental questions (Exploratory Projects) while seventy percent (70%) would be directed toward specific products (Specialty Projects). The parties hereto recognize that facility renovation and construction is to be funded as a Program activity within the limitation of the financial support specified in Article VIII hereof.

5.3 Following the identification of a field of interest by the Advisory Committee the Program Director shall seek Project proposals from faculty members of the University.

5.4 Project proposals, continuations and supplements thereto shall be on forms provided by the Program Director. The Program Director shall provide copies of Project proposals to all

of the eight (8) members.

4.3 Should the Program Director or any member of the Advisory Committee be unable to continue service, a replacement shall be promptly appointed by the appropriate party. Program Director replacements shall be mutually acceptable to Monsanto and the University; provided, however, that acceptance by Monsanto shall not be unreasonably withheld. If the University cannot nominate an acceptable replacement for the Program Director within one (1) month following the inability of the Program Director to continue service, Monsanto may suspend its financial support for the Program until an acceptable Program Director is appointed. If such suspension continues beyond six (6) months, Monsanto may summarily treat this Agreement as breached under provisions of Paragraph 12.2 and the ninety (90) day notice provision of Paragraph 12.2 is not applicable.

4.4 The Program Director shall convene a meeting of the Advisory Committee at least once each calendar quarter and otherwise as frequently as necessary to act on Program matters and pending proposals, to review the financial status and progress of active Projects, to deal with unanticipated problem areas, and to consider other matters concerned with the effectiveness of the Program. Except in an emergency, notice of a scheduled meeting and an agenda therefor shall be issued not less than two (2) weeks prior to any such meeting. Any Advisory Committee member may request convening of special meetings and

as provided for in this Agreement.

2.8 "Agreement of Program Participants" means the specimen agreement set forth in Exhibit A attached hereto.

ARTICLE III - TERM OF AGREEMENT

3.1. This Agreement shall be for a period of five (5) years commencing July 1, 1982 and terminating June 30, 1987, unless earlier terminated under the provisions of Paragraphs 4.3, 12.2 or 12.3.

3.2 On or about February 1, 1985, the parties shall enter into discussions as to whether both parties desire to continue the Program beyond the normal termination date of June 30, 1987. If continuation is mutually desirable the parties shall proceed with negotiations to arrive at mutually acceptable terms and conditions for such continuation. If continuation is not desired by either or both parties, this fact shall be confirmed in writing before the end of the third year of the initial term of this Agreement.

3.3 If, in accordance with Paragraph 3.2 the parties decide not to continue the Program beyond June 30, 1987, then Monsanto shall have the option of electing to continue its support, on a Project by Project basis, for any Project started but not completed during the normal term. Monsanto shall make

a) "Exploratory Projects": Those directed to fundamental research on basic scientific questions with a focus on proteins and peptides which modulate cellular function.

b) "Specialty Projects": Those directed to applied research with a focus on proteins and peptides which modulate cellular function and in which Monsanto sees more immediate commercial utility either in terms of technologies or products or both.

c) "Construction and Renovation Projects": Those construction and renovation activities directed to physical facilities required to accommodate and enhance the Program.

2.3 "Advisory Committee" means those representatives of the University and Monsanto charged with administering the Program. The Advisory Committee comprises a Program Director who shall be Chairman and appointed by the University, three (3) additional members appointed by the University, and four (4) members appointed by Monsanto. All members including the Program Director, shall have voting power.

through Monsanto, new commercial products and processes, while concurrently providing royalty income to the University to support its educational and charitable activities;

WHEREAS, the University and Monsanto recognize that the concept of academic freedom must be preserved by this Agreement and shall be a guiding principle in its administration;

WHEREAS, the University and Monsanto recognize that the 1964 Statement on Preventing Conflicts of Interest in Government Sponsored Research at Universities, issued by the American Association of University Professors and the American Council on Education expresses principles applicable to corporate and university relationships;

WHEREAS, the University and Monsanto are prepared to undertake a collaborative effort in the field of biomedicine with a focus on proteins and peptides which modulate cellular function, where the University currently has substantial personnel and facilities for the conduct of research and a field where Monsanto has in-house research underway and wherein Monsanto expects to increase its in-house research emphasis; and

WHEREAS, Monsanto proposes to provide significant financial support to the University in furtherance of this collaborative effort according to the terms set forth in this Agreement.

AGREEMENT

This Agreement, effective as of July 1, 1982, is by and between the parties:

WASHINGTON UNIVERSITY, a corporation organized under the laws of Missouri and having its principal offices at Lindell and Skinker Boulevards, St. Louis, Missouri 63130 (hereinafter "University")

AND

MONSANTO COMPANY, a corporation organized under the laws of Delaware and having its principal offices at 800 North Lindbergh Boulevard, St. Louis, Missouri 63167 (hereinafter "Monsanto");

WITNESSETH THAT;

WHEREAS, the University has sought and continues to seek the advancement of knowledge through education and research;

WHEREAS, the University desires that the useful results of its research be made available to society through established avenues of trade and commerce;

ARTICLE XV - MISCELLANEOUS PROVISIONS

15.1 This Agreement shall be construed, governed, interpreted and applied in accordance with the laws of the Commonwealth of Massachusetts, U.S.A., except that questions affecting the construction and effect of any patent shall be determined by the law of the country in which the patent was granted.

15.2 The parties hereto acknowledge that this Agreement sets forth the entire Agreement and understanding of the parties hereto as to the subject matter hereof, and shall not be subject to any change or modification except by the execution of a written instrument subscribed to by the parties hereto.

15.3 The provisions of this Agreement are severable, and in the event that any provision of this Agreement shall be determined to be invalid or unenforceable under any controlling body of law, such invalidity or unenforceability shall not in any way affect the validity or enforceability of the remaining provisions hereof.

15.4 LICENSEE agrees to mark the Licensed Products sold in the United States with all applicable United States patent numbers. All Licensed Products shipped to or sold in other countries shall be marked in such a manner as to conform with the patent laws and practice of the country of manufacture or sale.

15.5 The failure of either party to assert a right hereunder or to insist upon compliance with any term or condition of this Agreement shall not constitute a waiver of that right or excuse a similar subsequent failure to perform any such term or condition by the other party.

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands and seals and duly executed this License Agreement the day and year first set forth below.

Attest:

_____

Title_____

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

By_____

Title_____

Date_____

Attest:

_____

Title_____

<company>

By_____

Title_____

Date_____

against LICENSEE, M.I.T., at its option, shall have the right, within thirty (30) days after commencement of such action, to intervene and take over the sole defense of the action at its own expense.

9.6 In any infringement suit as either party may institute to enforce the Patent Rights pursuant to this Agreement, the other party hereto shall, at the request and expense of the party initiating such suit, cooperate in all respects and, to the extent possible, have its employees testify when requested and make available relevant records, papers, information, samples, specimens, and the like.

9.7 LICENSEE, during the exclusive period of this Agreement, shall have the sole right in accordance with the terms and conditions herein to sublicense any alleged infringer under the Patent Rights for future infringements.

ARTICLE X - PRODUCT LIABILITY

LICENSEE shall at all times during the term of this Agreement and thereafter, indemnify, defend and hold M.I.T., its trustees, officers, employees and affiliates, harmless against all claims and expenses, including legal expenses and reasonable attorneys' fees, arising out of the death of or injury to any person or persons or out of any damage to proerty and against any other claim, proceeding, demand, expense and liability of any kind whatsoever resulting from the production, manufacture, sales, use, consumption or advertisement of the Licensed Product(s) and/or Licensed Process(es) or arising from any obligation of LICENSEE hereunder.

ARTICLE XI - ASSIGNMENT

LICENSEE may assign or otherwise transfer this Agreement and the license granted hereby and the rights acquired by it hereunder so long as such assignment or transfer shall be accompanied by a sale or other transfer of LICENSEE's entire business or of that part of LICENSEE's business to which the license granted hereby relates. LICENSEE shall give M.I.T. thirty (30) days prior notice of such assignment and transfer and if M.I.T. raises no reasonable objection to such assignment or transfer, in writing within thirty (30) days after the giving of such notice and stating the reasons for such objection, then M.I.T. shall be deemed to have approved such assignment or transfer; provided, however, M.I.T. shall not be deemed to have approved such assignment and transfer unless such assignee or transferee shall have agreed in writing to be bound by the terms and conditions of this Agreement. Upon such assignment or transfer and agreement by such assignee or transferee, the term LICENSEE as used herein shall include such assignee or transferee. If LICENSEE shall sell or otherwise transfer its entire business or that part of its business to which the license granted hereby relates and the transferee shall not have agreed in writing to be bound by the terms and conditions of this Agreement, or new terms and conditions shall not have been agreed upon within sixty (60) days of such sale or transfer, M.I.T. shall have the right to terminate this Agreement.

royalties due and payable. Upon the expiration of the thirty (30) day period, if LICENSEE shall not have paid all such royalties due and payable, the rights, privileges and license granted hereunder shall thereupon immediately terminate.

7.3 Upon any material breach or default of this Agreement by LICENSEE, other than those occurrences set out in Paragraphs 7.1 and 7.2 hereinabove, which shall always take precedence in that order over any material breach or default referred to in this Paragraph 7.3, M.I.T. shall have the right to terminate this Agreement and the rights, privileges and license granted hereunder by ninety (90) days' notice by certified mail to LICENSEE. Such termination shall become effective unless LICENSEE shall have cured any such breach or default prior to the expiration of the ninety (90) day period from receipt of M.I.T.'s notice of termination.

7.4 LICENSEE shall have the right to terminate this Agreement at any time on six (6) months' notice by certified mail to M.I.T.

7.5 Upon termination of this Agreement for any reason, nothing herein shall be construed to release either party from any obligation that matured prior to the effective date of such termination. LICENSEE and/or any sublicensee thereof may, however, after the effective date of such termination, sell all Licensed Products, and complete Licensed Products in the process of manufacture at the time of such termination and sell the same, provided that LICENSEE shall pay to M.I.T. the royalties thereon as required by Article IV of this Agreement and shall submit the reports required by Article V hereof on the sales of Licensed Products.

ARTICLE VIII - ARBITRATION

8.1 Except as to issues relating to the validity, construction or effect of any patent licensed hereunder, any and all claims, disputes or controversies arising under, out of, or in connection with this Agreement, which have not been resolved by good faith negotiations between the parties, shall be resolved by final and binding arbitration in Boston, Massachusetts under the rules of the American Arbitration Association then obtaining. The arbitrators shall have no power to add to, subtract from or modify any of the terms or conditions of this Agreement. Any award rendered in such arbitration may be enforced by either party in either the courts of the Commonwealth of Massachusetts or in the United States District Court for the Eastern District of Massachusetts, to whose jurisdiction for such purposes M.I.T. and LICENSEE each hereby irrevocably consents and submits.

8.2 Claims, disputes or controversies concerning the validity, construction or effect of any patent licensed hereunder shall be resolved in any court having jurisdiction thereof.

8.3 In the event that, in any arbitration proceeding, any issue shall arise concerning the validity, construction or effect of any patent licensed hereunder, the arbitrators shall assume the validity of all claims as set forth in such patent; in any event the arbitrators shall not delay the arbitration proceeding for the purpose of obtaining or permitting

(b) Sales, tariff duties and/or use taxes directly imposed and with reference to particular sales;

(c) Outbound transportation prepaid or allowed; and

(d) Amounts allowed or credited on returns.

No deductions shall be made for commissions paid to individuals whether they be with independent sales agencies or regularly employed by LICENSEE and on its payroll, or for cost of collections. Licensed Product(s) shall be considered "sold" when billed out or invoiced.

4.3 No multiple royalties shall be payable because the Licensed Product(s), its manufacture, lease or sale are or shall be covered by more than one patent application or patent licensed under this Agreement.

4.4 Royalty payments shall be paid in United States dollars in Cambridge, Massachusetts, or at such other place as M.I.T. may reasonably designate consistent with the laws and regulations controlling in any foreign country. Any withholding taxes which LICENSEE or any sublicensee shall be required by law to withhold on remittance of the royalty payments shall be deducted from royalty paid to M.I.T. LICENSEE shall furnish M.I.T. the original copies of all official receipts for such taxes. If any currency conversion shall be required in connection with the payment of royalties hereunder, such conversion shall be made by using the exchange rate prevailing at a first-class foreign exchange bank on the last business day of the calendar quarterly reporting period to which such royalty payments relate.

ARTICLE V - REPORTS AND RECORDS

5.1 LICENSEE shall keep full, true and accurate books of account containing all particulars that may be necessary for the purpose of showing the amount payable to M.I.T. by way of royalty as aforesaid. Said books of account shall be kept at LICENSEE's principal place of business or the principal place of business of the appropriate Division of LICENSEE to which this Agreement relates. Said books and the supporting data shall be open at all reasonable times, for five (5) years following the end of the calendar year to which they pertain, to the inspection of the M.I.T. Internal Audit Division and/or an independent certified public accountant retained by M.I.T. and/or a certified public accountant employed by M.I.T., for the purpose of verifying LICENSEE's royalty statement or compliance in other respects with this Agreement.

5.2 LICENSEE, within thirty (30) days after March 31, June 30, September 30 and December 31, of each year, shall deliver to M.I.T. true and accurate reports, giving such particulars of the business conducted by LICENSEE during the preceding three-month period under this Agreement as shall be pertinent to a royalty accounting hereunder. These shall include at least the following:

(a) All Licensed Products manufactured and sold.

2.3 At the end of the exclusive period, the license granted hereunder shall become nonexclusive and shall extend to the full end of the.. term or terms for which the Patent Rights are issued, unless sooner terminated as hereinafter provided.

2.4 LICENSEE shall have the right to sublicense worldwide any of the rights, privileges and license granted hereunder only during the exclusive period of this Agreement.

2.5 LICENSEE hereby agrees that every sublicensing agreement to which it shall be a party and which shall relate to the rights, privileges and license granted hereunder shall contain a statement setting forth the date upon which LICENSEE's exclusive rights, privileges and license hereunder shall terminate.

2.6 LICENSEE agrees that any sublicenses granted by it shall have privity of contract between M.I.T. and sublicensee such that the obligations of this Agreement shall be binding upon the sublicensee as if it were in the place of LICENSEE. LICENSEE further agrees to attach copies of Articles II, V, VII, IX, X, XII, XIII, and XV of this Agreement to all sublicense agreements.

2.7 LICENSEE agrees to forward to M.I.T. a copy of any and all fully executed sublicense agreements, and further agrees to forward to M.I.T. annually a copy of such reports received by LICENSEE from its sublicensees during the preceding twelve (12) month period under the sublicenses as shall be pertinent to a royalty accounting under said sublicense agreements.

ARTICLE III - DUE DILIGENCE

3.1 LICENSEE shall use its best efforts to bring the Licensed Product(s) and/or Licensed Process(es) to market through a thorough, vigorous and diligent program for exploitation of the Patent Rights.

3.2 In addition, LICENSEE shall adhere to the following milestones:

(a) Deliver evidence to M.I.T. within <months A> months from the Effective Date of this Agreement of the amount of money, number and kind of personnel and time budgeted and planned for each phase of development of the Licensed Product(s) and/or Licensed Process(es).

(b) Develop a working model within <months B> months from the Effective Date of this Agreement and permit an in-plant inspection by M.I.T. within <months C> months from the Effective Date of this Agreement, and thereafter permit in-plant inspections by M.I.T. at regular intervals with at least <months D> months between each such inspection.

SAMPLE

LICENSE AGREEMENT

This Agreement, made and entered into this day of , 198 , (the Effective Date) by and between MASSACHUSETTS INSTITUTE OF TECHNOLOGY, a corporation duly organized and existing under the laws of the Commonwealth of Massachusetts and having its principal office at 77 Massachusetts Avenue, Cambridge, Massachusetts 02139 U.S.A. (hereinafter referred to as M.I.T.), and <company>, a corporation duly organized under the laws of <state> and having its principal office at <address> (hereinafter referred to as LICENSEE).

WITNESSETH

WHEREAS, M.I.T. is the owner of certain "Patent Rights" (as later defined herein) relating to <information> and has the right to grant licenses under said Patent Rights, subject only to a royalty-free, nonexclusive license heretofore granted to the United States Government;

WHEREAS, M.I.T. desires to have the Patent Rights utilized in the public interest and is willing to grant a license thereunder; and

WHEREAS, LICENSEE has represented to M.I.T., to induce M.I.T. to enter into this Agreement, that the LICENSEE is experienced in the development, production, manufacture, marketing and sale of products similar to the "Licensed Product(s)" (as later defined herein) and/or the use of the "Licensed Process(es)" (as later defined herein) and that it shall commit itself to a thorough, vigorous and diligent program of exploiting the Patent Rights so that public utilization shall result therefrom; and

WHEREAS, LICENSEE desires to obtain a license under the Patent Rights upon the terms and conditions hereinafter set forth.

NOW, THEREFORE, in consideration of the premises and the mutual covenants contained herein, the parties hereto agree as follows:

ARTICLE I - DEFINITIONS

For the purposes of this Agreement, the following words and phrases shall have the following meanings:

1.1 "LICENSEE" shall mean <company> and any subsidiary of <company>.

1.2 "Subsidiary" shall mean any corporation, company or other entity more than fifty percent (50%) of whose voting stock is owned or controlled directly or indirectly by <company>.

VIII. Arbitration

Under the arbitration provision in the sample agreement, issues concerning the validity, construction or effect of any patent are excluded from the arbitration and such patent issues are left to be decided directly by the courts. A recent change in the law, however, permits the issue of patent validity, etc., to be the subject of arbitration by agreement of the parties and the clause can be written to provide for this. In the sample agreement, the arbitration is to be conducted within the rules of the American Arbitration Association. Where the license agreement is with a foreign licensee, rules of the International Arbitration Association usually apply, although this again is subject to agreement between the parties.

IX. Infringement

It is advisable to clearly define the obligations and rights of both parties in any action to protect the licensed patent from infringement or to prosecute infringers. In the sample provision the university agrees to protect the patent from infringement and to prosecute infringers in its sole judgment. Licensee, however, is given the right during the exclusive term to also prosecute, at licensee's expense.

X. Product Liability

Due to the increased incidence of suit for injuries sustained by the consumer of a product and the ability of the consumer to reach through the immediate supplier to the manufacturer and, perhaps, ultimately to the inventing entity, it is advisable to ensure indemnification by the licensee for all liability for damage or injury resulting from the licensee's use of the invention.

XI. Assignment

It is important that the university retain some degree of control over the licensee's right to assign the license agreement to a third party. This is advisable since the university entered into the agreement initially with the licensee based on the licensee's support of the research or on its perceived capability of transferring the technology. Some agreements contain an absolute prohibition on assignment, although the sample agreement provides for assignment within the restrictions and limitations set forth.

XII. Non-use of names

This clause is self-explanatory and normally includes both the name of the university and the names of the inventors. As in research agreements, the purpose here is to prevent a licensee from benefitting commercially from use of the university's name and reputation.

definitions can be added as deemed appropriate under particular circumstances.

II. Grant (License rights)

The agreement should clearly specify the type of license and the rights granted. It may also contain provisions relative to requirements for sublicensing.

A. Type of grant

This section specifies the type of license as, for example, whether it is worldwide, whether it is a license for research purposes only, or one which allows the licensee to fully commercialize the invention (i.e., "to make, have made, use, lease and sell") and whether the licensee's rights are restricted to a certain field of use.

B. Degree of exclusivity

This section sets forth the period for which the exclusive license is granted. Attention should be given to any restrictions imposed by governmental regulation under OMB Circular A-124 for government funded inventions. Note also that, at the termination of the exclusive period, the license automatically becomes non-exclusive to the end of the remaining life of the patent.

C. Sublicensing rights

The remaining sections usually define the licensee's rights to sublicense; the reporting requirements where a sublicense is granted; and the terms of any such sublicensing rights, although royalty terms are usually addressed in the royalty clause which follows.

III. Due diligence - Performance milestones

A critical provision in any exclusive license is the "due diligence" clause, which sets forth the performance milestones that must be achieved by the licensee if the license is to continue in effect. The clause is a form of "march-in" which allows the university the right to terminate the agreement if the licensee does not perform as agreed. In some license agreements, the due diligence provision allows the university to revoke the exclusivity for failure of performance but permits the licensee to retain a non-exclusive license. This is usually the case where the licensee is a research sponsor and would, at minimum, be entitled under the research contract to a non-exclusive license in any event.

LICENSING AGREEMENTS

As noted in Unit 1 of this series, "Patents and Patent Rights", the owner, or joint owner, of a patent may grant a license to others. A license is the permission granted by the patent owner to another to make, use or sell the invention. No particular form of contract is required. A license is a contract and may include whatever provisions the parties agree to. It may be established by contract or implied from the conduct or legal position of the parties. This paper deals with licenses which are established under the terms of research contracts.

In some cases the invention which is the subject of the license may have resulted from research funded in whole or in part by the Federal government. In that case the license may be subject to Federal rights, These were discussed in Unit 2 of this series, "Patent Rights under Government Contracts" under the section on "Commingling," and are set forth in the standard patent clause at FAR 52.227-11, which is appended to that unit.

Patent licensing has also been discussed in Unit 3, "University Patent Policies and Practices" in connection with the development and marketing of inventions.

Finally, the clauses and commentary in Unit 4, "Patent Clauses in Industrial Research Agreements" cover the license rights and other options most frequently granted to industrial research sponsors by universities which retain title to resulting inventions.

Non-exclusive licenses. As noted in the last cited paper, the right most frequently granted to a research sponsor is an irrevocable, non-exclusive license for the life of the patent. It may be the only right granted, or it may be granted in conjunction with a limited term, exclusive license, or with an option to acquire such a license. It may be royalty-free or royalty-bearing.

Exclusive licenses. In recent years, however, universities which retain title to inventions resulting from sponsored research appear to be more willing than previously to provide industrial sponsors with exclusive patent licenses, and to view them as an appropriate vehicle for the effective transfer of technology. In most cases, the rights granted are for a limited term.

In connection with exclusive licenses, many universities require (1) performance milestones and/or minimum annual payments as incentives for the licensee to develop the technology and to ensure that it becomes available for the benefit of the public, or (2) other forms of assurance that commercialization will be diligently pursued.

Because of its growing use and its importance in the technology transfer process, the sample agreement and commentary which follows deals with a typical exclusive, limited term, royalty-bearing license in use at one university.