National Cancer Institute's Technology Transfer Center:

External Customer Satisfaction Survey Final Report

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EXECUTIVE SUMMARY

The National Cancer Institute Technology Transfer Center (NCI TTC) External Customer Satisfaction Survey ("the Survey") was designed to assess needs and attitudes of external customers (i.e., industrial biotechnology, pharmaceutical and medical device companies) who are current and potential collaborators and licensees for National Institutes of Health (NIH) technologies. The Web-based survey collected information on the characteristics of TTC external customers, their strategic directions, and their familiarity and experiences with TTC. A total of 270 respondents agreed to participate and completed all or part of the survey (response rate 13-14%). This report presents findings from the TTC External Customer Satisfaction Survey conducted in 2011.

Company Characteristics

More than half (55%; 148) of respondents were C-level, managing directors, or founders or principals. The two most common company types were for-profit pharmaceutical (32%; 84) and biotechnology companies (29%; 78). More than two thirds of the companies were privately held (69%; 187), and more than half (57%; 154) had 50 or fewer employees. Companies were most frequently headquartered in the United States (70%; 188), followed by Japan (7%; 18), Canada (4%; 10), Germany (3%; 8), and the United Kingdom (3%; 8).

Strategic Directions

Nearly all (96%; 258) respondents indicated that their companies developed partnerships, usually initiated with research collaborations (35%; 89) as compared with licensing (10%; 25). The companies formed research partnerships with all types of organizations, with universities being the most common (86%; 221), followed by for-profit companies with 50 or fewer employees (42%; 107), and Federal laboratories (36%; 94). Factors considered very/extremely important by most respondents in selecting a partnership included talent and knowledge depth in the research area; terms of intellectual property (IP); and commitment from both the company's and the partner's senior management. Respondents reported being most likely to find new research partners through personal peer networks, internal scientific staff, and internal or external marketing or competitive intelligence analysts, and this was most likely to

occur via scientific and technical conferences, peer-reviewed scientific literature, and business partnering conferences. Although respondents reported developing all types of research partnerships, the largest proportions reported developing material transfers and university collaborations or sponsored research agreements. Respondents reported adopting partnerships at all stages of commercialization, with the most common stages being basic research/ discovery (*in vitro*) and preclinical (animal studies). Nearly all respondents reported that their companies considered the stage of research and development to be very or extremely important in selecting a research partner, followed by access to preexisting intellectual property. Nearly two thirds (65%; 146) indicated that their companies had established or were planning to establish nondomestic (off-shore) partnerships.

Familiarity and Experiences with TTC

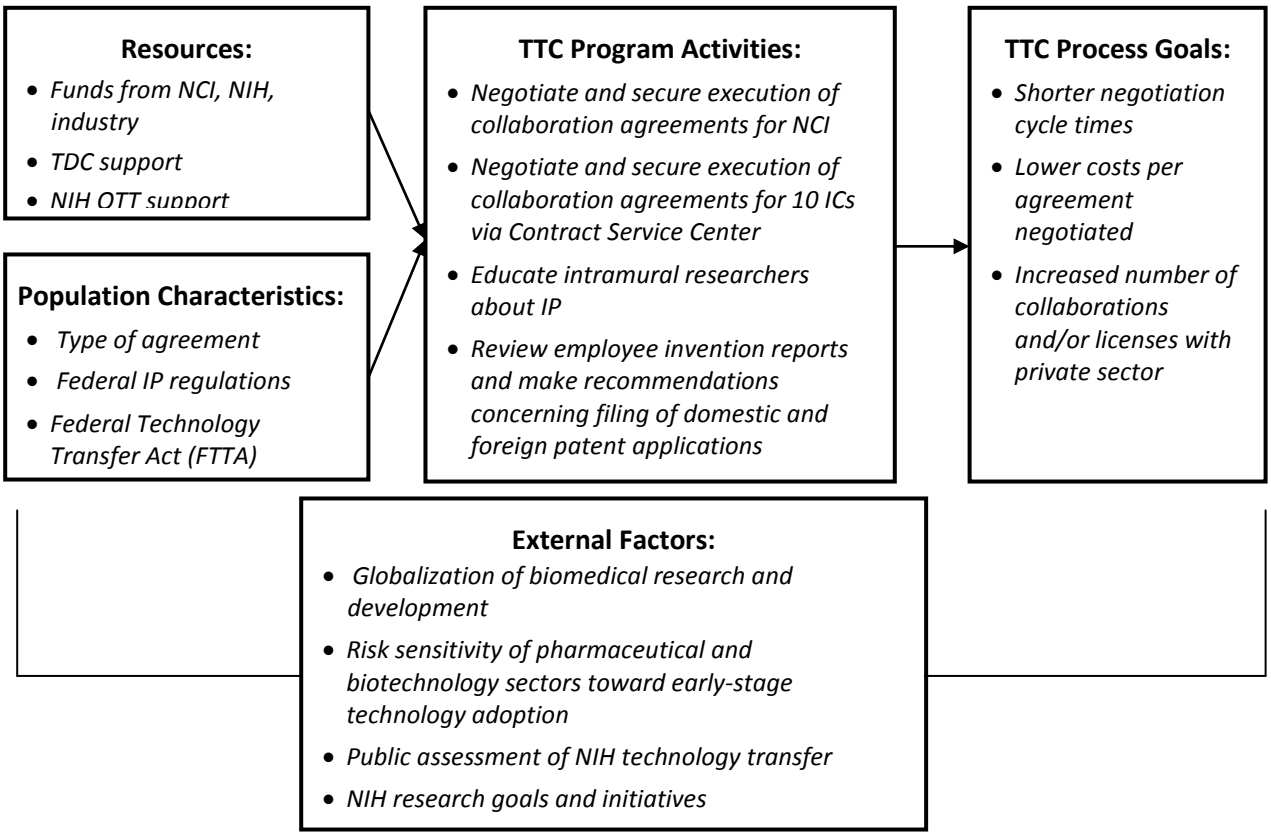
Nearly half (42%; 92) of respondents reported being unfamiliar with the NCI TTC. Respondents from companies headquartered within the United States and from larger companies were more likely to report having no familiarity with the NCI TTC than were those from smaller companies or companies headquartered outside the United States. The most common ways respondents reported first learning about the TTC were from receipt of an unsolicited email (23%; 30) and from NIH research staff (23%; 30). The most commonly stated reasons for not forming partnerships with NIH researchers through the NCI TTC were "length of time to negotiate agreements (22%)," "terms of agreement (18%)," and "not aware of any collaborations with NIH researchers (18%)." The most prevalent reasons for partnering with NIH were "access to additional scientific expertise (83%; 33)," "track record of NIH researcher or team (60%; 24)," and "access to clinical trials expertise (55%; 22)." Scientific and technical conferences, personal networks, and established relationships with NIH researchers were the most frequently reported ways in which companies located NIH research partners. These same three sources were also among the most frequently used sources for finding research partners in general. The majority (72%; 167) of respondents indicated that they would like to receive information from the NCI TTC on developing research collaborations with NIH; in particular, information about new technology collaborations and licensing opportunities from NCI or other NIH Institutes.

I. BACKGROUND AND INTRODUCTION

Background

The Technology Transfer Center of the National Cancer Institute was established in January 1988 to address the mandate set forth in the Federal Technology Transfer Act of 1986.[1] The NCI TTC provides a complete array of technology transfer services to NCI as well as to nine other NIH Institutes and Centers under a Competitive Service Center (CSC) agreement.[2] The TTC's long-term goals are to: 1) transfer knowledge, materials, and technologies to industry and university partners for translation into clinical settings; and 2) improve public health by facilitating the development of biomedical discoveries of NIH researchers. A conceptual framework of the TTC is shown in Exhibit 1, including resources, population characteristics, activities, process goals, and external factors.

EXHIBIT 1: Conceptual Framework of TTC Program



[1] Federal Technology Transfer Act of 1986 (FTTA), Pub. L. No. 99-502 (1986).

[2] Center for Information Technology, Clinical Center, National Center for Complementary and Alternative Medicine, National Eye Institute, National Institute of Neurological Disorders and Stroke, National Institute on Aging, The *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, National Institute on Drug Abuse, National Library of Medicine.

Following a survey of NIH staff members in 1999, TTC established workflow process improvements in 2000 to improve the services it provides to its constituents—the NIH research community and potential collaborators and licensees in the private sector. A second survey of researchers was conducted in 2006 for the NIH Office of Technology Transfer.[3] In 2008, the National Institute of Allergy and Infectious Diseases (NIAID) surveyed NIH Clinical Center researchers for barriers to clinical research at NIH.[4] These inputs helped TTC determine the extent to which process changes made in 2000 achieved their goals and establish new process objectives.

There has been significant change in the biotechnology and pharmaceutical industries driven by factors such as genomics, information technology, health economics, and globalization. Taken together, these factors represent a fundamental change in the market environment. Although it is not yet understood how this change will affect the transfer of discoveries from NIH to the public, benefits to NIH and public health can be realized through increased TTC productivity in negotiating technology transfer agreements and in outreach efforts and communications. Increasing this effectiveness and efficiency means redefining workflow and process improvements for services provided by the NCI TTC to the NIH research community, and this will require input from TTC's external customers. In March 2010, on behalf of the TTC, the NCI Office of Science Planning and Assessment (OSPA) contracted with NOVA Research Company and The Madrillon Group Inc., to design, develop, and conduct a customer satisfaction survey of NCI TTC external customers. In conjunction with OSPA, the TTC Project Officer, assisted by an Advisory Committee, oversaw the design and administration of the Survey and analysis of Survey data.

Organization of this Report

This report presents findings from the Web-based survey of TTC external customers conducted in 2011. Section II presents an overview of the purpose and objectives of the Survey, including study questions. Section III describes the study methodology, including the target

[3] Final Report, "NIH Scientists' Role in Technology Transfer: Findings from Qualitative and Quantitative Research," National Institutes of Health, Office of Technology Transfer, by Pursuant, Inc., June 2006.

[4] Jorge Tavel (NIH/NIAID) and Betsey Herpin (NIH/NIAID) examined barriers to clinical research at NIH in a survey commissioned by the Intramural Working Group and the MEC.

population, instrument design and testing, Paperwork Reduction Act/Office of Management and Budget (OMB) clearance, recruitment and data collection, and data analysis strategies. Section IV presents findings, including participant characteristics, strategic directions, and experience with the TTC. Section V examines the relationships between key variables and includes a discussion of bias resulting from nonresponse. Section VI considers summary conclusions based on survey findings. Section VII offers recommendations for TTC to implement possible process improvements as well as recommendations for future surveys of this population, including modifications to the instrument design, sampling strategy, and innovative ideas to increase response rates. The OMB Submission package is provided in Appendix A. Data tables showing the Survey questions, response options and instructions to respondents (e.g., please check only one, please check all that apply) and item-by-item response frequencies are provided in Appendix B.

II. PURPOSE AND OBJECTIVES OF THE SURVEY

In contrast with previous internally focused survey efforts, the current Technology Transfer Center External Customer Satisfaction Survey was designed to assess needs and attitudes of external customers (i.e., industrial biotechnology, pharmaceutical, and medical device companies) who are current and potential collaborators and licensees for NIH technologies and who have a strategic view of their needs with respect to research collaborations. Findings from this study will enable the TTC to update the process goals it established following the internally focused surveys. The External Customer Satisfaction Survey will also enable formulation of goals based on customers' stated rather than presumed needs. Expected outcomes include higher performance obtained from greater efficiency and effectiveness in technology transfer, including:

- TTC workflow process improvements
- Increased NCI TTC productivity in negotiating technology transfer agreements and in outreach efforts
- More focused marketing of NIH discoveries to external customers
- Better communication of industry needs to NIH scientists.

The objectives of the TTC External Customer Satisfaction Survey were threefold and were to enable understanding of:

- The strategic direction of companies engaging in collaborations and alliances with NIH
- The preferred and expected communications channels of TTC's external customers
- Levels of satisfaction with TTC's customer services among its external customers.

Study questions framed around these overarching goals and objectives included:

- What is the overall level of awareness and knowledge among external customers regarding the technology transfer services provided by the NCI TTC?
- How could the NCI TTC more effectively facilitate mutually beneficial collaborations between government laboratories and the private sector?
- Are past and current external customers satisfied with existing NCI TTC processes and services?
- Are there services not currently offered by the NCI TTC that would be useful to meet the technology transfer needs of external customers?

III. METHODOLOGY

Web-based technology was selected for this Survey of external TTC customers in order to reduce respondent burden and costs.

Target Population

The Survey universe (target population) included companies that had utilized the services of the NCI TTC, "users," and "non-users" of TTC services. Since the target population (n=2,150) was relatively small, it was decided that everyone included in the population would be invited to participate in the Survey. This "population survey" approach is common in satisfaction surveys,[5] particularly if the universe is relatively small, as was the case with the NCI TTC Survey. These factors (relatively small population and stated purpose of the Survey), in conjunction with the data acquisition methodology (i.e., Web-based), supported the approach that a representative from each of the companies in the known population be invited to participate in the Survey. Analytically, the population survey method provided a larger sample, thus increasing statistical power of the analyses.

[5] Wholey JS, Hatry HP, Newcomer KB. *Handbook of practical program evaluation*. 2nd ed. San Francisco (CA); Jossey-Bass, A Wiley Imprint; 2004.

Survey Instrument Design and Testing

Development of the Survey instrument was an iterative process that began with a draft questionnaire developed by TTC staff members with input from a survey specialist and a cognitive psychologist at the NCI Division of Cancer Control and Population Sciences (DCCPS) who specializes in survey design. A crosswalk was developed (shown in Exhibit 2) between the draft Survey questions, the evaluation questions, and three key components critical to TTC performance. This process ensured that the Survey questions would provide the information required to answer the evaluation questions and address the critical components.

EXHIBIT 2: TTC External Customer Satisfaction Survey—Crosswalk with the Three Components Critical to the Performance of TTC and with the Four Evaluation Questions

CROSSWALK WITH THE THREE COMPONENTS CRITICAL TO PERFORMANCE OR TTC

EVALUATION COMPONENT	SURVEY QUESTIONS	TOTAL
Demographic characteristics	1, 2, 3, 4, 5, 6	6
I. Satisfaction of TTC's external customers with its customer services	22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 38	13
II. Preferred and expected communications channels of TTC's external customers	13, 33, 34, 35, 36, 37	6
III. Strategic direction of companies engaging in collaborations and alliances with NIH	7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 37	16

CROSSWALK WITH THE FOUR EVALUATION QUESTIONS

EVALUATION QUESTION	SURVEY QUESTIONS	TOTAL
Demographic characteristics	1, 2, 3, 4, 5, 6	6
1. What is the overall level of awareness and knowledge among external customers regarding the technology transfer services provided by the NCI TTC?	22, 23	2
2. How could the NCI TTC more effectively facilitate mutually beneficial collaborations between government labs and the private sector?	7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 24, 25, 26, 31, 33, 34, 35, 36, 37	24
3. Are current external users satisfied with existing NCI TTC processes and services?	27, 28, 29, 30, 31, 32, 33	7
4. Are there services not currently offered by the NCI TTC that would be useful in meeting the technology transfer needs of external customers?	37	1

A pretest was conducted to optimize the design of the Survey instrument and ensure that the questionnaire was appropriate for use with TTC's broader external customer base. In addition, the pretest of the Survey instrument was used to collect information necessary to calculate respondent burden—information required as part of the OMB clearance process. The pretest sampling plan was based upon a convenience sample of company representatives who were considered likely to provide useful information about the usability and functionality of the Web-based Survey and provide feedback on its content. A list of 20 individuals representing companies with different characteristics (e.g., position of respondent in the company, company size, primary business focus, public/private status) was created by the TTC, and 10 eligible persons on this list were invited to participate in the pretest and a brief follow-up telephone interview. Eight of the ten individuals completed the pretest. Follow-up telephone interviews were conducted with pretest participants in order to elicit feedback on the following aspects of the Survey instrument: accessibility and navigation, comprehension and relevance, usability, and acceptability. Overall, the pretest fulfilled the purposes for which it was intended. The Survey questions were found to be appropriate and could be answered effectively using a Web-based methodology. The average time to complete the pretest Survey was 17 minutes, a timeframe the pretest participants considered acceptable. The pretest also demonstrated that the Survey design and data collection methods should accomplish the stated goals and objectives of the Survey. Respondents' experience, suggestions, and comments included several possible changes to the Survey instrument. Based on this feedback, changes were made to the Survey instrument to improve the outcome of the full-scale Survey.

The final Survey instrument went through several rounds of internal and external testing using a variety of Web browsers to optimize accessibility, navigation, usability, and comprehension (including use of hover text with definitions of selected terms and phrases).

Paperwork Reduction Act/OMB Clearance

The TTC External Customer Satisfaction Survey was designed and developed in compliance with the NIH Office of Human Subjects Research (OHSR), the Privacy Act, and the Paperwork Reduction Act. Although this research involved human subjects, it was survey research and therefore qualified for an Institutional Review Board (IRB) exemption. The OHSR determined

that the Survey was exempt from NCI's Special Studies Institutional Review Board on July 21, 2010, in accordance with 45 CRF 46 (Exempt No. 5301).

A Privacy Impact Assessment (PIA) was also conducted for the information technology (IT) system used to collect, use, store, maintain, disclose, and transmit Survey data. The NCI Privacy Act Coordinator reviewed the Survey instrument and determined that no personally identifiable information was being collected and that use of a vendor's server would not impact privacy concerns. Because the Web server hosting the Survey was owned and maintained by the Survey contractor (and the Survey design application developer, SurveyGizmo), physical and software security clearance was not required by NCI's Center for Biomedical Informatics and Information Technology (CBIIT).

In order to comply with the Paperwork Reduction Act, necessary documentation was submitted to OMB for clearance. The OMB Submission package, including the Survey instrument and supporting documentation, is provided in Appendix A. Following OMB approval on April 25, 2011, the OMB control number was displayed prominently on the questionnaire, along with appropriate notification that participation in the Survey was voluntary.

Recruitment and Data Collection

Data collection focused on the invitation process—providing multiple invitations to potential responders in order to maximize the response rate. Each participant in the study received from the NCI Project Office electronic advance notice and an electronic invitation to participate in the Survey. This invitation from the Director of the TTC explained the purpose of the Survey, provided information about the confidentiality of responses, and invited participants to take part in the Survey. One week later, the Survey contractor sent each participant an electronic invitation to participate. The email contained a secure URL and password to access the Web-based Survey. Two weeks after the email invitation to participate was sent, an email "reminder to participate" was sent by the Survey contractor to all Survey non-respondents. An additional "reminder to participate" email was sent to non-respondents one week prior to the closing date of the Survey and a final reminder was sent prior to the close of the Survey.

The Survey contractor established and maintained quality control procedures to ensure standardization and quality of data collection and processing. A written log was maintained of all decisions affecting study design, conduct, or analysis. The Survey contractor monitored performance of data collection activities, especially with regard to response rates and completeness of acquired data. Weekly reports were developed showing response rates, including completed and partial responses, and sent to the Project Officer. The Survey was fielded between October 6 and December 2, 2011.

Once the Survey closed, a series of steps was implemented to clean and customize the data in preparation for analysis. After downloading the final Excel file from SurveyGizmo, row-by-row review of the data file was conducted, with any anomalies or problems noted. Preliminary frequency runs were generated and reviewed for any anomalies that appeared in the tabulations. Open-ended responses were coded; respondent identifiers were removed; and a separate linking file was created. A final quality control review was conducted and final frequency runs were generated.

Data Analysis

Both quantitative and qualitative methods were applied to the results of the TTC Survey. Open-ended responses to items (e.g., to "Other, please specify") were examined for consistencies that could inform TTC work practices. Responses that were either very positive or very negative were examined in relation to company characteristics. This type of analysis, in conjunction with quantitative analyses, can help TTC understand what it does well and where workflow improvements might be made.

Quantitative analyses examined item response distributions and the numbers of responses in item categories. The frequency distributions of item responses were displayed for each Survey question (see Appendix B). Since items that contain response categories with small n's (e.g., < 5 including 0) may be problematic when conducting further analyses, data were aggregated where possible. For example, several questions had Likert-type responses, with five response options ranging from "not familiar" to "extremely familiar" or "not at all important" to "extremely important." An examination of the distribution of responses to these items indicated that certain categories could be combined to form three categorical response

options: "not familiar," "a little/somewhat familiar," and "very/extremely familiar" and "not at all important," "a little/somewhat important," and "very/extremely important." Frequency distributions of both the original responses (5-point scale) and recoded responses (3-point scale) are included in Appendix B.

Two-way cross-tabulations were conducted with key company characteristic variables and response variables. Univariate measures of association were obtained (e.g., Fisher's exact test, Chi-square test), as appropriate, for the specific qualities of the items examined and the research questions asked. Additional two-way cross-tabulations of NCI TTC user status (users vs. non-users) were conducted in an attempt to differentiate company characteristics that were associated with use of TTC services. Because of the low response rate, multivariate analyses (e.g., Ordinary Least Squares regression, logistic regression) were considered unreliable and therefore not calculated. In addition, cell sizes resulting from multiway cross-classification tables resulted in many cells containing very small sample sizes (<5, including 0).

IV. FINDINGS

The results of the Survey are summarized in the following section, which is divided into five parts. The first part is a discussion of response rates, which is followed by a discussion of the definitions of the terms "users" and "non-users" of TTC services. The three remaining parts present findings from the corresponding three sections of the questionnaire: general participant characteristics; strategic directions; and experience and satisfaction with the NCI TTC. Data tables for item-by-item responses are presented in Appendix B.

Response Rates

In total, 3,475 email advance notices and invitations to participate in the Survey were sent by the NCI Project Office. A total of 2,150 potential participants remained after removal of email duplicates, "undeliverables," and those for which out-of-office and "unsubscribed" messages were received. The Survey contractor sent an email to the 2,150 potential participants that contained a secure URL and a password to access the Web-based Survey. The distribution of responses to the contractor email invitations is shown in Exhibit 3. A flow

diagram showing the dropouts, beginning with the initial email advance notice and concluding with the final survey respondents, is presented in Exhibit 4.

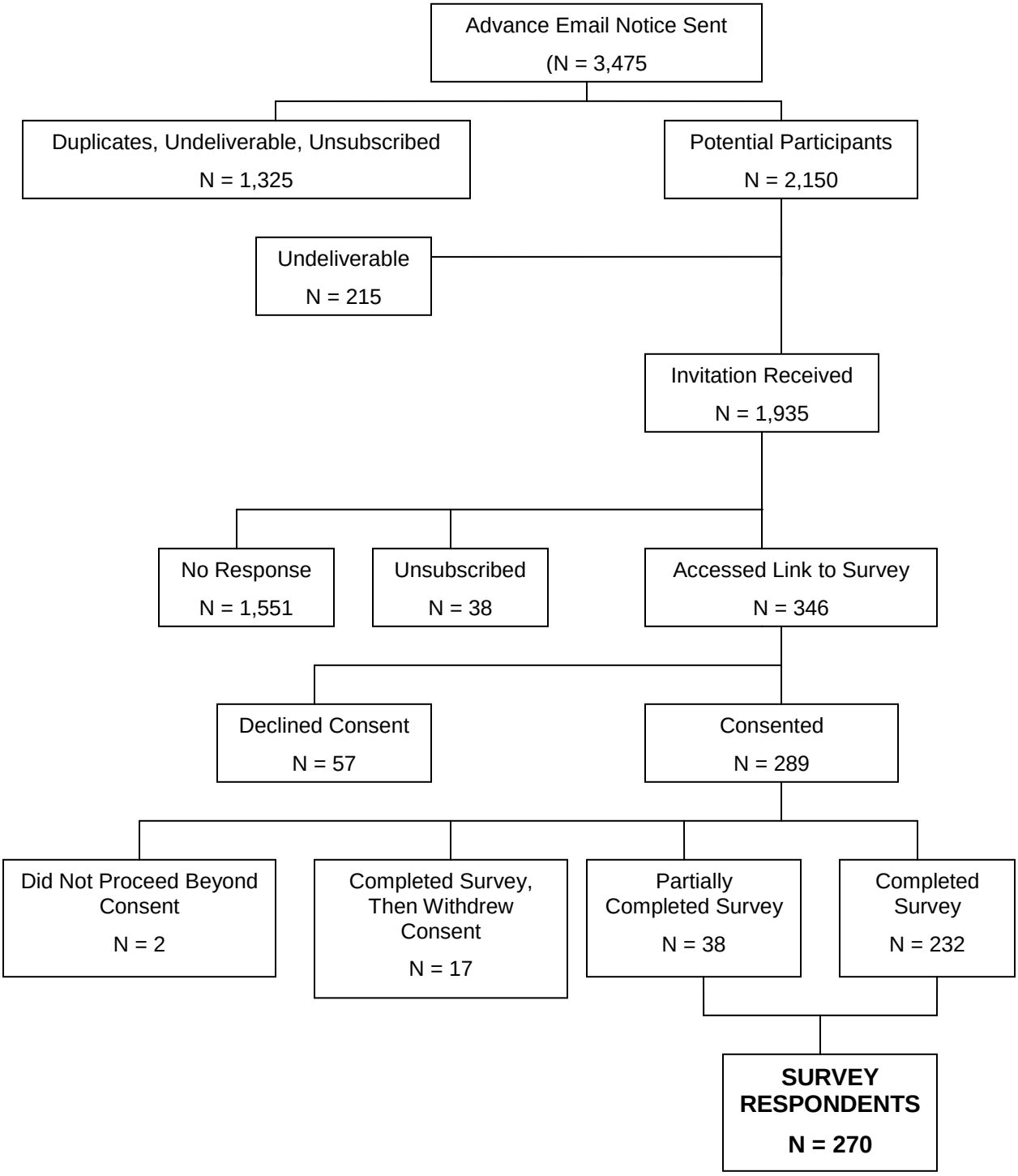
The biotechnology and pharmaceutical industries are quite volatile, with individuals changing companies and companies merging or going out of business. Since 215 of the email invitations were returned as undeliverable, these individuals were considered ineligible to participate, thereby reducing the total number of possible participants to 1,935. The responses of the 38 partial responders who agreed to participate were included with those of the 232 individuals who agreed to participate and completed the Survey, which yielded a total of 270 respondents (response rate 14%). Utilizing the conservative assumption that the 215 individuals whose emails were undeliverable were actually still eligible to participate, the number of possible participants would be 2,150, yielding a response rate of 13%.

EXHIBIT 3: Frequency and Distribution of Response Status and Status Definitions

Status	Status Definition	TOTAL
Bounced	Email was unable to be delivered. Possible explanations include an incorrect email address was used; email was blocked by a spam filter; or the email address was not accepting new mail, etc.	**215**
Unsubscribed	User requested to be removed from the email campaign and no longer wished to receive any messages regarding this Survey.	**38**
Reminded/Sent	User received the initial invitation and reminders, but did not click on the link.	**1,551**
Hit	User clicked on the link, accessed the Survey, and decided not to enter any data or move on to the next page (abandoned).	**2**
Complete	User finished the Survey.	**249**
	Agreed to participate	***(232)***
	*Refused to participate**	***(17)***
Partial	User reached the Survey, entered data for at least the first page, and clicked the Next button. Partial responders received reminder emails, but their status remained as "partial" rather than being switched to "reminded."	**95**
	Agreed to participate and completed some questions	***(38)***
	Did not answer consent question and thus did not get past the first page	***(57)***
	TOTAL	**2,150**

* Seventeen individuals completed the Survey and then went back to the beginning of the Survey and checked the item "I have read the information about this study, and I do not wish to participate in this survey at this time."

EXHIBIT 4: Flow Diagram of Survey Respondents



Response Rate Factors

A review of the literature on client and customer satisfaction surveys,[6] particularly information provided by companies that provide Web-based survey services[4,7,8] suggests that response rates to Web-based customer satisfaction surveys offering no incentive to respond typically range between 10 and 15%. While it is reasonable to expect that service providers might be biased, the fact that all of the service provider Web sites examined endorse the 10-15% response rate for customer satisfaction surveys lends credence to the numbers. In addition, response rates appear to be decreasing over time.[9,10] A variety of factors influence the response rates of Web-based surveys. These factors include:

- Target audience
- Length of the questionnaire
- Nature of survey content
- Whether incentives are offered and the perceived value of incentives
- Day of week and time of day invitation emails are sent
- Level of personalization of the email.

With regard to target audience, executives/upper management and sales professionals tend to have the lowest response rates compared with other occupational groups, while homemakers and teachers have the highest response rates. In addition, workers with the highest seniority (e.g., chairman/board member, president/CEO/COO, executive vice president/senior vice president, vice president) respond at the lowest rates, while developers/programmers, CPAs, and doctors respond at the highest rates, although the authors[11] note that the presence of higher-than-average financial incentives/honoraria for doctors may be responsible for their higher response rates. The fact that a portion of the target

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[6] Shih T, Fan X. Comparing response rates from Web and mail surveys: a meta-analysis. *Field Methods*. 2008;20:249-71.

[7] PeoplePulse. Survey response rates: tips on how to increase your survey response rates [Internet]. Available at: http://www.peoplepulse.com.au/Survey-Response-Rates.htm.

[8] Henning J. Response rates (and how to increase them) [Internet blog post]. 2009 Mar 10. Available at: http://blog.vovici.com/blog/bid/18134/Survey-Response-Rate-Directly-Proportional-to-Strength-of-Relationship

[9] Donna. Survey response rates [Internet]. 2010 Jan 28. Available at: http://www.surveygizmo.com/survey-blog/survey-response-rates/

[10] Sheehan K. E-mail survey response rates: a review. *Journal of Computer-Mediated Communication*. 2001 Jan;6(2).

[11] Knapton K, Myers S. Demographics and online survey response rates. *Quirk's Marketing Research Review*. 2005 Jan. p. 58.

audience of the TTC Survey was senior executives may help to explain the response rate observed. Since executives who rank at the director level or above are considered[12] one of the most difficult to reach of all audiences, research on effective ways to reach them needs to be done. One study of 275 senior executives disclosed that the average executive who participates in surveys responds to one survey per month.[12] In this same study, participants reported that they felt that survey sponsors try to ask too much in a survey and understate the time required to complete the survey, thus causing frustration among respondents. Clearly, questionnaire length is a critical factor. The average time to complete the TTC pretest was 17 minutes, which most pretest participants felt was acceptable. Based on the results of the pretest, the content of the Survey also is not likely to have contributed to the low response rate.

Access to the online TTC Survey may have contributed to the response rate to some extent. Participants' email addresses were used as the usernames and passwords were utilized for access to the online Survey. The Survey contractor recorded 34 instances of participants' inability to log into the Survey site. One reason for the problem was that the respondent's current email address was different from the one used in the Survey database; however, the respondent still received the email invitation because messages sent to the old address were forwarded to the new address. Another reason this error message occurred was because of case sensitivity; that is, the respondent's email address was provided in upper case and the respondent entered the email address in lower case. In all cases, a technical support staff member was able to correct the problem and these respondents subsequently completed the Survey. The number of individuals who encountered this problem, failed to seek technical assistance, and abandoned the Survey is unknown.

Response Rate Analysis by Survey Question

Since questionnaire length is a factor known to impact response rate, the response rate to each survey question was examined in order to determine patterns of decline and ascertain whether particular questions were problematic. The distribution of response rates by question is shown in Exhibit 5. The response options for each question and the item-by-item response

[12] BuyLine Research. So you want to survey business executives: executives speak out on what works to gain their participation [Internet]. 2008 Aug. Available at: http://www.marketo.com/library/buyline-surveying-business-executives.pdf

frequencies are shown in Appendix B. The number of potential responses varies by question due to skip patterns. For example, respondents who answered "no" to question 6 were asked question 6b and then were skipped to question 30. Overall, the response rates were highest for Section 1 of the Survey and lowest for Section 3, suggesting that questionnaire length probably did contribute to a decline in response rate. Although several of the questions in Section 2 were long and complicated, response rates for Section 2 were 87% or higher, with the exception of that of question 15 which asks about the numbers of partnerships developed in the past two years by a variety of stages of patent prosecution, for which the response rate was 80%. In Section 3, the response rates for the two open-ended questions were particularly low, with Question 28 yielding a 21% response rate and Question 33 yielding a 19% response rate.

EXHIBIT 5: NCI TTC External Customer Satisfaction Survey: Response Rate Analysis

TTC Survey Questions	Potential Number of Responses	Actual Number of Responses	%
Section 1: Respondent/Company Information			
1. Which of the following best describes your current position in your company?	270	270	100
2. How is your company best described?	270	268	96
3. Is your company private or public?	270	270	100
4. Where is your company's parent or headquarters located?	270	270	100
5. Approximately how many full-time employees does your company have?	270	270	100
Section 2: Strategic Directions			
6a. Does your company develop strategic technology partnerships (research collaborations, licensing, etc.) with outside organizations?	270	270	100
6b. Why does your company choose not to develop strategic technology partnerships (research collaborations, licensing, etc.) with outside organizations?	12	12	100
7. When forming a strategic technology relationship with an outside organization, which type of partnership do you typically prefer to start with?	258	256	99
8a. For research and development (not negotiated as in-licenses or contracts), please indicate the types of research partners for research collaborations you formed within the last two years.	258	249	97
8b. For research and development (not negotiated as in-licenses or contracts), approximately how many research collaborations did you form in the last two years with…?	249	216	87
9a. For research and development (not negotiated as in-licenses or contracts), please indicate the types of research partners you anticipate forming partnerships with in the next two years.	258	238	92

TTC Survey Questions	Potential Number of Responses	Actual Number of Responses	%
9b. For research and development (not negotiated as in-licenses or contracts), approximately how many research collaborations will you form in the next two years with…?	238	213	90
10. How important are the following factors in selecting a research partner?	258	239	93
11. In general, how does your company find new research partners?	258	236	91
12. In general, where does your company find new research partners?	258	234	91
13a. Please indicate the types of research partnerships developed by your company within the past two years, that may or may not include licensing.	258	229	89
13b. For research partnerships developed by your company within the past two years, that may or may not include licensing, approximately how many were…?	229	205	90
14a. For ALL research partnerships developed by your company within the past two years, that may or may not include licensing, please indicate the stage of research and development at which the partnerships were adopted.	258	231	90
14b. For ALL research partnerships developed by your company within the past two years, that may or may not include licensing, approximately how many were adopted at the following stages?	231	208	90
15. For ALL research partnerships developed by your company within the past two years, that may or may not include licensing, approximately how many were adopted at the following stages of patent prosecution?	258	207	80
16. How important are the following to your company in selecting a technology for a research partnership?	258	224	87
17a. Does your company have or plan to have partnerships with off-shore organizations?	258	225	87
17b. When considering research and development partnerships with off-shore organizations (not negotiated as in-licenses or contracts), with what kind and how many do you anticipate your company to form in the next two years?	146	144	99
17c. At what stage of research/development will your company most likely seek off-shore partnerships?	146	142	97
17d. For what reason(s) will your company seek off-shore partnerships?	146	141	97
Section 3: Experience with NCI TTC			
18. Patenting and licensing of all NIH technologies are handled centrally by the NIH Office of Technology Transfer (NIH OTT). The NCI TTC has oversight of the NCI technology portfolio and negotiates collaboration agreements, such as CRADAs. Please indicate your level of familiarity with the following prior to receiving this survey.	258	224	87
19. How did you first learn about the NCI Technology Transfer Center?	168	132	79
20. Should NCI Technology Transfer Center marketing involve an NIH inventor in the process?	168	129	77
21a. Has your company developed a research partnership (not in-license) with NIH researchers through the NCI TTC in the past two years?	168	130	77
21b. Which factors led you to not partner with NIH researchers?	72	71	99
22. Which factors led you to partner with NIH?	58	40	69

TTC Survey Questions	Potential Number of Responses	Actual Number of Responses	%
23. What type of agreement with NIH was most recently completed?	58	40	69
24. Were you satisfied with the length of time required to negotiate the agreement?	58	40	69
25. During or immediately following the completion of a collaboration (CRADA, CTA, etc.), were you or your staff given the opportunity to provide specific feedback about the process and your interactions with the Technology Transfer Specialist?	58	40	69
26. Would/Did giving feedback on TTC's level of service provide value to your company?	58	38	66
27. Please tell us how satisfied you are with the following aspects of the NCI TTC technology transfer staff member(s) you worked with.	58	37	64
28. Please provide additional comments and/or recommendations regarding TTC's customer services.	58	12	21
29. How do you or your staff locate NIH research partners for potential collaborations or partnerships?	58	38	66
30. Would you like to receive information from the NCI Technology Transfer Center on developing research collaborations with NIH?	270	233	85
31. What types of information would you like to receive from the NCI Technology Transfer Center?	206	168	82
32. What is your preferred method of receiving NCI Technology Transfer Center information?	206	166	81
33. Are there services not currently offered by the NCI Technology Transfer Center that would be useful to meet the technology transfer needs of your company?	270	50	19

Influence of Response Rate on Survey Results

Given that nonresponse bias cannot be examined, the principal impact of the response rate is on generalizability of the findings. Since very little is known about those who did not respond to the Survey, it is impossible to know whether the respondents were representative of the "population" as a whole. While the results provide information about responders and their company characteristics, partnerships developed, use of the NCI TTC, and satisfaction with TTC services, they cannot be generalized to the broader population.

This raises the issue of why a simple random sample or a stratified random sample (users and nonusers) was not selected as a sampling strategy. Early on, the strategies were considered and rejected because the population was small and it would have been necessary to sample a large portion of the population. Given what is now known about the response rate, it would

have been necessary to sample the entire population in order to achieve the target sample size (which would never have been achieved). It is unlikely that the sampling procedure used (i.e., sampling everyone) was the cause of the low response rate; there is no reason to believe that a higher response rate would have been achieved if a sampling procedure with multiple waves had been used. What likely would have occurred is an extended response period as multiple waves of sampled persons were invited to participate in the Survey.

Definitions of Users and Non-users of TTC Services

The initial list of 2,052 potential Survey participants generated in April 2010 consisted of 1,394 users of TTC services obtained from the internal TTC database and 31 inquirers (company representatives who inquired about TTC services but never completed an agreement with TTC) also obtained from the internal TTC database. Contact information for 627 non-users was obtained from external subscription databases (Infinata's Biopharm Insights and Medtrack). The inquirer group was small and was added to the non-user group, bringing the total number of non-users to 658. Given the volatile nature of the companies of interest to TTC, particularly in the current economy, in preparation for fielding the Survey in September 2011, the list of potential participants was updated. By matching the list of 2,150 potential participants noted in Exhibit 3 with the earlier list, 780 users, 198 non-users, and 26 inquirers from the original list were identified (total N=1,004). The user status of the remaining 1,146 potential participants was not known but would be self-identified in Survey responses.

Respondents who answered "yes" (38 respondents) or "do not know" (20 respondents) to the question "Has your company developed a research partnership (not in-license) with NIH researchers through the NCI TTC in the past two years?" were coded as users (58 respondents). Respondents who answered "no" to the question (72 respondents) were coded as non-users. These respondents were asked for reasons for not partnering with NIH and skipped to the last section of the questionnaire. Respondents who answered that they were not familiar with TTC (92 respondents) were also coded as non-users, which yielded a total of 164 non-users. Those respondents who were not familiar with TTC were also skipped to the concluding section of the questionnaire. Some of the respondents coded as users were listed as non-users on the earlier list and some of the respondents coded as non-users were listed as users on the previous list.

Since the new definition of user captures only users within the past two years, it is possible that some of the non-users by the new definition had partnerships with TTC more than two years previously. Conversely, since about 18 months elapsed between the creation of the earlier list and the fielding of the Survey, it is possible that some former non-users established partnerships with TTC in the interim. Of the 270 Survey respondents, 48 could not be coded as users or non-users because they did not answer the requisite questions.

General Characteristics of Respondents

This section presents a general description of respondent and respondent company characteristics, followed by a brief description of issues related to non-respondent characteristics.

Exhibit 6 shows the distribution of the respondents' current positions within their companies. Over half (55%; 148) described themselves as C-level, managing directors, or principals or founders, and 23% (61) reported being scientists or research managers/group leaders.

Exhibit 7 shows the distribution of respondents' current positions for users (n=58) and non-users (n=164) compared with all respondents (n=270). Users were more likely to report being C-level, managing directors, or principals or founders, and slightly more likely to report being scientists or research managers/group leaders. Conversely, non-users were more likely to report being in business development or legal/patent counsel.

Exhibit 8 shows the company types reported by respondents. Nearly one third (31%; 84) of respondents described their companies as for-profit pharmaceutical/small molecule therapeutics companies. The second most frequent company type, with 29% (78), was for-profit biotechnology/biological therapeutics companies.

EXHIBIT 6: Distribution of Respondents' Current Positions (%)

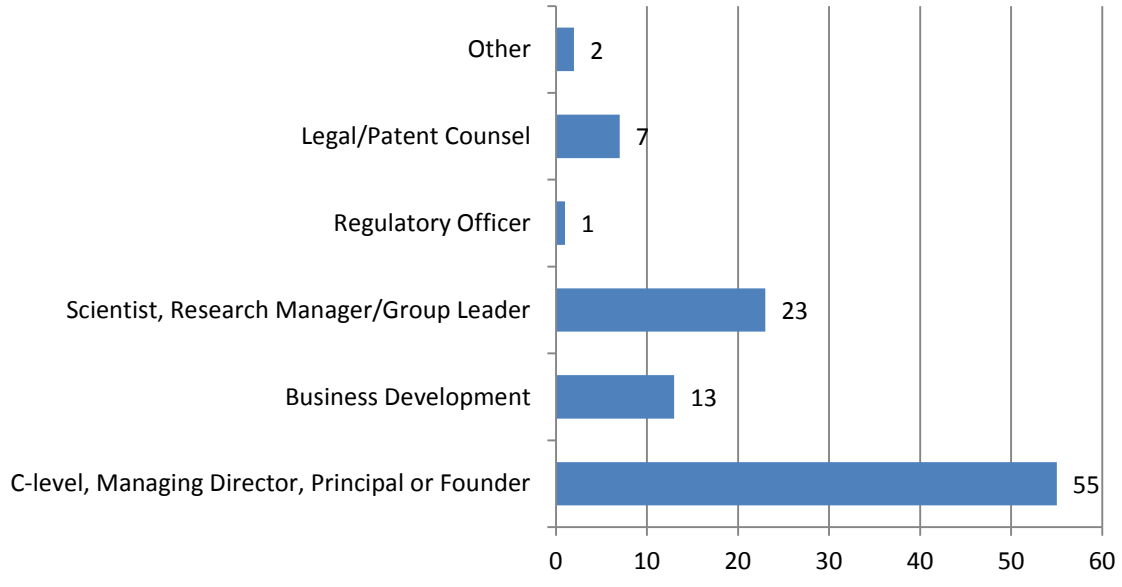
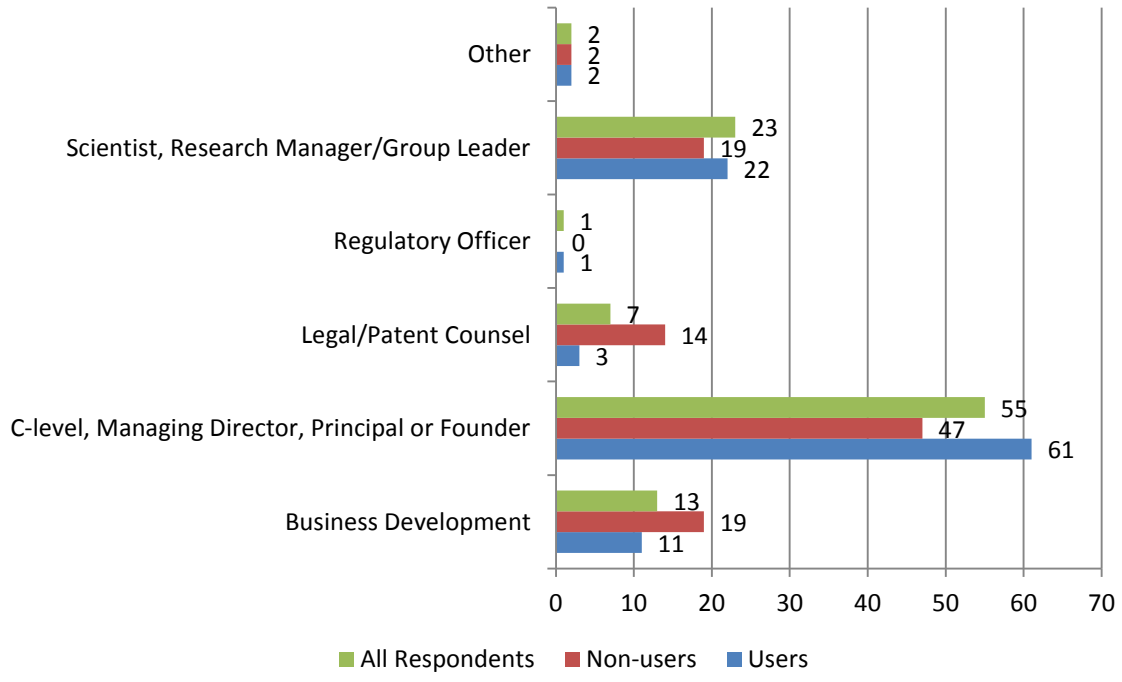
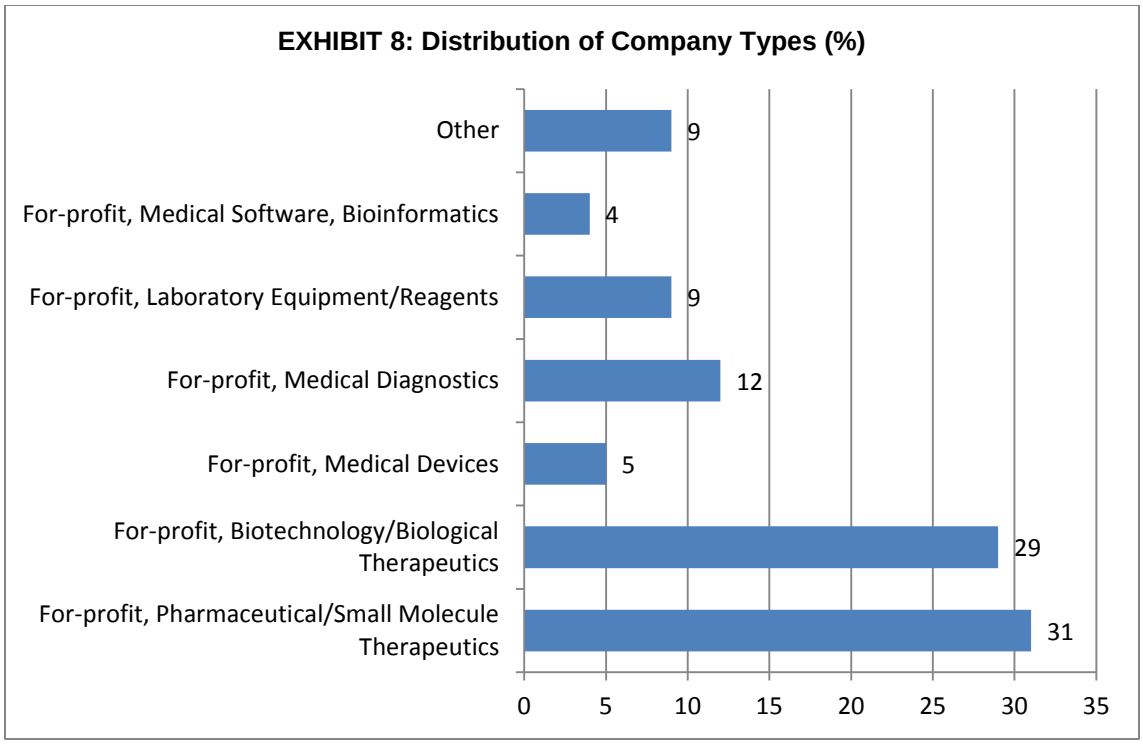
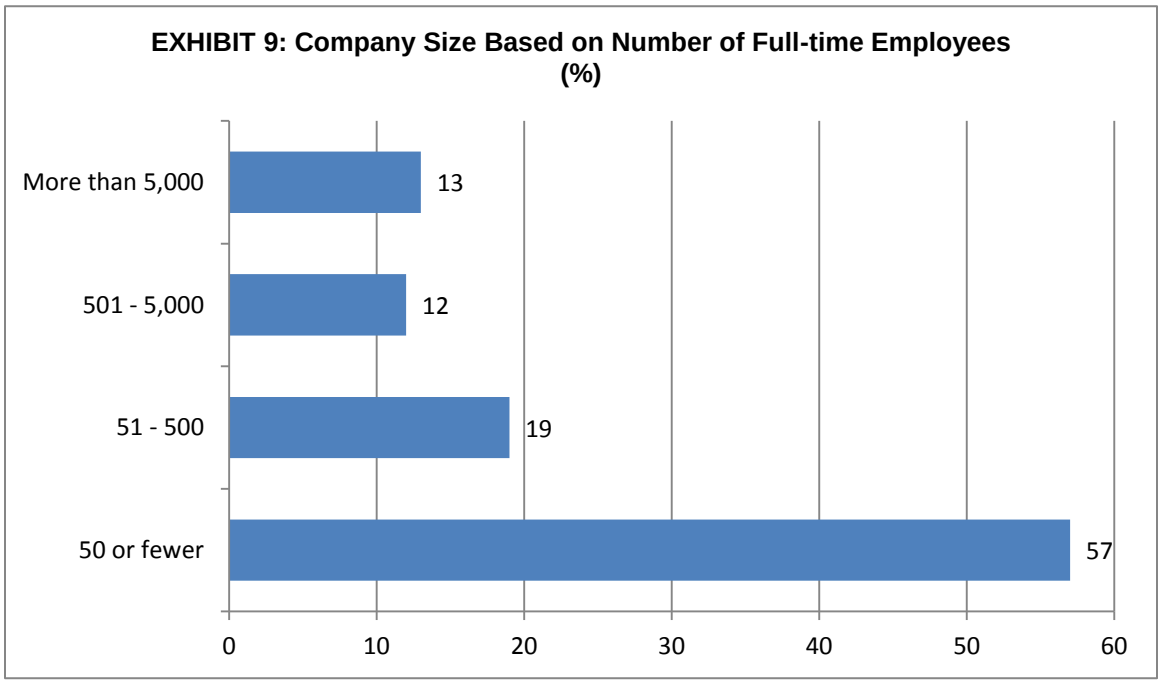


EXHIBIT 7: Distribution of Respondents' Current Positions (%) for Users, Non-users, and All Respondents





More than two thirds (69%; 187) of the companies were private and the remaining 31% (83) were public. Exhibit 9 shows the distribution of company size as defined by the number of full-time employees. Over half of the respondents (57%; 154) reported that their companies had 50 or fewer employees.



As shown in Exhibit 10, the vast majority of respondents (70%: 188) reported that their companies' parents or headquarters were located in the United States.

EXHIBIT 10: Headquarters Location	
Country of Parent Company/Headquarters	**Percent of Responses (#)**
United States	70 (188)
Japan	7 (18)
Canada	4 (10)
Germany	3 (8)
United Kingdom	3 (8)
France	2 (6)
Australia	2 (4)
Denmark	2 (4)
Italy	2 (4)
Switzerland	2 (4)
Israel	1 (3)
Austria	1 (2)
Belgium	1 (2)
India	1 (2)
Netherlands	1 (2)
Sweden	1 (2)
Poland	<1 (1)
South Africa	<1 (1)
Spain	<1 (1)

Strategic Directions

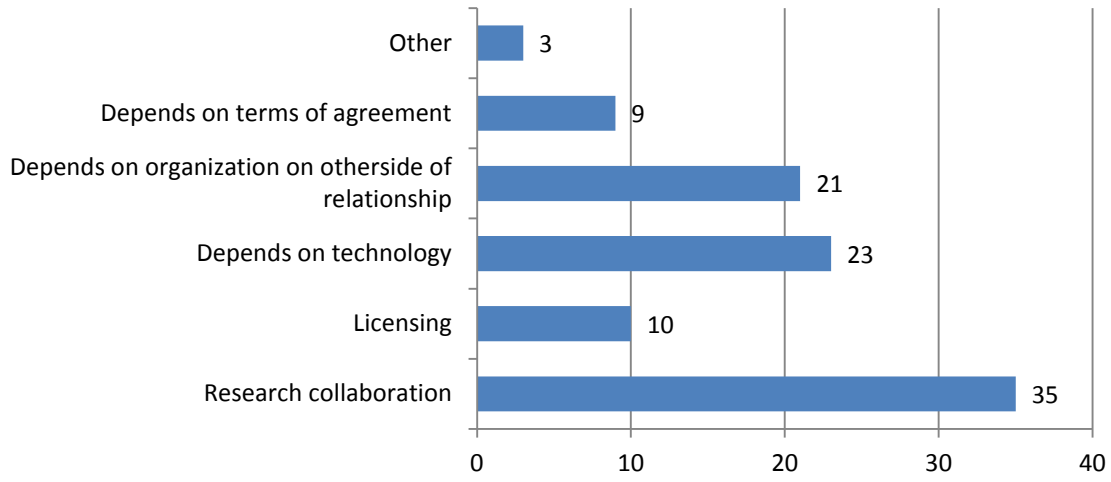
This section examines findings from responses to questions in the Strategic Direction section of the Survey questionnaire. The first question asks: "Does your company develop strategic technology partnerships (research collaborations, licensing, etc.) with outside organizations?" Respondents who answered "no" were asked to explain. Those who responded affirmatively were asked questions about topics such as types of preferred partnerships, recent and anticipated research collaborations, important factors in selecting a research partner, and how and where new research partners are located. Nearly all (96%; 258) respondents reported that their companies developed strategic technology partnerships. Twelve respondents reported that their companies did not form partnerships due to: "regulatory issues (1);" "geographic location (1);" "lack of awareness of the possibility (6);" "length of time to negotiate agreements (2)" and "other (6)."[13] Respondents who elaborated on the "other" response provided the following explanations:

[13] In answering the question, respondents were asked to please check all that apply; therefore, the number of responses exceeds the number of respondents.

- All research is done in house; no products or services are appropriate for partnerships
- Concern for sharing proprietary information
- Company is a law firm servicing clients
- Company is currently in the process of developing partnerships.

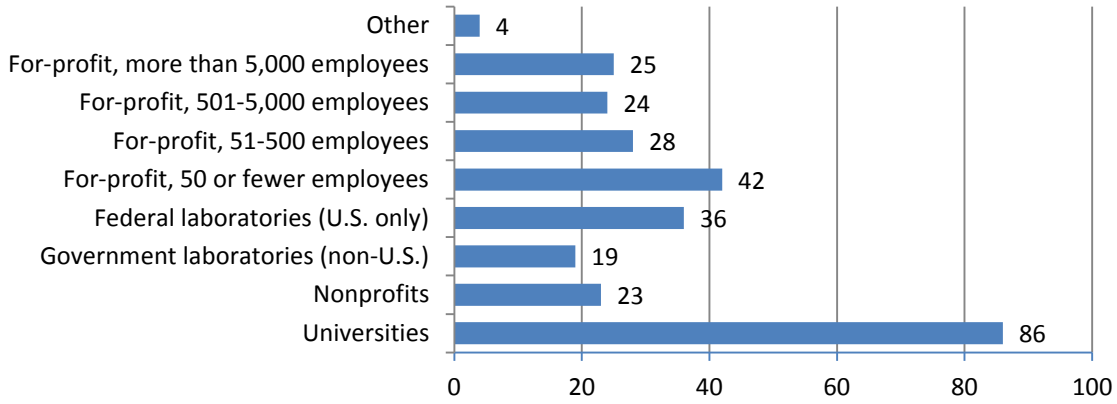
Exhibit 11 shows the types of partnerships initially formed by respondents who reported that they had strategic partnerships. More than a third (35%; 89) of respondents reported a preference to start with a research collaboration. The next most frequent choices were "depends on technology (23%; 59)" and "depends on the organization on the other side of the relationship (21%; 53)," while only 10% (25) indicated that they initiated partnerships based on licensing.

EXHIBIT 11: Initial Type of Partnership (% of Respondents)

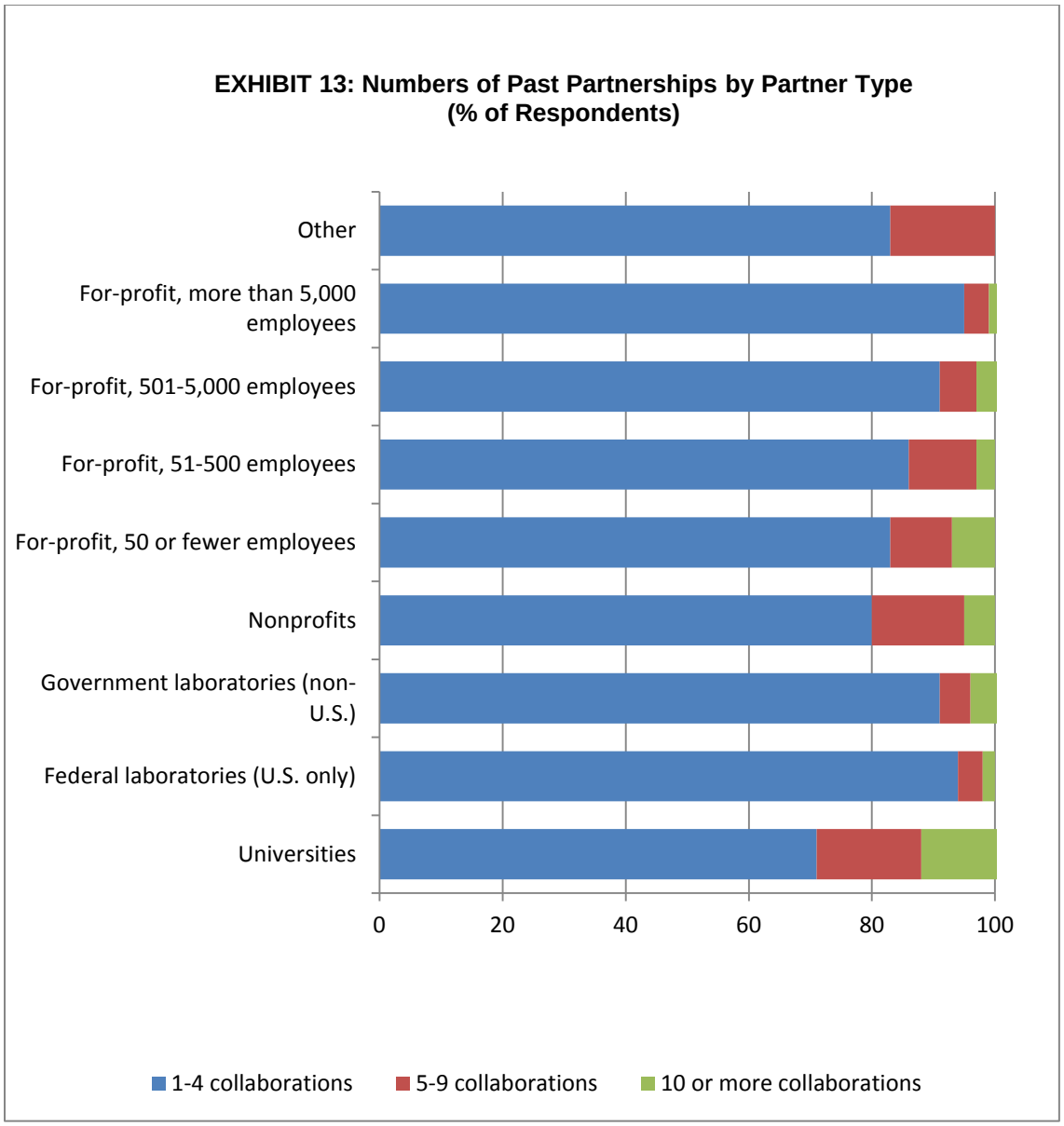


The distribution of types of past research and development partnerships is shown in Exhibit 12. It is important to note that because companies may have formed partnerships with more than one partner type, the percentages in Exhibit 12 add to more than 100%. Partnerships with universities were by far the most common, although relationships with other types of partners were also common. Other types of partners mentioned were medical centers, public non-university research institutions, and individual researchers.

EXHIBIT 12: Partnerships Formed in the Past Two Years by Partner Type (% of Respondents)



The numbers of past research and development partnerships by partner type are shown in Exhibit 13. For all partnership types, one to four collaborations within the past two years were most prevalent.



Types of partnerships anticipated in the next two years are shown in Exhibit 14 and the numbers of anticipated partnerships by partner type are shown in Exhibit 15.

EXHIBIT 14: Partnership Formation in the Next Two Years, by Partner Type (% of Companies)

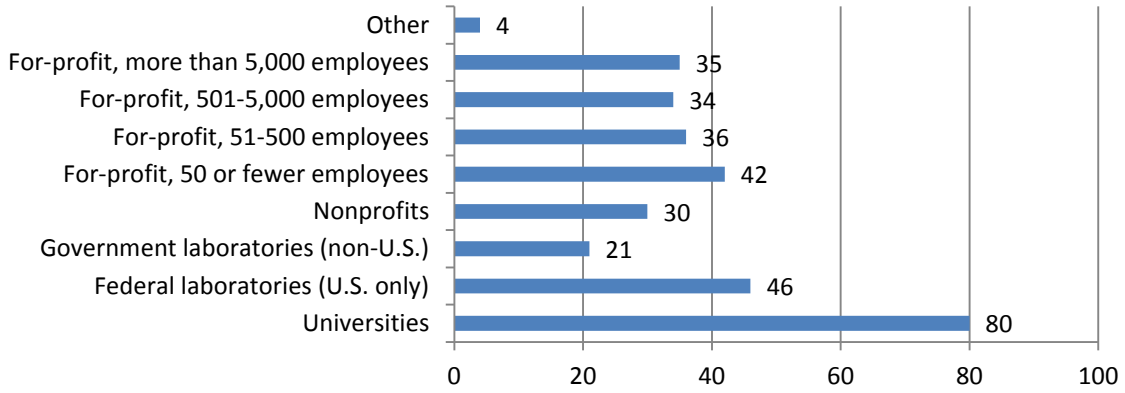
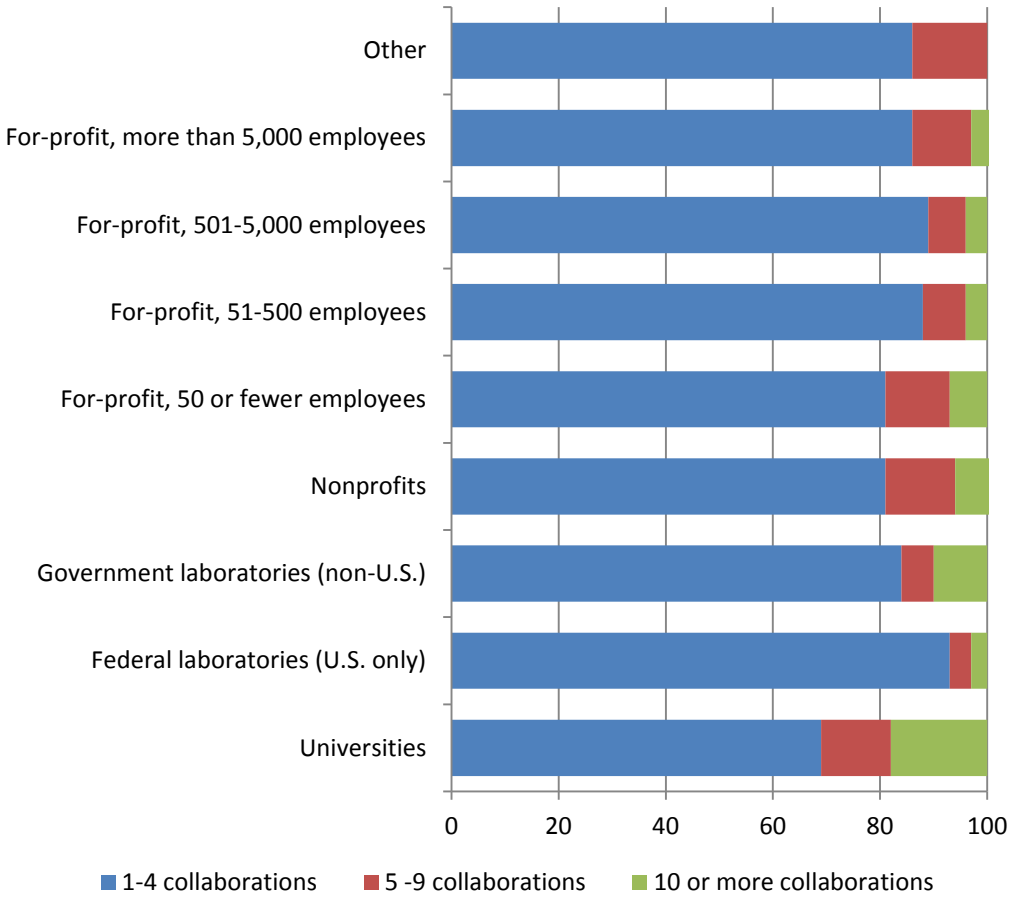


EXHIBIT 15: Numbers of Partnerships Anticipated in the Next Two Years (%) by Partner Type



As shown in Exhibit 16, in general, companies appeared to plan to continue the same types of collaborations as in the past two years, although the numbers suggest that more companies planned to collaborate with nonprofits and for-profits with 51-500, 501-5,000, and more than 5,000 employees than they did in the past two years, and slightly less with universities and Federal laboratories.

EXHIBIT 16: Numbers of Partnerships Formed in the Past Two Years (%) Compared with Numbers of Partnerships Anticipated in the Next Two Years (%)

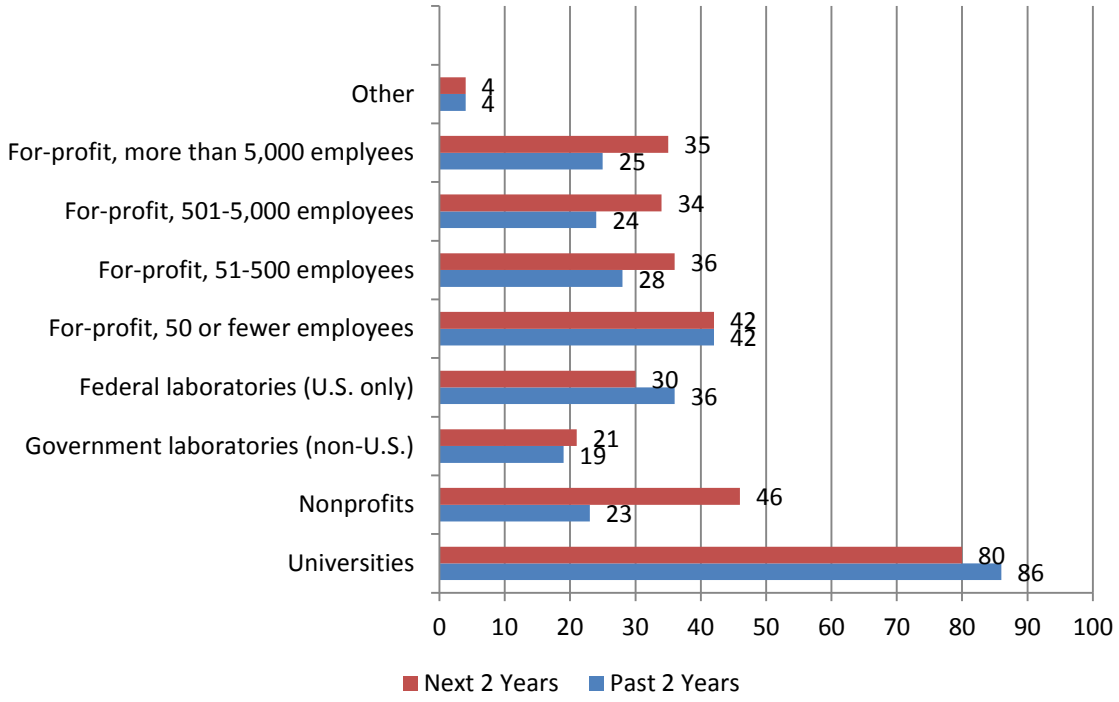
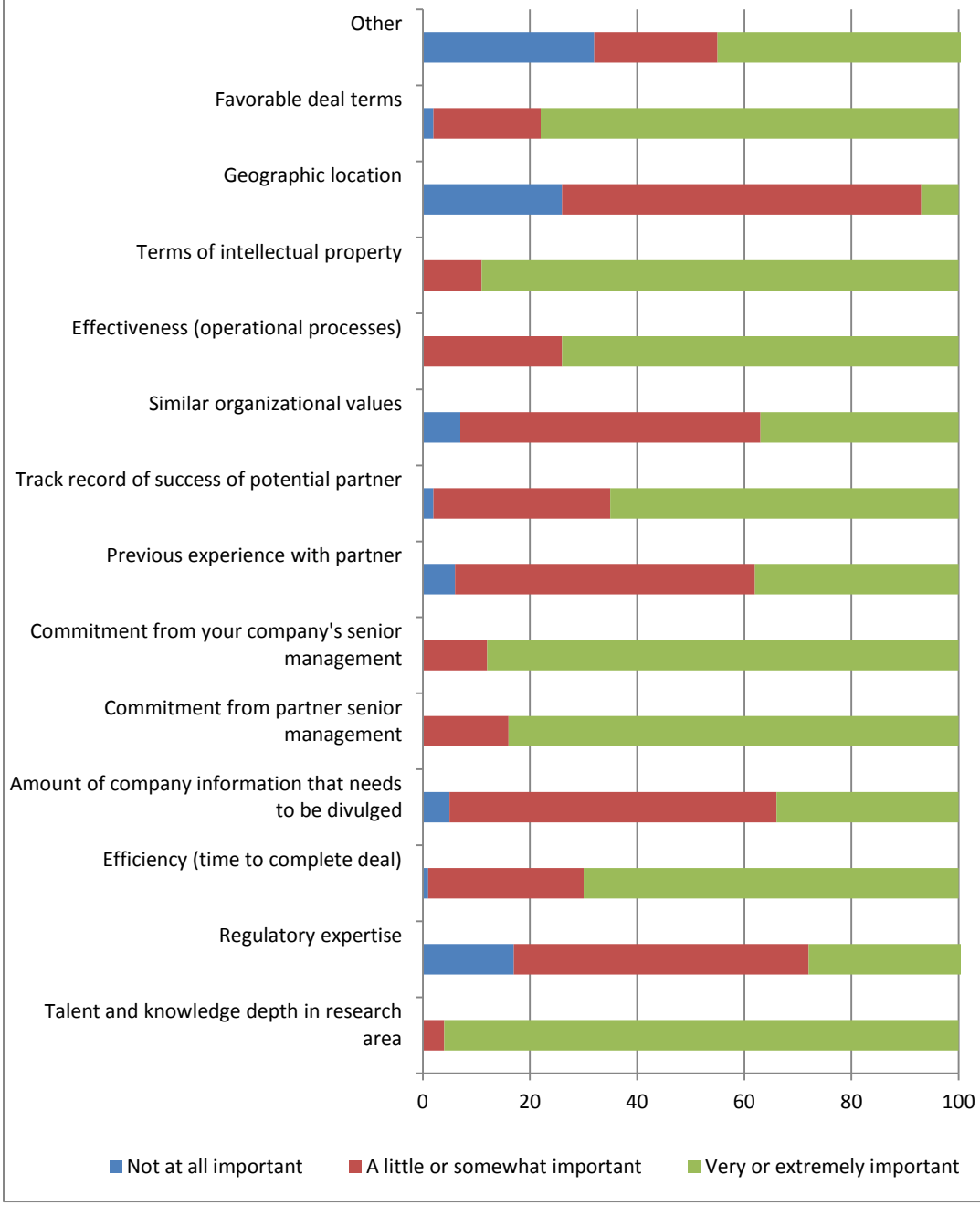


Exhibit 17 shows how important respondents considered various factors in selecting research partners. Several of the factors were considered very or extremely important by most respondents, including: talent and knowledge depth in research area, commitment from both partner senior management and respondent's company senior management, and terms of intellectual property. At least 65% of respondents also considered favorable deal terms, efficiency (time to complete deal), effectiveness (operational processes), and track record of success of potential partner very or extremely important. Less than 40% of respondents considered previous experience with partner and similar organizational values very or

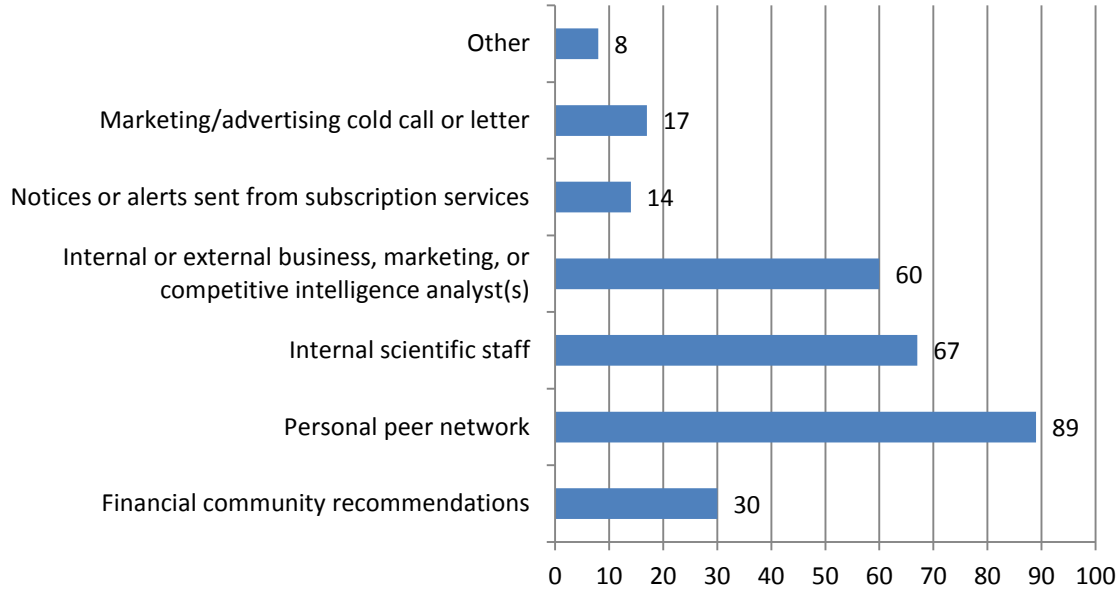
extremely important, and less than 7% considered geographic location very or extremely important.

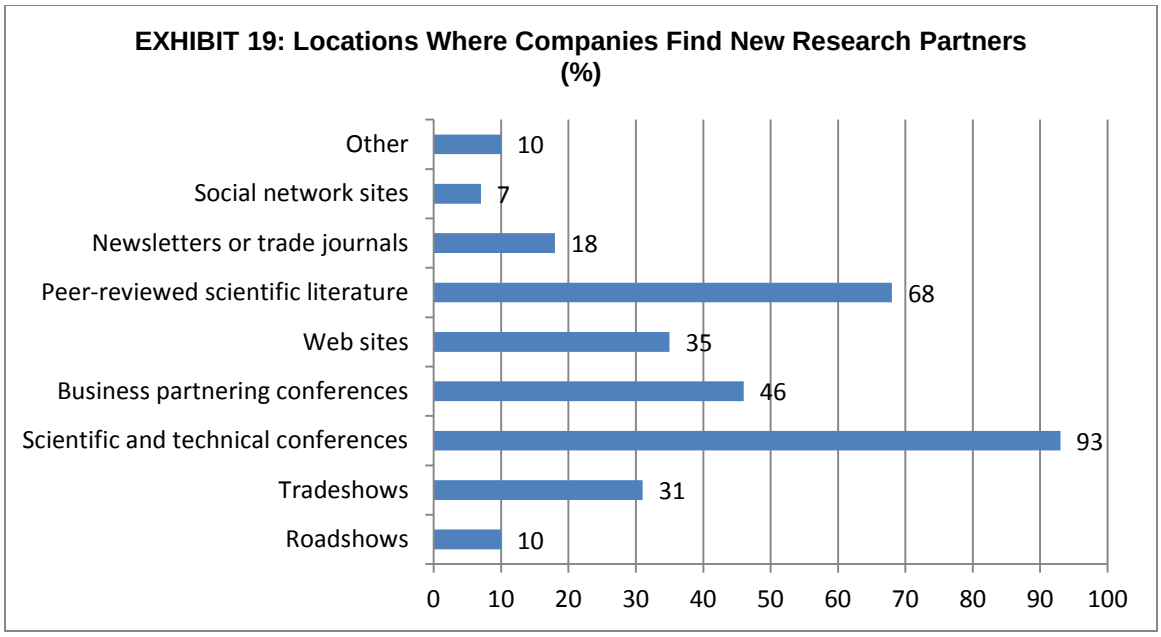
EXHIBIT 17: Importance of Various Factors in Selecting a Partnership (%)



How and where respondents reported finding new research partners are shown in Exhibits 18 and 19, respectively. The most common mechanism for finding new research partners was personal peer networks, followed by internal scientific staff and internal or external business, marketing, or competitive intelligence analyst(s). Scientific and technical conferences were the most popular venue for locating new research partners, followed by peer-reviewed scientific literature and, to a lesser extent, business partnering conferences, Web sites, and tradeshows. Comments in the "other" sections of both questions suggest that respondents perceived the two questions as seeking the same information. Therefore, in future surveys consideration should be given to combining the two questions into a single question.

EXHIBIT 18: Mechanisms Companies Use to Find New Research Partners (%)





Respondents were then asked about the types of research partnerships developed by their companies within the past two years. As shown in Exhibit 20, material transfers and university collaborations or sponsored research agreements were the most common, while partnerships exclusively licensed from the U.S. Government were the least common. As shown in Exhibit 21, for companies that developed particular types of research partnerships, the most common number of partnerships was in the range of one to four.

EXHIBIT 20: Types of Partnerships Developed within the Past Two Years (%)

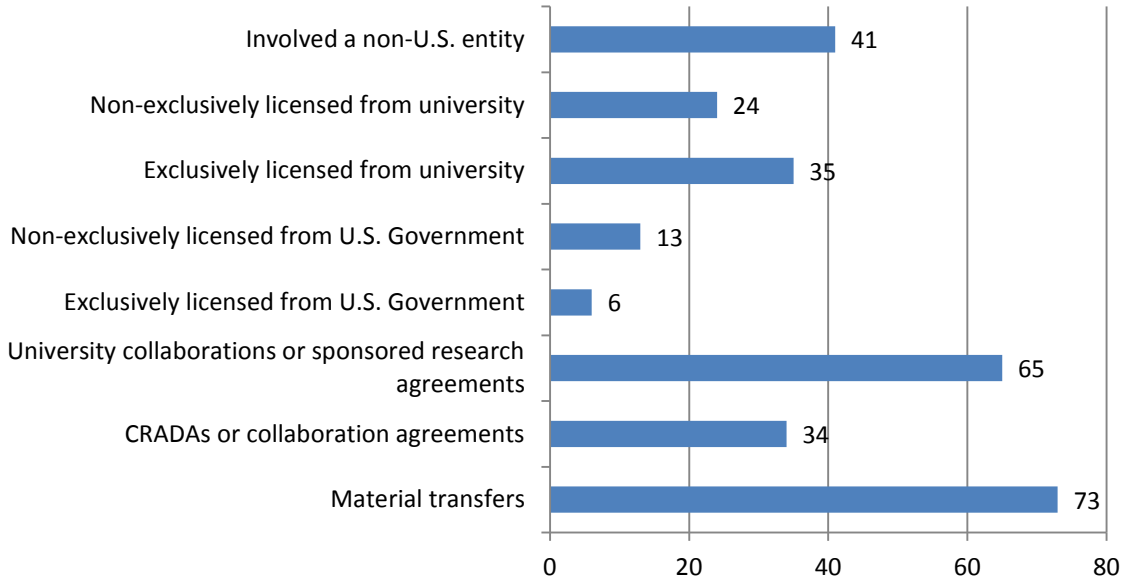
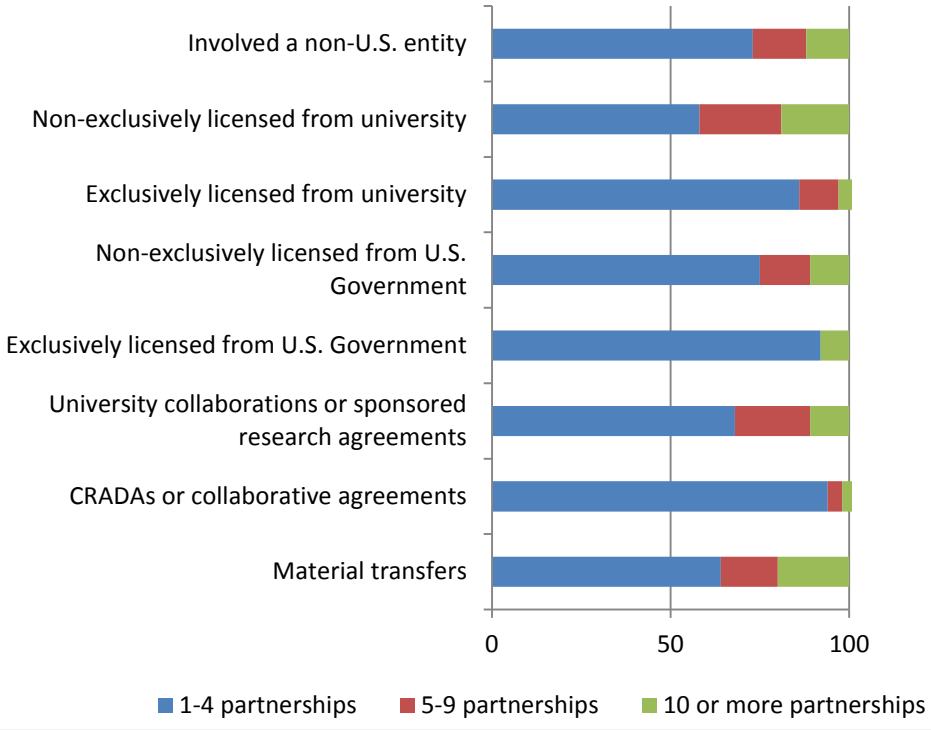
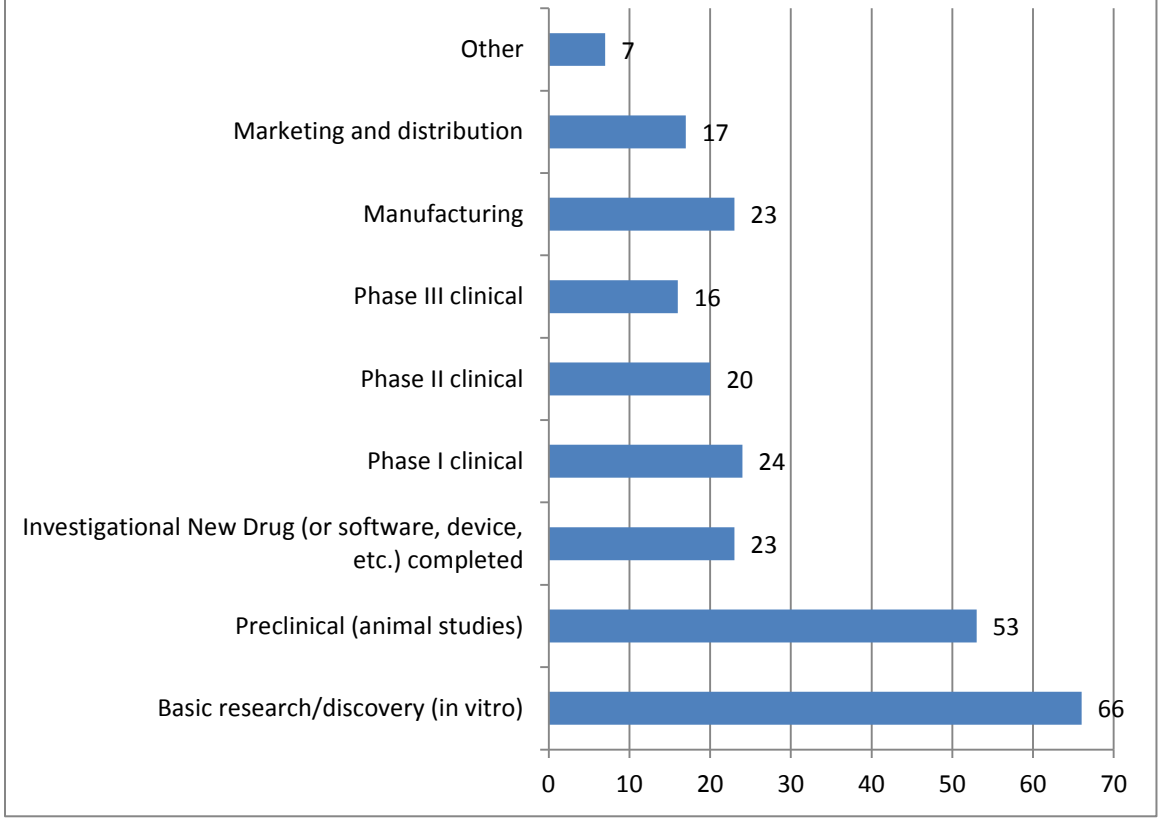


EXHIBIT 21: Numbers of Research Partnerships Developed within the Past Two Years (%) by Partnership Type



The distribution of research stages at which partnerships were developed within the past two years is shown in Exhibit 22. Basic research/discovery was the most common stage of adoption, followed by preclinical (animal studies), although all stages were represented to some extent. For companies that adopted partnerships at a particular stage, the numbers of partnerships are shown in Exhibit 23.

EXHIBIT 22: Partnerships Adopted vs. Stage of Research (% of Partnering Respondents)



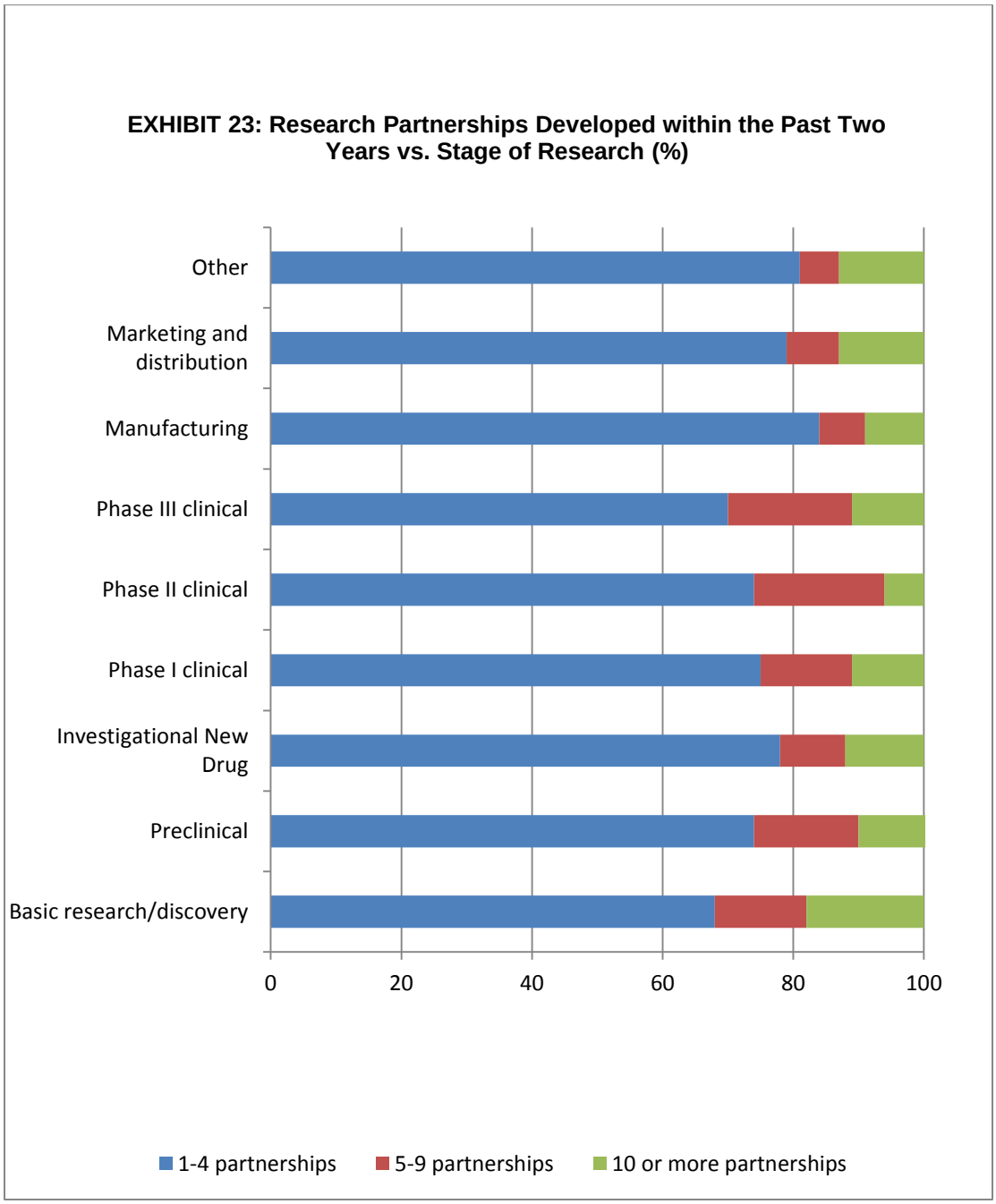


Exhibit 24 shows the distribution of responses to the question: "For all research partnerships developed by your company within the past two years…approximately how many were adopted at the following stages of patent prosecution?"

Respondents' ratings of the importance of various factors in selecting a technology for a research partnership are shown in Exhibit 25. Stage of research development was very or

extremely important to the largest proportion of respondents, followed by access to background, preexisting intellectual property.

EXHIBIT 24: Number of Partnerships Adopted vs. Patent Stage of Invention (%)

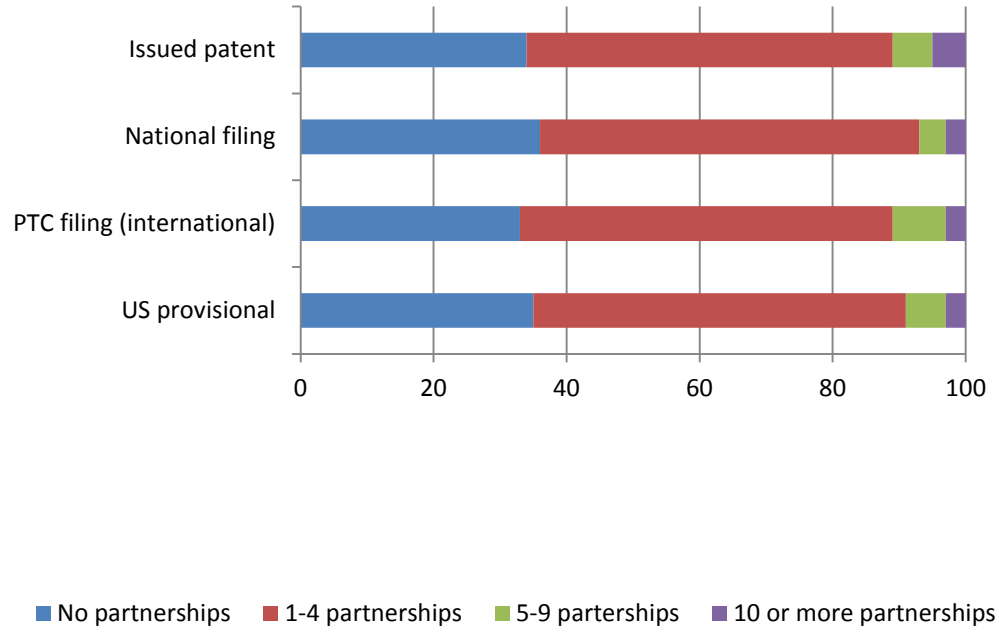
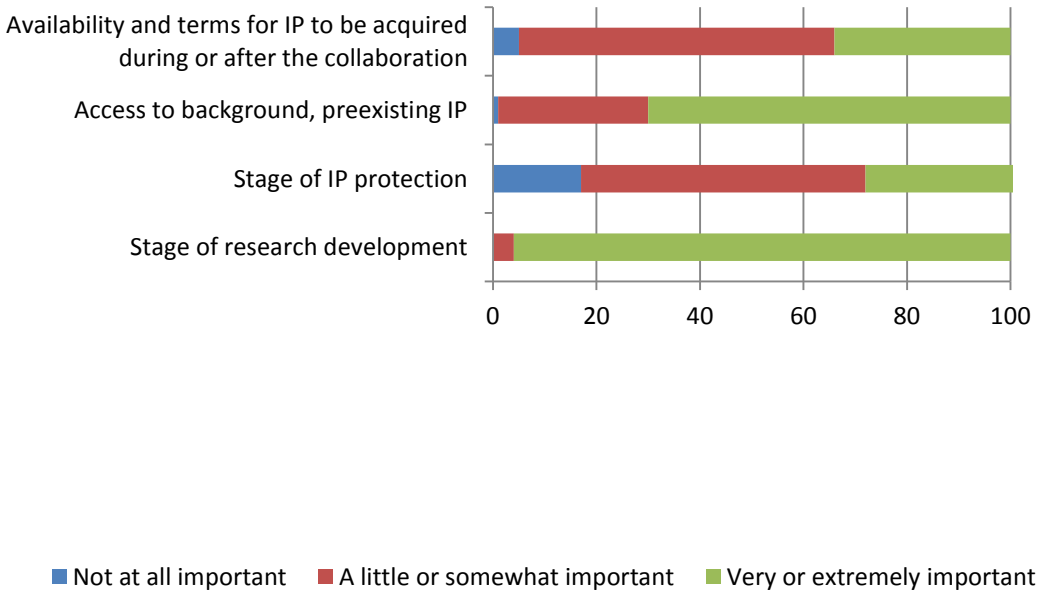
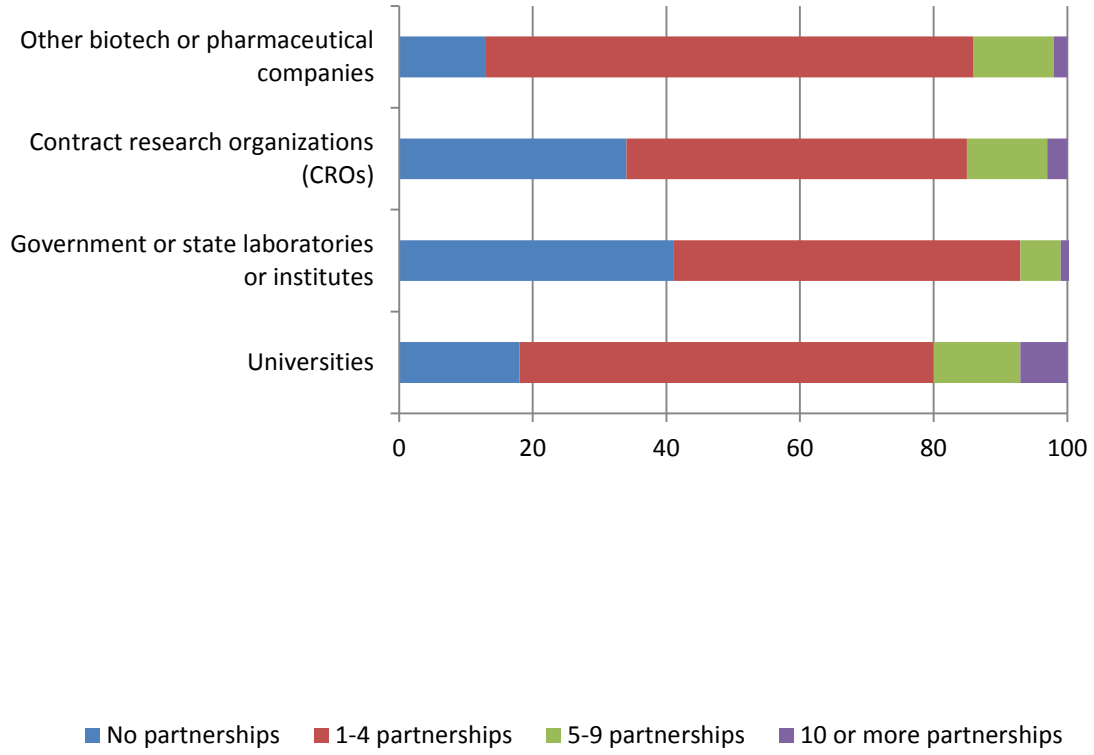


EXHIBIT 25: Importance of Partnership Selection Factors (%)

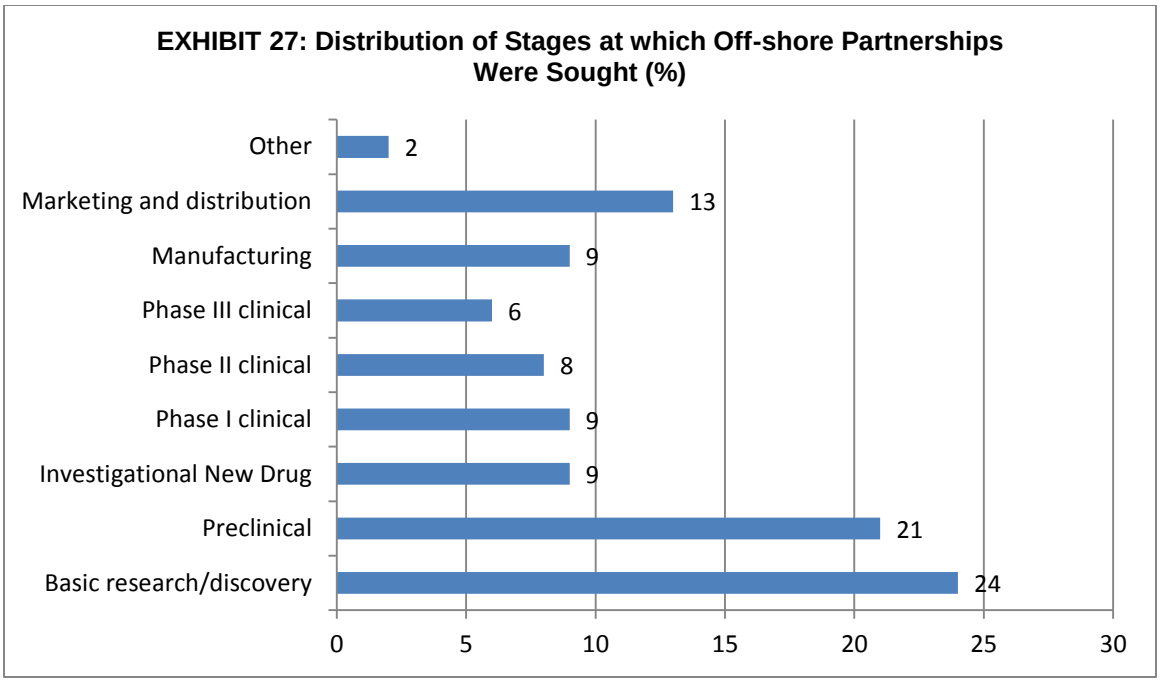


Almost two thirds (65%; 146) of respondents reported that their companies had or planned to have partnerships with off-shore organizations. Exhibit 26 shows the numbers and types of off-shore partnerships anticipated in the next two years. The largest proportions of respondents anticipated forming one to four partnerships with other biotech or pharmaceutical companies, followed closely by one to four partnerships with universities. For all types of off-shore partnerships listed, most respondents anticipated either no partnerships or one to four partnerships.

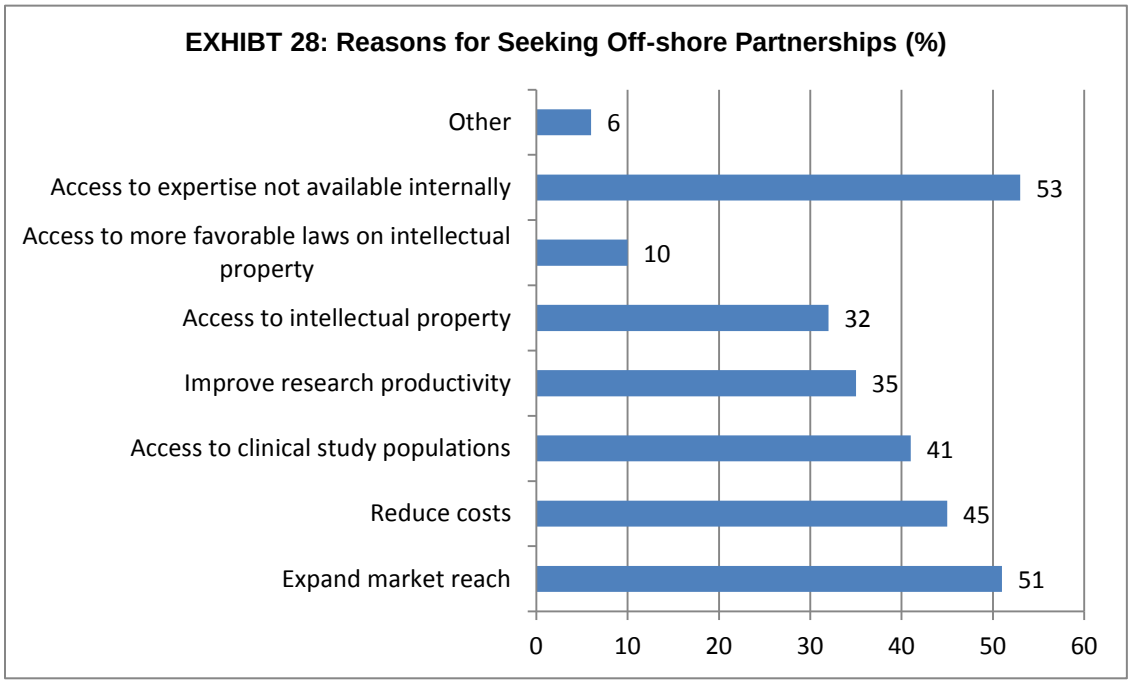
EXHIBIT 26: Numbers of Off-shore Partnerships by Partnership Type (%)



The distribution of stages at which companies sought off-shore partnerships is shown in Exhibit 27. Respondents reported seeking off-shore partnerships at all of the commercialization stages listed, with the most common being basic research/discovery, followed by preclinical and marketing and distribution.



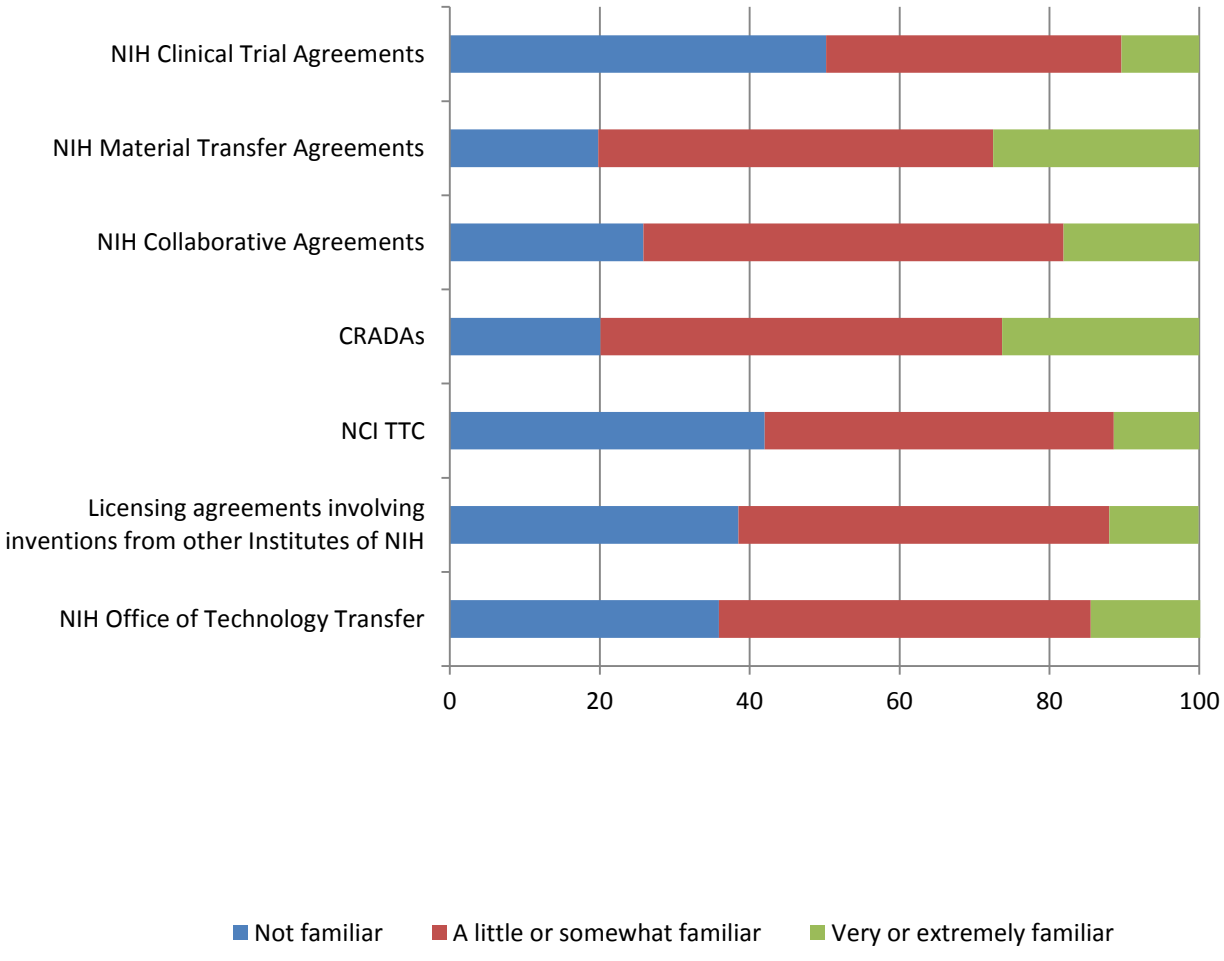
As shown in Exhibit 28, the most common reasons for seeking off-shore partnerships were to access expertise not available internally and to expand market reach. Least frequently mentioned was access to more favorable laws on intellectual property.



Experience with the NCI Technology Transfer Center

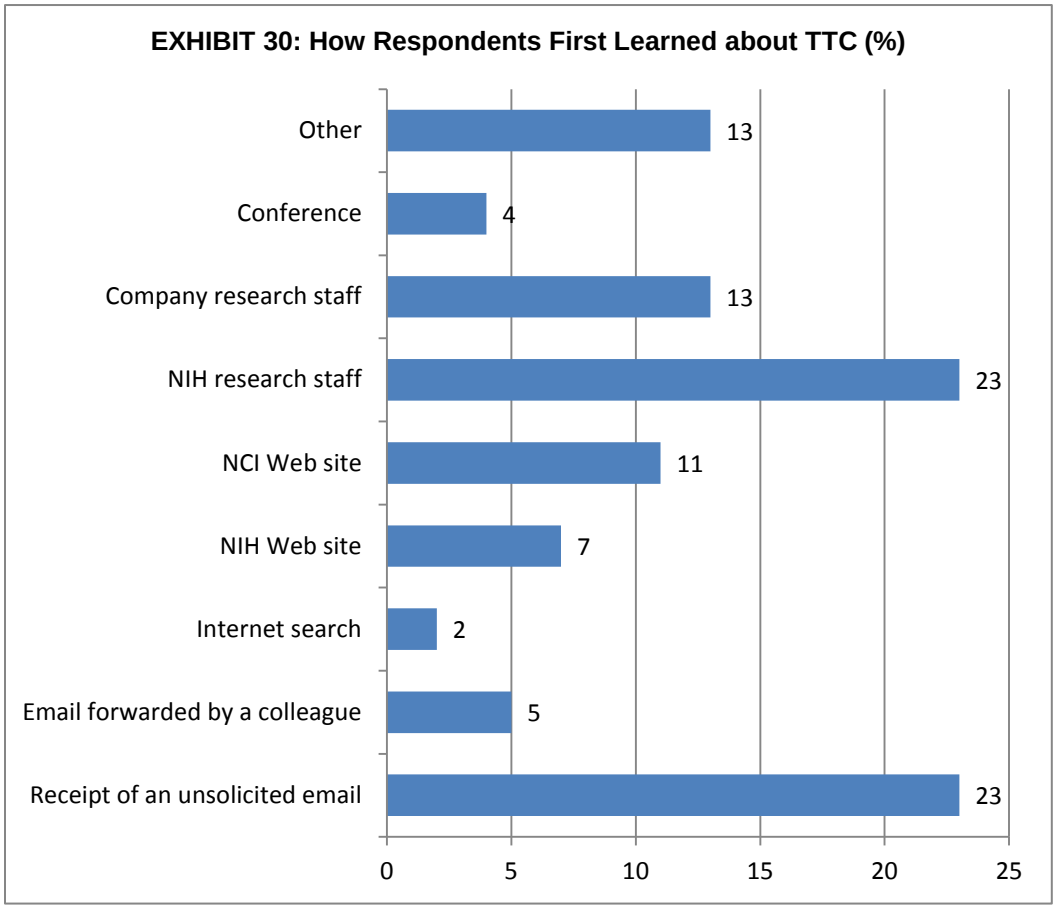
The third section of the Survey questionnaire regarding experience with NCI TTC services begins by assessing respondents' familiarity with NIH and NCI TTC services (see Exhibit 29). Survey participants who responded that they were not familiar with NCI TTC services (non-users) were skipped to the concluding portion of the Survey. Respondents who were at least a little familiar with NCI TTC were asked how they first learned of the TTC.

EXHIBIT 29: Level of Familiarity with NIH and NCI TTC Services (%)



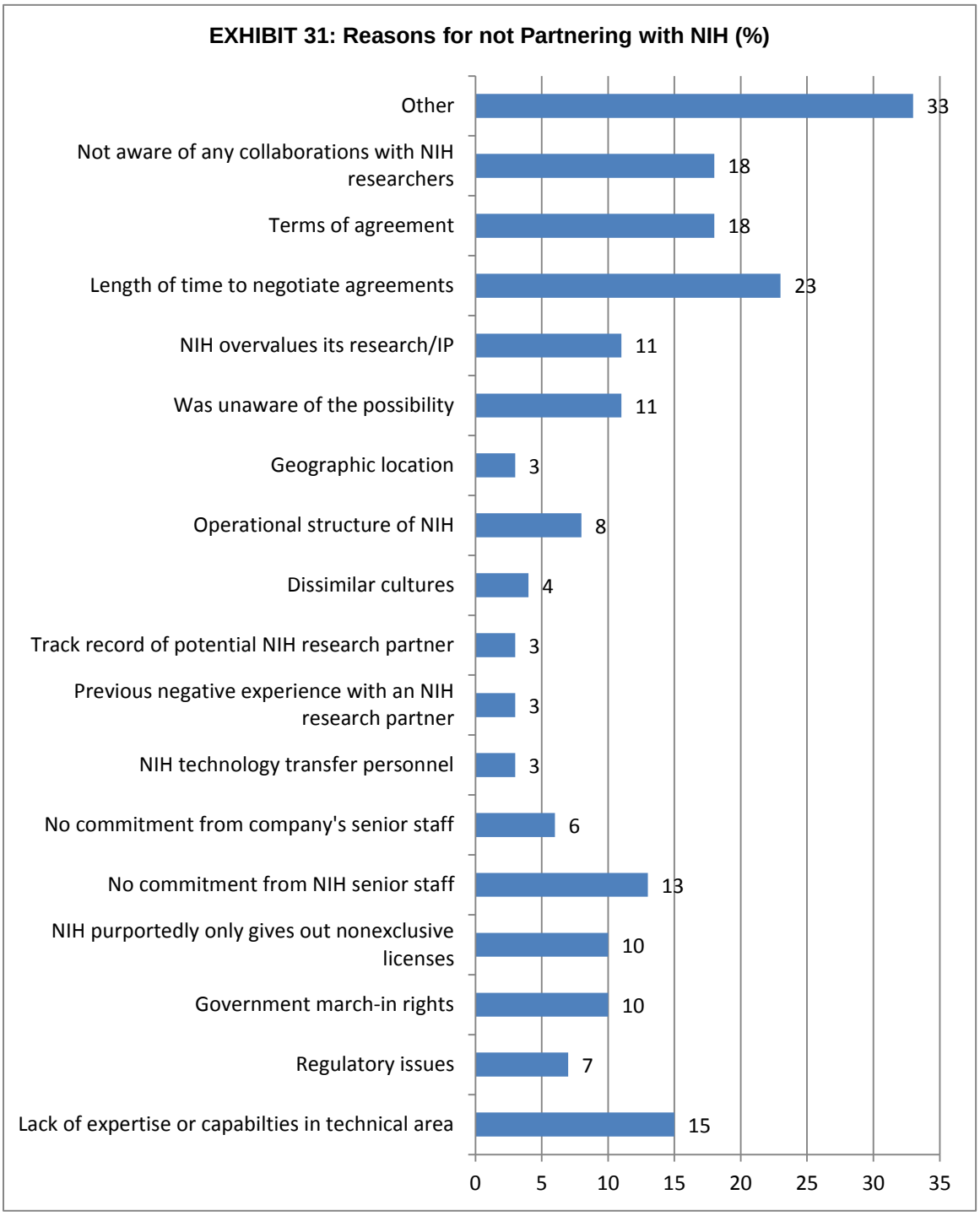
As shown in Exhibit 30, the two most frequently reported ways of first learning about TTC were by receiving unsolicited emails or from NIH research staff. The 13% (17) of respondents

who selected "other" listed sources such as the *Federal Register*, university staff, other negotiations and agreements with NCI, and a fellowship or other employment at NCI. No respondents reported learning about TTC from investors or articles in magazines or technical or trade publications.



Over three quarters (78%; 101) of respondents felt that TTC marketing should involve an NIH inventor in the process. Respondents were then asked whether their companies had developed research partnerships with NIH researchers through the NCI TTC in the past two years. Over half of the respondents (55%; 72) answered "no"; 29% (38) answered "yes"; and 15% (20) responded that they did not know. Respondents who reported not developing partnerships with TTC were then asked which factors had led them to not partner with NIH. Despite the large number of choices for not partnering offered, as shown in Exhibit 31, over one third (33%; 24) of respondents selected "other." Several of the responses were variations of "no need," "no reason to," or "never tried." In addition to "other," the three most common reasons

for not partnering with NIH were "length of time to negotiate agreements (23%; 16)," "terms of agreement (18%; 13)," and "not aware of any collaborations with NIH researchers (18%; 13)."



Quotes from more substantive responses highlight other reasons for not partnering with NIH:

"Even with SBIR & STTR, the evaluation of the ideas is still by researchers only. There should be company and commercial owners who evaluate its commercial potential and not the same researcher pool with their existing relationships and not willing to allow anyone with [a] good potential idea to break into the inner circle."

"Conflict of interest rules do not allow appropriate access to inventors."

"No interest from NIH scientists."

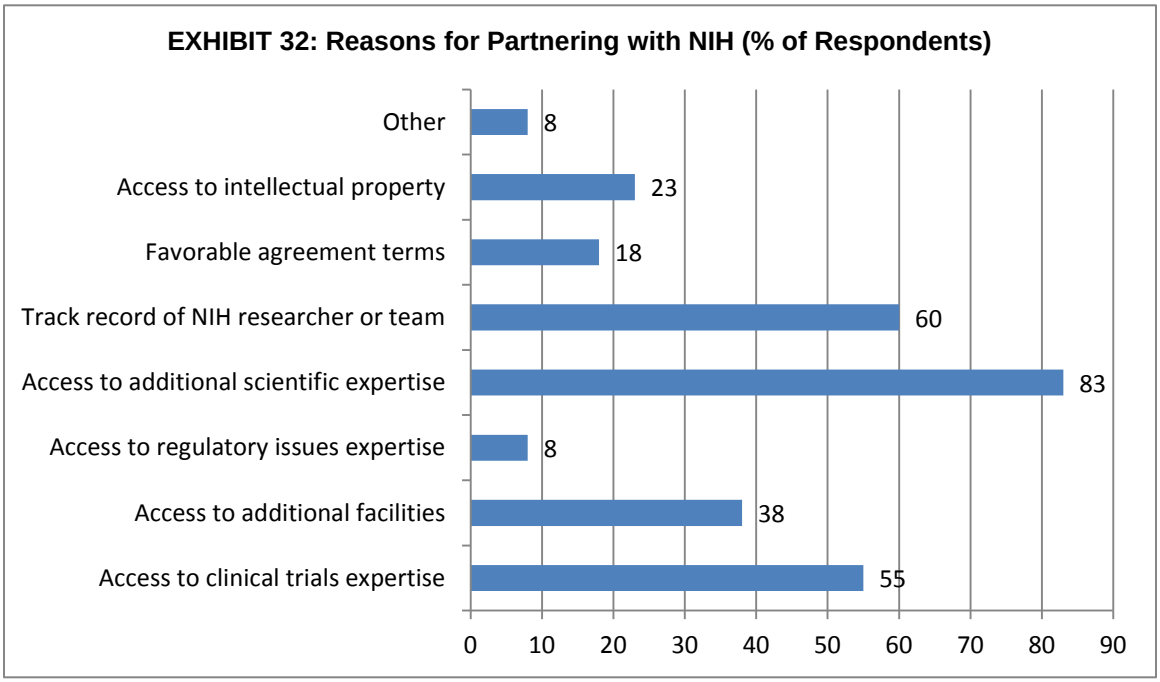
"Paucity of data and lack of commitment to commit resources to facilitate development beyond the lab data. Licensee takes on all the developmental risk and expense."

"Perception of front-loaded deals only."

"Abolition of NIH research group."

Respondents whose companies partnered with NIH were asked which factors had led them to partner. As shown in Exhibit 32, access to additional scientific expertise was the leading factor in partnering with NIH, followed by the track record of the NIH researcher or team and access to clinical trials expertise.

EXHIBIT 32: Reasons for Partnering with NIH (% of Respondents)



The types of agreements most recently completed with NIH are shown in Exhibit 33. Almost half (45%; 18) of the agreements were Collaborative Research and Development Agreements (CRADAs), followed by Material Transfer Agreements (13 %; 5) and Collaboration Agreements (13%; 5). Seventy percent (28) of respondents who had developed partnerships with NIH reported being satisfied with the length of time required to negotiate the agreements. Thirty-

one percent (12) of respondents reported that they had been given the opportunity to provide feedback about the process and interactions with the Technology Transfer Specialist either during or immediately following the completion of collaboration. Forty-one percent (16) reported that they had not been given the opportunity to provide feedback and 28% (11) were unsure. Half (19) of the respondents thought that having the opportunity to provide feedback had been or would be of value to their companies. Thirteen percent (5) did not think providing feedback had been or would be of value; the rest were unsure.

EXHIBIT 33: Most Recent Type of Agreement with NIH (%)

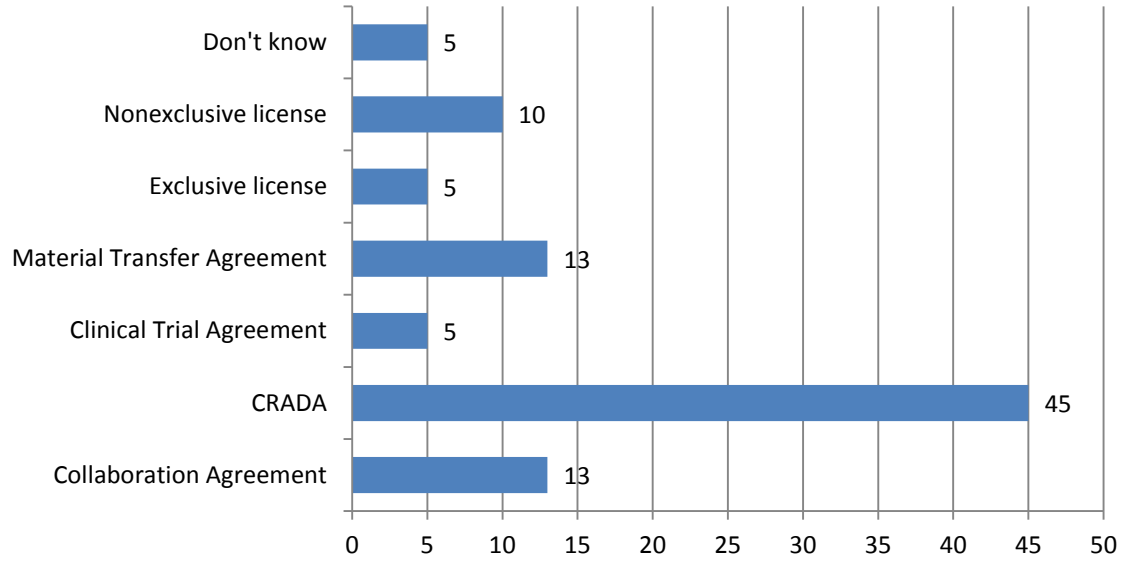
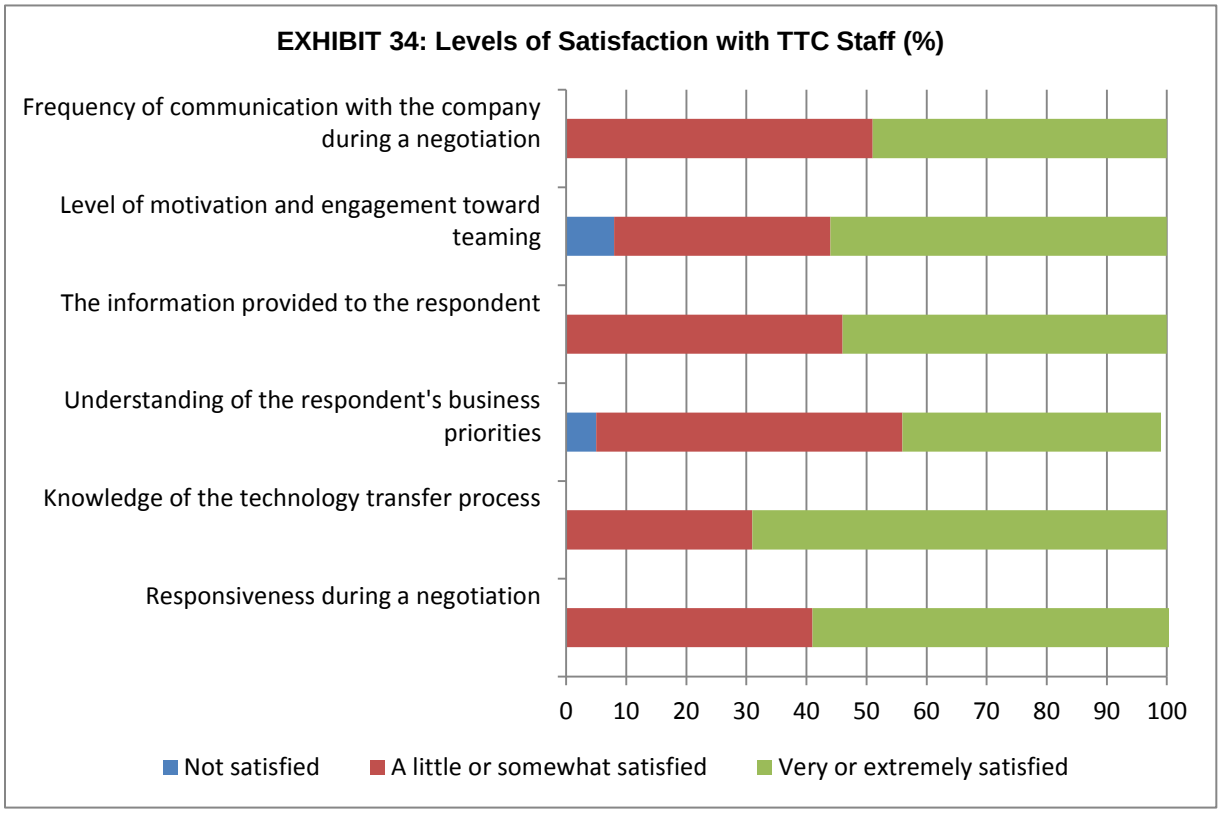


Exhibit 34 shows respondents' levels of satisfaction with a variety of aspects of the NCI TTC technology transfer staff member or members with whom they had worked. Overall, respondents were satisfied with all aspects of the TTC staff. The highest number of respondents reported being very or extremely satisfied with their TTC technology transfer staff members' knowledge of the technology transfer process. A few respondents reported that they were not satisfied with their TTC staff members' level of motivation and engagement toward teaming and their understanding of the respondents' business priorities. The variability in the levels of satisfaction suggests that degree of satisfaction may depend on the particular TTC technology transfer staff member being reported on. This is further borne out by the additional comments provided by respondents. One respondent articulated the same thought: *"The level of*

communication or teamwork involved with the NCI TTC is dependent on the actual associate handling/processing the request. While some are very communicative, others are not. The overall variability is pretty large."



Additional comments and suggestions provided by individual respondents included:

"Not enough time or space to write them all—top line: terms are typically unreasonable, use 'government regs' as excuse, 1-2 years to complete is absurd, and no regard for the best license and terms for the desired technology. No real world business experience from the TTC counterparty."

"The CRADA we have with NCI was avidly supported by the NCI scientist, but the support by the administrative group was poor and frustrating. Our collaborator and I persevered and, eventually, the agreement was signed."

"The Frederick NCI TT office has been exceptionally supportive in the CRADA process and has attempted to be helpful in the licensing negotiations with NIH OTT."

"Process is difficult, but the people are generally cooperative and pleasant to deal with."

"The partnership initiatives, especially in the area of biomarkers/early detection, are outstanding and I am very satisfied with the resources. I am somewhat less satisfied with the process of decision making, which could be faster."

"The responsiveness seems to be related more to the internal NIH technical sponsor than an actual process. A better understanding of the process would be helpful to external partners."

"She was very friendly and helpful. I enjoy working with her."

"The company's agreement draft should be acceptable. We are only allowed to use the unified NIH form."

Examination of the positive and negative satisfaction comments by respondent position, company type, company size, and company location showed no discernible pattern, giving further credence to the idea that level of satisfaction with TTC is primarily related to the individual TTC staff members involved.

Exhibit 35 shows how respondents who partnered with NIH reported locating NIH research partners for potential collaborations or partnerships. Scientific and technical conferences, personal networks, and established relationships with NIH researchers were the most frequent sources. As shown previously in Exhibits 18 and 19, these same three sources were also among the most frequently used sources for finding research partners in general.

Over 70% (167) of respondents indicated that they would like to receive information from the NCI TTC on developing research collaborations with NIH. As shown in Exhibit 36, respondents would like to receive all types of information listed from TTC, especially information about new technology collaboration opportunities from NCI or other NIH Institutes and new technology licensing opportunities from NIH Institutes. The vast majority of respondents (93%; 155) listed email as their preferred method of receiving information from NCI TTC, while 4% (6) preferred the "What's New" site on the TTC Web site and 2% (4) preferred a hardcopy newsletter. One person reported a preference for RSS feed and no respondents indicated that Facebook, LinkedIn, or other social Web applications were their preferred method of receiving information.

EXHIBIT 35: Locations Where Companies Found NIH Research Partners (%)

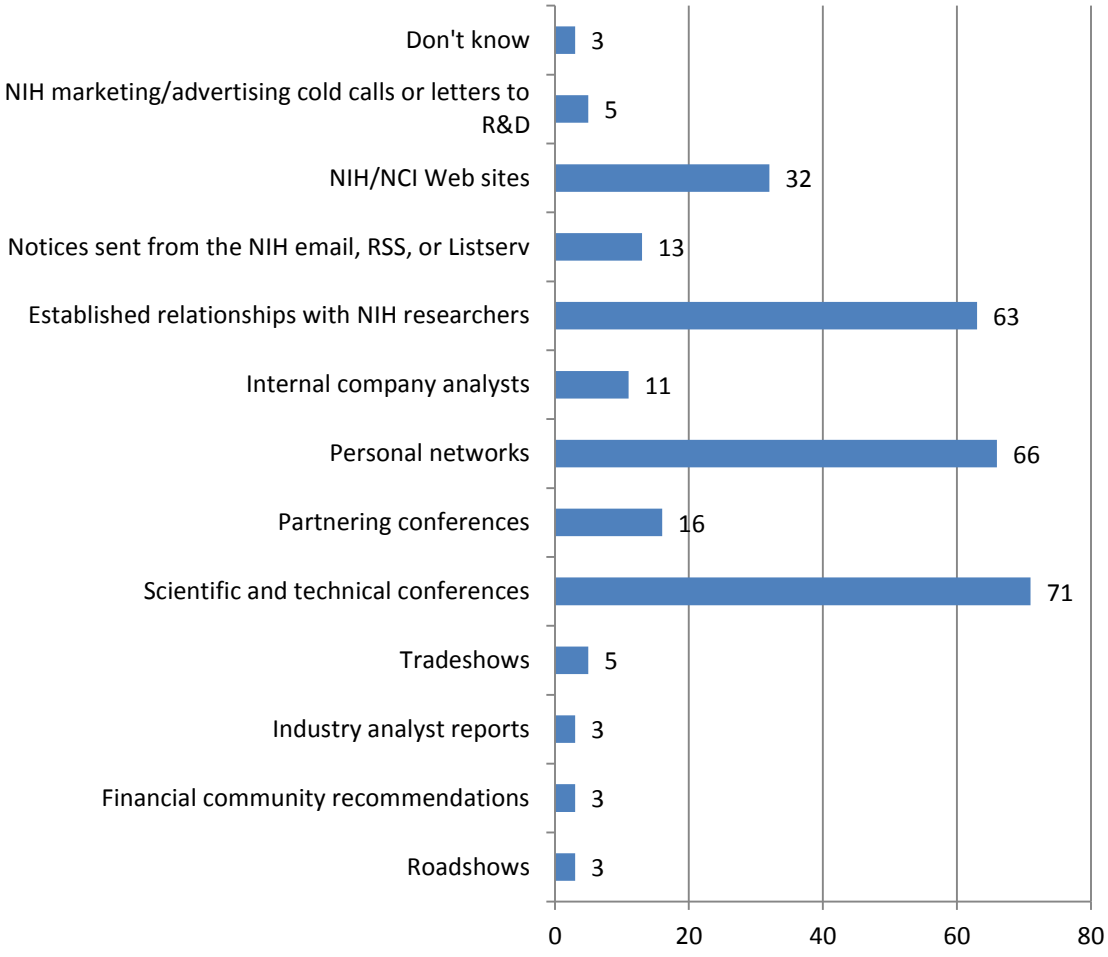
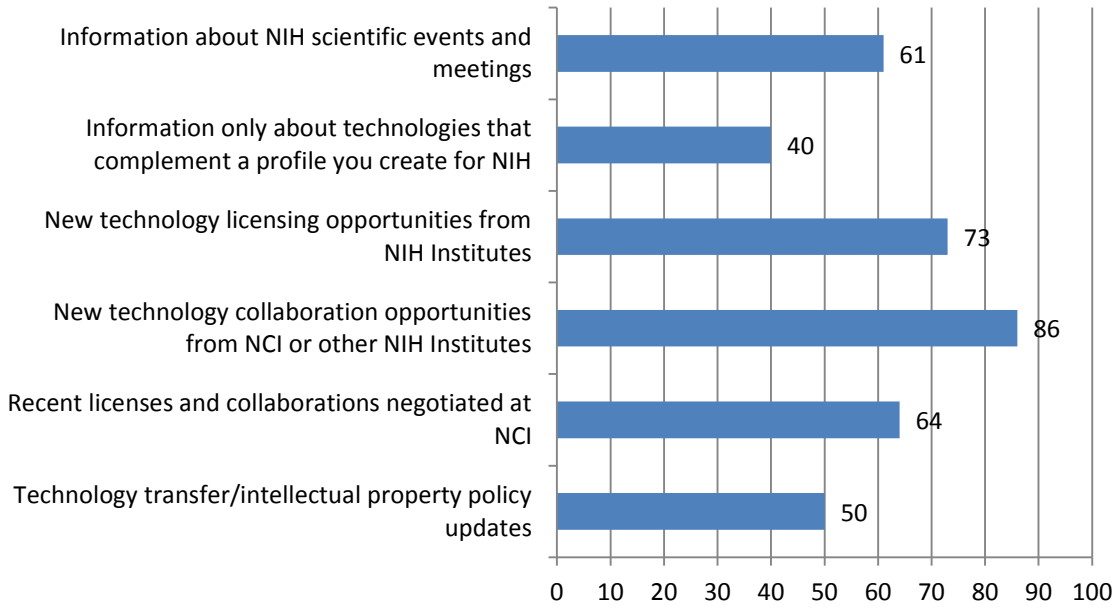


EXHIBIT 36: Other Types of Information Companies Would Like to Receive from TTC (%)



The final question in the Survey is open-ended and asks: "Are there services not currently offered by the NCI Technology Transfer Center that would be useful to meet the technology transfer needs of your company?" Fifty respondents provided comments that were reviewed and categorized as shown in Exhibit 37. The responses cover a broad range of topics. Suggestions related specifically to services that are within TTC's purview are highlighted below.

EXHIBIT 37: Distribution of Types of Responses to the Question Seeking Suggestions for TTC Services Not Currently Offered

Category	Frequency	%
Additional services	5	10
Agreement modifications	1	2
Communication	6	12
Communication vehicles	2	4
Databases	2	4
Don't Know/NA/No	26	52
Facilitate collaborations	2	4
Greater TTC involvement	1	2
Information	3	6
Praise of TTC	2	4
Total	50	100

Over half of the responses (52%; 26) were in the category "Don't Know (2 responses)/NA (1 response)/No (23 responses)."

Comments in the Communication category included:

"Need to discuss opportunities for collaboration."

"I don't know what is offered (2 respondents)."

"NIH TTC should participate in AUTM [Association of University Technology Managers] and LES [Licensing Executives Society] and get to know BD [Business Development] people."

"Being more transparent and showing a true commitment to working with small US companies."

Suggestions under Additional Services included:

"Assistance dealing with Patent Office; grant-writing assistance."

"Perform a matchmaking function to match small business discovery and capability with research needs at NCI."

"Stronger IP that is more aligned with industry needs. Advice on IP strategy from someone with industry experience would be helpful."

Suggestions under Communication Vehicles included:

"It might be nice to every once in a while get an email listing technologies, new and old, that are available for licensing and the status of the technologies as far as patent protection is concerned. Getting into NIH.gov to find technologies is too burdensome and we will not do it."

"Something like the Wales Tech magazine (in e-format) for new opportunities, and very user- friendly access to methodology and terms and conditions for agreements."

Suggestions related to Information needs included:

"Description of TTC policies, including a sample agreement."

"Funding opportunity grant and contract listings that are relevant to the licensed technologies."

"Market studies of the offered technology."

Suggestions related to Facilitating Collaborations included:

"Facilitate collaborations, including enabling face-to-face meetings with the inventors" (2 respondents).

The complete list of suggestions can be found in Appendix B under question 33.

V. RELATIONSHIP BETWEEN VARIABLES

This section examines the relationship between company characteristics and selected response variables, including: awareness of TTC services, NCI TTC usage, and satisfaction with TTC staff. This section also includes a discussion of the limitations of the analyses because of the low response rate and a discussion of response bias.

Company Characteristics

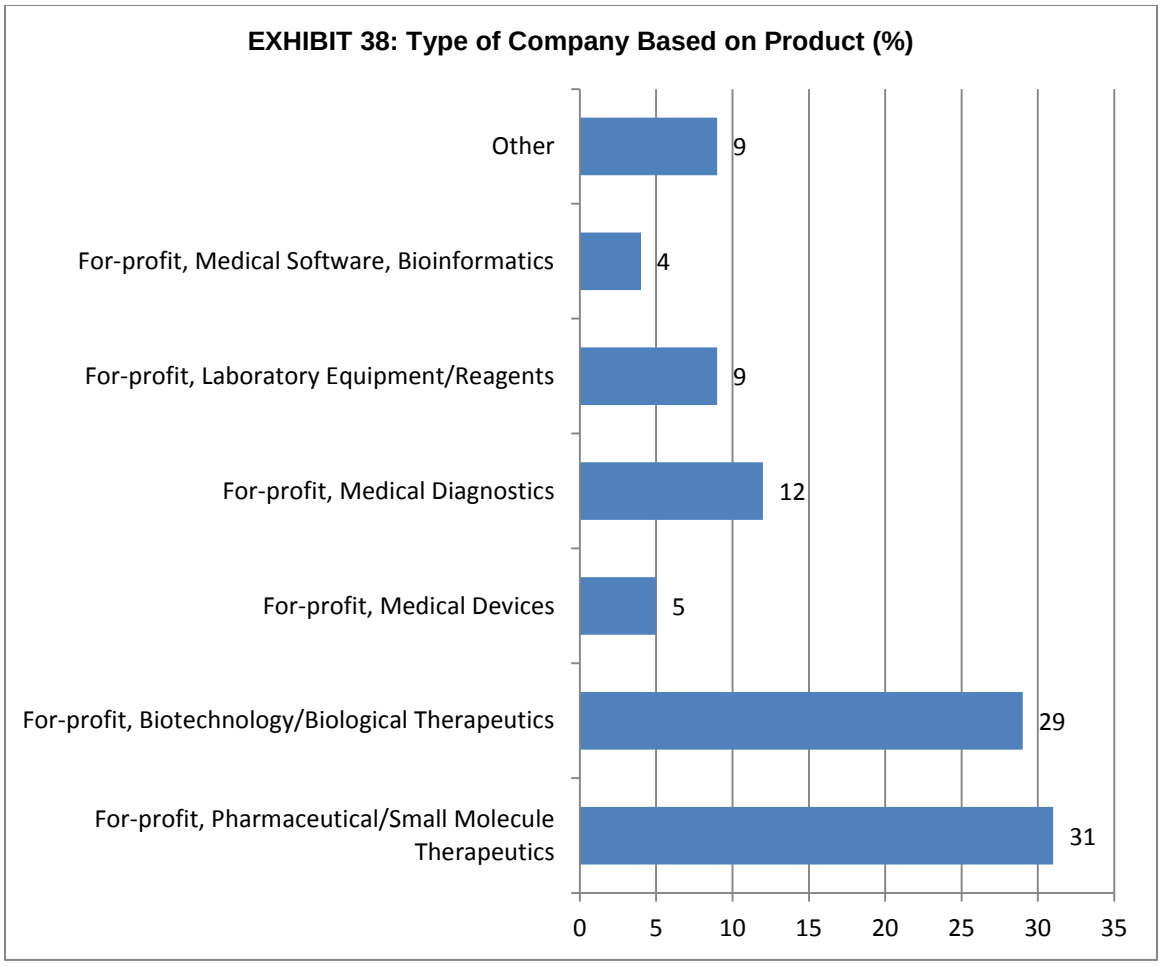
Four major company characteristics: 1) company type, 2) company ownership (public or private), 3) headquarters location, and 4) size of company (based on number of employees) were considered potentially important with respect to their relationship to selected response variables. The distributions of these company characteristics are briefly discussed below.

Company Type

Company type is a function of the company's product, and the following options were provided for purposes of categorization:

- Pharmaceuticals/small molecule therapeutics
- Biotechnology/biological therapeutics
- Medical devices (e.g., implantable devices)
- Medical diagnostics (e.g., assays, kits)
- Laboratory equipment/reagents (e.g., instrumentation, biomarkers)
- Medical software, bioinformatics
- Other.

The distribution of responses, as a percentage of total respondents (N = 268), is displayed in Exhibit 38.



Nearly one third (31%; 84) of respondents reported pharmaceuticals/small molecule therapeutics as their primary product, followed closely by companies reporting biotechnology/ biotherapeutics (29%; 78) as their primary product. Where possible, "other" responses were recoded to existing categories but this still left 9% (24) of respondents who reported their companies' focus or primary products as something other than those listed as response options.

Company Ownership

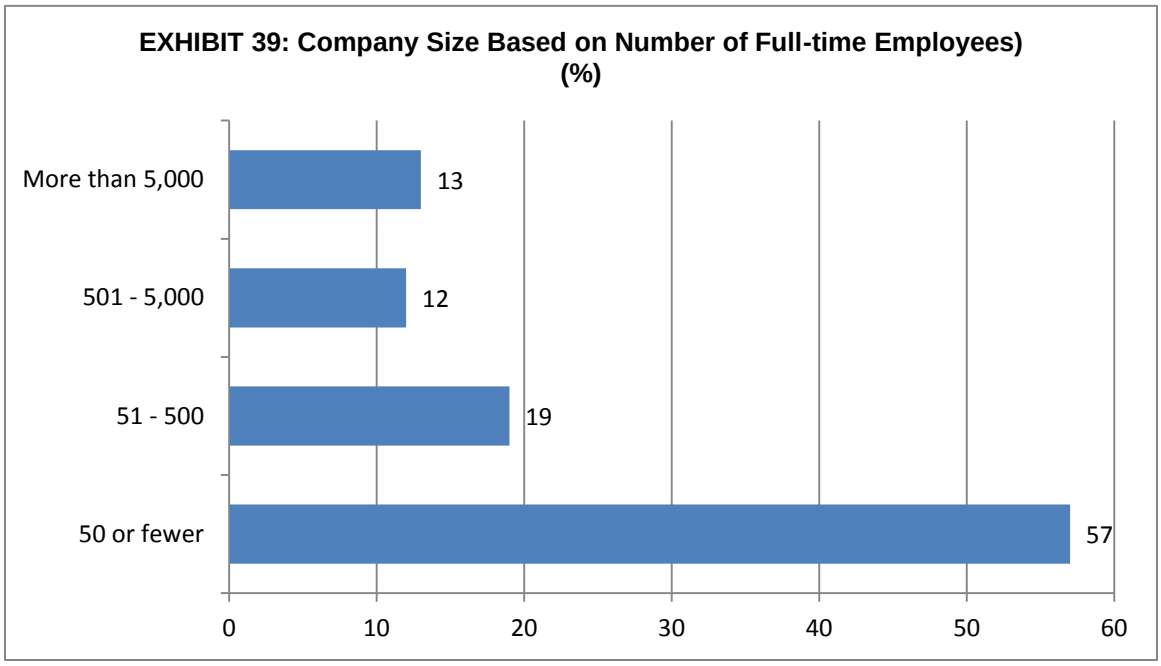
Ownership of companies was dichotomized as private or public-owned entities. Just over two-thirds (69%; 187) of respondents (N=270) indicated that their companies were privately owned and the remainder (31%; 83) reported that their companies were publicly owned enterprises.

Headquarters Location

Respondents were asked to identify the countries in which their company headquarters were located. Including the United States, 19 countries were reported as housing the companies' headquarters. Seventy percent (188) of companies' headquarters were reported to be located in the United States; Japan was the second most reported headquarters location, with 7% (18) of respondents. Consequently, for analytical purposes, this variable was dichotomized as U.S. versus outside of U.S.

Company Size

Company size was based on the number of full-time employees. Response categories were: 50 or fewer, 51-500, 501-5,000, and more than 5,000 employees. The distribution of responses to this item is displayed below in Exhibit 39.



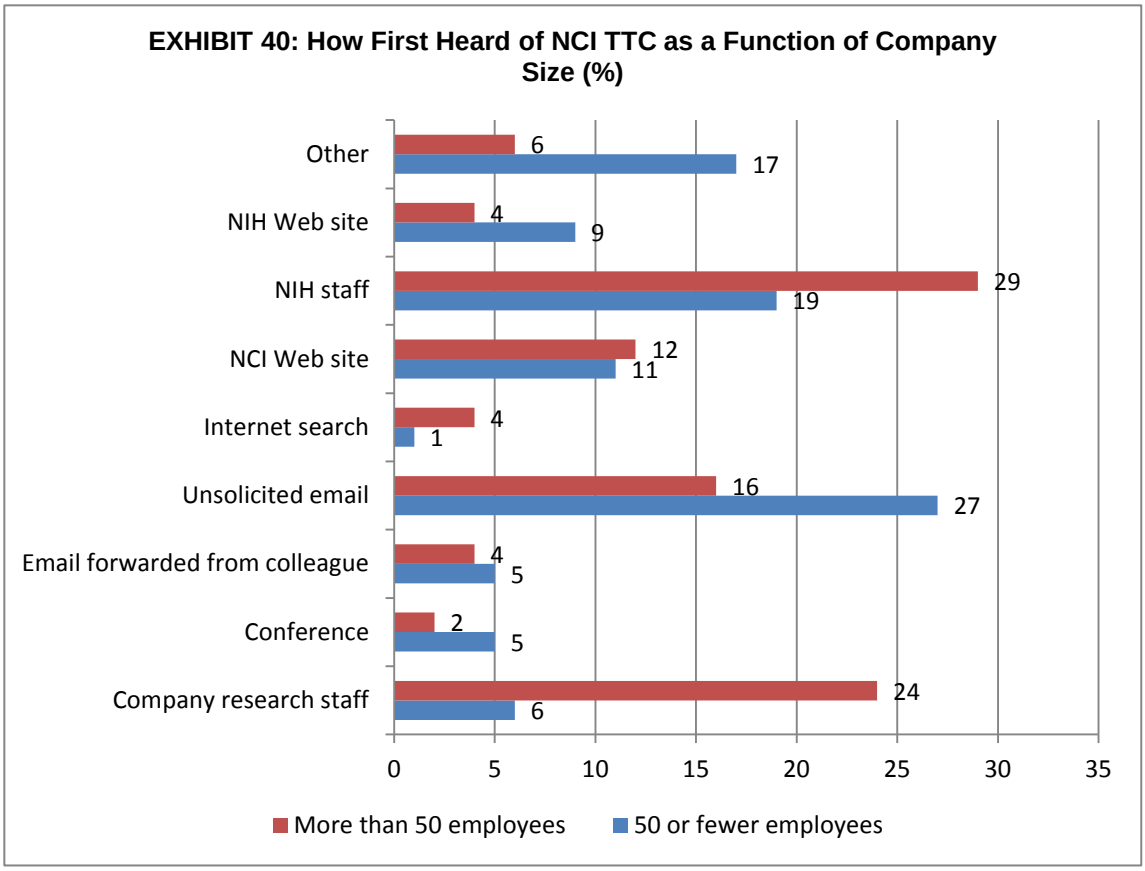
Due to the uneven distribution on this variable, and to simplify analysis and interpretation of the data, company size was dichotomized to 50 or fewer employees (56% of respondents; 154) and more than 50 employees (44% of respondents; 116).

Company Characteristics and Awareness of TTC Services

Each of these four major company characteristics was examined as to its relationship with indicators of companies' awareness of the technology transfer services provided by the NCI TTC specifically and the NIH Office of Technology Transfer generally. This awareness or familiarity with provided services was ascertained through a series of seven items asking respondents to indicate the degree to which they were familiar with the various offices/services. Item responses were Likert-type, with five response options ranging from "not familiar" to "extremely familiar." As mentioned earlier, an examination of the distribution of responses to these items suggested that certain categories could be combined to form three categorical response options: "not familiar," "a little/somewhat familiar," and "very/extremely familiar."

A chi-square test was performed on the two-way classifications of each of the company characteristics and each of the items assessing familiarity with TTC services. No company characteristic was significantly related to the degree of familiarity with the NIH OTT or NIH Licensing Agreements. With respect to familiarity with the NCI TTC, however, two trends ($p< .10$) are worth noting: companies headquartered within the United States (45% vs. 35%, $X^2(2)=5.60$, $p=.061$) and larger companies (45% vs. 40%, $X^2(2)=4.82$, $p=.090$) were more likely to report no familiarity with the NCI TTC than were companies headquartered outside the United States or smaller companies, respectively. Only one other significant relationship was observed between company characteristics and items assessing familiarity with TTC services—privately owned companies were more likely to report being unfamiliar with NIH Clinical Trial Agreements than were publicly owned companies (55% vs. 38%, $X^2=7.29$, $p=.026$).

Those companies that reported at least some familiarity with the NCI TTC (n=132) were asked how they first heard about the NCI TTC. As done previously, the frequencies of these responses were classified as a function of the company characteristics and a chi-square analysis was performed. Only company size was significantly related to how a company first heard about the NCI TTC, $X^2(8) = 16.76$, $p=.033$. These relationships are shown in Exhibit 40.



Smaller companies were more likely to have first heard about the NCI TTC via an unsolicited email or some "other" mechanism than were larger companies, while larger companies were more likely than smaller companies to have first heard about the NCI TTC through company research staff or NIH staff.

NCI TTC Usage and Satisfaction with TTC Staff

TTC Usage

Respondents were asked if they had developed a partnership with NIH researchers through the NCI TTC in the past two years. Based on the response to this item and a previous item asking about familiarity with the NCI TTC, respondents were classified as either users or non-users of the NCI TTC. Company characteristics were examined for possible relationships to this user classification. NCI TTC user status was marginally related ($p<.10$) to both company type and ownership, and significantly related to headquarters location and size. These data are shown in Exhibit 41.

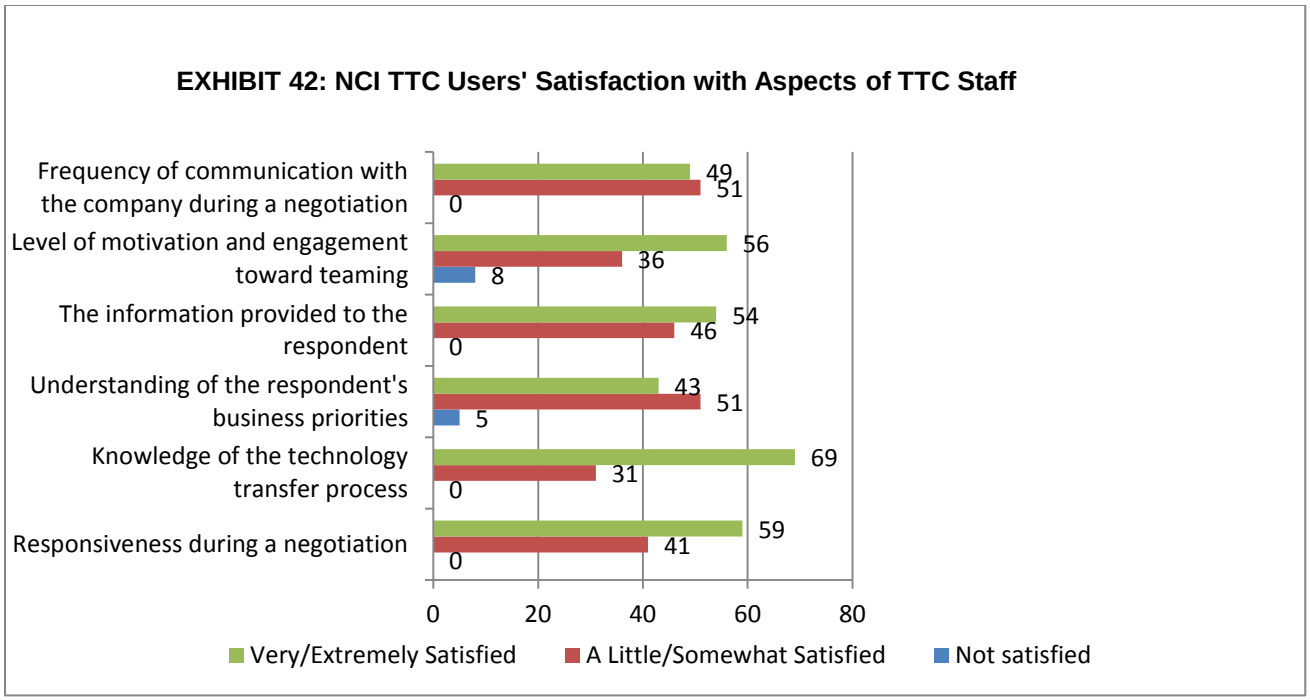
EXHIBIT 41: Company Characteristics and NCI TTC Usage

Company Characteristics	% of Respondents		p-value
	TTC Users	TTC Non-Users	
Company Type			.087
Pharmaceuticals/Small Molecule Therapeutics	5	4	
Biotechnology/Biological Therapeutics	45	25	
Medical Devices	10	9	
Medical Diagnostics	5	6	
Laboratory Equipment/Reagents	7	13	
Medical Software/Bioinformatics	21	37	
Other	7	7	
Ownership			.054
Private	60	74	
Public	40	26	
Headquarters Location			.003
U.S.	53	74	
Outside U.S.	47	26	
Size			.035
50 or fewer	48	64	
More than 50	52	36	

Companies classified as NCI TTC users were significantly more likely than non-users to be headquartered outside the United States and to be larger companies. In addition, TTC users were more likely to be publicly owned and to focus in the area of biotechnology/biological therapeutics and less likely to focus in the area of medical software/bioinformatics.

Satisfaction with TTC Staff

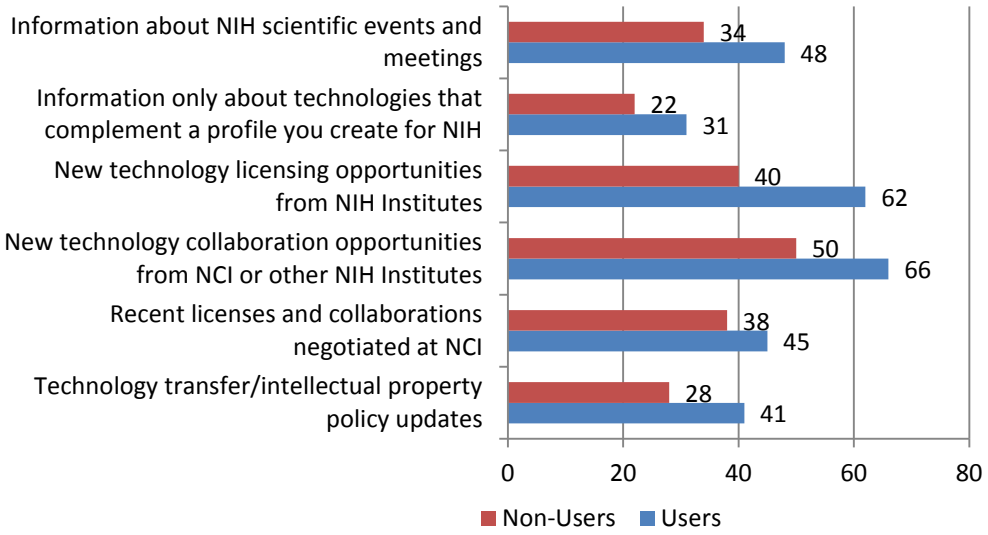
NCI TTC users were also asked to rate their level of satisfaction with six aspects of the NCI TTC staff members with whom they had worked. Ratings were based on a Likert scale that included: "not satisfied," "a little satisfied," "somewhat satisfied," "very satisfied," and "extremely satisfied." Based on the distributions of responses and the small sample size (responses restricted to users), some categories were combined, resulting in three category response options: "not satisfied," "a little/somewhat satisfied," and "very/extremely satisfied." These data are presented in Exhibit 42 and suggest there are areas for improvement in terms of NCI TTC staff communications and interactions with TTC external customers, primarily in moving customer ratings from the "a little/somewhat satisfied" category into the "very/extremely satisfied" category.



Information Desired from the TTC

Both users and non-users of the NCI TTC were asked what kinds of information they would like to receive from the NCI TTC. This information was elicited using six specific items. The percentages of users and non-users who indicated they desired each of the specific types of information are shown in Exhibit 43.

EXHIBIT 43: % of NCI TTC Users and Non-Users Desiring Specific Types of Information



For each type of information, a greater percentage of NCI TTC users indicated they would like more information from the NCI TTC on the topic. However, the percentage of non-users requesting information from the NCI TTC ranged from 22% to 50% depending on the specific topic. As these current non-users indicated some level of interest, this may provide an opportunity for the NCI TTC to increase its external customer base.

Restriction to Two-Way Classifications

The original analysis plan suggested some multivariate analysis in order to simultaneously examine the contributions of multiple variables on outcomes such as users/non-users, satisfaction, and types of agreements. The response rate to the Survey was substantially less than expected, resulting in a sample size too small for multivariate analyses. This small sample size occurred despite the strategy to invite participation of the population of TTC users and non-users known to NCI.

Response Bias

As not all persons invited to participate in a survey will actually respond to the survey, it is standard procedure to assess data for response bias (i.e., examine potential differences in some characteristics of survey respondents compared with non-respondents). In this case, however,

very little is known about the non-respondents; information about companies is obtained as part of the Survey itself. Consequently, it is not possible to examine response bias.

VI. SUMMARY AND CONCLUSIONS

The Technology Transfer Center External Customer Satisfaction Survey was designed to collect information on the demographic characteristics of TTC external customers, provide information required to answer four evaluation questions, and address three key components critical to TTC performance. A great deal of useful information required to inform all of these areas was gained from the Survey.

Evaluation questions included:

- What is the overall level of awareness and knowledge among external customers regarding the technology transfer services provided by the NCI TTC?
- How could the NCI TTC more effectively facilitate mutually beneficial collaborations between government laboratories and the private sector?
- Are current external users satisfied with existing NCI TTC processes and services?
- Are there services not currently offered by the NCI TTC that would be useful to meet the technology transfer needs of external customers?

Key components critical to TTC performance include:

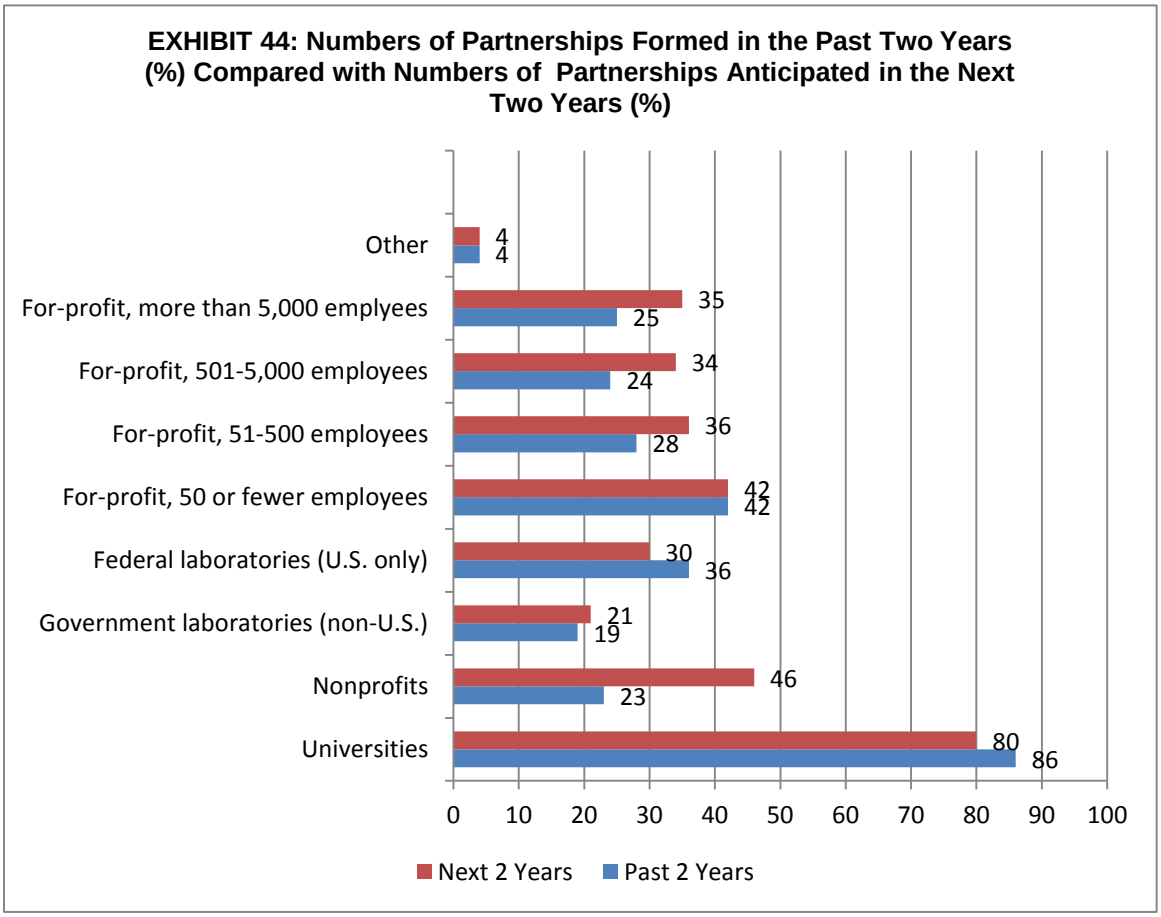
- Satisfaction of TTC's external customers with its customer services
- Preferred and expected communications channels of TTC's external customers
- Strategic direction of companies engaging in collaborations and alliances with NIH.

In terms of general respondent and company characteristics, more than half (55%; 148) of respondents were C-level, managing directors, or founders or principals. The two largest company types were for-profit pharmaceutical (32%; 84) and biotechnology companies (29%; 78). More than two thirds of the companies were privately held (69%; 187), and more than half (57%; 154) had 50 or fewer employees. Companies were most frequently headquartered in the United States (70%; 188), followed by Japan (7%; 18), Canada (4%; 10), Germany (3%; 8), and the United Kingdom (3%; 8).

In terms of company strategy and direction, nearly all (96%; 258) respondents indicated that their companies developed partnerships, usually initiated with research collaborations (35%; 89) as compared with licensing (10%; 25). The companies reportedly formed research

partnerships with all types of organizations, with universities being the most common (86%; 221), followed by for-profit companies with 50 or fewer employees (42%; 107), and Federal laboratories (36%; 94). For all partner types, the majority of respondents reported having formed one to four partnerships in the two years prior to the Survey, and respondents anticipated forming the same types and numbers of partnerships in the two years following the Survey, with a greater emphasis on targeting larger for-profit companies and nonprofits. Exhibit 44 compares the numbers (%) of partnerships formed in the prior two years with those anticipated for the next two years.

EXHIBIT 44: Numbers of Partnerships Formed in the Past Two Years (%) Compared with Numbers of Partnerships Anticipated in the Next Two Years (%)



Factors considered very/extremely important by most respondents in selecting a partnership included talent and knowledge depth in the research area; terms of intellectual property; and commitment from both the company's and the partner's senior management. Geographic location, regulatory expertise, previous experience with the partner, and similar organizational values were not considered as important. Respondents indicated that they were

most likely to find new research partners through personal peer networks, internal scientific staff, and internal or external marketing or competitive intelligence analysts, and that this was most likely to occur via scientific and technical conferences, peer-reviewed scientific literature, and business partnering conferences. Although respondents reported developing all types of research partnerships, the largest proportions reported material transfers and university collaborations or sponsored research agreements. In general, respondents' companies had formed one to four of these partnerships. Respondents reported adopting partnerships at all stages of commercialization, with the most common being basic research/discovery (*in vitro*) and preclinical (animal studies). Most respondents reported one to four partnerships being adopted at each patent stage, with the next largest proportion reporting no partnerships. Nearly all companies were reported to consider the stage of research and development to be very or extremely important in selecting a research partner, followed by access to preexisting intellectual property. Stage of IP protection was reported to be less important. Nearly two thirds (65%; 146) of respondents indicated that their companies had established or were planning to establish nondomestic (off-shore) partnerships. The largest proportion of companies planned to form one to four partnerships with other biotech or pharmaceutical companies, followed by universities. Off-shore partnerships were reported to be sought at all stages of research and development but basic research/discovery, preclinical, and marketing and distribution were the most common. Respondents indicated that their companies formed partnerships for all of the reasons indicated in the Survey, with "access to expertise not available internally" and "expansion of market reach" being the most common.

In terms of experience with NIH technology transfer offices, 36% (79) of respondents reported being unfamiliar with the NIH OTT; 42% (92) reported being unfamiliar with TTC services; and 50% (111) reported being unfamiliar with NIH Clinical Trials Agreements. No company characteristics were associated with lack of familiarity with the NIH OTT. With respect to familiarity with the NCI TTC, respondents from companies headquartered within the United States and from larger companies were more likely to report having no familiarity with the NCI TTC than were those from smaller companies or companies headquartered outside the United States. Respondents from privately owned companies were more likely to report being

unfamiliar with NIH Clinical Trials Agreements than were respondents from publicly owned companies. Over three quarters (78%; 101) of respondents reported believing that TTC marketing should involve an NIH inventor in the process of looking for new partners. Overall, the most common ways respondents reported first learning about the TTC were from receipt of an unsolicited email (23%; 30) and from NIH research staff (23%; 30). Respondents from smaller companies were more likely to have first heard about the NCI TTC via an unsolicited email or some "other" mechanism than were those from larger companies. On the other hand, respondents from larger companies were more likely than those from smaller companies to have first heard about the NCI TTC through company research staff or NIH staff.

Respondents were asked if they had developed a partnership with NIH researchers through the NCI TTC in the two years prior to the Survey. Based on the response to this item, as well as a previous item asking about familiarity with the NCI TTC, respondents were classified as either users or non-users of the NCI TTC. NCI TTC user status was marginally related ($P < .10$) to both company type and ownership, and was significantly related to the location of the company headquarters ($P < .005$) and company size ($P < .05$).

The most commonly stated reasons for not forming partnerships were "length of time to negotiate agreements (23%; 16)," "terms of agreement (18%; 13)," and "not aware of any collaborations with NIH researchers (18%; 13)." The most prevalent reasons for partnering with NIH were "access to additional scientific expertise (83%; 33)," "track record of NIH researcher or team (60%; 24)," and "access to additional facilities (38%; 15)." Half of the respondents reported that having the opportunity to provide feedback on their experience with TTC would be of value. Overall, respondents were at least somewhat satisfied with all aspects of the TTC technology transfer staff members with whom they had worked. The highest number of respondents reported being very or extremely satisfied with their TTC staff members' knowledge of the technology transfer process. Some reported that they were not satisfied with their TTC staff members' levels of motivation and engagement toward teaming and their understanding of the respondents' business priorities. The variability in the levels of satisfaction reported suggests that degree of satisfaction may depend on the particular TTC staff member

with whom the respondent had worked. None of the satisfaction variables were related to company size or company type, possibly due to the small sample sizes.

Scientific and technical conferences, personal networks, and established relationships with NIH researchers were the most frequently reported ways respondents' companies located NIH research partners. These same three sources were also among the most frequently used sources for finding research partners in general.

The majority (72%; 167) of respondents indicated that they would like to receive information from the NCI TTC on developing research collaborations with NIH. Respondents reported wanting to receive all types of information from TTC listed in the Survey, especially information about new technology collaborations and licensing opportunities from NCI or other NIH Institutes. The vast majority of respondents (93%; 155) listed email as their preferred method of receiving NCI TTC information updates. None of the respondents indicated that Facebook, LinkedIn, or other social Web applications were their preferred method of receiving information.

VII. RECOMMENDATIONS

This section presents two types of suggestions and recommendations—those related to steps TTC could take to implement process improvements, and those related to possible future surveys.

Suggestions/Recommendations for NCI TTC Process Improvements

- Consider ways to increase potential external customers' levels of familiarity with the NCI TTC and consider utilization of the venues most popular with external customers for this purpose, including: unsolicited emails, NIH research staff, scientific and technical conferences, and NIH and NCI Web sites.
- Consider offering all partners the opportunity to provide specific feedback about the partnership process and interactions with TTC staff either during or immediately following the completion of a collaboration.
- Consider ways to make the NCI TTC agreement process more transparent to external customers so they will understand the steps and limitations and have more realistic expectations. As one respondent indicated: *"The responsiveness seems to be related more to the internal NIH technical sponsor than an actual process. A better understanding of the process would be helpful to external partners."*

- Consider taking steps to improve external customer satisfaction by enhancing TTC staff members' levels of motivation and engagement toward teaming.
- Consider taking steps to improve external customer satisfaction by providing training to TTC staff members to increase their understanding of external customers' business priorities.
- Over three quarters of respondents felt that TTC marketing should involve an NIH inventor in the process. Consider exploring ways to increase NIH inventor involvement.
- Over 70% of respondents indicated they would like to receive information from TTC on developing research collaborations with NIH. Consider exploring ways to provide external customers with this information.
- Focus future TTC marketing and communication efforts on specific areas and topics of interest to respondents, including: new collaboration opportunities; new licensing opportunities; recent licenses and collaborations negotiated; NIH events and meetings; and technology transfer policy updates. This may provide an opportunity for the NCI TTC to increase its external customer base.
- Nearly all respondents (93%) listed email as their preferred way of receiving information from TTC. None of the respondents indicated that Facebook, LinkedIn, or other social Web applications were their preferred method of communication. Consider utilizing this information when designing new communication strategies.

Suggestions/Recommendations for Future Surveys

Suggestions/recommendations for future surveys begin with general suggestions related to future surveys and then focus on specific suggestions related to certain questionnaire items.

- Consider creating separate questionnaires for "users" and "non-users." The current Survey was designed to target actual TTC customers (users) and potential customers (non-users). Only the users were able to complete the customer satisfaction portion of the Survey. This dual focus made the Survey longer and more complex.
- Consider making future surveys shorter and more focused. The number of respondents dropped from 270 for responses to general respondent and company characteristics to 224 in response to the first question (familiarity with TTC) in the third section about experience with NCI TTC services. In addition, the response rate literature suggests that the types of respondents targeted are willing to spend five to eight minutes on surveys. A shorter survey will likely improve response rates as well.
- In order to improve the design and response rates of future surveys, consider examining non-respondent characteristics and comparing the characteristics of respondents and non-respondents. Unfortunately, beyond respondent name, email address, title, and company name, the files for the current Survey contained very little information on the characteristics of non-respondents and their companies. Therefore, a comparison of

characteristics of respondents and non-respondents and their companies could not be performed.

- Depending on the information of interest, consider a more focused telephone survey, particularly with users of TTC services.
- Consider making some of the survey questions less complex. Part of the reason for the steady decrease in response rate through the section on strategic directions may have been the nature or complexity of the questions about types and numbers of actual and anticipated partnerships. If such questions are necessary, another strategy would be to put them at the end of the survey.
- Consider clarifying the definition of TTC "users." The list of Survey respondents generated by the NCI TTC characterized users as companies in the NCI database that had developed research partnerships with NIH researchers through the NCI TTC. The list of non-users was generated utilizing external databases (Medtrack or Biopharm Insight). The current Survey defined "users" as: 1) respondents who were at least a little familiar with the NCI TTC, and 2) respondents who reported that their companies had developed research partnerships (not in-license) with NIH researchers through the NCI TTC *in the past two years*. Respondents who answered "do not know" were also counted as "users." The results showed differences between the two methods for designating "users." Some of the differences may be attributable to the two year limitation in the self-designated method. Broadening the definition to companies that have *ever* developed research partnerships with NIH researchers or developed partnerships *in the past 10 years* may result in a larger group of "users."
- Consider asking why respondents said "no" to certain questions such as having an NIH inventor involved in the marketing process, whether the opportunity to provide feedback about the collaboration process would provide value, and whether they were satisfied with the length of time taken to negotiate agreement(s).
- If information on the length of time taken to negotiate a TTC agreement is important, consider asking the actual length of time required.
- When using Likert-scale type questions, consider using three-point scales rather than five-point scales.
- Consider having NIH/NCI staff send the survey participation invitations or having the survey contractor send the invitations via an NIH email account. The process used for the pretest involved the NCI TTC sending an invitation letter (via USPS) to respondents, followed up with an email requesting their participation. Follow-up emails were then sent by the Survey contractor via NIH email with delivery and read receipts requested. For the actual Survey, the NCI TTC introductory letter (via USPS) was not sent and an NIH email address was not used for follow-up emails from the Survey contractor. The use of an alternate (non-NIH) email address for follow-up with respondents may have had a negative impact on response rates.

- Consider combining the how/where research partners are found questions into one question. In the Survey, respondents were first asked, "How does your company find new research partners?" In response to this question, 18 respondents (7 %) selected "other" and wrote in venues that were offered as responses to the question that followed on "where" new partners were found.
- Consider eliminating open-ended survey questions since response rates for these were the lowest in the Survey.

APPENDIX A: OMB SUBMISSION PACKAGE

(Attached in electronic document only)

APPENDIX B: ITEM-BY-ITEM SURVEY RESPONSE FREQUENCIES

NCI TTC External Customer Satisfaction Survey: Frequency Tables

Please note that for questions where respondents could check more than one option, percentages are based on the total number of respondents who chose at least one option. These tables are indicated by an asterisk in the table and a footnote below the table.

1. Which of the following best describes your current position in your company?

Position	Frequency	%
Business Development	34	12
C-level, Managing Director, Principal or Founder	148	55
Legal/Patent Counsel	19	7
Regulatory Officer	2	1
Scientist, Research Manager/Group Leader	61	23
Other (please specify) †	6	2
Total	*270*	*100*

†The six respondents who checked "other" provided additional information.

Position-Other Specified	Frequency
Account Manager	1
Clinical Research Associate	1
Fellow	1
Product Management	1
Project Manager	1
Sales	1
Total	*6*

2. How is your company best described?

Company Type	Frequency	%
For-profit, Pharmaceuticals/Small Molecule Therapeutics	84	32
For-profit, Biotechnology/Biological Therapeutics	78	29
For-profit, Medical Devices (e.g., implantable devices)	14	5
For-profit, Medical Diagnostics (e.g., assays, kits)	33	12
For-profit, Laboratory Equipment/Reagents (e.g., instrumentation, biomarkers)	25	9
For-profit, Medical Software, Bioinformatics	10	4
Other (please specify)†	24	9
Total	*268*	*100*

†The 24 respondents who checked "other" provided additional information.

Company Type-Other Specified	Frequency
Asia's leading CRO with services in Informatics, medicinal chemistry, biology, and clinical research	1
Chemical Industry	1
Custom development of molecular affinity agents for all market segments	1
For-profit, generic injectable/biosimilar and medical delivery/management systems	1
Health research support consulting services	1
International advisory firm	1
Manufacturer of nutritional products	1
Medical neurology practice	1
University technology transfer	1
Technology company with three divisions that help scientists access information to further their research	1
Producer of functional food ingredients ("nutraceuticals")	1
For-profit; biotechnology and pharmaceuticals	1
Preclinical diagnostic pharmaceutical company	1
Early-stage investment and development	1
Life sciences venture capital fund	1
Law firm	1
Legal firm for AAMC and Independent medical centers/universities	1
Business development consultancy (privately held)	1
Clinical research organization (for profit)	1
Contract research organization	1
Contract research organization, doing research for pharmaceutical companies	1
Contract research organization, preclinical drug efficacy testing in neurodegenerative disorders	1
CRO	1
CRO and R&D consulting company	1
Total	*24*

3. Is your company private or public?

Public or Private Company	Frequency	%
Private	187	69
Public or Private Company	83	31
Total	*270*	*100*

4. Where is your company's parent or headquarters located?

Location of Company Headquarters	Frequency	%
United States of America	188	70
Australia	4	1
Austria	2	1
Belgium	2	1
Canada	10	4
Denmark	4	1
France	6	2
Germany	8	3
India	2	1
Israel	3	1
Italy	4	1
Japan	18	7
Netherlands	2	1
Poland	1	<1
South Africa	1	<1
Spain	1	<1
Sweden	2	1
Switzerland	4	1
United Kingdom of Great Britain	8	3
Total	*270*	*100*

5. Approximately how many full-time employees does your company have?

Number of Full-time Employees	Frequency	%
50 or fewer	154	57
51 – 500	50	19
501 – 5,000	32	12
More than 5,000	34	12
Total	*270*	*100*

6a. Does your company develop strategic technology partnerships (research collaborations, licensing, etc.) with outside organizations?

Develops Partnerships	Frequency	%
Yes	258	96
No	12	4
Total	*270*	*100*

6b. Why does your company choose not to develop strategic technology partnerships (research collaborations, licensing, etc.) with outside organizations? (Please check all that apply.)

Reasons for not Developing Partnerships	Frequency	%*
Regulatory issues	1	8
Previous negative experience with a research partner	0	0
Dissimilar cultures	0	0
Geographic location	1	8
Unaware of the possibility	6	50
Length of time to negotiate agreements	2	17
Other (please specify) †	6	50
Total number of respondents	*12*	------

* For questions where respondents could check more than one option, percentages are based on the total number of respondents who chose at least one option.

†Five of the six respondents who checked "other" provided additional information.

Reasons for not Developing Partnerships-Other Specified	Frequency
No products/services appropriate for partnerships	1
We are a law firm, servicing clients	1
All research done in-house with external clinical trials	1
Currently in this process, although early (9/2011); CDA's signed and fully executed	1
Concern for sharing proprietary information	1
(Blank)	1
Total	*6*

7. When forming a strategic technology relationship with an outside organization, which type of partnership do you typically prefer to start with? (Please check only one.)

Starting Partnership Type	Frequency	%
Research collaboration	89	35
Licensing	25	10
Depends on technology	59	23
Depends on organization on other side of relationship	53	21
Depends on terms of agreement	22	8
Other (please specify) †	8	3
Total	*256*	*100*

†The eight respondents who checked "other" provided additional information.

Starting Partnership Type-Other Specified	Frequency
Research collaboration and licensing	1
Depends on many factors, three of which are noted above, but mostly depends on stage of development of the technology	1
A scientist within industry who attempts to initiate a strategic technology relationship with a branch of NIH will be required to demonstrate a very specific strategic objective and hoped-for outcome. The contractual nature of that obligation will be determined by the for-profit company legal representative, with significant input from project management and commercial representatives. Speaking as a scientist who is confident that truth does eventually prevail in all scientific endeavors; my own personal preference is a research collaboration. However, given the enormous challenges inherent to any development activity, stakeholders within the for-profit entity justifiably are going to insist on a more restricted, clearly defined relationship.	1
Depends on all of the above	4
Open to collaborations or licensing	1
Total	*8*

8a. For research and development (not negotiated as in-licenses or contracts), please indicate the types of research partners for research collaborations you formed *within the last two years***.** (Please check all that apply.)

8b. For research and development (not negotiated as in-licenses or contracts), *approximately* how many research collaborations did you form *in the last two years* with:

Past R&D Partnerships	Type Frequency %* (#)	Number 1 to 4 % (#)	Number 5 to 9 % (#)	Number 10 or more % (#)	Total % (#)
Universities	**89 (221)**	70 (145)	17 (35)	13 (26)	*100 (206)*
Federal laboratories (US only, includes FFRDCs)	**38 (94)**	94 (80)	4 (3)	2 (2)	*100 (85)*
Government laboratories (non-U.S.)	**20 (50)**	90 (37)	5 (2)	5 (2)	*100 (41)*
Nonprofits	**24 (60)**	80 (44)	15 (8)	5 (3)	*100 (55)*
For-profit , 50 or fewer employees	**43 (107)**	83 (81)	10 (10)	7 (7)	*100 (98)*
For-profit, 51-500 employees	**29 (73)**	85 (53)	11 (7)	4 (2)	*100 (62)*
For-profit, 501-5,000 employees	**25 (61)**	90 (49)	6 (3)	4 (2)	*100 (54)*
For-profit, more than 5,000 employees	**26 (64)**	95 (53)	3 (2)	2 (1)	*100 (56)*
Other(please specify)†	**4 (9)**	83 (5)	0 (0)	17 (1)	*100 (6)*
Total number of respondents	***249***	-----	-----	-----	-----

* For questions where respondents could check more than one option, percentages are based on the total number of respondents who chose at least one option.

†The nine respondents who checked "other" provided additional information.

Past R&D Partnerships-Other Specified	Frequency
None; all collaborations are in-licenses or contracts	1
Maybe more; do not know	1
Individual researchers	1
Public non-university research institutions (e.g. German Max-Planck-Society)	1
None within the last two years	1
Nonprofit/for-profit collaborations	1
Don't do pure research	1
None	1
Medical centers	1
Total	*9*

9a. For research and development (not negotiated as in-licenses or contracts), please indicate the types of research partners you anticipate forming partnerships with *in the next two years*. (Please check all that apply.)

9b. For research and development (not negotiated as in-licenses or contracts), *approximately* how many research collaborations will you form *in the next two years* with:

Anticipated R&D Partnerships	Type Frequency %* (#)	Number 1 to 4 % (#)	5 to 9 % (#)	10 or more % (#)	Total % (#)
Universities	**87 (207)**	69 (138)	13 (25)	18 (36)	*100 (199)*
Federal laboratories (US only, includes FFRDCs)	**50 (119)**	93 (105)	4 (5)	3 (3)	*100 (113)*
Government laboratories (non-U.S.)	**22 (53)**	84 (42)	6 (3)	10 (5)	*100 (50)*
Nonprofits	**33 (78)**	81 (58)	12 (9)	7 (5)	*100 (72)*
For-profit , 50 or fewer employees	**45 (108)**	81 (83)	12 (12)	7 (7)	*100 (102)*
For-profit, 51-500 employees	**40 (94)**	88 (79)	8 (7)	4 (4)	*100 (90)*
For-profit, 501-5,000 employees	**37 (88)**	89 (74)	7 (6)	4 (3)	*100 (83)*
For-profit, more than 5,000 employees	**37 (89)**	85 (71)	11 (9)	4 (3)	*100 (83)*
Other (please specify)†	**4 (10)**	86 (6)	14 (1)	0 (0)	*100 (7)*
Total number of respondents	***238***	-----	-----	-----	-----

* For questions where respondents could check more than one option, percentages are based on the total number of respondents who chose at least one option.

†The ten respondents who checked "other" provided additional information.

Anticipated Partnership Type-Other Specified	Frequency
Maybe all; you never know	1
Cannot say	1
For-profit and nonprofit consortia for obtaining disease patient specimens are most certain types of relationships to be sought in coming years	1
CROs	1
Impossible to predict; depends on decisions of Board of Directors and finance availability	1
All partnerships expected to be negotiated as contracts	1
None	1

Unknown based on future direction of business	1
None; company asleep, technology out-licensed	1
Medical centers	1
Total	*10*

10. How important are the following factors in selecting a research partner? (Please check one in each row.)

Important Partner Characteristics (5-point scale)	Not at all Important % (#)	A Little Important % (#)	Somewhat Important % (#)	Very Important % (#)	Extremely Important % (#)	*Total* % (#)
Talent and knowledge depth in research area	<1 (1)	1 (2)	3 (8)	26 (62)	69 (166)	*100 (239)*
Regulatory expertise	17 (39)	20 (48)	34 (81)	24 (56)	5 (11)	*100 (235)*
Efficiency (time to complete deal)	1 (3)	3 (7)	26 (60)	48 (113)	22 (52)	*100 (235)*
Amount of company information that needs to be divulged	5 (12)	22 (52)	39 (91)	25 (59)	9 (20)	*100 (234)*
Commitment from partner senior management	<1 (1)	2 (5)	14 (33)	46 (109)	38 (90)	*100 (238)*
Commitment from your company's senior management	<1 (1)	<1 (1)	12 (28)	35 (84)	52 (123)	*100 (237)*
Previous experience with partner	6 (15)	15 (35)	41 (98)	29 (69)	9 (21)	*100 (238)*
Track record of success of potential partner	2 (5)	7 (16)	26 (61)	49 (117)	16 (37)	*100 (236)*
Similar organizational values	7 (17)	23 (54)	33 (76)	30 (71)	7 (16)	*100 (234)*
Effectiveness (operational processes)	<1 (1)	5 (11)	21 (51)	53 (127)	20 (47)	*100 (237)*
Terms of intellectual property	<1 (1)	2 (4)	9 (21)	32 (77)	57 (134)	*100 (237)*
Geographic location	26 (62)	37 (88)	30 (71)	5 (12)	2 (4)	*100 (237)*
Favorable deal terms	2 (5)	3 (7)	17 (40)	54 (127)	24 (57)	*100 (236)*
Other (please specify)†	32 (7)	0 (0)	23 (5)	18 (4)	27 (6)	*100 (22)*

Important Partner Characteristics (recoded 3-point scale)	Not at all Important %	(#)	A Little or Somewhat Important %	(#)	Very or Extremely Important %	(#)	*Total* %	(#)
Talent and knowledge depth in research area	<1	(1)	4	(10)	95	(228)	*100*	*(239)*
Regulatory expertise	17	(39)	54	(129)	28	(67)	*100*	*(235)*
Efficiency (time to complete deal)	1	(3)	29	(67)	70	(165)	*100*	*(235)*
Amount of company information that needs to be divulged	5	(12)	61	(143)	34	(79)	*100*	*(234)*
Commitment from partner senior management	<1	(1)	16	(38)	84	(199)	*100*	*(238)*
Commitment from your company's senior management	<1	(1)	12	(29)	87	(207)	*100*	*(237)*
Previous experience with partner	6	(15)	56	(133)	38	(90)	*100*	*(238)*
Track record of success of potential partner	2	(5)	33	(77)	65	(154)	*100*	*(236)*
Similar organizational values	7	(17)	56	(130)	37	(87)	*100*	*(234)*
Effectiveness (operational processes)	<1	(1)	26	(62)	73	(174)	*100*	*(237)*
Terms of intellectual property	<1	(1)	11	(25)	89	(211)	*100*	*(237)*
Geographic location	26	(62)	67	(159)	7	(16)	*100*	*(237)*
Favorable deal terms	2	(5)	20	(47)	78	(184)	*100*	*(236)*
Other (please specify) †	32	(7)	23	(5)	45	(10)	*100*	*(22)*

†Nine of the 22 respondents who checked "other" provided additional information.

Important Partner Characteristics-Other Specified	Frequency
Funding to complete collaboration	1
Licensing of our technology by a partner	1
Similar culture	1
Frequency of communication	1
Associated cost	1
Represents a need for both parties and is good for both parties	1
Easy communication with key personnel	1
Alliance management capabilities	1
English language	1
(Blank)	13
Total	*22*

11. In general, *how* does your company find new research partners? (Please check all that apply.)

How New Partners Found	Frequency	%*
Financial community recommendation (venture capitalists, investors, etc.)	71	30
Personal peer network	209	89
Internal scientific staff	158	67
Internal or external business, marketing, or competitive intelligence analyst(s)	141	60
Notices or alerts sent from subscription services	34	14
Marketing/advertising cold call or letter	32	17
Other (please specify)†	18	8
Total number of respondents	*236*	-------

* For questions where respondents could check more than one option, percentages are based on the total number of respondents who chose at least one option.

†The 18 respondents who checked "other" provided additional information.

How New Partners Found -Other Specified	Frequency
Inquiry from scientists††	1
Call for proposals††	1
Focused research for best potential partners in an area of relevance to our company††	1
Scientific publications	3
Publications of potential collaborator	1
Conventions	1
Scientific conferences/literature	3
Meetings and conferences	1
Partnering meetings	1
Conference, Industry journals	1
All this information flows on the net	1
Publications	1
News services, NIH Web sites	1
Scientific symposia, professional medical societies, translational research organizations, i2iconnect.org	1
Total	*18*

†† Unique responses; all of the remaining responses were also selected by the same respondent in question 12.

12. In general, *where* does your company find new research partners? (Please check all that apply.)

Where New Partners Found	Frequency	%*
Roadshows	24	10
Tradeshows	72	31
Scientific and technical conferences	217	93
Business partnering conferences	108	46
Web sites	82	35
Peer-reviewed scientific literature	159	68
Newsletters or trade journals	43	18
Social network sites (Twitter, LinkedIn, etc.)	17	7
Other (please specify)†	24	10
Total number of respondents	*234*	-------

* For questions where respondents could check more than one option, percentages are based on the total number of respondents who chose at least one option.

†The 24 respondents who checked "other" provided additional information.

Where New Partners Found -Other Specified	Frequency
Personal introductions/ networking/networks	7
Don't know where found	2
Institutions familiar to company principals	1
Contacts with CTO's office or research division	1
Inquiries/request for product	1
Organized updates with universities and institutes	1
Teaming under contracts	1
Direct contacts	1
Personal experience	1
Scientific network	1
Established, non-research relationships	1
Introductions by scientific advisors	1
Established partners	1
Internal expert networks	1
i2iconnect.org	1
Company's collaboration program with external scientists	1
Internal business development activities	1
Total	*24*

13a. Please indicate the types of research partnerships developed by your company *within the past two years* that may or may not include licensing. (Please check all that apply.)

13b. For research partnerships developed by your company *within the past two years* that may or may not include licensing, *approximately* how many were:

Partnerships Developed	Type Frequency %* (#)	Number			Total
		1 to 4 % (#)	5 to 9 % (#)	10 or more % (#)	% (#)
Material transfers	**83 (189)**	64 (117)	16 (30)	20 (36)	*100 (183)*
U.S. government Collaborative Research and Development Agreements (CRADAs) or collaboration agreements	**38 (88)**	94 (76)	4 (3)	2 (2)	*100 (81)*
University collaboration or sponsored research agreements	**73 (168)**	68 (110)	21 (33)	11 (18)	*100 (161)*
Exclusively licensed from U.S. Government	**7 (16)**	92 (11)	0 (0)	8 (1)	*100 (12)*
Nonexclusively licensed from U.S. Government	**15 (34)**	75 (21)	14 (4)	11 (3)	*100 (28)*
Exclusively licensed from university	**39 (90)**	86 (73)	11 (9)	3 (3)	*100 (85)*
Nonexclusively licensed from university	**27 (62)**	58 (33)	23 (13)	19 (11)	*100 (57)*
Involved a non-U.S. entity, either collaboration or licensing	**46 (105)**	73 (74)	15 (15)	12 (12)	*100 (101)*
Total number of respondents	***229***	-----	-----	-----	-----

* For questions where respondents could check more than one option, percentages are based on the total number of respondents who chose at least one option.

14a. For ALL research partnerships developed by your company *within the past two years* that may or may not include licensing, please indicate the stage of research and development at which the partnerships were adopted. (Please check all that apply.)

14b. For ALL research partnerships developed by your company *within the past two years* that may or may not include licensing, *approximately* how many were adopted at the following stages?

Stage Research Partnership Adopted	Type Frequency %* (#)	Number# 1 to 4 % (#)	5 to 9 % (#)	10 or more % (#)	Total % (#)
Basic research/discovery (*in vitro*)	**73 (169)**	67.70 (109)	14.29 (23)	18.01 (29)	*100 (161)*
Preclinical (animal studies)	**59 (137)**	73.64 (95)	15.50 (20)	10.85 (14)	*100 (129)*
Investigational New Drug (or software, device, etc.) completed	**26 (60)**	73.64 (46)	10.17 (6)	11.86 (7)	*100 (59)*
Phase I clinical	**26 (61)**	75.44 (43)	14.04 (8)	10.53 (6)	*100 (57)*
Phase II clinical	**22 (52)**	73.47 (36)	20.41 (10)	6.12 (3)	*100 (49)*
Phase III clinical	**17 (40)**	69.44 (25)	19.44 (7)	11.11 (4)	*100 (36)*
Manufacturing	**26 (60)**	83.93 (47)	7.14 (4)	8.93 (5)	*100 (56)*
Marketing and distribution	**19 (45)**	78.95 (30)	7.89 (3)	13.16 (5)	*100 (38)*
Other (please specify)†	**7 (17)**	81.25 (13)	6.25 (1)	12.50 (2)	*100 (16)*
Total number of respondents	***231***	-----	-----	-----	-----

* For questions where respondents could check more than one option, percentages are based on the total number of respondents who chose at least one option.

†The 17 respondents who checked "other" provided additional information.

Stage Research Partnerships Adopted-Other Specified	Frequency
Don't know about all of our partnerships	1
Diagnostic trials	1
Product development	1
Regulatory advisory meeting with German BfArm and UD FDA	1
R&D	1
Note: relationships with CROs not considered when checking the above boxes (e.g., contracting support for Phase I and II clinical trials)	1
Bioinformatics database	1
Development of diagnostic tests	1
Clinical study for diagnostic development	1
Preclinical supplies	1
Preclinical research (*in vitro*) study	1
Instrument/reagent development	1
Applied research	1

Performance testing	1
Clinical diagnostic study	1
Postmarket, retrospective cohort	1
?	1
Total	*17*

15. For ALL research partnerships developed by your company within the past two years that may or may not include licensing, approximately how many were adopted at the following stages of patent prosecution?

R&D Partnerships Adopted at Patent Stage	None % (#)	1 to 4 % (#)	5 to 9 % (#)	10 or more % (#)	*Total* % (#)
US provisional	35 (65)	56 (104)	6 (11)	3 (6)	*100 (186)*
PCT filing (International)	33 (59)	56 (101)	8 (15)	3 (6)	*100 (181)*
National filing	36 (59)	56 (92)	4 (6)	4 (6)	*100 (163)*
Issued patent	34 (59)	55 (95)	6 (11)	5 (8)	*100 (173)*

16. How important are the following to your company in selecting a technology for a research partnership? (Please check one in each row.)

Important Partner Characteristics (5-point scale)	Not at all Important % (#)	A Little Important % (#)	Somewhat Important % (#)	Very Important % (#)	Extremely Important % (#)	*Total* % (#)
Stage of research development	3 (6)	8 (18)	27 (60)	49 (109)	13 (29)	*100 (222)*
Stage of IP protection	5 (10)	7 (15)	18 (41)	44 (97)	26 (58)	*100 (221)*
Access to background, preexisting IP	4 (8)	10 (21)	24 (53)	41 (90)	21 (50)	*100 (222)*
Availability and terms for IP to be acquired during or after the collaboration	3 (6)	2 (5)	12 (26)	38 (84)	45 (101)	*100 (222)*

Important Partner Characteristics (Recoded 3-point scale)	Not at all Important % (#)	A Little or Somewhat Important % (#)	Very or Extremely Important % (#)	*Total* % (#)
Stage of research development	3 (6)	35 (78)	62 (138)	*100 (222)*
Stage of IP protection	5 (10)	25 (56)	70 (155)	*100 (221)*
Access to background, preexisting IP	4 (8)	33 (74)	63 (140)	*100 (222)*
Availability and terms for IP to be acquired during or after the collaboration	3 (6)	14 (31)	83 (185)	*100 (222)*

17a. Does your company have or plan to have partnerships with off-shore organizations?

Off-shore Partnerships	Frequency	%
Yes	146	65
No	79	35
Total	*225*	*100*

17b. When considering research and development partnerships with off-shore organizations (not negotiated as in-licenses or contracts), with what kinds of organizations and how many do you anticipate your company to form in the next two years?

Type of Off-shore Partnerships	None % (#)	1 to 4 % (#)	5 to 9 % (#)	10 or more % (#)	*Total* % (#)
Universities	18 (24)	62 (82)	13 (17)	7 (9)	*100 (132)*
Government or state laboratories or institutes	40 (47)	52 (60)	6 (7)	2 (2)	*100 (116)*
Contract research organizations	34 (41)	51 (61)	12 (15)	3 (4)	*100 (121)*
Other biotech or pharmaceutical companies	13 (18)	72 (99)	13 (17)	2 (3)	*100 (137)*

17c. At what stage of research/development will your company most likely seek off-shore partnerships? (Please check only one).

Stage Off-shore Partnerships Sought	Frequency	%
Basic research/discovery (*in vitro*)	34	24
Preclinical (animal studies)	30	21
Investigational New Drug (or software, device, etc.) completed	13	9
Phase I clinical	12	8
Phase II clinical	11	8
Phase III clinical	8	6
Manufacturing	12	8
Marketing and distribution	19	13
Other (please specify)†	3	2
Total	*142*	*99***

**Does not total to 100% due to rounding

†The three respondents who checked "other" provided additional information.

Stage Off-shore Partnerships Sought-Other Specified	Frequency
Not involved with most of this	1
None	1
Depends on technology	1
Total	*3*

17d. For what reason(s) will your company seek off-shore partnerships? (Please check all that apply.)

Reason Off-shore Partnerships Sought	Frequency	%*
Expand market reach	75	53
Reduce costs	66	47
Access clinical study populations	60	43
Improve research productivity	51	36
Access intellectual property	47	33
Access more favorable laws on intellectual property	14	10
Access expertise not available internally	77	55
Other (please specify)†	9	6
Total number of respondents	*141*	-------

* For questions where respondents could check more than one option, percentages are based on the total number of respondents who chose at least one option.

†The nine respondents who checked "other" provided additional information.

Reason Off-shore Partnerships Sought-Other Specified	Frequency
More favorable funding likelihood	1
Less regulatory burden and more receptive investigators with good resources	1
Possibility of research reagents being made in countries other than US	1
Infrastructure tax breaks	1
Licensing fees	1
Profit	1
Access funding	1
All of the above	1
More favorable regulatory climate	1
Total	*9*

18. Patenting and licensing of all NIH technologies are handled centrally by the NIH Office of Technology Transfer (NIH OTT). The NCI TTC has oversight of the NCI technology portfolio and negotiates collaboration agreements such as CRADAs. Please indicate your level of familiarity with the following prior to receiving this survey. (Please check one in each row.)

Familiarity with TTC Agreements (5-point scale)	Not Familiar % (#)	Little Familiar % (#)	Somewhat Familiar % (#)	Very Familiar % (#)	Extremely Familiar % (#)	*Total* % (#)
NIH OTT	36 (79)	19 (42)	30 (67)	9 (20)	6 (12)	*100 (220)*
Licensing Agreements involving inventions from other Institutes of NIH	38 (84)	23 (50)	27 (58)	8 (18)	4 (8)	*100 (218)*
NCI TTC	42 (92)	20 (45)	26 (57)	8 (17)	4 (8)	*100 (219)*
Cooperative Research and Development Agreements	20 (45)	22 (48)	32 (72)	17 (38)	9 (21)	*100 (224)*
NIH Collaboration Agreements	26 (57)	20 (45)	36 (79)	14 (32)	4 (8)	*100 (221)*
NIH Material Transfer Agreements	20 (44)	19 (42)	34 (75)	22 (50)	5 (11)	*100 (222)*
NIH Clinical Trials Agreements	50 (111)	23 (52)	16 (35)	8 (17)	3 (6)	*100 (221)*

Familiarity with TTC Agreements (recoded 3-point scale)	Not Familiar % (#)	A Little or Somewhat Familiar % (#)	Very or Extremely Familiar % (#)	*Total* % (#)
NIH OTT	35 (79)	50 (109)	14 (32)	*100 (220)*
Licensing Agreements involving inventions from other Institutes of NIH	38 (84)	50 (108)	12 (26)	*100 (218)*
NCI TTC	42 (92)	47 (102)	11 (25)	*100 (219)*
Cooperative Research and Development Agreements	20 (45)	54 (120)	26 (59)	*100 (224)*
NIH Collaboration Agreements	26 (57)	56 (124)	18 (40)	*100 (221)*
NIH Material Transfer Agreements	20 (44)	53 (117)	27 (61)	*100 (222)*
NIH Clinical Trials Agreements	50 (111)	39 (87)	11 (23)	*100 (221)*

19. How did you first learn about the NCI Technology Transfer Center? (Please check only one.)

First Learned about TTC	Frequency	%
Received unsolicited email	30	23
Email forwarded to me by colleague	6	4
Internet search (Google, AltaVista, Yahoo, other)	3	2
NIH Web site	9	7
NCI Web site	15	11
NIH research staff	30	23
Company research staff	17	13
Article in magazine or technical or trade publication	0	0
Investor	0	0
Conference	5	4
Other (please specify)†	17	13
Total	*132*	*100*

†The 17 respondents who checked "other" provided additional information.

First Learned about TTC-Other Specified	Frequency
Don't recall	1
Worked at NCI and dealt with Office	1
Unknown	1
Company-internal information	1
Previous experience	1
Managed NCI FFRDC Contract	1
Postdoc at NCI	1
Worked at a university	1
Was involved in possible licensing deal initiated by someone else in my company	1
Directly interacted over the years	1
Assumed responsibility for ongoing relationship with NIH	1
University staff	1
Worked at NIH and have some knowledge of system	1
Former job with NGO	1
Negotiation and entry into CRADA shortly after being hired by current company 11 years ago	1
Federal Register	1
Response by NCI TTC upon our interest in innovative active agent developed by NCI	1
Total	*17*

20. Should NCI Technology Transfer Center marketing involve an NIH inventor in the process?

Involve NIH Inventor in Marketing	Frequency	%
Yes	101	78
No	28	22
Total	*129*	*100*

21a. Has your company developed a research partnership (not in-license) with NIH researchers through the NCI TTC in the past two years?

Partnerships Developed through TTC	Frequency	%
Yes	38	29
No	72	56
Don't know	20	15
Total	*130*	*100*

21b. Which factors led you to not partner with NIH researchers? (Please check all that apply.)

Reasons for not Partnering with NIH	Frequency	%*
Lack of expertise or capability in technical area	11	16
Regulatory issues	5	7
Government march-in rights	7	10
Assumption that NIH gives out only nonexclusive licenses	7	10
No commitment from NIH senior management	9	13
No commitment from your senior management	4	6
NIH Technology Transfer Office personnel	2	3
Previous negative experience with NIH research partner	2	3
Track record of potential NIH research partner	2	3
Dissimilar cultures	3	4
Operational structure at NIH	6	8
Geographic location	2	3
Unaware of the possibility	8	11
NIH overvaluing of its research/IP	8	11
Length of time to negotiate agreements	16	23
Terms of agreement	13	18
Unaware of any collaborations with NIH researchers	13	18
Other (please specify)†	24	34
Total number of respondents	*71*	-------

* For questions where respondents could check more than one option, percentages are based on the total number of respondents who chose at least one option.

†The 24 respondents who checked "other" provided additional information.

Reasons for not Partnering with NIH-Other Specified	Frequency
Not NCI researchers	1
License to pharma	1
Abolition of NIH research group	1
Right technology not arisen	1
Never tried	1
Even with SBIR & STTR, the evaluation of the ideas is still by researchers only. There should be company and commercial owners who evaluate its commercial potential and not the same researcher pool with their existing relationships and unwillingness to allow anyone with a good potential idea to break into the inner circle.	1
Conflict of interest rules that do not allow appropriate access to inventors	1
No interest from NIH scientists	1
No scientist with desired expertise on our radar	1
No need	3
Currently focus on clinical development at other institutions	1
Seems to waste a lot of time and not go anywhere	1
No reason to	1
Unknown	1
We are in the process of negotiating; terms have not been simple with certain government regulations, but anticipate we will work through them.	1
Project not a top technical priority	1
No relevant opportunities within timeframe	1
No particular common research interest at this time	1
None	1
We are working to commercialize our initial product developed through NIH researcher collaboration and have not sought to take on additional research partnerships.	1
Paucity of data and lack of resources committed to facilitate development beyond lab data; licensee takes on all developmental risk and expense	1
Perception of front-loaded deals only	1
Total	*24*

22. Which factors led you to partner with NIH? (Please check all that apply.)

Reasons for Partnering with NIH	Frequency	%*
Access to clinical trials expertise	22	55
Access to additional facilities	15	38
Access to additional sales and/or marketing capabilities	0	0
Access to additional regulatory issues expertise	3	8
Access to additional scientific expertise	33	83
Track record of NIH researcher or team	24	60
Favorable agreement terms	7	18
Access to intellectual property	9	23
Other (please specify)†	3	8
Total number of respondents	*40*	-----

* For questions where respondents could check more than one option, percentages are based on the total number of respondents who chose at least one option.

†The three respondents who checked "other" provided additional information.

Reasons for Partnering with NIH-Other Specified	Frequency
High quality of research staff	1
Access to *in vitro* testing	1
NIH investigator need for our company technology	1
Total	*3*

23. What type of agreement with NIH was most recently completed? (Please check only one.)

Type of Agreement with NIH	Frequency	%
Collaboration Agreement	5	13
CRADA (Cooperative Research and Development Agreement)	18	45
CTA (Clinical Trials Agreement)	2	5
MTA (Material Transfer Agreement)	5	13
CDA (Confidential Disclosure Agreement)	2	5
Exclusive License	2	5
Nonexclusive License	4	10
Don't know	2	5
Total	*40*	*101***

**Does not total to 100% due to rounding

24. Were you satisfied with the length of time required to negotiate the agreement?

Satisfaction with Agreement Negotiation Time	Frequency	%
Yes	28	70
No	12	30
Total	*40*	*100*

25. During or immediately following the completion of a collaboration (CRADA, CTA, etc.), were you or your staff given the opportunity to provide specific feedback about the process and your interactions with the Technology Transfer Specialist?

Opportunity Provided for Giving Feedback	Frequency	%
Yes	12	31
No	16	41
Don't know	11	28
Total	*40*	*100*

26. Would/Did giving feedback on TTC's level of service provide value to your company?

Value in Giving Feedback	Frequency	%
Yes	19	50
No	5	13
Don't know	14	37
Total	*38*	*100*

27. Please tell us how satisfied you are with the following aspects of the NCI TTC technology transfer staff member(s) you worked with:

Satisfaction with TTC Staff (5-point scale)	Not Satisfied % (#)	A Little Satisfied % (#)	Somewhat Satisfied % (#)	Very Satisfied % (#)	Extremely Satisfied % (#)	*Total* % (#)
Responsiveness during negotiation	0 (0)	6 (2)	35 (13)	43 (16)	16 (6)	*100 (37)*
Knowledge of technology transfer process	0 (0)	6 (2)	25 (9)	58 (21)	11 (4)	*100 (36)*
Understanding of your business priorities	5 (2)	11 (4)	41 (15)	32 (12)	11 (4)	*100 (37)*
Information provided to you	0 (0)	3 (1)	43 (16)	43 (16)	11 (4)	*100 (37)*
Level of motivation and engagement toward teaming	8 (3)	3 (1)	33 (12)	42 (15)	14 (5)	*100 (36)*
Frequency of communication with your company during negotiation	0 (0)	11 (4)	41 (15)	43 (16)	5 (2)	*100 (37)*

Satisfaction with TTC Staff (recoded 3-point scale)	Not Satisfied % (#)	A Little or Somewhat Satisfied % (#)	Very or Extremely Satisfied % (#)	*Total* % (#)
Responsiveness during negotiation	0 (0)	41 (15)	59 (22)	*100 (37)*
Knowledge of technology transfer process	0 (0)	31 (11)	69 (25)	*100 (36)*
Understanding of your business priorities	5 (2)	52 (19)	43 (16)	*100 (37)*
Information provided to you	0 (0)	46 (17)	54 (20)	*100 (37)*
Level of motivation and engagement toward teaming	8 (3)	36 (13)	56 (20)	*100 (36)*
Frequency of communication with your company during negotiation	0 (0)	51 (19)	49 (18)	*100 (37)*

28. Please provide additional comments and/or recommendations regarding TTC's customer services.

Additional Comments and/or Recommendations Regarding TTC's Customer Services	Frequency
I am an attorney with a long history of working with government agencies. This was the most efficient and positive experience that I have had. I give great credit to the OTT training and leadership and, most importantly, the personal commitment made by Michael Pollack of OTT in working with us.	1
None at this time.	1
Not enough time or space to write them all—top line: terms are typically unreasonable, use "government regs" as excuse, 1-2 years to complete is absurd, no regard for the best license and terms for the desired technology; and no real-world business experience from the TTC counterparty.	1
Nothing to add.	1
Process is difficult, but the people are generally cooperative and pleasant to deal with.	1
She was very friendly and helpful. I enjoy working with her.	1
The company's agreement draft should be acceptable. We are only allowed to use unified NIH form.	1
The CRADA we have with NCI was avidly supported by the NCI scientist, but the support by the administrative group was poor and frustrating. Our collaborator and I persevered and, eventually, the agreement was signed.	1
The Frederick NCI TT office has been exceptionally supportive in the CRADA process and has attempted to be helpful in licensing negotiations with NIH OTT.	1
The level of communication or teamwork involved with the NCI TTC is dependent on the actual associate handling/processing the request. While some are very communicative, others are not. The overall variability is pretty large.	1
The partnership initiatives, especially in the area of biomarkers/early detection, are outstanding and I am very satisfied with the resources. I am somewhat less satisfied with the process of decision making, which could be faster	1
The responsiveness seems to be related more to the internal NIH technical sponsor than an actual process. A better understanding of the process would be helpful to external partners.	1
Total	*12*

29. How do you or your staff locate NIH research partners for potential collaborations or partnerships? (Please check all that apply.)

How NIH Partners Located	Frequency	%*
Roadshows	1	3
Financial community recommendation (venture capitalists, investors, etc.)	1	3
Industry analyst reports	1	3
Tradeshows	2	5
Scientific and technical conferences	27	71
Partnering conferences	6	16
Personal networks	25	66
Internal company analyst(s)	4	11
Established relationships with NIH researcher(s)	24	63
Notices sent from the NIH email, RSS, or Listserv	5	13
NIH/NCI Web sites	12	32
NIH marketing/advertising cold calls or letters to R&D	2	5
Don't know	1	3
Total number of respondents	*38*	-------

* For questions where respondents could check more than one option, percentages are based on the total number of respondents who chose at least one option.

30. Would you like to receive information from the NCI Technology Transfer Center on developing research collaborations with NIH?

Request for TTC Information	Frequency	%
Yes	167	72
No	66	28
Total	*233*	*100*

31. What types of information would you like to receive from the NCI Technology Transfer Center? (Please check all that apply.)

Type of TTC Information Requested	Frequency	%*
Technology transfer/intellectual property policy updates	84	50
Recent licenses and collaborations negotiated at NCI	107	64
New technology collaboration opportunities from NCI or other NIH Institutes	144	86
New technology licensing opportunities from NIH Institutes	121	72
Information only about technologies that complement a profile created for NIH	66	39
Information about NIH scientific events and meetings	101	60
Total number of respondents	*168*	-------

* For questions where respondents could check more than one option, percentages are based on the total number of respondents who chose at least one option.

32. What is your preferred method of receiving NCI Technology Transfer Center information? (Please check only one.)

Preferred Method for Receiving TTC Information	Frequency	%
Email	155	93
RSS feed	1	<1
Hardcopy newsletter	4	2
Facebook, LinkedIn, or other social Web application	0	0
"What's New" site on the Technology Transfer Center Web site	6	4
Total	*166*	*100*

33. Are there services not currently offered by the NCI Technology Transfer Center that would be useful to meet the technology transfer needs of your company?

Services not Currently Offered by the NCI Technology Transfer Center	Frequency
A mechanism of implementing new technologies for NCI and NIH use is not obvious at present. Such opportunity for implementing new and useful technology from small companies would be very useful.	1
Any and all would be interesting to know about.	1
As noted, our company is likely to shift direction and such collaborations may not be relevant for our new client base.	1
Assistance dealing with Patent Office; grant-writing assistance.	1
At present, we don't have any needs. When we have a good candidate, we would have some needs, especially in the formulation area.	1
Being more transparent and showing a true commitment to working with small US companies.	1
Description of TTC policies, including a sample agreement.	1
Don't know.	1
Early discussions on technology applications from NIH or our company ideas; need to discuss opportunities for collaboration.	1
Enable face-to-face meeting with inventors.	1
Excellent services and people but difficult to complete deal due to nature of agreements.	1
I am unaware of services not currently offered by NCI TTC that would be useful in meeting the technology transfer needs of this company.	1
I don't know that "services" is the right word for this, but there is a great need for NCI OTT to be more involved with the transition between the CRADA and the licensing negotiations between the company and NIH OTT. There seems to be a major disconnect between the two organizations with respect to the continuity of the process from CRADA to inventions to licensing. Better project-specific integration of the two organizations is vital.	1

Services not Currently Offered by the NCI Technology Transfer Center	Frequency
I don't know what is offered. We are currently expanding our business from cancer immunotherapies into the areas of infectious disease, allergy, and autoimmunity. I just met some people from NIAID last week and intend to call them when I return to the US in two weeks.	1
I have no idea at this time.	1
I may evaluate this answer once getting more familiar with the information listed in the previous page. Our company is focused on R&D for glycoconjugate vaccines and LPS-peptide complex vaccines.	1
I'm not fully aware of what is currently offered so am unable to comment in a meaningful way.	1
It might be nice to every once in a while get an email listing technologies, new and old, that are available for licensing and the status of the technologies as far as patent protection is concerned. Getting into NIH.gov to find technologies is too burdensome and we will not do it.	1
It would be helpful to obtain funding opportunity grant and contract listings that are relevant to the licensed technologies. In the current SBIR contract offering (due 11/7), one Institute is soliciting contract applications to offerors willing to undertake product development of NIH-owned products in collaboration with the NIH inventor/investigator. The biggest impediment to product development is lack of funding, and this might be a very workable model for high-priority technologies.	1
Market studies of the offered technology.	1
Not applicable.	1
NIH TTC should participate in AUTM and LES and get to know BD people.	1
No.	9
No. It would be helpful to have a database of monoclonal antibodies developed by researchers for ease of use. Some universities are contacting principal inventors to create an inventory/listing of available research materials.	1
Not at this time.	4
Not aware of any.	4
Retrospective tissue archives owned and maintained by NCI are of interest to us, as are data maintained within the SEER database. Both are extremely difficult to access. We anticipate approaching NCI/NIH with a new technology of our invention within the next two years and are seeking a partnership (CRADA) to help demonstrate and validate that new technology.	1
Since these things waste too much time, we don't pursue them anymore.	1
Something like the Wales Tech magazine (in e-format) for new opportunities, and very user-friendly access to methodology and terms and conditions for agreements.	1
Stronger IP that is more aligned with industry needs. Advice on IP strategy from someone with industry experience would be helpful.	1

Services not Currently Offered by the NCI Technology Transfer Center	Frequency
The NCI TTC provides an extremely valuable service to society. The US Government, any national government for that matter, would not be able to provide a mechanism for the cost-effective development and continued manufacture of many types of disease therapies. The NCI TTC and affiliate government agencies do provide an extremely effective vehicle for assisting in the further evaluation and development of technologies that arise from the efforts of the highly accomplished researchers that staff their Institutes. Relationships of these types will always be fraught with complex legal concerns. In my experience, the staff of the NCI TTC are dedicated toward a goal of effectively engaging in the types of activities that will maximize society's benefit from the application of discoveries that are made within their basic and applied clinical laboratories.	1
There is language in the CRADA that makes it nearly impossible for us to collaborate.	1
Unsure.	1
We are very interested in collaboration with NCI and NIH to bring their appropriate technology in-house for development and commercialization. We have significant expertise in drug development, from preclinical to clinical and marketing; however, our economic situation is limited. We would like NCI to work with us in the capacity that we can bring in appropriate technology and develop toward market.	1
We have ultrasensitive platform diagnostic technology for protein marker detection that would benefit NCI to enable new scientific discoveries because of its sensitivity and could be used in a variety of research applications, including clinical studies. It would be beneficial to both NCI and small business to have a matchmaking function to match small business discovery and capability with research needs at NCI.	1
Yes. Please visit our Web site at [URL]. We are seeking clinical trials partners to work with us during the Phase I, II, and III trials in patients. [The remainder of this response has been deleted to protect the respondent's identity.]	1
Total	*50*