AMERICAN INSTITUTE FOR MEDICAL AND BIOLOGICAL ENGINEERING

# *A Call to Action*: *Defining the Industry-Academic Relationships for Effective Technology Transfer*

## Meeting Summary

June 13-14, 2011
Stanford University
Palo Alto, California

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## *Executive Summary*

In June 2011, the American Institute for Medical and Biological Engineering (AIMBE) hosted a meeting in Palo Alto, California—*A Call to Action: Defining the Industry-Academic Relationships for Effective Technology Transfer in Medical and Biological Engineering*. The meeting attracted eighty participants with nearly equal representation from leaders in the biomedical industry and academic communities, with additional representation from government officials. Implicit in the charge of those gathered was to diagnose the existing obstacles in the area of technology transfer for innovations in the fields of medical and biological engineering, and to identify best practices to move innovations to patients and consumers. Four panels were organized to discuss government, university, and industry-related aspects of the technology transfer process.

The flow of technology transfer usually begins in university laboratories, where research projects are executed and discoveries are made. Innovations resulting from this research and discovery are then sent first to the university technology transfer office, then the patent protection offices, and ultimately to the corporate sector for development into products benefiting patients. However, while most are familiar with this bench-to-bedside paradigm, capturing university innovation for technology transfer is not as linear as it seems. Distinct and fundamental differences exist between the missions of the research oriented university faculty, the often overburdened technology transfer offices, and the profit-driven corporations. As a result, these differing goals create obstacles, conflicting expectations, and misunderstandings stifling sustainable and enthusiastic partnerships, and unfortunately, may lead to the decreased commercialization of ideas or even stop these ideas from reaching the market entirely.

Improving communication and understanding between the stakeholders in academia and industry was the focal point of the meeting. Often, research faculty are not aware of the potential commercial aspects of their work, yet their university's Office of Technology Transfer (OTT) relies on research faculty to initiate contact with the corporate sector. Further exacerbating the process is the perception from industry that most OTTs simply "shop" technology to potential industry buyers hoping to land a connection. However, industry's reflected interests in interacting with universities is not limited to purchasing intellectual property (IP) after its discovery, but now often include partnering with individual researchers in the earlier developmental stages of innovation research. However, the OTTs of many academic institutions have policies regulating them in such a way that limits the early involvement corporations are seeking. These policies are vastly unsupported by the corporate sector, which believes evaluating the economic feasibility and risk factors associated with new innovations impacting human health is beneficial early in the research process.

Effective communication from the beginning of the innovation process between universities and industry would alleviate potential obstacles. For example, the most significant roadblocks in negotiations between academia and industry occur during the processes of valuation, IP ownership, indemnification, royalties, and conflict of interest (COI). Often, academic representatives do not have enough information to appreciate the market factors during negotiations. For example, compared to other sectors in the medical industry, medical device innovations are usually packaged into an integrated product containing multiple parts exercising many patents. Corporations responsible for product development possess the expertise to assess and ultimately produce these multiple IP products. From the corporate perspective, proprietary issues restrict corporations from sharing information with regard to risk mitigation and value assessment for given products and markets. Lack of knowledge on

the university side coupled with the inability to share knowledge on the corporate side can make negotiations difficult. Additionally, industry has expressed a desire for academic representatives to appreciate their strategic financial plan and corporate missions. Companies are more willing to discuss potential projects and innovations that align with these needs. Enhanced appreciation for constraints, instead of focus on incentives, is required in order to share ideas earlier and spark development sooner.

To help foster communication and effective partnerships between industry and academic institutions, meeting participants agreed more regular interaction between industry, university scientists, engineers, and students would be a good first step. Potential ways to do this may include forums, advisory boards, industry days, webcasts, social media outlets, or even something as simple as casual lunches. These forums should include clinical collaborators, in addition to industry, so that discussion could include the realities of clinical needs. However, a more essential element of this early communication, is creating comprehensive research agreements including specifications if IP were to emerge at a later time. These agreements will reduce unnecessary barriers to relationship building, educating all involved parties so that no conflict of interest or IP agreements later jeopardize the partnership.

One of the most intriguing recommendations was for universities to adopt a more systematic approach to industry relations. Virtually every university has an Office of Sponsored Programs (OSP), designed to handle all funded interactions with government agencies and foundations. However, no such office exists for industry interactions. Academic-Industry partnerships encompass a wide array of programs, which include early-to-late stage research, technology transfer, legal relationships for sponsored research, licensing agreements, start-up ventures, workforce development, and advisory boards. Moreover, one or more of these interactions can derive from distinct schools or colleges within a given institution (e.g., engineering, medical, etc). Therefore, many participants supported the idea of having a single university office or point person responsible for these necessary and symbiotic interactions. One suggestion is to create an "Office of Industry Programs" within a university, also referred to as an "Innovation Entity," which could serve as a central point of contact for connecting industry, investment communities, technology transfer offices, and researchers. These Innovation Entities would guide projects through the complex pathways inside and outside the university. The adoption of a systematic approach to technology transfer was identified as a potential best practice that could make building relationships with academia more inviting to industry.

An additional challenge central to improving relationships is the need to identify metrics of success for technology transfer at universities. There is a need for a measurement system that would engage the entire academic institution holistically, not just the OTTs. Examples of hard metrics that could be used include clinical adoption or impact of IP on human health, eventual commercialization, return on investment (ROI), publications, licenses, start-up companies, impact on students, and creation of jobs.
In the same vein, additional qualitative measures may involve investigating the number of faculty educated about and involved in the innovation process. Universities need to be more cognizant of the breadth and depth of expertise of personnel within their technology transfer offices, especially with each individual's capacity to converse at an appropriate technical level with a corporate partner. This means that companies must have confidence that they can rapidly identify the appropriate technology transfer or university staff to substantively discuss the scientific, technical, and business issues for a potential innovation and how it relates to that company's strategic goals.

Throughout the workshop, two related issues arose multiple times as essential topics impacting the medical and biological innovation ecosystems. First, the FDA regulatory process was described broadly by all as becoming increasingly inflexible, non-transparent, and with unclear guidelines for balancing

patient benefit with patient risk for emerging technologies. This amplifies the monetary and personnel burden, especially on smaller companies in ways that can inhibit innovation and entrepreneurship. Ultimately, this slows or stops patient access to new medical innovation.

A related concern was the idea that the public views new technology as a driving factor for increased health care costs. The workshop participants felt a strong obligation to provide greater clarity to the public on how technology is an essential component to decreasing costs while improving quality of care. Nevertheless, this lack of understanding influences the landscape for research and development and might actually increase their costs.

These challenges and opportunities create a clear role for AIMBE to drive change. AIMBE can assist in defining appropriate metrics of success for academic parties such as the OTT and university faculty. Once compiled, AIMBE can disseminate best practices of successful technology transfer relationships, and use this information to advocate for public policies, regulations, and funding that will drive innovation. In conjunction with its advocacy for the fields of biological and medical engineering, AIMBE can utilize this information to educate faculty and students about innovation and the process of technology transfer. Additionally, the organization can educate the general public on the value, and potential cost reductions, of medical technologies and the benefits of defining guidelines for rules of engagement in industry-academic relationships.

In conclusion, it was well recognized that one size does not fit all for technology transfer as various factors affect the OTT like tradition, geography, state politics, and access to capital. Nevertheless, extraordinary opportunities exist. The best OTTs are those that see their role as removing obstacles to translation and innovation. In turn, companies need to be aware of the challenges of universities and willing to engage with them more closely to align with their strategic interests.

## Panel 1: University-Government Relations for Effective Academia Generated Technology Transfer

**Moderator:**

- Matthew Tirrell, Ph.D., Professor and Chair of Bioengineering, University of California, Berkeley

**Panelists:**

- Stephen Badylak, M.D., Ph.D., Director of Tissue Engineering, McGowan Institute for Regenerative Medicine, University of Pittsburgh Medical Center
- Regis Kelly, Ph.D., Executive Director, California Institute for Quantitive Biosciences (QB3)
- Thomas W. Peterson, Ph.D., Assistant Director of the Engineering Directorate, National Science Foundation
- Thomas Skalak, Ph.D., Vice President for Research, University of Virginia

**Reporters:**

- Walt Baxter, Ph.D., Principal Scientist, Medtronic, Inc.
- Timothy Wick, Ph.D., Chair, Department of Biomedical Engineering, University of Alabama at Birmingham

**Summary: Panel 1**

Representatives from NSF, non-profit, academic, and clinical entities provided their perspective on technology transfer and university-government relations. The discussion covered the issues of recognition and facilitation of discoveries, the need for a facilitator to work with faculty and the OTT, early stage investment, differences between academia and industry, and implementation of discoveries. The process of technology transfer was broadly outlined, with the recognition by several on the panel as well as audience participants that capturing university innovation for technology transfer is not an exact science. Distinct differences in missions exist between the faculty (research driven), and technology transfer offices (commercialization/licensing driven), and industry (profit driven). These missions often create obstacles and a lack of understanding that stifle partnerships within and outside the university and ultimately stop the pursuit of commercialization of ideas. Often faculty are not aware of the potential commercial aspects of their work and technology transfer offices rely on faculty to initiate contact, creating a disconnect in the first linkage of the technology transfer chain. Furthermore, industry reflected that their interest in interacting with universities goes beyond buying IP but instead wanting to partner with researchers for development of concepts in the initial stages of innovation. This counters the widely practiced trend of the OTT "shopping" technology to potential industry buyers by sharing non-confidential summaries of faculty IP with industry. Academic researchers are restricted to varying degrees by conflict of interest policies set by academic institutions, some restricting an inventor from further involvement with the technology once it has been licensed. To compound these disconnects, it was also widely recognized that funding for proof of concept/early stage work is scarce. Finally, some researchers do not collaborate with clinical counterparts and instead create technology and then look for an application instead of addressing current clinical challenges (i.e., technology push vs. clinical pull approach).

Despite the challenges, several best practices were presented. One identified best practice was the inclusion of clinical co-investigators to ensure that developed technology not only addresses a clinically relevant problem but also smoothes the introduction of the new technology especially if it involves a paradigm change in the way clinicians practice. Having a clinical co-investigator also helps avoid having a technology push as opposed to a market pull for new innovations.

Academic programs shared that having a singular point person responsible for interacting with researchers, industry, and the OTTs in order to shepherd projects as well as interactions was a best practice. A singular project manager is one aspect of the Coulter Process that has been implemented at ten universities. The Coulter Process was cited as a best practice with return on investment for Coulter programs being 7:1. Key hallmarks of this program include available seed/proof of concept (POC) funding, the requirement of both engineering and clinical co-collaborators for projects, project management within the university, a singular person who serves as the project manager and guides the project through the university and aids the OTT with industry interaction, and an outside advisory team (mostly business, investment, and clinical advisors) that provides critical guidance to the project PIs. It was proposed that Innovation Entities could also serve in this function within universities to serve as a central point of contact for connection to funding agencies, investment communities, technology transfer offices, and researchers. These Innovation Entities would mentor projects through the complex relationships inside and outside the university.

Academic representatives also shared that faculty incentives for technology transfer work are variable. In some institutions, patents, start-up companies, and successful licenses are not counted significantly in the tenure and promotion process. Negative professional impact coupled with a lack of available seed funding, confusing or restrictive conflict of interest policies, and lack of relationship with the OTT can create, in some cases, insurmountable road blocks for faculty to pursue technology transfer research.

Industry also commented that the ability to interact with universities, specifically technology transfer offices, varied widely, with some relationships particularly difficult to establish. Key issues included the fact that the OTTs/researchers do not understand the product development process and cost, regulatory approval and reimbursement and how these impact the total investment required to bring a technology to market. Academia approaches start-up and large, established companies with a “one size fits all approach” when in reality each has different goals and approaches to commercialization. In addition, conflict of interest (COI) policies were mentioned several times as being a major stumbling block between universities and industry. COI issues were reported as “stifling” innovation by industry. Industry expressed a strong desire to develop relationships with researchers and institutions and not just “buy” intellectual property (IP).

Two clear calls to action for AIMBE to address included funding and Conflict of Interest agreements. Government agencies such as NSF and NIH already have established programs to facilitate university-industry partnerships with a goal of technology transfer. Total funding for such programs is a very small fraction of the entire yearly government investment in R&D—30 billion. A distinct need for early stage funding is necessary to catalyze technology transfer. It was proposed that STTR funds be moved further upstream in the innovation pipeline. It was also proposed to redirect 1% of this $30B towards early stage innovation with a goal of creating new technologies that will lead to increased business, more start-ups, and ultimately greater employment opportunities and economic security, or “innovation security.” This 1% solution, totaling $300M, would be directed toward proof of concept funding to remove risk and increase subsequent investment from the private sector in academic technology

transfer projects. It was proposed that funding go beyond just the project but also include establishing the internal academic infrastructure necessary to mentor and create critical funding and industrial partnerships to ensure project translation. How to implement early stage funds created a debate as to whether technology centers such as NSF-Engineering Research Centers (ERC) should serve as Innovation Hubs or a wider distribution throughout all academic institutions would be best.

## Panel 2: Facilitating Tech Transfer Between Industry & Academia

**Moderator:**

- Vinit Nijhawan, Director Office Technology Development, Boston University

**Panelists:**

- Christine Bunt, Founder, President and Chief Executive Officer, INTICA Biomedical
- Fred Farina, Assistant Vice President, Office of Technology Transfer, California Institute of Technology
- Stanton Rowe, Chief Scientific Officer, Edwards Lifesciences

**Reporters:**

- Richard Korsmeyer, Ph.D., Senior Research Fellow, Pfizer Global Research and Development
- Michael Straightiff, Senior Licensing Manager, Life Sciences, Case Western Reserve University

**Summary: Panel 2**

Representatives from a start-up medical device company, a large medical device company, and OTTs served as panelists on a session devoted to facilitating technology transfer between industry and academia. The OTT was the focus of much of the discussion. Serving as the locus of the transaction with industry, most focus on licensing and do little work with start-ups. OTTs are often understaffed, experience high turnover, have a lack of experience due to a wide range of technologies they must represent, and are often not in touch with the faculty inventor. Many OTTs focus almost solely on licensing, providing little or no guidance for faculty interested in pursuing a start-up with their technology. OTTs "shop" technology, cold-calling companies to see if existing university IP is of interest. This approach provides little success in producing successful partnerships or transactions with industry. To compound the challenges, multiple university offices interact with industry including alumni, development, and career services. No unified point of contact usually exists within the university to facilitate a smoother interaction with industry.

From the industry side, several issues were important regarding the academic/industry relationship. In particular, industry desired to build relationships with faculty and the OTTs. Industry cited that is it better to build relationships early in the process with both parties as many obstacles will come up that need to be addressed including valuation, IP ownership, royalty stack, indemnification, royalties, and COI. They also commented that there is a wide range of knowledge levels in the OTTs but often a lack of knowledge regarding the business model of commercialization of drugs or medical technologies. Different factors are important to large corporations vs. start-ups companies and venture capital firms (VCs). This lack of understanding compounds the issues in negotiating and working with the OTTs.

Industry also expressed a desire to partner with researchers early in the innovation process; developing partnership and establishing early comprehensive research agreements with universities to allow multiple projects and extended interaction. Enhanced appreciation for the constraints versus incentives in these partnerships is required in order to share ideas earlier and spark innovation. Industry desires to

build relationships that are weighty, personal, and rewarding. Having an ability and willingness to be flexible can exist only when there is a foundation of respect and trust. This includes a shared approach to identifying exciting and important challenge areas, inventor/scientist access, a shared respectful method to assess market opportunities, valuation, risk, and the regulatory landscape. To this end, academia requested that industry serve to instruct on market knowledge, product development processes, and valuation. Challenges exist here as risk mitigation and value assessment are proprietary to companies yet insufficiently understood by the OTT staff and faculty.

Best practices or desired relationships on the part of industry included informal brainstorming and exchange of ideas in casual settings with faculty and students. OTTs warned of these interactions without formal agreements in place as faculty might unknowingly give away IP. It was generally agreed that industry should interact in multiple ways with the university including advisory boards, research days, and forums. Both parties cited the best OTTs as those that see their role as removing obstacles to translation and innovation. A systems approach to tech transfer was endorsed within the university. One point of contact, possibly outside the OTT, that would interact with industry was promoted.

It was readily acknowledged that a one size does not fit all for the OTTs as geography, state politics, proximity of companies, and access to capital impacts the ability, mission, and direction an office will pursue. Nonetheless, extraordinary opportunities exist. Northern California universities have access to a huge network of entrepreneurs and venture investment, while Midwest or Southern universities need to build an effective national network of corporate partners and investment advisors, and companies need to be aware and willing to engage with universities more closely aligned with their strategic interests.

## Panel 3: Designing Effective Partnerships between Industry and Academia: From Concept Development to Technology Transfer

**Moderator**:

- Youseph Yazdi, Ph.D. Director of Center for Bioengineering Innovation and Design Johns Hopkins University

**Panelists:**

- Mark Crowell, Executive Director of Innovation Partnerships and Commercialization, University of Virginia
- Mike Harsh, Vice President and Chief Technology Officer, GE Healthcare
- Mudit Jain, Ph.D., Partner, Synergy Life Science Partners
- Walt Baxter, Ph.D., Principal Scientist, Medtronic, Inc.

**Reporters:**

- Thomas Foo, Ph.D., Chief Scientist, GE Global Research
- Pratap Khanwilkar, Ph.D., MBA, Founder/CEO, Ignition Key, LLC

**Summary:**

Representatives from industry, academia, and venture capital discussed how to design effective partnerships between industry and academia. One best practice was the need for comprehensive agreements to be established early between universities and industry to avoid conflicts as relationships evolve. Initially, it is presumed that IP will emerge over time but that none exist at the early stages of collaboration. Comprehensive master agreements help to create a fair playing field facilitating easy collaboration and exchange of ideas. This also avoids the "buffet" approach of the OTT selling IP to industry. Effective partnerships have sustained engagement and also include oversight with advisory boards. AIMBE was called upon to help academic institutions recognize the need for more structured agreements and disseminate information on how to construct these partnerships.

The OTT and faculty were encouraged to build relationships with industry scientists and engineers for joint technology development and establish relationships in the early stages of project development. To develop partnerships between industry and academia, it was suggested to provide regular interaction between industry and university scientists as well as students. Several formats to encourage relationship development were discussed including forums, advisory boards, the Coulter model, embedded scientists, and "pizza lunches" as a way to create a market pull situation. Embedded scientists were also suggested as ways to spur collaboration. Other ways to increase collaboration included industry days, webcasts, and social media outlets. To create solutions that address clinical needs, it was suggested that projects include clinical collaborators in addition to industry input.

Lack of funding for technology transfer research was cited as a significant hurdle to innovation. It was recommended that government grant programs include translational research, specifically proof of concept, clinical efficacy, and commercialization activity. AIMBE was called upon to encourage changes in funding vehicles such as NIH R-01 grants to allow commercialization activities such as IP/patenting, business plan development, and market analysis. A bottom-up approach was advocated regarding government funding of translational research. The CTSA program was cited as making huge investments

for small returns. Public policy changes have also created new barriers in regulation that threaten the innovation ecosystem. Industry attendees commented that more monetary investment is made in regulatory approval and clinical trials than in Research and Development and innovation; specifically 80% of total project expenses to commercialize are in regulatory/clinical stages. Several participants commented that current issues with the Food and Drug Administration (FDA) process are approaching crisis levels and stifling innovation. A call to action to streamline the regulatory process and encourage innovation was suggested. Finally, additional educational opportunities for faculty and students to learn about the innovation pathway and steps to commercialization were encouraged.

## Panel 4: Case Studies: Successful Models of Technology Transfer and SRA Processes

**Moderator**:

- Paul Yock, M.D., Director of BioDesign and Professor of Biomedical Engineering, Stanford University

**Panelists**:

- Barry Myers, M.D., Ph.D., Director of Emerging Programs, Duke Center for Entrepreneurship and Research Commercialization (CERC)
- Rosibel Ochoa, Ph.D., Commercialization Director, University of California, San Diego, William J. von Liebig Center
- Paul Citron, Former Vice President of Technology Policy and Academic Relations, Medtronic, Inc.
- John Collins, Ph.D., Chief Operating Officer, Center for Integration of Medicine and Innovation Technology (CIMIT)

**Reporters**:

- Lynne Jones, Ph.D., Associate Professor, Johns Hopkins Orthopaedics at the Good Samaritan Hospital
- Banu Onaral, Ph.D., Director, School of Biomedical Engineering, Science and Health Systems, Drexel University

**Summary: Panel 4**

In the final session of the meeting, panelists shared case studies of how their organizations handle industry-academic relations to create an impact in health care. Participants included a representative from a Coulter/CTSA private university, the perspective of a former large medical device company executive, a non-profit academic medical center/university consortium, and an innovation center within a public university. Major themes included the importance of project management, oversight, guidance, and appropriate identification of funded technologies. A best practice of using facilitation teams that include the engineering faculty as well as a clinical partner was defined. Having a clinical pull approach as opposed to a technology push position when defining the project was seen as a best practice. Also creating advisory boards to guide the projects and vet IP was seen as a best practice.

Another best practice was to have a facilitator/mentor work as the point person in collaboration with the principal investigator to guide the business aspects of the project. The facilitator/mentor would interface on behalf of the project team with groups within the university as well as industry. Companies can touch universities in many ways including technology transfer, career placement, sponsored research, and legal relationships. A model that provides integrated and coordinated response (i.e. “one-stop shopping”) for industry to connect all the entities within the university could be transformational. Also acknowledged were the differences between academic and industry cultures, mission, expectations, student involvement and education, motivations of involved individuals, and the need for appropriate metrics to drive desired outcomes. Industry must appreciate the distinct mission of

universities, particularly the role of students, and necessity for faculty to publish. Likewise, faculty and universities must appreciate the distinction between an invention and the process of innovation with the latter requiring more than just good science but also millions of dollars investment, with much of the investment tied to regulatory approval and marketing.

Furthermore, universities and investors must realize that the development paths for drugs versus devices are different and must organize their technology transfer relationships accordingly. Devices typically live dynamically as they incorporate several technologies which can be upgraded and advanced on different timelines. Whereas drugs are typically based on a single core IP platform and have a finite period of time under patent protection before generic options are introduced. This difference is vital to understand as it affects the negotiation of drugs and/or devices and the relationship between industry and academia. It also changes the business model of the licensing office, with drugs being fewer bets with large payoffs, and devices being many more bets each with much smaller payoffs. Defining the relationship with industry early regarding IP, royalties, and valuation was seen as vital to having a productive partnership between industry and academia.

Another critical aspect of the technology transfer within universities is how the OTTs are measured. Metrics of success drive the way the OTTs approach relationships with industry and their faculty. AIMBE's role in driving change could include defining appropriate metrics for various academic parties (OTT, faculty, etc). These metrics should go well beyond the typical metrics associated with licensing, to include the overall effectiveness of the whole organization in translating science into clinical impact. Metrics may include clinical adoption/impact, eventual commercialization, ROI, patents, publications, licenses, start-up companies, impact on students, and creation of jobs. Also encouraging the development of funding mechanisms for POC/early stage work was seen as a relevant role AIMBE could hold. The "sweet spot" for early stage/POC device/system and procedure funding was reported to be $100-300K per project. This amount allows critical investigation to determine if further funding or outside investment is obtainable.

AIMBE's role was seen as disseminating best practices of successful tech transfer relationships; supporting public policies in regulatory and funding that drive technology innovation and transfer; educating faculty and students on innovation and technology transfer; educating the general public on the cost savings of medical technologies; and defining guidelines for rules of engagement in industry-academic relationships.

## List of Participants

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| Russ Altman | Stanford University |
| Kathryn Atchison | University of California, Los Angeles |
| Stephen Badylak | University of Pittsburgh |
| Walton Baxter | Medtronic, Inc. |
| Christine Bunt | INTICA Biomedical |
| Jeff Calcagno | Johnson & Johnson |
| Sylvaine | Cases Sanofi |
| Benjamin Chu | University of California, Los Angeles |
| Gary Cleary | Corium International, Inc. |
| John Collins | Center for Integration of Medicine and Innovation Technology |
| Kevin Costa | Mount Sinai School of Medicine |
| Mark Crowell | University of Virginia |
| GregDane | Georgia Institute of Technology |
| Carlo De Luca | Boston University |
| Bill Enquist | Stryker Endoscopy |
| Corine Farewell | University of Rochester |
| Fred Farina | California Institute of Technology |
| Thomas Foo | GE Global Research |
| Adam Gall | Varian Medical Systems, Inc |
| Sean Gallagher | AIMBE, Director of Public Policy |
| John Gassert | Milwaukee School of Engineering |
| Katie Goodman | AIMBE, Program Coordninator |
| Roberta Gottlieb | San Diego State University |
| David Gough | University of California, San Diego |
| Warren Grundfest | University of California, Los Angeles |
| Michael Harsh | GE Healthcare |
| Kevin Healy | University of California at Berkeley |
| Leonard Herzenberg | Stanford University School of Medicine |
| Mike Hess | Medtronic, Inc. |
| Alan Hirschman | University of Pittsburgh |
| Christopher Hunter | Zimmer Inc. |
| Mudit Jain | Synergy Life Science Partners |
| Matthew Jenusaitis | Octane |
| Lynne Jones | Johns Hopkins Orthopaedics at the Good Samaritan Hospital |
| Regis Kelly | California Institute for Quantitive Biosciences (QB3) |
| Pratap Khanwilkar | Ignition Key LLC |
| Richard Korsmeyer | Pfizer Global Research and Development |
| Kelly Lamarco | Science Translational Medicine |
| Kenneth Lutchen | Boston University |
| Marc Malandro | University of Pittsburgh |
| Jonathan Mansbridge | Histogen Inc. |
| Eric Masingale | Stryker Endoscopy |
| James McGrath | University of Rochester |
| Alexey Melishchuk | Drexel University |
| Todd Merchak | National Institute of Biomedical Imaging and Bioengineering |

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| Ronald Newbower | Center for Integration of Medicine and Innovative Technology |
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| Rosibel Ochoa | University of California, San Diego |
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| Frederick Schoen | Harvard Medical School |
| Richard Schoephoerster | University of Texas at El Paso |
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| Arthur Tipton | Surmodics, Inc. |
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| Phil Triolo | Phil Triolo and Associates LC |
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| Timothy Wick | University of Alabama at Birmingham |
| Gary Williams | The University of Texas at El Paso |
| Savio Woo | University of Pittsburgh |
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