A Summary of Eleven Case Studies of Independent Educational and Research Institutions with a Focus on Generating Insights for Planning for Field Stations

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Introduction

This document summarizes case studies of 11 education and research institutions operated as independent 501c3, or similar, organizations. These visits were conducted as part of a strategic planning process conducted by the Rocky Mountain Biological Laboratory. We visited organizations related to, but separate, from the field station community in order to generate ideas as our Board thinks about RMBL's future, as well as to better understand our position within the larger research and educational landscape. We thought it would be worth sharing the information with the larger field station community.

The case studies involved a combination of website research, tours of facilities, and onsite interviews with key staff of 11 institutions: Aquarium of the Pacific (the Aquarium), the Bigelow Laboratory for Ocean Sciences (Bigelow), the Broad Institute of MIT and Harvard (Broad), Forsyth Institute, the La Jolla Institute for Allergy and Immunology (LJI), Mt. Desert Island Biological Laboratory (MDIBL), Salk Institute for Biological Studies (Salk), San Diego Zoo Global (the Zoo), Walking Mountain Science Center (Walking Mountain), the Whitehead Institute for Biomedical Research (Whitehead), and the Wyss Institute for Biologically Inspired Engineering (Wyss). They were conducted from the spring 2015 (starting with Walking Mountain) through the spring of 2016 (ending with the Aquarium).

Visits ranged from relatively short one-hour discussions to full-day tours. There was a similar range in how much time we spent researching institutions before the visits. The variation in the amount of time we spent on each institution does not reflect anything about the institutions; it was simply a matter of scheduling, time limitations, and what issues we focused on. For reasons of cost effectiveness and time, we focused on institutions in four geographic areas: Maine, Boston, San Diego/LA, and Colorado.

The representatives from RMBL on each trip varied, but at different times included RMBL Board Members: Cindy Carlisle, Kurt Giesselman, and Kailen Mooney (also a RMBL scientist); RMBL staff Ian Billick (Executive Director), Sarah Oktay (Director of Institutional Advancement), and Amy Ellwein (Director of Science Communications and Engagement); and consultant Robert Forrester. Billick and Giesselman participated in all visits.

Prior to the visits, RMBL participants were provided institutional summaries. Following the visits, Billick distributed what he identified as relevant observations from the visit, as well as notes of items he considered useful. Other members of the visiting team had an opportunity to review and comment on the notes.

Funding and Caveats

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This report was written by Billick and was not reviewed by participating organizations. It may contain mistakes that are attributable to Billick, and not to participating organizations or other members of the RMBL team that participated in the visits. Additionally, we collected a large amount of information in the visits, not all of which is included. What has been identified as key observations and notes, simply represent insights that struck us at the time as potentially useful for RMBL. These notes are by no means comprehensive.

Summary of the Organizations

Mission

The eleven organizations represent a range of missions, including education (Walking Mountain), outreach to the general public (Aquarium, the Zoo), fundamental research with an NIH focus (Broad, Forsyth, La Jolla Institute, MDIBL, Salk, Whitehead), fundamental research with an NSF focus (Bigelow), and translating research (Wyss). While none of them are field stations, San Diego Zoo Global operates three field stations and MDIBL used to be a field station. And in some ways, the Broad operates like a field station though with a different scientific focus; they offer access to a research platform and the expertise associated with that platform that is used by scientists from institutions around the world.

Organizational History

In terms of organizational history they represent relatively mature organizations (e.g., Bigelow, Forsyth, Salk, Whitehead) as well as relatively new organizations going through rapid change including the Broad, Walking Mountain, and LJI.

Financial Models

In terms of financial models many of them receive substantial support from federal grants (Broad, Forsythe, La Jolla Institute, MDIBL, Salk, Whitehead). Several of them involve large founding private gifts (Broad, Forsythe, Salk, Whitehead, Wyss). Endowments have been critical for several (Salk, Whitehead) and LJI receives quite a bit of support from corporate and academic sponsors. Their budgets range from $2 million/year to $300+ million/year (Broad, San Diego Zoo). Several of the organizations make an effort to generate income from intellectual property (Broad, La Jolla Institute, Wyss). Several operate core facilities that are important to their financial model (Bigelow, Broad, La Jolla Institute, Salk),

Ten General Observations

Below is a summary of observations that may be useful for field stations, particularly independent field stations. These emerged across the visits and represent Billick's idiosyncratic filter.

1. **Alignment**: A number of the organizations stress alignment—across staff, board, and stakeholders. This helps in many ways, including staff and scientist retention, beyond fundraising. Reputation and brand was important in some organizations for similar reasons.
2. **Fundraising- themes versus capital campaigns**: A number of organizations are using theme-based fundraising, rather than a capital campaign, with themes developed with the scientists. This approach offers the advantages of being outcome-focused (rather than institution-focused) as well as being nimble/flexible. Theme/outcome-based fundraising can include capital/programmatic needs.
3. **Fundraising- impact-driven:** There are considerable opportunities with impact-driven philanthropy, though demonstrating impact is the challenge/opportunity.
4. **Fundraising- scientific versus public motivations**: For organizations focused on fundraising, one of the challenges is wedding "why the public funds science" with "why the scientists do science."

5. **Management- scientific leadership**: Except for Walking Mountain and the Zoo, each organization was led by a scientist. These institutions pair a scientist serving as CEO with a COO who brings corporate experience. This model can be useful when funding is following vision/impact, which can flow more naturally from a scientific leader.
6. **Management- metrics:** The organizations used metrics that would be familiar to the field station world (citation rates, use/visitation numbers, publication rates). However, a number of organizations used press coverage and social media as board-level metrics that capture societal relevance and outreach.
7. **Financial- Intellectual Property:** IP revenue streams are challenging. The upfront cost for negotiating those streams is high, especially when multiple institutions are involved. At lower levels of return it may make more sense to pursue corporate sponsorships than invest in owning patents and licensing income.
8. **Financial- federal funding:** A decrease in federal funding, especially within NIH-funded institutions because of their reliance on overhead to cover basic costs, is forcing many organizations to rethink their financial models.
9. **Financial- collaboration**: There are opportunities to collaborate, and receive financial support, from a wide range of organizations. However, it is important to know exactly what value you are providing, and to whom.
10. **Communications- multiple channels**: A number of the organizations use multiple channels to reach the public, including art, music, science cafes, open houses, and community conversations.

Summary of Individual Organizations

Below a summary is provided for each organization visited, including who was interviewed and background information about the mission, finances, and history. The observations include key points that seemed to be particularly relevant to RMBL's strategic planning, and the notes represent more detailed information that emerged from the interviews. The brevity of the notes for some organizations does not reflect anything about an institution; rather, it reflects the amount of time we had for an interview and to prepare, as well as whether the extent to which the visit offered insights into field stations. The notes are primarily factual, though editorial judgment was made concerning what to include.

Aquarium of the Pacific

Interviewed: Jerry Schubel, President/CEO and David Bader, Director of Education

Mission: To instill a sense of wonder, respect, and stewardship for the Pacific Ocean, its inhabitants, and ecosystems

Vision: To create an aquarium dedicated to conserving and building Natural Capital (Nature and Nature's services) by building Social Capital (the interactions between and among peoples).

What it Does: The Aquarium of the Pacific is the fourth most-attended aquarium in the nation. It displays over 11,000 animals in more than 50 exhibits that represent the diversity of the Pacific Ocean. Each year more than 1.5 million people visit the Aquarium. Beyond its world-class animal exhibits, the Aquarium offers educational programs for people of all ages from hands-on activities to lectures by leading scientists. Through these programs and a variety of multimedia experiences, the Aquarium provides opportunities to delve deeper into ocean science and learn more about our planet.

In addition to their public programs and exhibits, the Aquarium is involved in numerous conservation efforts, including sustainable seafood, watershed education, ocean literacy, and more. Their team of scientific divers collects critical data used by a variety of ocean research institutes and reporting agencies. And through their Aquatic Forums, the Aquarium brings together scientists, educators, community leaders, and policymakers to develop solutions to complex environmental issues.

The diverse marine science and conservation ventures include: breeding and conservation programs for endangered marine animals and habitats; housing of unreleasable seals, sea lions, and sea otters from local care centers and marine parks; beach and habitat cleanups; a variety of green business practices; and continuing efforts to educate visitors on the importance the ocean, its threats, and conservation.

Governance and Staffing: The Aquarium of the Pacific is a 501(c)3 non-profit organization. It has 24 members of its governing board. Dr. Jerry Schubel serves as the CEO and President of the Board. It has an independent Chairman of the Board. It has a total staff of over 900 people including more than 300 employees and about 650 volunteers.

History: Founded in 1998, the 156,000 sq. ft. Aquarium of the Pacific at Long Beach, California was conceived as an aid to economic development, following the model of the National Aquarium (US) and Baltimore's Inner Harbor. The community passed a $120,000,000+ bond to finance construction of the facilities. The institution's mission was later agreed to include both social development and environmental protection issues: issues most difficult to address in a large, urban and highly diverse population.

The development project became the fastest such project completion in US history (44 months from initiation to opening); it is structured as a public entity developed by private developers, non-governmental owners, and private debt financing.

Finances: Their annual expenses were approximately $35 million in 2013. They generated about $24 million in operational revenue, $6 million in contributions, $4 million in memberships, and $2 million from government support. Approximately 37,000 households are members.

Observations

1. It's important for people to feel safe as part of developing workshops/conferences.
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Additional Notes

1. Goals of public outreach include incorporating art into the museum and diversifying socioeconomic groups and cultures who visit the Aquarium.
2. Public outreach, education and research are important, since management and the board want the Aquarium to be "more than a fish tank."
3. The primary research relates to animal husbandry.
4. They find that they can get a greater return from bringing in scientists rather than paying them as employees—hence the focus on secondary science. They pick a topic and bring in experts.
5. Reports that emerge from conferences carry the endorsement of the institution.
6. Most aquariums don't have a lot of research strength, but they are good at telling stories.
7. Most activities happen at the aquarium; they run a whale-watching operation at a nearby pier.
8. They are a partner in Conservation International's efforts to create the largest marine protected area. They are involved in the public outreach.
9. Other partnerships are with the local institutions: UCI, UCLA, USC and UCSD's Scripps Institution of Oceanography.
10. They run festivals. The festivals have to have some component related to the Aquarium. It was a lot of work to get started, but now they run themselves.
11. They have 26 board members; they can have up to 30 under their by-laws, which also provide for a review of proposed membership by the city manager of Long Beach.
12. Every board member is expected to make a significant donation to the annual fund and a major gift to the capital campaign.
13. The board meets quarterly, down from monthly in the past.
14. It is now a national board, though most trustees have ties to Southern California.
15. Though they don't have a formal strategic planning process, they developed a campus master plan and use that as a framework to focus their efforts.
16. Their current focus is a $50 million campus expansion. They will be able to accommodate another 200,000 people/year. It will also be an opportunity to provide new/updated content.
17. For metrics they look at whether people come and asked for help. Other metrics are the number of visitors and the number of papers based on work at the aquarium.
18. The CEO has five direct reports—operations, communications, finance, education, and HR.
19. They have an all staff meeting several times/year.

Bigelow Laboratory for Ocean Sciences

Interviewed: Graham Shimmield (Executive Director), Ben Twining (Director of Research and Education, and member of the Senior Research Staff/SRS)

Mission: Bigelow Laboratory for Ocean Science's mission is to investigate the microbial drivers of global ocean processes through basic and applied research, education, and enterprise.

Governance: They have 17 board members, including one SRS, Graham, and Ben. The board meets 3 or 4 times/year while the committees meet almost monthly. The executive committee meets four times/year in between full board meetings. The board has a significant number of individuals such as the former director of the Woods Hole Oceanographic Institute who have had senior positions in academia/research. They have placed a high premium on having board members who understand the institution's position within the larger scientific landscape.

They aim for alignment between the Board and the SRS. The SRS meet as a group monthly and are involved in providing input into strategic decisions (e.g., strategic plans, hiring, policies, etc.).

Programs and Staffing: They have approximately 80 employees. They organize research around three main themes, Blue Biotechnology, Ocean Biogeochemistry and Climate Change, and Ocean Health. The core staff are 16 SRS. These are research scientists who maintain research laboratories of their own. Scientists are responsible for generating grants to cover most of their salary, sufficient overhead to operate Bigelow, and the expenses of the research. Their primary funding comes from NSF, but they also receive NOAA money and local contracts. The average longevity of an SRS is 7-10 years. They do about one hire/year to replace people. They have recently added a merit review system that allows individuals to get jumps in pay beyond cost of living. Scientists are ranked on 4 general categories and 10 grades within each category. The process is transparent and fairly objective.

There is no overarching review of research. They are considering establishing an external science advisory board.

Additionally, the Bigelow operates core facilities. These core facilities support research within Bigelow, but also generate income by providing fees for services for researchers both inside/outside Bigelow. The core facilities include the Provasoli-Guillard National Center for Marine Algae and Microbiota, the Single Cell Genomics Center, and the J.J. MacIsaac Facility for Aquatic Cytometry. An SRS heads each core facility and who receives one month's salary each year in return for overseeing the facility. The largest core generates about 10% of their revenue. Each core facility has a 5 year business plan.

They have recently started an education program with Colby.

They added the position of Director of Research and Education in 2013 to which all SRS report.

Growth/History: Bigelow was founded in 1974 with a focus on marine microorganisms. Upon retirement of the previous ED in 2008, they hired Graham Shimmield, who was previously the director of the Scottish Association of Marine Sciences. Graham focused on recruiting board members bringing with corporate experience, philanthropic capacity, and an understanding of Bigelow's position within the scientific world. In 2012 they opened a brand new 60,000 square foot building. The project involved receiving $28 million in grants (NSF, NIST, and the state of Maine) and taking out $12 million in loans, which they are currently servicing.

Because of declining national funding and a desire to keep unrestricted donations at 10% of annual revenue or less, they are pushing hard to increase revenue from their core facilities, and to capture revenue from intellectual property generated at Bigelow.

Financial Model: Their annual budget is approximately $12 million, with 75% of that amount the direct cost of research and education, and the remainder on management and advancement. Approximately half of their revenue comes from grants and contracts, and contributions makes up the largest remaining portion. They are heavily dependent upon NSF, but also receive some support from NOAA and NASA.

They continue to work on their model for technology transfer. They see potential for intellectual property not just in the activities of their SRS faculty, but also in their value-added activities associated with core services.

Development: They have a chief advancement officer, an advancement officer, and an individual in charge of donor relations and the campaign.

Growth: A reduction in the amount of money available to scientists for PI grants is pushing them to change their financial model. The refinements will emphasize use of core facilities by outsiders, developing corporate relationships through their SRS faculty members, seeking federal funds outside NSF, and exploitation of IP.

Communications: They have invested in communications. They focus communications on the three themes (described above in programs and staffing) in part to simplify and amplify their messaging for major supporters, visitors, and funding agencies. Communications are consistent between signage, interactive interpretive displays, and printed materials. They brought in someone from Brown and they track media coverage.

Observations

1. They are seeking to increase revenue from services and intellectual property rights. On fees for services, they have 5 core facilities, of which four offer scientific services that are difficult to replicate elsewhere. These are ongoing services, which they are trying to promote by adding additional value to what they have historically provided. On intellectual property rights they had an early success and are trying to figure out how to create more of a pipeline.
2. Their strategic plan helps not only with organizational strategy and tactics but also with fundraising.
3. They have a strong focus on building reputation.

4. They are building an undergraduate research program as part of creating a higher profile.
5. They have spent a great deal of time building alignment within the organization, particularly with the senior research staff.
6. They are anticipating that development income hit a high from which it is expected to decline as the new facilities are funded.
7. Despite Bigelow's emphasis on strategic planning, growth and major change for Bigelow in the past has been more opportunistic. They have grown opportunistically/organically rather than by fiat. They were able to acquire some land and then waited until the timing was right to move to the new location and build the new lab.
8. They built a new facility that might be larger than their immediate needs on purpose, but as a result they have to manage the cash flow consequences.
9. They received substantial federal stimulus money and state-level public funding. The state funding was made possible in part by banding together with other nonprofits to increase their lobbying footprint.

Notes

1. The State of Maine passed a bond that created funds to invest in science as part of stimulating economic growth. The Bigelow received approximately $5 million as part of a state-wide competition for the funds. There are approximately 8 institutions in Maine that compete as research institutions for such funds.
2. Maine is an EPSCOR state, which means that institutions there have access to certain federal funds that are not available in better-funded states.
3. They have posters and television screens outside many of the research clusters that communicate about the science.
4. Each of three wings of their new building complex is named according to the focus of the grant/bond that funded it.
5. They are in the process of retiring an old logo (the founder of oceanography Henry Bigelow at the wheel of a ship) and rebranding with the move to the new space.
6. They need to increase housing in order to grow their education programs.
7. There aren't really many other independent marine laboratories. Examples include the Woods Hole Oceanographic Institute, the Marine Biology Laboratory, University of Hawaii, and Scripps Institute of Oceanography.

Broad Institute of MIT and Harvard

Interviewed: Marian Orfeo (Assistant Director for Planning and Evaluation), Samantha Singer (Chief Operating Officer)

Mission: In 2001, the decoding of the human genome, led in large part by Broad Director Dr. Eric Lander, sparked a revolution in how we understand human health and disease. Three years later, the Broad was founded to reveal the fundamental basis of disease and catalyze treatments.

Based in the biomedical hub of Kendall Square, Cambridge, Broad brings together an community of scientists from MIT, Harvard, and the five Harvard teaching hospitals. Broad's management believes the toughest challenges in biomedicine require new institutions that are:

Collaborative**:** Spanning across nations, research institutions and scientific disciplines, and academia and industry.
Nimble**:** Able to move quickly and mount projects at any scale—from a single laboratory to an industry-style team.
Bold: Willing to tackle high-risk, high-reward projects.
Open: Committed to sharing tools, methods, and data with the entire scientific community.

The Broad aims to embody this new model. Equipped with world-leading technology and unrivaled scientific platforms, our scientists are narrowing the gap between biological insight and clinical impact, paving the way for novel therapeutics for a wide range of human diseases.

Notes

1. There are 11 Core Faculty members, and the Broad also serves several hundred other Institute and Associate Members. All Faculty have appointments at other institutions.
2. They work hard to attract scientists with high potential to become Associate Members.
3. Scientists are closely involved in governance and strategic planning. For example, there are three Core Faculty members on the Executive Leadership Team and the Operations Committee includes Faculty and professional scientists.
4. Their research platforms provide three main values and services—access to data-generating research platforms (e.g., sequencing), the community of scientists that forms around those platforms, and the ability to manage/understand data. They empower research more broadly.
5. They report citation rank within molecular biology as well as cross disciplinary to the Board. They also report media coverage in the Boston Globe (which is a well known outlet for pharma) and other elite media outlets, the number of highly cited scientists, the success rate of federal funding, and overhead rate. They evaluate institutional success more broadly by looking at research impact, which is measured in a variety of ways.
6. Their strategic planning is driven by scientists identifying where science is moving.
7. Broad's annual budget is $350 million/year, with $125 million from philanthropy, $30 million from endowment, and $50 million from industry sponsorship. The rest is from grant funding, generated by core and associate faculty. Since they have a consulting model, they generate very little from simple fees for services. They are more focused on collaboration.

Forsyth Institute

Interviewed: Phil Stashenko (President and CEO), and Diane McDonald (Chief Operating Officer)

Mission: The Forsyth Institute reinvents oral and overall health through pioneering biomedical research and transformational healthcare practices.

History: Forsyth, an independent not-for-profit research organization, is located in Kendall Square, Cambridge, an epicenter of biotechnology with one of the highest densities of biomedical researchers in the world. In addition to our affiliation with the Harvard School of Dental Medicine, Forsyth has collaborations with academic institutions, hospitals, independent research institutes, and biotech and pharmaceutical companies.

Vision and Implementation: In the early 20th century, the Forsyth Institute was founded to provide free dental care to Boston's poorest children. It was quickly determined that treating the ravages of dental disease was simply impossible given the limitations in knowledge of their causes and best means of prevention—thus began a exciting journey of research for the Institute. In the decades following, Forsyth's research helped to transform the way the world understands oral health.

Notes

1. With a decline in federal funding they are looking to boost their revenue from philanthropy.
2. They use a tandem of a scientist-CEO and MBA or MPA-COO model. Dr. Stashenko was a faculty member before becoming director.

La Jolla Institute for Allergy and Immunology

Interviewed: Steve Wilson, COO

Mission: The La Jolla Institute for Allergies & Immunology is dedicated to increasing knowledge and improving human health through studies of the immune system. The essential purpose of the Institute is to expand our understanding of how the immune system works and to discover the causes of immune system disorders. The knowledge gained through our biomedical research can, in turn lead to the prevention, treatment and cure of a wide range of human diseases.

Vision and implementation: The founders of LJI envisioned a unique and dynamic partnership between basic science and applied research, one that would lead to breakthroughs in the understanding of the immune system and improve human health through the development of treatments and cures for immune system disorders. Today this vision is summarized in the motto "Finding cures faster."

What it Does: LJI is one of only a few non-profit biomedical research institutes in the world focused on understanding the immune response to infectious agents and cancers and on advancing progress toward the prevention, treatment and cure of immune system diseases. LJI was recently ranked among the top five molecular biology and genetics research institutions in the world. The Institute currently has over 200 employees, more than half who have doctoral (Ph.D. or M.D.) degrees.

Governance and Staffing: LJI is a 501(c)3 non-profit organization. It has 23 members on its governing board, including three faculty members. Today, the Institute is led by Dr. Mitchell Kronenberg, who was appointed as President/Scientific Director in 2003, and now serves as both President and Chief Scientific Officer. Dr. Kronenberg's vision for the future has included the development of a new research facility to accommodate the Institute's growth, an accompanying expansion of LJI faculty and laboratories, the creation of an Emerging Infectious Disease and Biodefense Center at LJI, and the development of a joint Center for Immunology with UCSD. Steve Wilson serves as Chief Operating Officer. He is responsible for various Institute departments, and planning of systems and initiatives ranging from network/information systems, communications, and biotechnology to institute relations. Before joining LJI as an NIH postdoctoral fellow, Wilson trained in basic medical research, lectured in medical microbiology, and was a network administrator at the University of Arizona's College of Medicine. He is Executive Director of the RNAi Center, Deputy Principal Investigator of the NIH's national Immune Epitope Database and Analysis Program, and holds a B.S.A. and Ph.D. from the University of Arizona.

History: LJI was established in 1988 by a coalition of leaders from academia and industry, including Dr. Makoto Nonaka, the Institute's founding President, and Dr. Kimishige Ishizaka, the Institute's first Scientific Director, who came from Johns Hopkins University. LJI was formed with strong ties to major academic and medical centers, including the University of California, San Diego (UCSD) and The Scripps Research Institute. In 1996, LJI moved from its initial location on Torrey Pines Road in La Jolla to a newly designed and constructed facility on Science Center Drive on the Torrey Pines Mesa. The Institute has had a long-standing

partnership with Kyowa Hakko Kirin Co., Ltd., a leading pharmaceutical company headquartered in Japan.

Finances: Their annual expenses were approximately $52 million in 2013. LJI generated about $34 million in government grant revenue, $12 million in other grant revenue, and other income from royalties, investment income, and other sources.

Observations

1. They operate in a discipline of science, immunology, which is a very active area. When combined with their ability to attract and retain some of the best people, they are in a strong position.
2. They have used strategic partnerships very effectively--- both in originally establishing a relationship with Kirin and more recently with UCSD.
3. They are a growth organization and are rapidly trying ideas.
4. They have made sustained efforts to build a private fundraising program. As part of their current efforts, they are focusing on messaging/branding.
5. They see translation and IP as important largely because of the reputational benefits, not just because of potential revenue generation.

Notes

1. The CEO is the chief scientific officer and an elite scientist. He leads the recruitment of scientists and sets scientific direction.
2. Steve was a postdoc who moved up to running a core facility and eventually COO. His scientific background is immunology.
3. LJI has grown from 100 people in 1997 to 380 currently.
4. They use a broad definition of immunology, including oncology, neurobiology, and other disciplines which interface with immunology.
5. They have 25 principal investigators. They like that number because they can build alignment with that many people. They feel they would start splintering if there were many more. And it would dilute their resources.
6. Some of their success is due to the snowball effect. They attracted good scientists that attracted more good scientists.
7. They worked with multiple branding firms, one of whom came up with the tagline, "life without disease". The tag line prompted internal discussions. It was originally too aspirational for some but is now accepted and used.
8. Part of their current focus on development includes developing the board and bringing in board members from the community, and getting full participation by the board in fundraising.
9. They have raised funds for three new research positions, with a focus on genomics and informatics.
10. They recently signed an affiliation agreement with UCSD. It gives them access to patients for clinical research, as well as financial support. UCSD, which has first-rate science that will facilitate leveraging immunology in other fields, has access to what amounts to a world-class immunology department.

11. Their ideal funding for scientific laboratories involves 70% external sponsorship and 30% discretionary internal funding. That mix provides a good balance of freedom to innovate while getting the validation of external support.
12. They have looked into "program related investments" (venture philanthropy). In the typical deal, the donor might get a return from ventures started with their money. When that return begins, then the transaction is no longer a charitable contribution.
13. For metrics, they track whether their publication rate is improving, and they look at the percentage of publications in high impact journals and secondarily whether the publications are getting cited. They also track where money is going.
14. Faculty turnover has been low.
15. They have been ranked the number 1 research institution at which to work. This is based upon streamlined administration, funding support, and a collegial environment.
16. For faculty-administrative interactions, they have a faculty member assigned to each administrative area. This helps information flow.
17. In the past, they have not accepted much foundation money because it does not yield adequate indirect cost recovery.
18. They have very little endowment support and meet institutional commitments from current operations, including corporate and academic sponsors.
19. For the future they are focused on endowment, faculty retention, and IP.

Mount Desert Island Biological Laboratory

Interviewed: Kevin Strange (MDI BL ED), and Jerilyn Bowers (Director of Development and Public Affairs).

Mission: Its mission is to improve human health and well-being through basic research, education, and development ventures that transform discoveries into cures.

Governance: They have 28 board positions, of which 22 are currently filled. Kevin Strange serves as President. There is a five person executive committee. It was originally a membership organization, though the membership gave up those powers. The faculty scientists are not involved in governance or strategic direction.

Programs and Staffing: They have approximately 65 employees, of which 10 are faculty scientists. Their primary funding comes from NIH contracts.

History: The MDI Biological Laboratory was founded in 1898 as a summer research and education facility that offered access to the rocky Maine coastline and associated species. Originally located elsewhere with a focus on training Tufts students, it incorporated as an independent organization and received a land donation that drew it to Bar Harbor.

MDI Biological Laboratory scientists narrowed their research in the 1920s to focus on important human health issues. Milestone discoveries in kidney function and the health impacts of environmental toxins like DDT and oil were some of the highlights of the work conducted during the 20th century.

In 2000, a senior scientist approaching retirement received NSF funding through MDIBL and became the first full-time research scientist. In 2002, MDIBL received an NIH grant to facilitate biomedical training and capacity building. In 2009, MDIBL hired Kevin Strange as ED. Until that point, previous directors had been four year appointments of individuals whose primary affiliation was elsewhere. Kevin was hired full-time and it was understood that he would write grants in addition to operating MDIBL. The institution is operated almost entirely on NIH funding.

Dr. Strange developed a focus on using comparative anatomy and physiology to study regenerative and aging biology and medicine, which maintains an intellectual thread with the past. Jeri suggested that the relationship with the site was important. While MDI BL still hosts occasional visiting scientists, that is a much smaller part of what it does now.

Financial Model: Their annual budget is around $11 million. They spend about $6 million on research and training, $1.6 million on administration, $770,000 on development and public affairs, $1 million on the dining hall and facilities, and $1.2 million depreciation.

Development: They have four development staff and are hiring a fifth person in communications. They raise about $2 million/year of which about $800,000 is unrestricted donations.

Growth: They felt that MDIBL had no path except to move away from visiting scientists and NSF support. The NIH grants have given them the opportunity to transition to an NIH-funded, soft money institution. They have been very successful with the NIH COBRE and INBRE programs, which are available to states like Maine that do not have a substantial medical research infrastructure. COBRE and INBRE have enabled MDIBL to fund top recruits on pilot awards until they win competitive awards on their own. However, this makes them very dependent upon renewing their NIH grants. Ultimately they hope that private philanthropy will fill the gap.

Observations

1. Meaningful ways to engage the public, including art programs as well as science cafes, have been very important for development.
2. They felt they need to reinvent themselves, moving away from the historic research focus on the comparative biology of non-model systems for human health. As a result they shifted from hosting scientists to staff scientists, as well as shifted focused to a focus on aging and regeneration.
3. Board and CEO alignment is critical.
4. It helps to have a development officer fluent with communicating the science.

Notes

1. They have received considerable support from the state of Maine—grants from multiple rounds of state bond money. They are working on the next round.
2. They hope to increase the number of research faculty from 10 to 16, including adding senior scientists. The primary challenges to adding more faculty are raising the start-up packages through private giving and creating sufficient laboratory space to house the research groups.
3. While Dr. Strange worked on kidney research before moving to MDIBL, his work has emphasized aging and regeneration. This emphasis is based upon his analysis that comparative physiology has a great deal to offer. They have a very strong focus on this area and the messaging reflects that focus. Furthermore, the obvious tie-ins to human health help them with their communications.
4. Like other institutions, they are working on succession planning.
5. Their artist-in-residence program has been really important in helping build their profile. They also run integrated dinner/science programs as well as science cafes.
6. MDIBL hosts lots of conferences, especially that help build reputation and that are related to their research programs.
7. MDIBL is spinning off a tech firm based upon a regeneration discovery; revenue from IP is something they are thinking about.

Salk Institute

Interviewed: Kim Witmer, VP, Jennefer Collins, Academic and Administrative Services, Judy Hodges, Director, Annual and Special Giving, Tyrone Gorden, ED Foundation Relations, Anna-Marie Rooney, Chief Communications Officer

Mission: (from 2007 strategic plan—a new planning process is underway). To undertake transforming research in the biological sciences and to disseminate that knowledge to the scientific community.

At Salk individual scientists engage in basic research for with the aim of making discoveries that will generate knowledge leading to improving the health of humankind. The Institute also vigorously trains young researchers to become independent scientists and future innovators. The faculty and administration believe that curiosity, problem-driven science is the pedestal on which rest the translational applications of science that benefits society.

Vision and implementation: Jonas Salk envisioned the Salk Institute as a scientific Shangri-la where academic governance's main role is to ensure scientific excellence. A Salk community of faculty, scholars, Non-Resident Fellows, staff, administration, and Board of Directors has grown together to carry out Dr. Salk's vision. The faculty's role includes recruitment, promotions, administrating laboratory space, and generally nurturing the cultural values that support productive scholarship. In this strategic plan, the Salk community continues its quest for discovery in the "Salk Way", a unique blend of interactions, camaraderie, vision, a nose for the big questions, and self reliance that characterizes the Salk Institute. This winning formula has kept the Salk Institute a world leader and envy of other scientific institutions.

What it Does: The major study areas are aging and regenerative medicine, cancer biology, immune system biology, metabolism and diabetes, neuroscience and neurological disorders and plant biology.

Governance and Staffing: Salk Institute is a 501(c)3 non-profit organization. It has 25-30 members on its governing board, including three faculty members. Dr. Elizabeth Blackburn, a Nobel Laureate biologist from UC San Francisco became President earlier this year. Salk has a total staff of about 1000 people including about 50 principal investigators (heads of labs). Notably, Salk's top management team—the President, the Vice Presidents and the Senior Vice President—are women.

History: In 1957, Jonas Salk, developer of the first safe and effective polio vaccine, began his quest to fulfill his second dream: create a collaborative environment where researchers could explore the basic principles of life and contemplate the wider implications of their discoveries for the future of humanity. Gifted with 27 acres overlooking the Pacific Ocean by the City of San Diego in 1960, Salk partnered with architect Louis Kahn to design such a research center. He summarized his aesthetic objectives by telling Kahn to "create a facility worthy of a visit by Picasso." Today the resulting facility is indeed regarded as one of the world's great modernist buildings. With financial support from the National Foundation/March of Dimes, the Salk

Institute for Biological Studies opened its doors in 1963. In the mid 1990s, the Institute expanded with two similar buildings between the original structures and North Torrey Pines Road.

Finances: Their annual expenses were approximately $120 million in 2014. Salk generated about $86 million in grant revenue, $46 million in contributions, $10 million in investment income, and $7 million of other revenue. Their investments were $328 million.

Observations

1. They have faced similar struggles in developing a focus that aligns the public's desire for the outcomes of research with the desire of the scientists to focus on scientific discovery itself. The current tag line of "where cures begin" prompted internal conversations about whether it is too applied, though it now has broad support.
2. They focus on having a call to action on all of their advertising and collateral.
3. They regularly report media metrics to the board.
4. They raise a lot of money from foundations. This supports the research but creates structural challenges because it doesn't generate overhead.

Notes

1. They indicated bioinformatics was a current area of focus.
2. They are currently in the midst of a nine month strategic planning process. At a recent faculty retreat they talked about what the big questions are and where the Salk can make a difference. They also involved their Scientific Advisory Board. Communications will be one of the organization units of the strategic planning. They have hired an onside firm—" CFAR- http://www.cfar.com/" to organize the strategic planning..
3. They have a scientific advisory board consisting of non-resident fellows.
4. They have about 44 active labs, down from their historic and desired number of 50-52. The physical space seems to set the upper limit and they indicated that 50 seems right.
5. The original building design, now 50 years old, is flexible in that it provides for large open labs that keep walls to a minimum. The amount of dry space and core space has been increasing.
6. They went through a branding process several years ago. It is a constant challenge to communicate and sell basic science.
7. Salk has not had a scientific director, so it has essentially been 50 independent labs reporting to the director.
8. In terms of recruiting and retaining scientists, they identify differentiators as small size, no teaching, strong faculty, and responsive administrative staff.
9. Salk is a faculty run institution. Under the bylaws three faculty are on the board.
10. Salk is focused on quality—bigger is not better.
11. For metrics they track the H-index, publication rates, publications in top three journals, the number of members of the National Academy of Sciences, HHMI fellows, and funding.
12. They worked with a Los Angeles-based agency—Omelet—to do their branding. It was an 18 month process that led to a new look, new style guide, website, magazine, and collateral. It was more of a fine-tuning of the brand, and led to an elevator speech. They have a "messaging committee" consisting of faculty and board members.

13. They work with Cision, a media tracking service. It also helps them connect to reporters interested in specific types of stories.
14. They report media metrics to the board.
15. Fundraising is one of the primary reasons they invest in communications.
16. Their VP of External Relations oversees three departments, communications, development, and events.
17. Maintaining a 4 star rating on Charity Navigator is important for them. It generates first time gifts as high as $25,000 from people they have not previously connected with.
18. The Board donated 30% of the previous campaign.
19. They do three major sets of events—Explore Salk (when the public visits the facility), Symphony at Salk, and a Music Series.
20. They use the term foundational research instead of basic research.
21. *Huffington Post* drives huge coverage to their website. Other important outlets are Reuters, *Forbes*, *Science Daily* and the *Economist*. The *Economist* is hard to get into, but their board reads it.
22. They try to have a "call to action" on any of their collateral and advertising. There is a "for what" for each piece.
23. They use social media, with a focus on Facebook and Twitter, to amplify messages.
24. They have an education/outreach program that consists of two people. There has been a lot of support for outreach.

San Diego Zoo Global

Interviewed: David Page, Director of Finance; Ted Molter, Chief Marketing Officer; Doug Myers, CEO; Allison Alberts, Chief Conservation and Research Officer; Robin Keith, Innovation, Strategy and Vision; Bob Wiese, Chief Life Sciences Officer; Mark Stewart, Development.

Mission: San Diego Zoo Global is committed to saving species worldwide by uniting their expertise in animal care and conservation science with their dedication to inspiring passion for nature.

Vision: Lead the fight against extinction.

Strategic Priorities:

1. Unite internally and externally, with a laser focus on their cause.
2. Fight against extinction of animal and plant species.
3. Ignite a life-changing passion for wildlife.

What It Does: They operate the San Diego Zoo and the Safari Park. They also operate the San Diego Zoo Institute for Conservation Research that preserves wildlife, banks resources (animals, plants, and seeds), conducts research on disease, conserves and restores habitat, and inspires change, with projects around the world. They operate four field stations (Hawaii, Peru, Cameroon, and Mexico).

Zoo Field Stations: The focus of the Mexican field station is the reintroduction of the Condors into the Sierra de San Pedro Martir. The Cocha Cashu Biological Station in Manu National Park in southeastern Peru is operated as a traditional field station. Established in 1969, the Zoo has been operating the field station since 2011.

The Cameroon field station supports to the Ebo Forest Research Project. The overall goal of the SDZG-EFRP is to secure the population of gorillas, chimpanzees and other endangered primates of the Ebo forest for posterity. The project started in 2002 with the observation by San Diego Zoo researchers of gorillas in 2002.

The focus of the Hawaii facilities is bird conservation. The Hawaii Endangered Bird Conservation Program (HEBCP) is a unique collaboration between the San Diego Zoo Global's Institute for Conservation Research, the U.S. Fish and Wildlife Service, the State of Hawaii Department of Land and Natural Resources Division of Forestry and Wildlife, the U.S Geological Survey Biological Resources Discipline, and private landowners (e.g. Kamehameha Schools). The HEBCP comprises two captive breeding facilities, the Keauhou and Maui Bird Conservation Centers (KBCC and MBCC), and works at a number of field sites around Hawaii. Using intensive propagation and release techniques, the HEBCP aims to re-establish self-sustaining populations of critically endangered birds or augment existing ones. More than 1,000 birds have been successfully raised by the HEBCP since 1993.

Governance and Staffing: San Diego Zoo Global is a not for profit organization that has a 12 person board. Douglas Myers serves as the CEO and President. It has an independent Chairman of the Board. Their leadership team includes a COO, CFO, Chief Development and Membership Officer, Director of the San Diego Zoo, Director of the Safari Park, Chief Conservation and

Research Officer, Chief Life Sciences Officer, a Corporate Director of Animal Health, a Corporate Director of Marketing, Chief Human Resources Officer, and Chief Technology Officer. They have approximately 3,000 employees and 2,000 volunteers.

History: The San Diego Zoo grew out of exotic animal exhibitions abandoned after the 1915 Panama-California Exposition. Dr. Harry M. Wegeforth founded the Zoological Society of San Diego, meeting October 2, 1916. He served as president of the society until 1941. A permanent tract of land in Balboa Park was set aside in August 1921.

The San Diego Zoo was a pioneer in building "cageless" exhibits. Dr. Wegeforth was determined to create moated exhibits from the start, and the first lion area at the San Diego Zoo without enclosing wires opened in 1922. Until the 1960s, admission for children under 16 was free regardless of whether they were accompanied by a paying adult.

They opened the Safari Park in 1972. The zoo's Center for Reproduction of Endangered Species (CRES) was founded in 1975. CRES was renamed the division of Conservation and Research for Endangered Species in 2005 to better reflect its mission. In 2009 CRES was significantly expanded to become the Institute for Conservation Research.

Finances (2014): Their annual expenses are approximately $235 million, broken down as $185 million for operations, including exhibits and husbandry; $21 for million research; and $5 million for education. They generated $93 million from admissions/memberships, $107 million from auxiliary services, $14 million from contributions, $17 million from tax revenue, and $7 million from grants. They have approximately 250,000 member households. Starting in the 1920's the voters adopted a series of property taxes to help fund the Zoo, with the major one in the 1930's.

Key Performance Metrics:

1. Conservation Impact
2. Long-term financial sustainability
3. Levels of member support
4. Levels of conservation project support

Observations

1. They developed a focus on "ending extinction" that flows naturally from their strength with single species work, is simple and easy to remember, and that unites across areas rather than reinforcing silos among conservation, education, and recreation.
2. They have a strong focus on internal alignment and use a fundraising foundation as a way to increase social networks while maintaining a board focused on governance and financial oversight.
3. They put a strong premium on attracting good people and retaining them.
4. They dealt with the same challenge of having a strongly branded name that implied geographic limitations. Their mission is now global and some of their board members now come from out of town.
5. Much of their strategic planning and branding comes across as a process of self-discovery that seems natural in retrospect, but involves substantial exploration and associated pruning.

Finances and Marketing Notes

1. They manage communications with a goal of driving visitation. They are strongly integrated with regional tourism.
2. Their finances are heavily operationally based, with steep fixed costs. The programs for the general public kick off sufficient excess revenue to subsidize conservation activities.
3. They focus on market segregation. Tourists are not price sensitive, whereas the locals are.
4. As a budgeting strategy, they fund special projects from amounts that members pay for "premium" membership levels. The normal membership fee goes into the operating budget.

Strategic Planning and Branding Notes

1. They are always in some phase of strategic planning, with a 3-5 year cycle.
2. They started a formal branding process in 2010, before the current strategic planning cycle.
3. They needed to pull their different brands together. The name San Diego Zoo was well known and a strong brand, but the geographic focus obscured their global relevance.
4. Their focus on ending extinction and animal welfare lets them turn tables on animal rights extremists.
5. A key component of strategic plan is "unite"; it helps create strong internal alignment.
6. One of the advantages of focusing on "ending extinction" is that the previous mission had silos—people tended to focus on one of three areas, recreation, education, and conservation. Now it is clear that each of three areas work together towards a larger outcome.
7. As the developed the current focus on ending extinction, they wanted something simple. They also focused on the insight that people give through organizations as a way of supporting their aspirations and dreams.
8. Their previous focus on conservation was a bit too fuzzy. In addition, the separate missions of education, research and conservation led to organizational silos.
9. A positioning analysis was critical in their strategic planning. They analyzed what they didn't do as well as examining strengths. The focus on single species—ending extinction—as opposed to biodiversity, captures their focus on individual animals and species level conservation.
10. The board "needed to be ready" for the new strategic focus.
11. Even if "end extinction" is aggressive, they can demonstrate successes, including the California Condor and the Lord Howe Island stick insect.
12. The Victoria Zoo in Melbourne had ended up with a similar focus—fighting extinction. For San Diego, their "vision is to be the world's leading zoo-based conservation organisation."
13. Managing concerns about treatment of animals is one of their current areas of focus.
14. Doug suggested that by the time they proposed ending extinction, the board was ready for the idea, whereas 10 years before they weren't. He said, "serve no idea before its time".

Culture Notes

1. They create a corporate culture that genuinely cares about employees. Several times their CEO stressed the importance of hiring the best people. They are proud of the longevity of their employees but expect significant retirements in the next five years.
2. They also focus on communications/alignment. They have internal newsletters and their CEO has an all hands meeting once a year. He also visits the 7 locations three times/year.
3. They focused on not laying people off during the last recession.
4. They also have a focus on all being good story tellers.
5. They spend quite a bit of time visiting other organizations and zoos. They see it as an important opportunity to learn as well as provide leadership in the zoo community.
6. They set up a global academy as a way of training husbandry workers. It is a tool that serves the larger zoo community.

Research and Field Station Notes

1. The research arm has approximately 140 ongoing projects.
2. They are operating a field station in Peru, which they acquired during the previous strategic planning cycle as a way of getting more heavily engaged in conservation. They are involved in managing a large part of Peru because of that station. They are setting strategic priorities for the station and considering opportunities for species conservation.
3. They see training, especially of Peruvians, as a critical function of the field station.
4. The surplus from visits and memberships supports their research program.
5. Science has been a part of the organization since its founding. It stepped forward in the 1970s as an outgrowth of improving breeding. They began investing in postdocs in the late 1980's and that ended up opening a lot of doors. Postdocs were seen as a cost effective way to increase scientific productivity.
6. Their scientists publish. It is not their main priority but they try to get information to the scientific community through peer-reviewed literature.

Governance and Relationship to Fundraising Notes

1. They have a 12 person governing board that is self appointed with a term limit of 15 years. They oversee a $300 million/year budget, so the members either come from academic administration or Fortune 100 companies. Thirty years ago the board was operational, but they made the transition to a strategy focused board.
2. The consultant Jerold Panas (Linzy & Partners) has helped them quite a bit with fundraising, including recommending either a foundation board or increasing the size of the governing board.
3. They have a separate foundation that focuses on fundraising for the zoo. The director of development serves as the president of the board. They set up the foundation board about 10 years ago in a response to the need for more people to help with fundraising, while avoiding increasing the size of the board. That board serves as a feeder for the governing board.
4. The foundation is a separate supporting organization in service to the zoo.
5. Foundation members can serve 3 3-year terms and then have to cycle off for at least a year.

Walking Mountain Science Center

Interviewed: Markian Feduschak (Executive Director), Kim Langmaid (founder, board member, staff member)

Mission: To awaken a sense of wonder and inspire environmental stewardship and sustainability through natural science education. They focus on Eagle County, Colorado.

Governance: They have 23 voting directors and 10 advisory directors. Advisory directors receive all the benefits of being a voting director, but they are not expected to make every meeting and they don't vote. The board meets quarterly. The committees also meet quarterly. The standing committees are Executive, Governance, Development, and Education. The ad-hoc committees are Capital Campaign, Learning Center, and Special Events. Most board members are not Vail residents, but they have ties to the area and a few key board members that live in Vail.

Programs and Staffing: They have four primary groups of programs: science education programs with the schools, community outreach programs, graduate programs and internships, and sustainability. They have approximately 25 permanent staff.

Growth/History: Walking Mountain started as a small non-profit with no seasonal employees operating out of a seasonal building in the mid 1990's. In the early 2000's they were offered a parcel of property on which to develop a campus if they could raise the funds. They hired their ED in 2003. They went into campaign mode around 2006 and raised approximately $11 million, opening their campus in 2011. They are now preparing for another campaign to acquire additional property and meet the growing demand for their sustainability and school programs.

Financial Model: Their total budget is about $2 million and about two-thirds of that is fundraised. All of their programs except the school programs cover their expenses through fees and contracts. For example, their sustainability programs are partly funded by the town of Vail. Their public outreach programs are funded in part by the USFS and Vail Resorts. For the school programs, they charge about $15/person/day, though it costs $80-$100. They fundraise the gap.

Development: They have five full-time development folks (VP of Development, Annual Gifts Officer, Marketing Manager, Director of Planned and Major Gifts, Education Grants Officer and Special Events Coordinator). Their major donors are all connected to Vail through property ownership. Most are not residents. They are typically second howeowners who want to give back to the community.

Most of their donors have a:

1. Belief in education.
2. Belief in stewardship.
3. Love of Vail.

Growth: They are a growth organization and have a culture that is comfortable with risk. As they build programs they hire people to bring in resources. They also manage the risk.

Observations

1. Walking Mountains is aspirational and mission-driven—focused on the impacts they are having with local school kids. They have a relatively simple mission statement and are outwardly focused.
2. They have a strong focus on why their programs for children are unique, as well as program quality.
3. They have spent a great deal of time building alignment within the organization.
4. They are aggressive with development. They have a significant number of fundraising staff and used a local development consultant with substantial campaign experience to map out their campaign. While they are a relatively new organization, they have gone through a rebranding process which was valuable.

Notes

1. Hired a development consultant who put together a campaign plan. He also put together a business plan. The plans were very outcome oriented.
2. They hired a development director who was supportive of the mission.
3. They updated their strategic plan when they opened the doors to a new facility in 2011.
4. Their Board President at the time was very focused on alignment (mission, vision, and values) as well as building a good culture on the Board. They used the "Triple Crown Leadership" approach to build the alignment (mission, values, vision, goals, strategy, people, process, metrics, actions, feedback).
5. Kim has played an important role in providing vision for the organization, including anchoring it as it has gone through changes.
6. They conducted an extensive rebranding exercise in 2010, about a year before they opened the new facilities. The rebranding involving the look, feel, fonts, websites, and design templates, so that it was all consistent and looked professional.
8. They recently hired a VP of Development. They did not outsource the process.
9. They hire people to bring in resources
10. Housing is a real problem.

Whitehead Institute for Biomedical Research

Participants: Martin Mullins (Vice-President/COO), and Matt Fearer (Director of Communications and Public Affairs)

Mission: Whitehead Institute is a world-renowned non-profit research institution dedicated to improving human health through basic biomedical research. By cultivating a deeply collaborative culture and enabling the pursuit of bold, creative inquiry, Whitehead fosters paradigm-shifting scientific achievement.

History: Whitehead grew from a desire of founder Jack Whitehead to establish a world-renowned, self-governed research institute dedicated to improving human health through basic biomedical science. He scoured the country for potential partners, believing the institute should be affiliated with a leading research university. Eventually he contacted Nobel Laureate David Baltimore and the Institute started an affiliation with MIT in 1982. By 1990, the Institute for Scientific Information in Philadelphia identified Whitehead as the top research institution in the world in molecular biology and genetics based on the impact of its scientific publications.

Notes

1. Their fundraising is focused on theme-based initiatives, (e.g., cancer) rather than on a capital campaign.
2. They evaluate institutional performance based upon overall reputation of faculty, number of publications in top journals, citation rates, the number of national academy members and Howard Hughes investigators, press coverage, and financial measures (credit rating, endowment performance, standard financial measures from Moody's), and financial performance against budget on a fairly granular basis.
3. They strongly emphasize PI-driven science. NIH funding shifted from PI-driven to big science about 10 years ago, but has shifted back somewhat in the last three years.
4. Reduced NIH funding is a challenge.
5. MIT and the Whitehead are woven together. Whitehead is financially independent, but their investigators are MIT faculty members and participate in MIT governance and act in every way as MIT faculty.
6. They focus on media for a range of reasons, including board and donor engagement.
7. They maintain a commitment to science education and outreach by offering programs meant to enhance science teaching and learning for the entire community.
8. They maintain the tandem of a scientist-President and COO/VP- business person model. As one of the scientists the President serves a five year term. The President establishes an agreed upon five year plan with the board and then works with the COO to achieve that five year plan
9. They spend a great deal of time on faculty hires. It is one of the biggest decisions they make.

Wyss Institute for Biologically Inspired Engineering

Interviewed: P. Ayis Antoniou (Administrative Director)

Mission: The Wyss (pronounced "Veese") Institute for Biologically Inspired Engineering uses Nature's design principles to develop bioinspired materials and devices that will transform medicine and create a more sustainable world. By emulating Nature's principles for self-organizing and self-regulating, Wyss researchers are developing innovative new engineering solutions for healthcare, energy, architecture, robotics, and manufacturing. These technologies are translated into commercial products and therapies through collaborations with clinical investigators, corporate alliances, and new start-ups.

History: The idea for the Wyss Institute was seeded in 2005, when the Provost of Harvard University challenged its faculty to envision the future of Bioengineering across the entire university. In January 2009, Harvard received the largest philanthropic gift in its history -- $125 million -- from Hansjörg Wyss to make this vision a reality by launching the Wyss Institute for Biologically Inspired Engineering. In 2013, Mr. Wyss renewed his gift for another 5 years.

What it does: Working as an alliance among Harvard's Schools of Medicine, Engineering, and Arts & Sciences, and in partnership with Beth Israel Deaconess Medical Center, Boston Children's Hospital, Brigham and Women's Hospital, Dana Farber Cancer Institute, Massachusetts General Hospital, the University of Massachusetts Medical School, Spaulding Rehabilitation Hospital, Tufts University, MIT, Boston University, Charité Hospital, and the University of Zurich, the Institute crosses barriers to engage in high-risk research that leads to transformative technological breakthroughs.

Notes

1. They offer scientists at Harvard and its affiliates three main things: integration of research and early product development (path towards commercialization), enabling transdisciplinary research and collaboration across institutions, and greater freedom to take risks with flexible funding for new research directions.
2. They have found that barriers to commercialization/impact are not in the science/innovation stage where academia excels, but in moving innovations from the academic bench through early product development and technology de-risking, including understanding end user needs and problems.
3. They assess the success of the institute based upon scientific productivity and leadership (evaluated by an external scientific advisory board), the strength of the Intellectual Property portfolio they create, the number of licensing deals and startups from ideas generated at the institute, and technologies being productized or used.
4. A novel element of the Institute is the collaborating agreement with its partner institutions, which lowers the barriers for people and ideas to flow between the collaborating institutions and addresses a thorny issue in technology translation, namely the challenge of negotiating IP agreements among institutions.
5. They focus on impact. Commercialization and philanthropy are just two components of a financial model aimed at bridging the gap between academia and industry in order to bring innovation out of the labs and into the world.

6. They have created a process for surrounding scientists with technical, product development and commercialization personnel that collaborate with faculty to identify ideas which might have the greatest impact, develop and review projects, guide the de-risking of ideas within the context of the market place, and maintain continuity of projects, as young scientists move from institution to institution following the academic stages of their career. To bring domain expertise into the projects, they have resident entrepreneurs, who work with the scientist and engineers to figure out the best way to bring technologies to the market. Scientists are given more opportunities to take risks and minimize the fear of failure. Faculty and fellows are expected to help work with the product development and business development teams, but the presence of these teams minimizes the time demands for their involvement.
7. They encourage experimentation and accept failure as part of the innovation process, both with the science and how they operate institutionally.