

# **Leadership Development Priorities to Advance Undergraduate Life Science Education Reform**

*A Report from the AIBS Faculty Leadership Development Synthesis Meeting, April 2014*

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## **Introduction**

There is a strong consensus that undergraduate life science education needs to reflect the accelerating rate of scientific discovery, the development of new research tools, innovations in pedagogical approaches to instruction, and research insights into how people learn. Our undergraduate programs must engage and inspire learners to become part of a future life sciences workforce that is representative of our diverse community and, therefore, prepared to innovatively address the complex challenges facing our modern society. Undergraduate students taking life science courses should experience the dynamic nature and process of science, gain an understanding of core biological concepts, and increase their ability to use biological knowledge and the scientific process in order to make informed decisions and solve real-world problems.

Although this may seem self-evident—especially given the suite of recent report recommendations—new initiatives, programs, and requests for proposals seeking innovative ways to transform higher education will need to prioritize a broader and more integrative perspective across the biological/life sciences. This perspective will need to be grounded in a holistically representative and progressively developmental vision contributing to the fullest breadth and depth of the biological/life sciences. This approach will require not only new efforts in our approach to teaching and learning but also a renewed emphasis on the development of leadership capacities and dispositions. Academic leadership coming from all fronts, not just those with administrative positions, will be critical in meeting the challenges that we face in the coming years.

The Education Committee of the American Institute of Biological Sciences (AIBS) recommended that the organization focus its education efforts on supporting those in leadership positions who are responsible for transforming life science education in higher education. Although there are many leadership development programs available, the Committee believed much more could be done specifically to help individuals and teams develop their abilities and capacities to describe a forward trajectory, align their efforts, and commit to improved life science education programs for their students.

Accordingly, beginning in 2012, the AIBS Education Committee, led by Chair Muriel Poston, engaged in a needs assessment about faculty leadership development through a series of interviews, two surveys, and conversations with individuals involved in higher education reform. The Committee's work culminated in the organization of a synthesis meeting in April 2014 supported by the Howard Hughes Medical Institute (HHMI), which shares a common concern about the future of leadership in life science undergraduate education.

## **Synthesis Meeting**

A subgroup of the AIBS Education Committee extended invitations to individuals with experience as leaders in higher education and/or expertise in leadership development to participate in a multiday

synthesis meeting to explore the leadership needs of higher education. The intended outcomes of the meeting were to

1. Develop a shared conceptual understanding about leadership development for change in undergraduate life science education that will be described and shared with the community.
2. Identify mechanisms and/or questions that need to be answered in order to increase the capacity for leadership development in undergraduate life science education.

Although AIBS organized the meeting, the resulting outcomes were not expected to inform only AIBS's future work. The scope and complexity of the challenges involved in increasing leadership capacity to improve the life sciences is quite large. AIBS recognized that no single organization would be able to take on this issue by itself. Therefore, the meeting organizers envisioned that the meeting outcomes would be shared with the broader life sciences community and that members of that community would be encouraged to consider how they can contribute to addressing the challenges. AIBS, in turn, planned to identify which pieces of the challenge it could tackle, on the basis of alignment with organizational mission and availability of resources. Here, we report on the meeting process and outcomes to share what we heard from the community as a whole and to explain how what we learned will inform AIBS's future work.

### **Meeting Process and Overview**

Twenty-five individuals participated in the meeting (see the appendix for a full list of participants), along with three graduate students and one postdoctoral scholar, who recorded the thoughts, ideas, and priorities shared by the participants throughout the meeting. The meeting facilitator encouraged participants to think broadly and boldly about the challenges and solutions.

During the first part of the meeting, the participants engaged in constructive dialogue and exploration of the need for leadership to develop a representative, engaged, and well-prepared workforce that approaches science as a social process; the challenges related to the current landscape of higher education and the sciences in transition; concepts of leadership and leadership development, including the need for academia to foster shared responsibility; the results from AIBS's yearlong discovery process; and gaps in leadership and leadership processes (including barriers that need to be overcome to address them).

Perspectives from participants' discussions, individual work, and breakouts yielded a significant amount of qualitative data that was examined formatively during the meeting through a constant comparative analysis by the facilitator and organizers, allowing for a set of priorities to emerge naturally. Through this organic process, the participants identified the following needs:

- 1) Valuing diverse pathways and identities
- 2) Articulating and understanding leadership in the life sciences
- 3) Developing and prioritizing incentives and rewards structures for leadership
- 4) Developing tools and capacity in faculty
- 5) Developing tools, dispositions, and capacity in students

A sixth area of need—bridging silos and building collaborations—was established as a binding connection among the previous five.

During the second part of the meeting, after the presentation of these as the emergent needs from the opening discussions, the participants were engaged in an active group process to identify inclusive, innovative initiatives (with both short- and long-term timelines) that aligned with and further defined the needs as priorities or areas for action. Finally, the participants self-selected into working groups to more clearly define a set of outcomes and evidence of impact.

## Outcomes

The meeting discussions further affirmed that, if we are to achieve our envisioned future of undergraduate biology education, the life sciences in higher education leadership culture needs to be inclusive, networked, and collective. Going forward, we must place significant value on leadership as a way of thinking and acting that equitably empowers the diverse populations within the biological sciences. A new culture becomes possible when the life sciences community as a whole embraces shared responsibility grounded in action, employs reward structures that recognize those who take risks and embody innovative practice, and secures commitments at all levels to adopt ownership of challenges and develop consensus for adaptive solutions.

The foundation for achieving this new culture lies within the overarching priority and critical need identified by the participants: *bridging of silos and establishing networks of collaboration*. This was identified as overarching because of its connective nature and space for individual perspectives aimed at advancing collective efforts. Included within this is recognition of the need to create spaces and opportunities to work with others on and off campus, share and exchange innovations, talk across disciplines, and find ways to “create new turf.” These practices cut across all other priority areas and would create opportunities for significant advancement of the field. It was recognized, however, that they require high emotional intelligence and a collective leadership mindset—and therefore, another area for strategic intervention is development of noncognitive skills within the academic life sciences community.

Through their group work, the participants also developed specific examples of strategies and results within each of five other priority areas that would help achieve a shift in the leadership culture of life science higher education. The following priorities and corresponding suggested strategies might serve as a starting point for individuals and organizations wishing to contribute to the collective work.

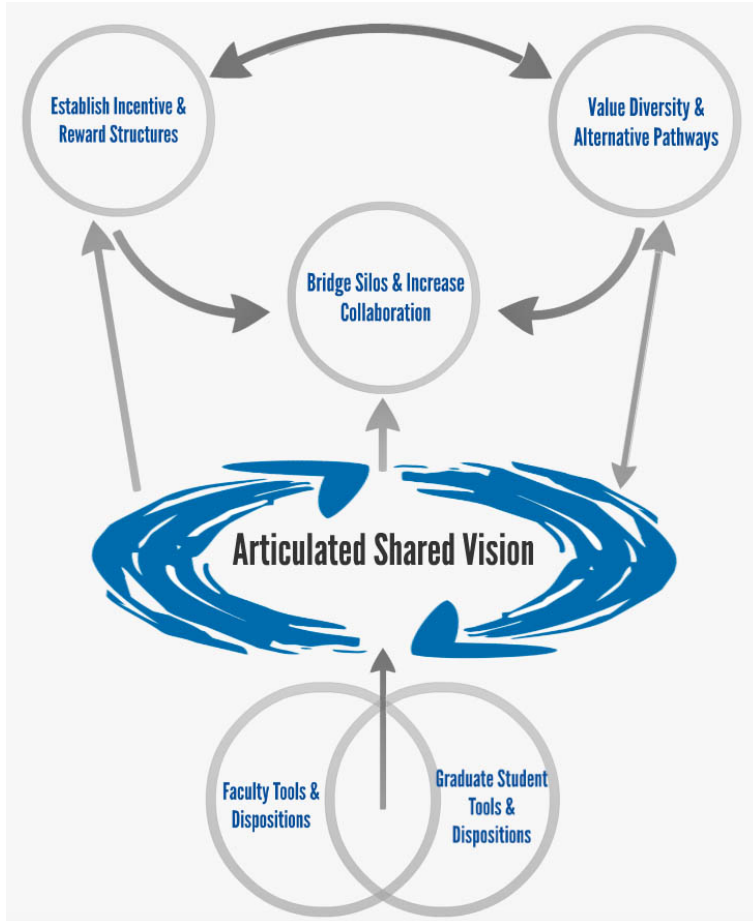
1. *Value Diverse Pathways and Identities*. This is essential to the advancement of life science leadership in general and acts as a foundational platform for the other identified outcomes. Specifically, this priority includes facilitating cultural change by ensuring that stakeholders in the life sciences community value and respect cognitive, cultural, and experiential diversity. This idea is inherently grounded in the perspective that science is enriched by diversity and that diversity leads to innovation. Strategies for achieving this kind of cultural change include: creation of rubrics that can be used for hiring, promotion, tenure; departmental reviews that include a component on inclusiveness; resource allocation that accounts for diverse faculty agendas; awards and recognition structures for diverse backgrounds and trajectories; and identification of model programs that are honored through professional societies.
2. *Define and Articulate a Vision of Leadership in Life Sciences Education*. Although meeting participants significantly advanced the conversation regarding the types of leadership needed to support transformation in undergraduate life sciences education, there was a recognized need to more clearly define and articulate a vision for the broader community. One such effort might include drafting a whitepaper and calling for broader input regarding field-specific needs for leadership-relevant knowledge, skills, dispositions, and capacities, as well as envisioning and describing a culture that supports the development of these. A definition will ideally be inclusive of all those who play a role in leading change and explain why there is a need to expand our collective understanding of leadership. It was clear to the participants that the sciences are in a rapid state of dynamic change and that we need an approach to leadership that recognizes these complex challenges and values diversity (perspectives, cultures, etc.).

Leadership capable of innovation and advancing the field will also need to encompass perspectives and attitudes that embrace and promote loyalty to organizations, institutions, and communities, as well as to our academic disciplines. A whitepaper must describe the consequences of not taking action to foster a new leadership culture in higher education and call out the specific priority areas and actions needed. Once the proposed whitepaper is published, it is recommended that a conference be convened to bring together individuals and organizations committed to this new leadership paradigm to collaborate on specific priority areas (such as those listed below) in order to make progress toward understanding our collective impact.

3. *Match Incentives and Rewards for Leadership with the Value Institutions Should Place on It.* Higher education policies must be revised across institutional designations (i.e., public, private, research, etc.) to promote cultures that reward and value inclusive, networked, collective leadership; embrace the perspectives of people at all levels within our organizations, as well as external stakeholders; and share responsibility for initiatives that extend our field at the organizational, institutional, and interdisciplinary levels (defined broadly here as more than administrative positions alone). This could be accomplished by identifying best practices and conceptual models at institutions that serve as exemplars for the biological sciences community. Specifically, promotion and tenure documents and processes, along with annual reviews and related evidence, should be examined at institutions that value leadership. It is recommended that a clearinghouse for sharing examples and practices regarding critical issues be developed. For example, given that institutions are seeking other sources of funding as budgets shrink and that alumni are excellent sources of bequests and donations, can institutions connect stories about impactful student experiences that relay the value of teaching and the role of leadership back to interested alumni? These stories can be shared with upper administration to illustrate the value of leadership for the institutional mission.
4. *Develop Graduate Students' Skills, Dispositions, and Capacity to Lead.* There is a need to increase and improve graduate student professional development, particularly in the “noncognitive” areas related to communication and interpersonal leadership competencies. This could be done in collaboration with professional societies and other organizations. It might be valuable to create a “toolbox” of what is already available (activities, models, organizations, opportunities, etc.) and find, adapt, or create models for training. Professional societies could be approached to administer surveys and determine the developmental needs of their graduate student populations. This could lead to mini-workshops at societies’ annual meetings aimed at raising graduate student awareness of opportunities and connecting them to larger entities or events (e.g., CIRT, SACNAS, etc.). This could (and probably should) also be expanded to include professional development opportunities for postdoctoral associates.
5. *Provide Faculty, Educators, and Others Responsible for Leading Systemic Change with Tools and Resources to Develop Leadership Capacity within Themselves and Others.* There is a need to clarify competency expectations and highlight or catalog existing leadership development programs and resources (and/or develop new ones). It is intended that individuals responsible for leading change who use such resources and programs will be empowered to take risks and support those around them in adopting ownership of challenges. They will also be better equipped to develop consensus for adaptive solutions, and learn through innovation and reflection. A list of programs should be created that includes information about programmatic impact and opportunities for supported practice. Specific faculty groups can be targeted and connected to developmental opportunities, resources, and experiences through professional societies, as well as national programs and networks such as the Partnership for Undergraduate

Life Sciences Education, Project Kaleidoscope, and the National Academies Scientific Teaching Alliance.

The priority areas together form the basis of a conceptual framework that can be used to help inform future initiatives. The following figure depicts the emergent concept map conveying the holistic ideas aimed at enhancing leadership in across biological and life sciences. This framework was developed by the participants at the meeting and garnered significant support.



**Figure 1:** *Developmental Model for Field Advancement.*

The model (figure 1) is vertically progressive, establishing a foundation within faculty and graduate student development. This developmental foundation would provide shared or common experiences and skills that allow for the articulation of an actionable shared vision by those in the life sciences. This shared vision would be continually assessed and revised on the basis of the needs of the field and its stakeholders (represented by the circular arrows following one another). In other words, the shared vision would be inclusive of an incentive and reward structure that values diversity and alternative pathways. The emergent understanding and appreciation of diversity and alternative pathways reaffirms the incentive and reward structure, while providing considerations for the shared vision, as depicted by the two-way arrows. Finally, bridges are established among silos as collaboration grounded in the diversity of the field and its stakeholders is prioritized. The incentive and reward structure further validates this priority.

## **Next Steps**

The list of actionable initiatives that emerged from the April 2014 AIBS Meeting was shared with the meeting participants in June. Some specific initiatives included:

- Writing a whitepaper articulating leadership in life sciences
- Writing a “value of diversity” paper
- Developing and prioritizing incentives and rewards structures for leadership
- Creating a clearinghouse of faculty leadership development programs and their goals
- Developing a “toolkit” for graduate student leadership development and sharing it with professional societies

Participants were invited to indicate their interests and areas of commitment, if they had not already done so, as well as to let us know about their commitment to new initiatives. Some individuals are moving forward with specific items on their own, while others asked simply to be kept updated about AIBS’s progress.

As noted during the meeting, although AIBS is committed to building leadership capacity in the life sciences, the organization will not be able to tackle all of the priorities identified and implement all of the strategies described by meeting participants. Shifting the leadership culture in the life sciences is a highly complex issue that requires participation by multiple stakeholders in the community and collective action toward the named goal. We will use the identified priorities and list of actionable initiatives during our internal conversations to determine where and how AIBS can most effectively make an impact. Ideally, we envision developing a program grounded in the outcomes of this meeting, based on results from its surveys of the community, and informed by other AIBS research about the challenges facing the biology community and leadership in biology ([www.aibs.org/about-aibs/leadership\\_in\\_biology\\_program.html](http://www.aibs.org/about-aibs/leadership_in_biology_program.html)). During this process, AIBS will seek out organizations and individuals as collaborators who are both committed to our shared vision and interested in investing in its realization.

**APPENDIX:  
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