

National Science Foundation
Directorate for Biological Sciences

Advisory Committee (AC) Meeting
May 11-12, 2022
Virtual Meeting

Summary Minutes

BIO AC Members in Attendance:

Dr. Suzanne Barbour (5/12)	Dr. Michael Ibba (Chair)	Dr. Scott R. Santos
Dr. Henry L. Bart Jr.	Dr. C. Robertson McClung	Dr. Paul Turner
Dr. Barbara Beltz	Dr. B Gail McLean	Dr. Maria Uriarte
Dr. Thomas Daniel	Dr. Gretchen North	Dr. Kennedy S. Wekesa
Dr. Erich Grotewold	Dr. Maria Pellegrini	

Wednesday, May 11, 2022

Dr. Joanne Tornow, Assistant Director (AD) for BIO, convened the open session of the meeting at 10:01 AM EDT by welcoming the AC members, NSF staff, and guests.

Ms. Montona Futrell-Griggs, Staff Associate for the Office of the Assistant Director (OAD) for Biological Sciences, reminded attendants of the FACA rules and NSF virtual public meeting policies.

Dr. Michael Ibba, AC Chair, provided virtual meeting instructions and led the introduction of the AC members and senior NSF staff present at the meeting.

The AC unanimously approved the minutes of the November 2021 AC meeting without changes.

BIO Update – *Dr. Joanne Tornow, Assistant Director for Biological Sciences*

Dr. Tornow provided an update on BIO activities since the previous meeting. Topics included recent BIO staff changes; budgetary updates; new and established programmatic activity updates; information about NSF's new Directorate for Technology, Innovation and Partnerships (TIP); and opportunities for use-inspired research in the biological sciences. Dr. Tornow answered questions from the AC on use-inspired research and how the BIO directorate will partner with TIP to fund this research. Dr. Tornow also responded to questions about international partnerships and workforce development. The AC expressed interest in learning more about the success of BIO initiatives such as Leading Culture Change Through Professional Societies of Biology (BIO-LEAPS) and Research and Mentoring for Postbaccalaureates in Biological Sciences (RaMP), both of which are new solicitations aimed at broadening participating in biology.

Use-inspired Research: Accelerating – Doug Maughan, Section Head, Technology, Innovation and Partnerships/Innovation and Technology Ecosystems

Dr. Maughan began with an overview of TIP and its goal to advance use-inspired and translational research in all fields of science and engineering. TIP consists of three divisions; Fostering Innovation and Technology Ecosystems (Convergence Accelerator); Establishing Translation Pathways, which funds The National Science Foundation's Innovation Corps (I-Corps); and Partnering to Engage the Nation's Diverse Talent (launching in FY23). Dr. Maughan described the Convergence Accelerator program, which aims to create a new innovation model that expands and diversifies multidisciplinary teams and partnerships to include academia, industry, non-profits, government, and other sectors to deliver solutions that have a national societal impact. Dr. Maughan explained the current program model and discussed several tracks that align with biological sciences. He answered questions from the AC members on the current program model and how it is targeting involvement from smaller corporations and institutions and how it is engaging in strategic outreach to underrepresented communities. The AC members had questions over the fast timeline as well as the challenges associated with building collaborators between scientists and industry. Dr. Maughan stated TIP is working to conduct surveys and collect data metrics to address these questions and hopes to have quantitative data as the program progresses.

Use-inspired Research: Industry partnerships - Theresa Good, Division Director, Molecular and Cellular Biosciences (MCB); Chair, Bioeconomy Coordinating Committee; Clifford Weil, Program Director, BIO/MCB; Christina Paine, Program Director, Directorate for Engineering/Chemical, Bioengineering, Environmental and Transport Systems; Stephen DiFazio, Program Director (BIO/MCB)

Dr. Good gave a brief overview of the session and then introduced the speakers to describe three recent workshops sponsored by the NSF cross-directorate Bioeconomy Coordinating Committee on societal challenges of interest to academic and industry researchers. Dr. Weil discussed the workshop on Feeding the Planet Sustainably. The workshop focused on the need to feed densely populated city centers with dwindling resources and to foster open mindedness around new foods, crops, and meat substitutes. Dr. Paine discussed the workshop on a World Without Waste: A Circular Bioeconomy. This workshop focused on a need to achieve a zero-waste innovative sustainable circular economy, while facing challenges such as limits on biological systems, knowledge gaps, costs, and an insufficient waste collection infrastructure. Dr. DiFazio discussed the third workshop, A Biotechnology Ecosystem to Mitigate Climate Change. This workshop focused on how biotechnology can help to mitigate climate change by enhancing the adaptation, resilience, preservation, and restoration of natural and managed ecosystems. The AC members asked questions about the challenges of working with industry, the scope of these efforts to include international partners and those underrepresented in both academia and industry, and behavioral changes needed in society. Dr. Good replied to the last topic, noting an additional workshop that was held, which focused on societal aspects of how people engage with new technological developments. The AC members were interested in learning more about the outcomes of this workshop.

Use-inspired Research: Workforce development - Celeste Carter, Program Director, Directorate for Education and Human Resources (EHR)/Division of Undergraduate Education; Sonja Montas-Hunter, Program Director, EHR/HRD; Jeremy Guinn, Program Director, EHR/HRD; and Pat Soranno,

Division Director, BIO/Division of Biological Infrastructure (DBI)

Dr. Carter kicked off this session with a discussion about the Advanced Technological Education (ATE) program, whose goal is to provide opportunities for community college students to develop skills for working in industry and to reskill the current workforce as needs for new skills evolve. Dr. Montas-Hunter provided information on NSF's Hispanic Serving Institution (HSI) program, touching on a program called SomosSTEM which has developed seven Course-Based Undergraduate Research Experience (CURE) modules. Dr. Guinn described two other NSF programs: the Tribal Colleges and Universities Program (TCUP) and Historically Black Colleges and Universities (HBCU-UP), programs targeting underrepresented groups and which include research opportunities to build community partnerships and increase workforce development. The AC members were supportive of these efforts and noted the need for accompanying investments to ensure sufficient access to updated equipment at non R-1 institutions in order to better prepare the scientists working in these labs. Dr. Soranno continued discussions of workforce development with direct relation to programs in BIO, specifically in the Human Resources cluster of DBI, aimed at workforce development at several stages of the scientific career path. She answered questions from the BIO AC members on the future of BIO's programs, concerns about balancing the cost of CUREs against their benefit to students, and challenges of bringing together minority-serving institutions with research-intensive institutions to address shared goals.

Preparation for visit with Office of the Director (OD) leadership - Michael Ibba, AC Chair

Dr. Ibba led the discussion on talking points for the meeting with OD leadership. Topics were based on the day's discussions, and roles as discussion leads were assigned.

Meeting with OD leadership – Karen Marrongelle, Chief Operating Officer, and Brian Stone, Chief of Staff

Dr. Tornow introduced Dr. Karen Marrongelle and Mr. Brian Stone. Dr. Marrongelle expressed her gratitude to the AC for their service on the BIO Advisory Committee and conveyed the Director's appreciation. The AC provided updates on their discussions of the Convergence Accelerator (CA) program, including: the degree of readiness in the biological sciences research community for engaging in use-inspired research; the regional diversity of CA and TIP programming; partnerships among industry and different groups of scientists, and associated challenges thereof; workforce development and capacity building; impact of COVID-19 on the scientific enterprise and the associated long recovery; and the role of CUREs. AC member Dr. Turner noted a generational change in interests among undergraduate students, characterized by a shift towards problem-solving in science with a better insight and motivation. Dr. Marrongelle noted that students now are accessing information in increasingly sophisticated ways, seem less interested in traditional boundaries, and have an interdisciplinary, multidisciplinary curiosity. AC member Dr. Uriarte noted that students are considering broader impacts from the beginning of their projects and the outreach they are doing is astonishing; she encouraged NSF to continue to support these efforts. Dr. Marrongelle reiterated her appreciation for the AC's work. Drs. Tornow and Ibba concluded the session by thanking Dr. Marrongelle and Mr. Stone for their visit.

Report from Office of Integrative Activities (OIA) – Alicia Knoedler, Office Head, OIA

Dr. Tornow welcomed and introduced Dr. Alicia Knoedler. Dr. Knoedler provided an update on activities

in OIA including those of the Committee for Equal Opportunities in Science and Engineering (CEOSE), which OIA oversees. She discussed CEOSE thematic reports, including the most recent report (2019-2020), “Making the Invisible Visible Bold Leadership Actions”, and activities that have stemmed from the recommendations in the last four reports. Dr. Knoedler detailed key aspects of the 2019-2020 Report, such as statistics incorporated and action items identified. A recent NSF initiative that grew from a response to a CEOSE recommendation is the inclusion of the NSF Growing Research Access for Nationally Transformative Equity and Diversity (GRANTED) program in the FY 2023 Budget Request. One goal of this program is to enhance support for minority-serving institutions to mitigate the barriers to competitiveness at underserved institutions within the Nation’s research enterprise. AC members expressed their enthusiasm for the GRANTED program. Dr. Knoedler answered questions related to sustained research support infrastructure in Puerto Rico, NSF’s success at moving the needle for broadening participation, the importance of recognizing the differences in minority serving institutions, and retention of research support positions in places where they are most needed. Dr. Tornow concluded the session by thanking Dr. Knoedler.

Dr. Tornow adjourned the meeting at 4:57 PM EDT.

Thursday, May 12, 2022

Dr. Tornow reconvened the meeting at 10:01 AM EDT.

BIO portfolio analysis: Standard metrics - Brent Miller, Science Advisor, BIO/Office of the Assistant Director

Dr. Miller provided an update on the impact of proposal submissions in BIO following the elimination of deadlines in BIO core programs. Upon the advice of a BIO AC subcommittee, impacts have been assessed in four categories: proposal submission statistics, principal investigator demographics, institution demographics, and merit review outcomes. Dr. Miller presented data for each category, which showed consistency in all categories over the four-year span and noted no negative impacts with the elimination of deadlines. Dr. Miller responded to questions from AC members about additional data metrics such as dwell time and average award sizes. Dr. Malcomber responded to a question about difficulties holding panels in a no-deadline environment and how to encourage PIs to provide missing demographic data when submitting a proposal. Dr. Tornow responded to questions about the need to update gender categories, noting that whereas this has been discussed at NSF, options for NSF systems are limited by what is allowed at the Federal level.

Building the Bridge from Basic to Use-inspired Research on Climate Change - Stephanie Hampton, Division Director, BIO/Division of Environmental Biology

Dr. Hampton detailed several programs that BIO has recently launched to address climate change and clean energy. She spoke about a new partnership with the Paul G. Allen Family Foundation that will help to close the gap and create greater synergy between basic research and conservation action. There is also a new Industry University Cooperative Research Center, called the Wildfire Interdisciplinary Research Center (WIRC), which is funded in partnership between BIO and the Directorate for Geosciences (GEO) and is designed to provide better tools and policies to the community and industry stakeholders. Dr. Hampton concluded her remarks by touching on several of the workshops and programs discussed in the previous day’s session. The AC members were impressed with the breadth of areas BIO is covering but

had several questions such as the involvement of smaller or economically challenged communities, monetizing these areas to get buy-in from larger industry partners, and assessing risk.

Long-Term Ecological Research (LTER) Decadal Review: 40 Years - *Matthew Church, Flathead Lake Biological Station, University of Montana; LTER 40 Year Review Committee Chair*

Dr. Church gave an update of the fourth decadal review of the LTER program, in which the LTER subcommittee reported on the most recent 10 years of the 40-year program, noting strengths and weaknesses and providing recommendations for the next decade. Top recommendations included opportunities to offer solutions to human-driven alterations of ecosystems and their life-support functions and to create relationships with local communities to enable progress towards increasing diversity, equity, and inclusion. AC member Dr. North commended the subcommittee for their dedication to this review and the amount of interaction that occurred between the committee, LTER site members, and principle investigators. The discussion that followed focused on the challenges in retaining veteran researchers while bringing on new ones, engaging minority students, and tracking student involvement in the network. Drs. Tornow and Hampton thanked the subcommittee for their work, and the AC unanimously approved the posting of the report.

Report from the Advisory Committee for Environmental Research and Education (AC-ERE) - *Diane Pataki, School of Sustainability, Arizona State University; Member, AC-ERE*

Dr. Pataki presented the most recent report from the AC-ERE. Most notable was an update on the U.S. Global Change Research Program (USGCRP) which is leading the first National Nature Assessment. Dr. Pataki also provided updates on two white papers: the first aims to define engaged research for advancing discovery and societal impacts in environmental research and education; the second will examine how “green” innovations in nature and environmental research can be advanced at NSF via TIP and other programs. Dr. Pataki answered questions from the AC members on measuring the impacts of AC-ERE white papers and how programs such as CUREs or increased access to online education might be integrated into environmental education efforts.

Recap and Discussion of Topics for Fall 2022 Meeting - *Michael Ibba, AC Chair*

Dr. Tornow requested the AC members consider topics of interest for the next AC meeting. Dr. Ibba noted that the next AC meeting will include COV reviews from IOS and MCB. Other topics for consideration included more information about how the Natural Nature Assessment might intersect with BIO programs on climate change; progress reports on new BIO programs; continued discussion about strategic partnerships; increasing diversity, equity, and inclusion; and lessons learned from the pandemic.

Dr. Tornow adjourned the meeting at 12:57 PM EDT.