PROJECT SUMMARY

Overview:

Building a diverse and inclusive STEM workforce is a goal shared by many, including professional scientific societies. While these organizations have common goals and objectives focused on inclusion and diversity, efforts to understand effective interventions leading to increased participation of underrepresented minorities (URMs) in their scientific disciplines remain isolated. The URM STEM community would benefit from having a shared knowledge and unified voice across disciplines to help community members establish effective ways to coordinate collective efforts to address the needs of minority scientists, thus improving the efficiency and dissemination of URM-serving programs. To fill this gap, we propose the creation of the Alliance of Scientific Societies for the Development of the Next Generation of Scientists (herein referred to as the Alliance). As a first step to create this Alliance, we propose a three-meeting conference series that would convene the Committees for Diversity and Minorities Affairs Committees (MACs) and society leadership from many professional/scientific societies and other stakeholders that advocate for the diversification of our STEM workforce. The purpose of this grant application is to request funds to organize and implement this conference series. A key goal of the conference series will be to become a community of practice working together to compile, collect, and share reference resources on programs and evaluation efforts for STEM diversity. This information will give us the tools to launch individual and joint intersociety efforts to increase participation of URMs in STEM.

Intellectual Merit:

Our proposal is based on recent research showing that social science theories provide insights into how URM scientists develop, make choices, and meet challenges. Research in this field draws on a number of social science theories (including communities of practice, social cognitive career theory, identity formation, and cultural capital) that inform both the challenges URM face and strategies to intercede. From the social innovation framework perspective, one of the most salient theories is communities of practice (C of P) which reveals how newcomers to an established field may or may not be brought into full membership, and the risks of exclusion or marginalization. In science, individual research groups functions as C of P, but then all research groups and individual scientists integrate into larger C of P within their disciplines. Scientific societies are pivotal in creating the environments of their disciplinary C of P. We propose to unite our scientific societies in a C of P that will work collaboratively to better understand and shape how they support the success of both newcomers and those in training. Although each discipline has unique practices, there are core social science principles that cross over all. The social innovation occurs by multiple societies recognizing that they can consciously design and intervene in the ways proposed. To support the formation of such a C of P around the diversification of the STEM workforce, we are proposing the formation of the Alliance, an entity that will manifest initially through the establishment of a three-meeting conference series which will continue beyond the grant period.

Broader Impacts:

This proposal aims to build a C of P by unifying the established effective practices for inclusion and diversity within a large group of national and international scientific societies based in the US. The ultimate mission of the Alliance as a C of P is to promote broaden participation within the US STEM workforce through collaboration among scientific societies that can foster innovation, striving to improve access of all people living in the US to STEM careers. The long term goals of this Alliance are to: create effective and strategic plans across organizations to offer the opportunity to participate in STEM; establishing robust programs for retention of a diverse workforce in STEM; and expand the numbers of societies involved in diversity and inclusion efforts; and the potential to offer a broader impact model to be used with other associations and institutions.

PROJECT DESCRIPTION

We define diversity not only in terms of race and ethnicity, but as an inclusive term comprising women, individuals with disabilities, individuals in the LGBTQIA+ community, and any other group currently underrepresented in STEM. Building a diverse and inclusive STEM workforce is a goal shared by many professional scientific societies. While these organizations have many shared goals and objectives focused on inclusion and diversity, efforts to understand effective interventions leading to increased participation of URMs remain isolated in their scientific disciplines. The URM STEM community would benefit from having a unified, highly informed voice across disciplines that can help community members better understand and coordinate for the needs of URM scientists, thus improving the efficiency and dissemination of URM-serving programs (through the creation of a database). To fill this gap, we propose to create the *Alliance.* The first step in creating the Alliance will be a three-meeting conference series of the Committees for Diversity and Minorities Affairs Committees (MACs) from many professional/scientific societies and other stakeholders that advocate for the diversification of our STEM workforce. The purpose of this grant application is to request funds to organize and implement this conference series. This proposed conference series will be the first step in the construction of a community of scientific societies with the goals of learning, evaluating, and sharing the most effective approaches for broad participation in STEM. We will accomplish this by carrying out the following projects together.

Specific Aim 1. Create an annotated and indexed database of existing STEM diversity-building programs within the participating societies and a process for adding new programs to the database. Published information on studies of some interventions can be found in the 'Understanding Interventions' (UI) database (http://uiai.uccs.edu/article-database.php). But much of what is known about interventions, like those supported by Societies, has never been published. The intent of this database will be to help share what programs are available and existing evidence of their effectiveness, as well as facilitate comparative analysis and longitudinal studies of STEM programs within and across disciplines. The alliance will engage in deep discussion of existing diversity initiatives, as well as those tried in the past and discontinued. These discussions will include considering how the initiative designs 'make sense' from the perspective of theoretical considerations in the social sciences. The core concepts of Communities of Practice (C of P) will be introduced to explicitly guide the creation and sustainability of the Alliance.

The next task for the Alliance will be to initiate broad-based discussions of potential adoption of new efforts by (by each society and collaborating among societies).

Once our database is complete, we will launch and disseminate this database to the broader community of scientific societies as well as introduce how theories can inform design and evaluation of programs such as those compiled in the database.

Specific Aim 2. Develop a standard set of evaluation metrics to maximize the potential for comparative analysis and longitudinal studies of STEM programs across disciplines. These metrics will aim at enough degree of flexibility to accommodate the unique characteristics of each STEM field represented in the Alliance. The Alliance steering committee (formed by one member of diversity/minority affairs committees from each society, one society staff member, 2 members of the Northwestern Scientific Careers Research and Development Group (SCRDG), the meeting facilitator, and the evaluator), that will meet prior to each alliance meetings, will create a compendium of current strategies for evaluating programs, assess whether these strategies and the metrics they employ are appropriate, and then outline a reference set of the

best evaluation metrics that we hope will become standard. This compendium will be discussed during the first Alliance meeting. The second meeting will refine these and prepare them for dissemination. The final meeting will serve to launch and disseminate the compiled resources to the broader community advocating for broadening participation in STEM. In addition, in this meeting, we will discuss the best strategies to select and work with evaluators for program effectiveness while laying a foundation for comparative analysis and longitudinal studies.

Invitations to the third conference will be sent to representatives of national and regional scientific societies with newly established or no diversity/minority affairs (MAC) committees, in addition to societies with more established diversity/MAC committees (we have budgeted travel expenses for representatives of up to five additional societies but the invitation will be sent out to more societies). Conference participants will be trained on how to use these resources as tools to develop diversity/MAC committees by choosing the activities and metrics that best fit their target audiences. After this conference series, the evaluation metrics and diversity program database will be available to the community-at-large as online resources, and we will publish meeting proceedings or reports.

Ultimately, we expect this conference series to bring together professional society diversity/MAC committees and other stakeholders to create and disseminate a database of diversity programs in STEM, a standard reference set of evaluation metrics, and create a context in which to share resources, best practices, and program outcomes to broaden participation in STEM (all of our resources will reside in a central location within our societies and will serve as a reference linkage site to the public at large). This conference series will also be used to develop strategies to manage future efforts of the *Alliance* in a sustainable way.

Background

Why do we want to have this conference series?

Our long term goal is to create a strong and sustainable Alliance to share resources, best practices, experience of what has worked (and failed) to retain and offer support starting from undergraduate to faculty members and other science professionals of diverse backgrounds. By getting to know each other, sharing goals and joining forces, we will be much better situated to carry out intersociety activities that would benefit the STEM community at a national level. The principles that will be applied to the creation of this Alliance come from the communities of practice (C of P) described by Jean Lave and Etienne Wenger (1, 2). The societies and scientific group involved in this proposal have all been successful within their own communities supporting URMs. However, there is still a disconnect between the URM distribution within the general population in the US and the representation of URMs in STEM. We believe that in order to join forces to carry out intersociety activities that would benefit the STEM community, an important aspect of this intersociety relationship is having face-to-face meetings to essentially create a C of P. Once a relationship has been established with the support provided by NSF through this proposal, the participating societies will work together to continue the work of the alliance through a combination of remote interactions and face-to-face meetings supported by the societies involved. To the best of our knowledge, a lasting Alliance across scientific societies has never been established before to support the recruitment and retention of URM individuals in STEM.

Why are these efforts important?

It is well documented that many URM scientists feel isolated in STEM fields and that this isolation may play a role in the recruitment and retention of a diverse STEM workforce ((3-10), https://www.heri.ucla.edu/nih/downloads/ASHE2013-URM-Grad-Students-in-STEM.pdf). This isolation can be a significant barrier to young scientists becoming well integrated and fully functioning members of their scientific disciplines, another form of C of P. Scientific societies are essential linkages between trainee and successful professionals. Our team of partners is committed to contributing to identify and provide the best practices to increase diversity in STEM. We are also committed to reaching out to as many scientific societies we identify to encourage efforts to support diversity in STEM in their particular scientific area. We believe that scientific societies play a role in the challenge of improving recruitment and retention of URMs in STEM as societies gather individuals from different institutions and locations. Social and natural scientists have been working for decades to study and propose solutions to underrepresentation in STEM. For the work of the Alliance, we have chosen to build from recent work that has focused particularly on translating several social science theories into application within STEM diversification. Rather than focusing on a single theory, this work has shown how it is important to draw from several theories together to provide insights into how scientists develop, the choices they make, and the extra challenges that underrepresented minorities and women scientists face. Dr. Rick McGee and his research team (SCRDG) are leaders in this research. They have already collaborated with several of the investigators and Societies in this alliance. The social science theories they are drawing from include: identity formation and Cultural Capital with respect to individual development as scientists; Social Cognitive Career Theory with respect to career decisions and persistence; and C of P with respect to the process by which all young scientists succeed within various communities of scientists. The SCRDG is conducting large scale longitudinal studies of career progression (11-14) as well as testing a novel coaching-based model to address some of the limitations of previous diversity approaches (15-17). From the social innovation framework perspective, C of P is one of the most salient theories as it reveals how newcomers to an established field are brought into full membership or excluded. In science, each research group functions as a C of P, but then all research groups and individual scientists integrate into large C of P within their disciplines. Scientific societies are pivotal in creating the environments of their disciplinary C of P. By working collaboratively, each of the participating societies and those to be added in the future can understand and shape how they support the success of newcomers and those in training. Although each discipline has unique practices, the core principles of recognizing and working toward broader impact cross over all.

Founding Partners

The following founding partners have been selected because of their history of success in developing and implementing programs to sustain the diversification of the US STEM workforce. Ultimately, it is expected that Alliance membership will include many more STEM-related local and international scientific societies (see Appendix 1 for full list).

American Society of Biochemistry and Molecular Biology (ASBMB) Minority Affairs Committee (MAC). It is the mission of the ASBMB MAC to increase cultural diversity in the fields of biochemistry and molecular biology by increasing participation, visibility.

Society representatives: Takita Sumter, Sonia Flores, and Suzanne Barbour

American Society of Cell Biology (ASCB) Minority Affairs Committee (MAC). The ASCB MAC, one of the standing committees of the American Society for Cell Biology, has as its goal to significantly increase the involvement of underrepresented minority scientists in all aspects of the Society. To achieve this goal we recognize the need to promote the professional development of and to recruit minority scientists. The relatively small size of the pool of scientists with an interest in cell biology requires that we also develop programs for undergraduate and pre-doctoral students to assist them in achieving careers in biomedical research. The ASCB MAC has been successful in meeting its long-range goal of contributing to the Nation's effort to increase the number of underrepresented minority scientists. In fact, in 2004, ASCB was awarded the Presidential Award for Excellence in Mathematics, Science, and Engineering Mentoring, largely in part to the innovative programs of its MAC; (http://paesmem.net/node/1765). Additional evidence of the ASCB MAC's success is in the form of programs that consistently meet its desired outcomes such as the Visiting Professors Program (18, 19).

Society representatives: Veronica A. Segarra (Co-PI), Franklin Carrero-Martinez, and Sydella Blatch

American Society for Pharmacology and Experimental Therapeutics (ASPET) Committee on Mentoring Career and Development (CMCD). The mission of the ASPET CMCD is to promote a diverse pharmacology workforce through programs at the ASPET Annual Meeting, and mentoring and career development services to ASPET members throughout the year. This committee has recently established the ASPET Mentoring Network, based on the coaching model developed by Rick McGee. Now in its second year, the ASPET Mentoring Network is a year-long coaching program that helps young scientists, especially those from underrepresented groups, deconstruct the social, professional, and scientific skills needed to thrive in their careers.

Society representatives: Catherine Fry, Susan Ingram Osborn, and Lynn Wecker

Biophysical Society (BPS) Committee for Inclusion and Diversity (CID).The charge for the BPS CID is to increase the number of minority biophysicists and enhance the visibility and career opportunities of existing minority biophysicists, and to involve them in Society affairs. The Committee aims to foster a community for minority biophysicists through programs at the Annual Meeting and the Summer Research Program. Our summer research program is considered a success as one of the first participants is currently an assistant professor of Biochemistry and Biophysics (http://www.biophysics.org/Portals/1/PDFs/Biophysics%20Week/Profiles/YRivera.pdf).

Society representatives: Marina Ramirez-Alvarado (PI) and Daniel McNulty

The Endocrine Society (TES) Minority Access Program (MAP) The TES MAP is an innovative a two-year mentoring program designed to nurture the educational and career growth of future scientists and to introduce them into the endocrine research community of practice through participation in professional society meetings and research. It is open to undergraduate students from underrepresented minority groups, and offers professional development activities and training in top-notch endocrine research labs.

Society Representatives: Mark Lawson and Steve Anderson

Scientific Careers Research and Development Group (SCRDG) at Northwestern University. The members of the SCRDG bring a wealth of prior experiences, including many years of laboratory-based research and training of young scientists, training and research in sociology, social psychology and education research, extensive program evaluation experiences with STEM programs, expertise with theory and practice through programs promoting diversity and success of underrepresented groups and women. The SCRDG bring skills and experience with both qualitative and quantitative research methods and data analysis. Many important research questions require sophisticated quantitative and statistical data.

However, the SCRDG has purposefully chosen to bring together a unique group of qualitative researchers and to focus on those questions and hypotheses that can only be addressed with qualitative methods.

Partners: Rick McGee, Veronica Womack, and Christine Wood

Complementary and Synergistic Efforts that Bank on Each Society's Strengths

Each of the committees mentioned above has a successful track record of designing and implementing programs to diversify their scientific discipline. In this way, each society has found a niche that takes advantage of its society's strengths. Through the formation of this Alliance, we can reach a better understanding of what makes these programs successful and ultimately cross-pollinate in the benefit of all STEM societies, and ultimately, to avoid 'reinventing the wheel' in terms strategies to recruit and retain diverse individuals in the benefit of a diversified STEM workforce. The Alliance will also disseminate and optimize the way we assess success or progress in our efforts to recruit and retain a diverse workforce as the parameters to evaluate these may vary from society to society In doing this, the Alliance will foster the development of assessment standards that will ultimately allow different society programs to be evaluated in analogous ways that will facilitate integration of knowledge about efficacy of interventions.

Intellectual Merit

Proposed Activities

The main objective of this unsolicited proposal is a three-conference series to launch the creation and the work of the Alliance. Because so much of the diversity work of the participating societies is not designed to lead to peer-reviewed publications, very little is known about what each society is doing and the evidence each society has collected to evaluate those activities. Thus, societies are not really learning from each other and effective practices are not being spread. Additionally, many of the program designs do not have an articulated theoretical basis; although often times their intuitive designs do align with theoretical social science principles. By bringing societies together much can be learned and new synergies developed.

The Alliance starting group will include the 5 scientific societies and the Northwestern University SCRDG described above. The Alliance will reach out to all scientific societies based in the US with the goal of having committees dedicated to recruitment and retention of a diverse workforce in all societies. These societies will be invited to apply for participation to the third conference of this series (See Appendix 1 for full list).

Concrete deliverables for the Alliance three-conference series. This proposed conference series will be the starting point of the establishment of the Alliance. As any emerging C of P, we will get to know each other and start work together towards our common goal.

To begin with, we will establish the Alliance steering committee that will start working on the program for the first Alliance meeting. The steering committee will communicate with the major stakeholders and will coordinate efforts for the room/board and meeting venue for this first meeting. Every society in the Alliance will nominate participants for the meeting based on availability. The steering committee will appoint a database committee. In addition, we will also establish a new members committee that will start working on a listing of STEM diversity-building programs. This listing will be reviewed during the first meeting.

1. **C of P.** The first meeting will be designed to engage in deep conversations about the diversity efforts in place for each society, allowing time to get to know each other and to decide on the information we are gathering for our database. For example, whether or not each society is capturing the numbers of URMs in their membership, their positions and trajectories, and the influence of the numerous programs that scientific societies put together to enhance the professional development for URMs. We will talk about which programs within each society have been developed for URMs and how these programs are evaluating success. The possibility of cross society initiatives will be discussed in every meeting proposed for the alliance. Where appropriate, the SCRDG group will guide the group toward seeing how social science theories explaining challenges faced by URM scientists are established within these programs or could be. Over time, as the group acquires a shared understanding of programs and principles, they will begin to function as a C of P with the synergistic potential available to all.

2. Other information that will be pertinent in discussions will be to debrief about failed programs that each society has experienced: failure may be defined differently by each society and it would be important to come up with a consensus about how we define success and how we define failure as the Alliance. This will help us to standardize (within the idiosyncrasies of each society) what are the possible reasons for the failure of some of the diversity building programs. Finally we will discuss the characteristics of the MAC/diversity committees represented in our Alliance. How do MAC/diversity committees interface with other committees and leadership in their societies? Which MAC/diversity committees are the "best" integrated? Which MAC/diversity committees have the most "clout"? What are strategies that the various MAC/diversity committees are using to demonstrate their "relevance" to their societies and disciplines? Do societies get better results with smaller/larger committees? Do societies get better results with very active, multi activity MACs or is it better to focus in one area? What is the turnover of our committees and what is the connection of committee members with URMs? How does society staff synergize (or not) with our committees? The idea of this discussion is to provide an objective guideline of the dos and don'ts for societies that will be invited for our third conference.

3. **Database.** We will share strong, standardized reference resources on program information and evaluation for STEM diversity and inclusion. We will create a database of existing STEM diversity-building programs in different scientific societies Examples of these programs are: professional development programs, mentoring networks, and summer research programs for undergraduates. The intent of building this database will be to facilitate comparative analysis and longitudinal studies of STEM programs, within and across disciplines and to help share what works to increase and retain STEM diversity. Up until now, the evaluation of success that each society uses for each of their program has been isolated, making it difficult to share best practices across societies. In addition, as we mentioned above, few of the society efforts to increase participation of URM in STEM lead to publications and are based on theoretical social science principles. In preparation of our first meeting we will initiate the design of a database to organize and display standardized information about existing STEM diversity-building programs, as well as a process for submitting and adding new program information to the database. The knowledge and work we will conduct in the first meeting will enrich the work done prior to the first meeting. In the second meeting, we expect to deepen the relationships of the Alliance. We expect that some idea cross-pollination and joint efforts will occur. We will finalize the database design and populate the database. In the final meeting, we will announce and disseminate this database to the broader community.

The Alliance steering committee will appoint a database committee. The charge of this database committee will be to work with the Alliance evaluator identifying evaluation fields that have been already recorded from each society in addition to new evaluation fields that societies should gather for the Alliance. The database committee will also evaluate many of the databases already available on related topics (https://psalse.org/, http://uiai.uccs.edu/, and https://psalse.org/professional-resource-links/ to mention a few) to avoid redundancy of our efforts. They will work with the societies represented in the alliance to figure out the best platform to make the database available.

4. **Best practices and evaluation metrics.** A very important task of the Alliance is to develop a standard set of best practices and evaluation metrics to maximize the potential for comparative analysis and longitudinal studies of diversity in STEM programs across disciplines. In the first meeting we will create a compendium of current strategies for evaluating programs, assess whether these strategies, and the metrics they employ, are appropriate, and then outline a reference set of the best evaluation metrics that we hope will become standard. We expect that this discussion will allow all participants to get to know and start understanding the realities and challenges that each society faces and start identifying common solutions for common challenges. We expect that the best practices and evaluation metrics will be refined and prepare for dissemination. We expect that the final meeting will consist on working group meetings that will then be followed by the dissemination of diversity program evaluation metrics. By the third meeting, we will come up with plans to publish the results of our conference series given the fact that it is rarely a current practice from any scientific society to publish any of the efforts the societies undertake to recruit and retain a diverse STEM workforce.

5. **Dissemination.** In the third Alliance meeting, we will dedicate some time to share our findings to the new members of the Alliance and will plan for distribution/publication of the results of our work together. In this third meeting, we will welcome new societies into the Alliance. Conference participants will be trained on how to use these resources as tools to develop MACs by choosing the activities and metrics that best fit their target audiences. After this conference series, the evaluation metrics and diversity program database will be available to the community-at-large as online resources, and we will publish meeting proceedings or reports.

6. **Plans for a sustainable Alliance.** The steering committee will work throughout the three year period of support to make plans for the continuation of the Alliance by engaging in communication with societies' leadership.

Selection of participants for each conference. Each society will select the allotted participants for each conference. The selection from the first two conferences will be done within the MAC/diversity committees. For the third conference, the steering committee will decide if the invitation is extended for all society members or if it makes sense to invite members of other committees within each society.

First conference: 4 members of MAC/diversity committees + 2 staff members per society, 2 members of the SCRDG group, our meeting facilitator and our evaluator.

Second conference: 8 members of MAC/diversity committees + 2 staff members per society, 2 members of the SCRDG group, our meeting facilitator and our evaluator.

Third conference: 20 members of MAC/diversity committees + other society members +3 staff members per society, 3 members of the SCRDG group, 3 members of new Alliance societies (5

societies)+ 1 staff member from a new Alliance society, our meeting facilitator and our evaluator.

The membership committee will propose the 5 new societies in the Alliance and the steering committee will approve the selection.

All of our findings will be available to the scientific community as peer reviewed publications or, white papers with open access to anyone, members of our scientific societies through our societies' websites.

The final meeting will serve to: 1) introduce and disseminate these resources to the broader community advocating for broadening participation in STEM, 2) provide training for how it can be used to best assess program effectiveness while 3) laying a foundation for comparative analysis and longitudinal studies 4) Active encouragement and facilitation of new members to the Alliance and the C of P.

Invitations to this final meeting will be sent to representatives of national and regional scientific societies with newly established or no MACs, in addition to societies with more established MACs. Conference participants will be trained on how to use these resources as tools to develop MACs by choosing the activities and metrics that best fit their target audiences. After the conference, the evaluation metrics and diversity program database will be available to the community-at-large as online resources, and we will publish meeting proceedings or reports.

Future Directions

The goal for this 3-meeting series is to serve as the launching point for the Alliance with a full intention of sustaining and growing it in the future. All of the leaders of diversity initiatives within each Society are highly dedicated to this mission; the common mission is exactly what can sustain a Community of Practice. In essence, the funding is being sought to initiate a new C of P among individuals with common goals, many shared practices, and a strong desire to make a difference. Depending on priorities identified, future Alliance efforts could include periodic in-person meetings, regular virtual meetings, consultations to facilitate implementation of a program from one Society to another, joint grant applications, etc. The Alliance envisions continued training/outreach to societies that do not have diversity/broadening participation efforts in the future. The Alliance will consider continuing with our work through videoconferencing. The steering committee will explore future sources of funding for the Alliance efforts within each society and with other funding sources. However, our intent is to commit to sustaining the Alliance irrespective of additional funding sources. We envision that once the Alliance work is underway, the steering committee can plan their work virtually through video conferencing and each participating society can help host an Alliance meeting either during their respective annual meetings by providing a meeting venue and discounts for registration and housing or by helping with funds to maintain face-to-face biannual meetings.

DISSEMINATION PLAN

All of our findings will be available to the scientific community as peer reviewed publications, white papers with open access to anyone, members of our scientific societies through our societies' websites.

PROGRAM LEADERSHIP

Marina Ramirez-Alvarado (PI). Dr. Ramirez-Alvarado is currently the chair of the Committee for Diversity and Inclusion at the Biophysical Society. She is a council member for the

Biophysical Society and a member of the Committee for professional opportunities for women at the Biophysical Society. In addition, she is a member of the ASBMB Public Affairs Advisory Committee and a senior faculty representative at the American Association of Medical Colleges council of faculties and academic societies. Dr. Ramirez-Alvarado participated as a coach for the National Project called "the Academy of Future Science Faculty" (Director's Pathfinder Award to Promote Diversity in the Scientific Workforce - NIH/NIGMS (1 DP4 GM096807, PI: Richard McGee), a social sciences-driven program to offer additional mentoring (coaching) to PhD students throughout the country to help them succeed in academia.

Veronica Segarra (Co-PI). Dr. Segarra is currently one of the chairs of the Minorities Affairs Committee of the American Society for Cell Biology. In this capacity, she has led a team of cell biologists in the design and implementation of professional development programs. She has spearheaded the infusion of ASCB MAC programs with active learning strategies to great success (2017 CBE Life Sci Educ vol. 16 no. 2 le1and V.A. Segarra, M.E. Zavala, and L. Hammonds-Odie. **Applied theatre facilitates dialogue about career challenges for scientists. Journal of Microbiology and Biology Education. *in press*)**

Sara Volk de Garcia (Meeting Facilitator). Dr Volk de Garcia is a trained biochemist and molecular biologist with extensive experience in academia and in the design and delivery of professional development (PD) programs for scientists. Success in PD program design and delivery prompted her to start a science career consulting business, with particular interest in interventions that foster diversity in the STEM workforce. The Alliance will bank on her strengths as she works alongside the PIs to develop and implement Alliance meetings that will achieve the stated goals.

Patricia B. Campbell, (Alliance Evaluator)

The evaluation will be done by Patricia B. Campbell, PhD, President of Campbell-Kibler Associates, Inc. Dr. Campbell has been involved in research and evaluation on science, technology, engineering and mathematics education and issues of race/ethnicity, gender and disability for over 30 years. An Association for Women in Science (AWIS) Fellow, she has authored more than 100 publications including coauthoring Building Evaluation Capacity: Guide I Designing A Cross Project Evaluation and Guide II Collecting and Using Data in Cross-Project Evaluations"; "A Framework for Evaluating Impacts of Informal Science Education Projects"; "Engagement, Capacity and Continuity: A Trilogy for Student Success." Her website, www.BeyondRigor.org, provides easy to use tips to improve the quality of evaluations and research done with diverse populations.

EVALUATION PLAN

The evaluation will be performed by Dr. Patricia Campbell, PhD, President of Campbell-Kibler Associates, Inc. Dr. Campbell and will include formative and summative components. The formative evaluation will provide data to improve the ongoing project and will be done collaboratively with project staff. This will include the use of short, easy to summarize measures to collect data on: conference participant perceptions of the value and utility of each meeting. The results of each meeting will also be reviewed by the evaluator. Lessons learned will be shared after each meeting, to inform subsequent meetings.

The summative evaluation will focus on the degree to which the project meets its goals of creating a usable and used database, a common set of evaluation metrics and a structure for future cross society research or evaluation efforts. The evaluator will review the database design and document the degree to which societies are adding information to the database and accessing it. Participating societies will also be surveyed to determine the degree to which they are adding or modifying their strategies.

The evaluation will also assess both the process and preliminary and final results of the development of evaluation metrics. The evaluator will provide technical assistance to the evaluation metrics refinement efforts, and information on sources of existing measures as needed. Participating societies will be asked about their comfort with the metrics and their willingness to use them in their evaluation efforts. They will be asked about their willingness to continue to participate in the Alliance and in future cross society evaluations/research using those metrics. Similar information will be collected from societies who join the Alliance.

Along with ongoing feedback, annual evaluation reports and a final evaluation report will be submitted.

BROADER IMPACT

This proposal aims to unify the established effective practices for inclusion and diversity within a large group of national and international scientific societies based in the US. The collective knowledge power of the individuals in the Alliance also will be used to propose and test new practices. Its mission is to promote broad participation within the US STEM workforce through collaboration among scientific societies that can foster innovation, striving to improve access of all US citizens to STEM careers. The long term goal of this Alliance is to create effective and strategic plans to offer the opportunity to participate in STEM, establishing robust programs for retention of a diverse workforce in STEM, and scaling up the numbers of societies involved in diversity and inclusion efforts and the potential to offer a broad impact model to be used with other associations and institutions.

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