Purpose and Significance of the Proposed Conference. The Mi-Bio Summit on Flexible and Stretchable Bioelectronics will bring together academic, clinical, industrial, and government leaders from the United States and across the globe to address how a Materials Genome Initiative-based (MGI-based) approach will allow a Purdue-led center to create the next generation of devices for precision medicine, just-in-time monitoring, and treatment of disease. While the nascent field of flexible and stretchable electronics is emerging as a clear growth arena in the next ~20 years, the community is currently led primarily by device physicists in academia, device engineers in industry, and a few practicing medical doctors and surgeons. Because of this fact, almost no effort has been placed in creating the materials that will revolutionize the field such that tailored polymers can be implemented to create never-before-seen devices, medical responses, and positive patient outcomes. However, through the partial support of the Davidson School of Chemical Engineering, the Materials Innovation for Bioelectronics from Intrinsically-stretchable Organics (Mi-Bio) team at Purdue has assembled the senior personnel, junior scientists, and experimental and computational resources required to fundamentally alter this paradigm. As such, the timing of this meeting, which is to occur July 29 – July 31, 2019, is ideal in accomplishing our three overarching objectives. First, it will provide the appropriate media coverage such that scientific, medical, and industrial communities and the general public will associate Purdue University with
being the global leader in developing materials and devices for next-generation bioelectronics. In this way, we envision being able to continue to raise the public profile of Purdue University with respect to the university’s impact on human health. Second, the Mi-Bio Summit will afford our team a means by which to positively demonstrate our capabilities to the appropriate federal funding agencies such that Purdue will be the lead in the establishment of a large center in the next 2 – 4 years (vide infra). Finally, while our internal Purdue team is set and already co-mentoring students and postdoctoral researchers, writing joint grant applications, and producing co-authored, high-impact publications, we are in the process of assembling the appropriate external partners for this team; success in this aspect will be critical as we move forward towards creating a large center. Thus, inviting the leading team member candidates to this conference as invited speakers and panelists will allow the Purdue Mi-Bio team to evaluate our ability to work with these leading researchers in an intimate setting. In this way, we envision the Mi-Bio Summit to be an event that produces high impact in both the near-term and in the long-term as well.

Proposed Invited External Speakers. In order to provide a diverse list of speakers from across the multiple arenas that are impacted by bioelectronics, this 3-day conference will be a mixture of standard, lecture-format talks, moderated panel discussions, and breakout sessions with specific group leaders for each breakout session. Importantly, our goal is to have a varied group of speakers in terms of presenters from: (1) the myriad groups within science, medicine, and engineering that will allow for a diversity of backgrounds and experiences; (2) outside of science and engineering, including the social sciences, economics, and law; (3) academia, the medical community, government agencies, and industry; and (4) both the United States and from the international community. The following 10 external speakers/panelists are representative of our initially-targeted list, and we will expand this list; however, we have limited the names here due
to space constraints. We do note that we have working relationships with a number of the below-listed individuals; thus, we anticipate that a number of the speakers will be able to accept our invitation to participate in the Mi-Bio Summit.

1. Professor George Malliaras, Cambridge University (United Kingdom)
2. Professor Ana Claudia Arias, University of California, Berkeley (United States)
3. Professor Ana Teixeira, Karolinska Institutet (Sweden)
4. Professor Pamela Silver, Harvard University (United States)
5. Dr. Levi Hargrove, Center for Bionic Medicine (United States)
6. Dr. Shaohui Liu, Indiana University – Purdue University, Indianapolis (United States)
7. Dr. John Schlueter, National Science Foundation (United States)
8. Dr. James Parshall, Eli Lilly and Company (United States)
9. Dr. Kris Famm, Galvani Bioelectronics (United States)
10. Mr. Sanjiv Arora, Medtronic PLC (United States)

Value to Purdue University. To be transparent, the Mi-Bio Summit on Flexible and Stretchable Bioelectronics is already scheduled to occur thanks to partial support and the generosity of the Davidson School of Chemical Engineering. With this initial buy-in at the unit level, the impact from this proposal will be multiplied significantly. Perhaps most importantly, successful funding of this proposal will allow our team to brand the meeting as having the backing of the entirety of Purdue University. In turn, this will pointedly aid the Mi-Bio program in being able to recruit potential partners from myriad disciplines outside of academia and the engineering fields. That is, the Mi-Bio Summit should be a showcase for all of Purdue University, and for all of the wonderful research that occurs in the realm of bioelectronics across the Purdue campus. This is especially true as the Mi-Bio Summit fits well with the Health and Longevity Thrust of the 150 Years of Giants Leaps anniversary currently underway at Purdue. In particular, the entire focus of Mi-Bio is to provide the materials that will alter the current paradigm of how scientists, engineers, industry, and clinicians think about monitoring and treating patients in a low-cost, time-efficient manner. As such, we believe that the support associated with a university-level commitment is critical at this moment in time. With the Mi-Bio team at the center of this effort,
we will be able to establish collaborations with the best outside researchers, and top students from across the globe will be attracted to Purdue to become members of this team. Moreover, as the Mi-Bio Summit will be the final piece in setting the stage for the creation of the Mi-Bio Center, it will benefit Purdue in that it will bring a large, federally-funded center to campus in the near future.

**Linkage to Professional Associations.** Upon successful funding of this proposal, we will engage with a number of the local professional associations with whom we already have strong connections. For instance, we expect that the Indiana Medical Device Manufacturers Council (IMDMC) and the Purdue Section of the American Chemical Society (ACS) will be interested in linking their organizations with the Mi-Bio Summit and potentially co-sponsoring the event.

**Value to External Audiences and the Media.** As demonstrated recently by our internal Purdue team, the research associated with Mi-Bio sparks interest in prestigious technical journals (e.g., our three publications in a high-impact journal, *Science*, in 2018 alone) and with the popular press (e.g., our profiles on NPR and a number of other media outlets and having one of our materials being named a “Molecule of the Year” by *Chemical and Engineering News*). Therefore, we have little doubt that bringing other world leaders to Purdue in order to discuss a topic that combines human health with topics that were once thought to be science fiction will highlight our pioneering work while also attracting significant positive attention to Purdue University. In fact, we are currently working with the local media team within the Davidson School of Chemical Engineering to ensure that the press coverage is as large as possible. Having the backing of Purdue in general, and the impressive media teams associated with the university, would only add to our ability to communicate this event in a high-profile manner.

**Proposed Post-Event Impacts.** The primary motivation for the Mi-Bio Summit is to show the capabilities associated with Purdue and attract select individuals, institutions, and teams to
coalesce around the idea of a federally-funded center for which Purdue would serve as the lead. Thus, the post-event impacts include the immediate authoring of joint grant applications and joint publications with all of the partners of the Mi-Bio Center, and this would be consistent with the joint efforts that are already appearing from the Mi-Bio team members at Purdue. In particular, we anticipate targeting both the National Science Foundation and the National Institutes of Health in order to accomplish this aim, and the initial groundwork required to secure these approximately $20M (and, eventually, self-sustaining) centers has already been laid by the internal Purdue team. In these type of center initiatives, we will have three distinct advantages that will set our team apart from the scattering of other researchers working on bioelectronic devices. First, the Mi-Bio Summit will allow our team to establish itself as the leader in materials development for bioelectronics. Second, we will be the only team that is placing materials at the fore of the science and engineering associated with stretchable and flexible bioelectronics. Third, our team will be diverse with respect to the fields of study associated with the center (i.e., from sociological implications to device manufacturing). In this way, we envision the proposed conference to be remembered not just as an event that launched a center at Purdue, but as the defining event that brought an emergent field to prominence. This will positively impact Purdue, and it will alter the way in which society maintains health and treats disease.

**Proposed Budget.** The proposed budget requested here is $25,000 for a conference with an anticipated attendee size of ~75. These funds will go towards: (a) hospitality costs in the form of meals for the attendees during the event ($7,500, no alcohol included); (b) honoraria for 50% of the invited speakers ($5,000); (c) partial offset of travel costs for international invited speakers ($5,000); (d) lodging costs for 50% of the invited speakers ($3,000); (e) marketing and promotion costs ($2,500); and (f) conference room rental and organizational needs ($2,000).