

**U.S. Department of Health and Human Services
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Office of the Director
Division of Program Coordination, Planning, and Strategic Initiatives**

**Bridge to Artificial Intelligence (Bridge2AI) Module Microlab2
June 16, 2021**

**Draft Summary
Discussion Points, Highlights, and Action Items**

I. Welcome

Jocelyn Tejada, facilitator, Knowinnovation (KI), welcomed the participants and provided an overview of the Microlab agenda. She explained that the KI team would guide participants through today's session.

Grace C.Y. Peng, Ph.D., Program Director, Division of Discovery Science and Technology (Bioengineering), National Institute of Biomedical Imaging and Bioengineering, also welcomed participants. She highlighted the Grand Challenges page on KISstorm, which outlines several topics that participants should consider in preparation for the Grand Challenge Team Building Expo on June 23, 2021. Dr. Peng also encouraged participants to post other ideas on the Grand Challenges page.

- This Microlab 2 meeting covered the Standards and Tools modules in separate breakout discussions. Each module breakout session began with an introduction and overview. A third integration breakout session explored the intersection of the modules. Participants had an opportunity to meet other potential applicants and to form teams during the three breakout sessions.
- Participants were provided links to the [Slack channels](#) and [KISstorm](#) and [Wonder](#) platforms and were encouraged to participate using these platforms. The Zoom platform was used for the plenary and breakout sessions. The Slack channels were created to facilitate participant interaction, help participants identify potential collaborators, and deliver updates to the participants. Participants were asked to use KISstorm to provide input for breakout discussions, post questions, share ideas, and otherwise collaborate. The Wonder platform was made available 24 hours a day during the Bridge2AI event to allow participants to network.
- Participants were able to access technical support from the KI staff through Zoom and Slack messaging, as well as email.

II. Standards Module Breakout

Dr. Peng introduced the Standards module breakout session. She referenced the pre-event video on the [Standards module](#) and reiterated highlights from that video. She reminded the participants that the Bridge2AI Data Generation Project applications must include all six modules—Teaming, Ethics, Standards, Tools, Data Acquisition, and Skills and Workforce Development—and, ideally, demonstrate interaction across all six modules. The Teaming and Ethics modules were discussed during Microlab 1 on June 14.

Dr. Peng explained that the purpose of the Standards module is to unify data attributes in response to the chosen Grand Challenge. She encouraged participants to consider processes involved in developing and

establishing standards when building their project teams. She also encouraged participants to consider the ethical, social, and cultural issues associated with the chosen Grand Challenge; the types of data needed to respond to that Challenge; existing standards relevant to those types of data; and how developers could instantiate these standards into the tools for collecting the data.

Dr. Peng repeatedly emphasized the importance of diverse teams and perspectives from underrepresented communities and referred the audience to the [Other Components video recording](#) on KISform. This video explains the required Plan for Enhancing Diverse Perspectives (PEDP). She added that teams would be expected to include individuals with expertise in interoperability issues, distributed learning systems, and data harmonization across the diverse disciplines covered within the Grand Challenge.

- Discussion prompts for the breakout session included (1) What are the biggest challenges for the Standards module to work with other modules? and (2) How could the Standards module help create a culture of data interoperability across multiple data types? What are some of the challenges to building this type of interoperability?
- Dr. Peng also encouraged breakout participants to discuss how they could engage underrepresented communities in the development of standards in the context of the other modules.
- Breakout sessions were not moderated. Dr. Peng encouraged breakout participants to start the discussions themselves and to ask each breakout room participant to comment on the prompts. She also encouraged participants to post comments on the breakout room Post It boards.
- Participants were able to access videos on the modules through KISform.

III. Tools Module Breakout

Shurjo K. Sen, Ph.D., Program Director, Division of Genome Sciences, National Human Genome Research Institute, introduced the Tools module breakout session. He explained that the Tools module is part of an ecosystem comprising all six modules that interact bidirectionally with all other modules rather than in the sequential fashion illustrated in the slide. For the purposes of the Bridge2AI initiative, “tools” should be interpreted in the broadest possible way to include software, hardware, firmware, and a broad range of tools that encompass the complete cycle of research, from experimental design to data visualization and sharing. Dr. Sen suggested that the types of tools developed throughout a project might change. For example, teams might focus on automated data annotation tools early in the project, then pivot toward the development and implementation of data visualization tools later in the project. Dr. Sen emphasized the importance of tools that facilitate data sharing and interpretation in the later stages of projects because NIH wants to reduce the barriers to the use of artificial intelligence (AI) among scientists without an AI background. He pointed out that data scientists, for example, often find the download, installation, and use of machine learning (ML) tools to be challenging. Dr. Sen shared Tool module examples but also encouraged others to generate their own ideas for data generation tools.

Dr. Sen discussed the types of Tools module expertise that would be required for projects, including—

- substantial prior experience in building computational tools for incorporating AI and ML into biomedical research and the ability to demonstrate that these tools have been used by the biomedical research community
- expertise in the development of tools for data collection and annotation, analysis, modeling, and visualization

- the ability to prepare documentation for AI and ML tools, along with user guides that are accessible to biomedical scientists without AI and ML expertise

Applicants who wish to employ tools they have developed and published and that have been used in the past should consider whether those tools are usable across a broad range of different contexts (e.g., not limited to a specific research question or analysis framework). In addition, tools development should not be limited to one portion of the AI project lifecycle. Finally, all tools developed as part of the program must follow ethical and open source principles and be well documented so that people outside of the AI world are able to understand the documentation and use the tools without relying on a collaborator or hiring an expert for assistance.

Dr. Sen emphasized the importance of the Tool Module Components section in the Data Generation Project Research Opportunity Announcement (ROA). He explained that NIH is looking for a justification and description of the expertise that the Tools module would bring to the application. The Skills and Workforce Development module and Tools module are closely linked in that members of the project team will be expected to design training modules and materials to help the biomedical research community use the tools. Dr. Sen added that the Ethics module also is critical because the legal and ethical considerations of using AI will affect the development and implementation of every tool used as part of the program.

- Discussion prompts for the Tools module breakout session were (1) What tools need to be developed to create the workflows for ethically sourced AI/ML-friendly data? and (2) How could this module interact with the Skills and Workforce Development module?
- Dr. Sen asked participants to post questions about the Tools module on KISTorm.

IV. Integration Breakout

Dr. Sen introduced the integration breakout session goal, which was to discuss how the Standards and Tools modules will interact. Dr. Peng added that the Integration breakout session also could be used to discuss how other modules can work together, although the focus is Standards and Tools. Dr. Sen reminded participants about the Wonder networking opportunity at the end of the meeting. He remarked that the level of collaboration and idea generation occurring within the Wonder networking space was similar to the level of collaboration occurring during the Zoom meetings. Ms. Tejada remarked that all presentations delivered during this session are available on the Pre-Event Videos page in KISTorm.

V. Upcoming Bridge2AI Sessions and Next Steps

Ms. Tejada reminded the participants of the upcoming Microlab3 session on June 18, which will focus on Data Acquisition and Skills and Workforce Development. Ms. Tejada reminded the participants that they do not need to register for Bridge2AI meetings separately. She also encouraged participants to attend an informal networking session through the Wonder platform and indicated that the link to that session would be placed in the chat. Participants also can access the Wonder room via the Network Lounge link in KISTorm.

- Andy Burnett, Managing Director, KI, provided instructions for connecting with other participants through KISTorm, Slack (including the dedicated Bridge2AI Slack workspace), and Wonder. He reminded the attendees that they can seek support through the Slack channels and KI support email.

- Dr. Sen agreed to be available in the Wonder room to assist participants entering the space for the first time.
- Mr. Burnett clarified that KISstorm provides an online space for collaboration during events, and Slack is intended for continuous communication. He described the format and purpose of Wonder, which is a more informal networking space. He acknowledged that not all participants will be able to access Wonder, depending on security restrictions at their facilities.
- Mr. Burnett invited participants interested in applying to go to the Grand Challenges link on the KISstorm homepage and post a brief description of their application proposal idea that they would like to discuss with potential team members. He indicated that a list of groups that wish to host conversations during the Expo on June 23 would be available by the morning of June 21. Mr. Burnett explained that participants should review that list and choose three proposals that interest them. The Expo will include three 1-hour breakout sessions dedicated to discussions of proposals. A goal of the Expo will be to facilitate conversations among the proposal teams that have formed or are forming.
- Mr. Burnett also recommended that participants browse the Slack channels created for Bridge2AI. Several participants created specific Grand Challenge channels, and others created method-or tool-specific channels. He expected that the Slack workspace would remain active for the foreseeable future.
- Mr. Burnett encouraged participants interested in recruiting new members to a team to create a Post It note in KISstorm. Participants also can use the Participants page on KISstorm to search for participants with specific expertise.
- Dr. Peng encouraged participants to share ideas, which will allow them to improve their own ideas and develop their projects.
- Dr. Peng clarified that the point of the application is to communicate the planned Grand Challenge strategy to NIH, even if the strategy might change in the future. Reviewers will make decisions regarding the strongest strategies. NIH may end up pairing applicant team members with other teams examining other Challenges and data types. Dr. Peng added that the Other Transactions (OT2) mechanism even allows unaffiliated persons to apply, with the goal of involving people from underrepresented communities outside of traditional research institutions.
- Dr. Sen encouraged participants not to fear sharing ideas, because there is a low likelihood of someone else being able to develop a feasible proposal based on someone else's idea in the short time period before applications are due.

Action Items

- None