ODSS Concept Clearance – May 2024

Initiative 2: Undergraduate & Graduate Curricula/Module/Training Development and Assessment for AI-Ready Biomedical and Behavioral Researchers

Initiative Type: New

Activity Code: (R25) Education Projects

OBJECTIVE: To develop, evaluate, and disseminate curricula, module, and training opportunities for diverse groups of biomedical and behavioral researchers to develop the skills and competencies needed to make their data FAIR and AI-Ready; to understand the ethics challenges of AI in biomedicine; and to effectively collaborate within multidisciplinary teams for ethical, biomedical AI.

PROPOSED FUNDING: budget will grow from $900,000 in FY25 for 3 awards to $2,700,000 in FY27 for a steady state of 9 awards per year.

DESCRIPTION: This initiative uses the R25 mechanism to expand AI training for biomedical researchers to the full biomedical data lifecycle, with a focus on the early stages of data capture/generation, sharing, documentation, and best practices for transparency (e.g., data documentation, ontology usage, encoding, data cleaning and preparation, data curation and sharing); imbuing ethical practices throughout/from the onset (e.g., AI applications, bias detection, ethics, trust); and providing practicum opportunities for trainees to gain experience in multidisciplinary teams. This initiative will also allow for discipline-focused training to develop experience with relevant data, standards, ontologies, and ethical challenges.

Applications must specify the materials and training activities to be developed, and the skills and competencies targeted. Application must have a clear plan for formative and summative assessments, and for disseminating/making freely available educational materials including data and code (sharing with other training programs and educational portals/sandboxes is highly encouraged). Applications must have a recruitment plan that enhances diversity and may target trainees with biomedical or bioinformatics backgrounds at graduate or undergraduate levels. Suitable proposals will use relevant biomedical/behavioral data and use cases; target awareness of potential causes for inequity in AI and current best practices for avoiding or remediating bias, including case studies.

This program will support a portfolio of awards at well and lesser resourced institutions and institutions with focus on health disparity populations. PI meetings will strengthen connections among the cohorts and awardees will be invited to collaborate on the development of practicum opportunities for trainees for hands-on training. Awards will be limited to 3 years to keep pace with rapidly advancing technology.
Subsequent initiatives may include inviting institutions to re-use curricula/modules, leverage learnings and methodologies, and incorporate it into existing courses or training opportunities (encouraging adoption by under-resourced institutions); inviting sustainability plans and partnerships among institutions and industry that create career paths for trainees; and tools and infrastructure development to share complete resources (teaching materials, data, code in ready-to-use platforms).

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EXPECTED OUTCOMES: Re-usable, tested educational materials (e.g., datasets, curricula, modules) to develop skills and competencies described above with the goal of improving the AI-readiness of biomedical data long-term, and enhancing ethical biomedical-AI practice.

IMPORTANCE: This program bridges the skills learned in biomedical training and data science training by addressing discipline-specific skills for the future AI workforce.

HISTORY: This program builds on the findings and experience from pilot funding opportunities, PI meetings, landscape assessments, and other community engagements. Findings from these engagements highlight the need for training opportunities to focus on discipline-specific AI applications in biomedicine (to enable movement into practice); team-based science; enhanced ethical training and practices; enhanced pathways to partner with ethics experts; and improvement of AI-ready/FAIR data (generation of which begins at the research planning phase).