Administrative Supplements for P30 Cancer Centers Support Grants (CCSG) to Enhance the Utility of Data Available through the Childhood Cancer Data Initiative (CCDI) Ecosystem

Background

In December 2019, Congress approved funding for the Childhood Cancer Data Initiative (CCDI) that aims at improving treatment and outcomes for childhood and adolescent and young adult (AYA) cancer patients by accelerating data collection, analysis, and sharing.

The three major goals of CCDI are:

- gathering data from every child, adolescent, and young adult (AYA) diagnosed with a childhood cancer, regardless of where they receive their care
- creating a national strategy of appropriate clinical and molecular characterization to speed diagnosis and inform treatment for all types of childhood cancers
- developing a platform and tools to bring together clinical care and research data that will improve preventive measures, treatment, quality of life, and survivorship for childhood cancers.

The National Cancer Institute (NCI) is creating a pediatric and AYA cancer data ecosystem to aggregate and generate data of multiple types from multiple sources to accelerate innovative discovery of biomarkers and therapies in pediatric and AYA cancers. The data will include key information from basic research, pre-clinical studies, clinical trials, epidemiology and population studies, cancer surveillance, and routine healthcare settings including but are not limited to molecular data, imaging data, drug screen assay data, real-world patient data, patient-reported outcome, electronic health records, and cancer registry data that will be shared in accordance with FAIR Principles (findable, accessible, interoperable, and reusable). To date, a variety of datasets have been collected and shared through the CCDI data ecosystem including omics data (e.g., DNA/RNA sequencing, proteomic characterization), patient treatment or demographic data (phenomics), medical imaging, preclinical models (e.g., drug screens), environmental exposure, clinical trials (e.g., intervention, response, adverse events), longitudinal outcomes or survivorship data including recurrence and subsequent cancers, and other relevant patient information. This data ecosystem will continue to grow data and new resources will be added into the ecosystem on a continual basis. This presents an unprecedented opportunity for all types of investigators to learn from data on every child, adolescent and young adult represented in order to improve our fundamental understanding of pediatric cancer and new therapeutic interventions.

As part of CCDI, NCI has funded the collection and generation of datasets and tools including but are not limited to:

- Molecular Characterization Initiative (MCI) (phs002790) – including CNS and rare tumors, as well as soft tissue sarcomas
- Data supported by administrative supplements to the NCI's P30 Cancer Center Support Grants (CCSG) in FY20 (e.g., phs002518, phs002504, phs002620, phs002504, phs002599)
- Datasets accessible through CCDI supported resources (e.g., TARGET, Kids First)

For a more comprehensive list of pediatric cancer data, visit: Childhood Cancer Data Catalog for updates.

Additional resources have been developed for the ecosystem with community input to make these data easier to find, use, and understand. These include the:

- NCCR*Explorer, part of National Childhood Cancer Registry, which links clinical patient data from a variety of state and cancer-specific registries (e.g., Pediatric Proton/Photon Consortium Registry, Childhood Cancer Research Network) and public health resources and was created out

of the community desire for longitudinal, population-based information on young people with cancer
- Molecular Targets Platform, which gathers preclinical data that validates what drugs certain molecules involved in cancer growth respond to.
- Oncogenomics (https://omics-oncogenomics.ccr.cancer.gov/cgi-bin/JK; https://clinomics.ccr.cancer.gov/clinomics/public/login)
- CCDI Hub (https://ccdi.cancer.gov/)

More datasets, resources and enhancements will be developed as the CCDI data ecosystem continues to grow, such as datasets from NCI Pediatric MATCH (phs002883), Pediatric Preclinical in Vivo Testing (PiVOT) (phs003160; phs003161; phs003162; phs003163; phs003164), and My Pediatric and Adult Rare Tumor (MyPart) (phs003143) and Childhood Cancer Survivor Study (CCSS) (phs001327) studies anticipated to be released in the coming months. Please check for updates at CCDC or dbGaP periodically.

Purpose and Goals

The NCI's Center for Biomedical Informatics and Information Technology (CBIIT) announces the opportunity for funding NCI-designated Cancer Centers, in collaboration with appropriate pediatric cancer-focused affiliates (e.g., research centers, pediatric care hospitals, foundations, commercial partners, etc.), through P30 CCSG supplements to enhance the usability and utility of data in the CCDI data ecosystem and other relevant pediatric cancer data. The purpose of the administrative supplement is to provide the Cancer Centers with additional resources to aggregate, integrate, analyze and visualize pediatric cancer data from a variety of sources as a demonstration to enhance secondary reuse of data in this population. Ultimately, NCI seeks to use resources in the CCDI data ecosystem to accelerate the understanding of childhood cancer biology and identify potential for therapeutic translation through a more unified lens (e.g., identification of biomarkers predictive of therapeutic outcome in rare tumors).

Specific areas of study may include, but are not limited to, the following examples:

- Studies that involve aggregation, integration, analysis and visualization of relevant CCDI datasets or analytical tools from basic research, pre-clinical studies, clinical trials, and population studies, (e.g., expansion of electronic health record (EHR) extraction that could be aggregated and integrated with other data types in the ecosystem to build a knowledge base by learning from every child and drive discovery of diagnostic and prognostic biomarkers or new therapeutic targets). Co-analysis of CCDI datasets with other relevant datasets are eligible as long as the external data are currently accessible through a publicly available database or can be shared through such a database by the end of the administrative supplement project period.
- Studies that involve the development and deposition of new approaches or tools into the CCDI data ecosystem to further enhance the use of various data types.
- Studies that demonstrate the feasibility of federating institutional data systems (Cancer Centers and their affiliated partners) with CCDI's data ecosystem to facilitate cross-platform data findability, access and usability of various data sources under proper data governance.
- Studies that demonstrate the feasibility of a privacy preserving federated learning framework that does not require training/test data for artificial intelligence models to be shared, thus alleviating the impedance of data sharing restricting rules and regulations.
- Studies aimed at improving understanding of the molecular etiology and pathogenesis of childhood and AYA cancers not currently well understood.

NCI strongly encourages Cancer Centers to establish multidisciplinary teams comprised of diverse skillsets, including clinicians, computational biologists, software engineers, health information technologists, healthcare policy and legal experts, and experimental research scientists who will support innovative and integrative analysis approaches. Furthermore, we encourage Cancer Centers to collaborate with affiliated partners (such as research centers, pediatric care hospitals, foundations, commercial partners, etc.) to identify and utilize relevant datasets or tools to maximize the use of CCDI

and additional data. The Cancer Centers' collaborative teams are expected to aggregate, integrate, analyze and visualize relevant data at multiple levels and dimensions (e.g., sequences, networks and pathways; clinical research and health care data; multiple time points), as well as computational tool development for analysis, integration, and visualization of such complex data.

Eligibility and Budget

- This opportunity is open to all currently funded NCI-Designated Cancer Centers.
- The Center Director must be the PI of the supplement; you may name project leader(s) and point-of-contacts (POCs) with DMS oversight responsibilities in the application separately.
- No limit on the number of administrative supplement applications per Cancer Center.
- Supplement requests may not exceed $500,000 in total costs, and the project period is for one year. No-cost extension for the supplement awards will be limited to an additional 12 months if needed.
- Cancer Centers whose P30 CCSGs will be on an extension at the time the award is made in FY23 are not eligible for this supplement.
- It is anticipated that awards for this supplement opportunity will be made in September 2023 at the earliest.

Expectations for Data Management and Sharing

Sharing childhood cancer data with the broad scientific community is a central goal of the CCDI. Thus, NCI expects that data and results will be shared with the wider scientific community to the extent feasible and in a timely manner. Awardees will be required to abide by the CCDI program expectations.

Specifically, CCDI expects the following:

- All data, analysis results and tools that will be generated from this supplement should follow the guidance of NCI's Office of Data Sharing. In summary, primary sequencing data (e.g., FASTQ/BAM/CRAM); derived sequencing data (e.g., VCF/MAF); expression array data (e.g., IDAT); imaging data (e.g., DICOM); biospecimen data (JSON), deidentified clinical data (e.g., JSON). The clinical data in this context is defined as participant demography, clinical history, diagnoses, pathology, laboratory results, treatment and outcomes, long-term follow up, electronic health records data, and other phenotypic descriptions.
- Justifications for any sharing restrictions and alternate sharing plans whenever possible be provided to maximize sharing of data and resources.
- If applicants propose to utilize and link data (e.g., molecular data, surveys, EHRs) with administrative data (e.g., census, socioeconomic data) for analysis, include documentations of all necessary legal, ethical and regulatory permissions in the applications.
- Data be accessed, manipulated and analyzed by end users using open source codes or tools without license restrictions and fees, to the extent possible.
- The use of data standards associated with each data type and metadata standards whenever applicable (e.g., NAACCR, OMOP, mCODE, CaDSR).
- Data and/or tools be submitted to NIH/NCI-supported data repository(ies) and CCDI data ecosystem (e.g., NCI's Cancer Data Service, NCCR, dbGaP) where scientific data and metadata will be preserved and shared or other non-NIH data ecosystems or databases that will be federated with the CCDI data ecosystem through work supported by this supplement. Similarly, tools developed are expected to be open source either deposited into GitHub or incorporated into the NCI Cloud Resources, etc. Ensure that data will be findable and identifiable via the use of persistent unique identifiers or other indexing tools.
- Data and tools be shared as soon as possible, but no later than time of an associated publication or end of the supplement project period, whichever is sooner. If no-cost extension (NCE) is needed, the latest submission of data and tools would be the end of NCE period or time of publication, whichever is sooner.

- If other datasets to be combined with CCDI data for co-analysis are currently accessible through an NIH-approved repository(ies) (e.g., dbGaP) or other controlled access database (e.g., European Genome-phenome Archive): CCDI expects a brief description of the repository(ies) through which the proposed datasets including any data use limitations based on the associated consent form are available to the research community. If applicants plan to submit their own genomic data (not NCI-funded) to an NIH-supported repository (e.g., dbGaP), they must include an Institutional Certification for research subject to the Genomic Data Sharing (GDS) policy. Note that a completed Institutional Certification may be required prior to award.
- Disclosure of any applicable factors affecting subsequent access, distribution, or reuse of scientific data related to informed consent (e.g., disease-specific limitations, particular communities' concerns), and privacy and confidentiality protections (i.e., de-identification, Certificates of Confidentiality, and other protective measures) consistent with applicable federal, Tribal, state, and local laws, regulations, and policies.

Application Submission Format

Applications must be submitted electronically via eRA Commons to the parent award (P30) using PA-20-272: "Administrative Supplements to Existing Grants and Cooperative Agreements (Parent Admin Supplement)" on or before June 30, 2023 by 5pm EDT. Your submission should follow the instructions in the funding opportunity announcement, including the following:

1. **Research Plan (6 pages) including the following elements:**
   - Provide a background statement that explains how data aggregation, linkage, integration, analyses and visualization or development of tools would be beneficial to the pediatric and AYA cancer community and clearly articulates if they would further support research in ultra-rare tumors or in validation of the FDA Relevant Molecular Target List.
   - Provide a description of the background, relevant Cancer Center infrastructure, data sources, and specific aims for the proposed research.
   - Provide preliminary results if available, and a detailed list of data types, data categories, applicable tools, and other relevant documentation that will be part of the research objectives, preferably in a summary table format. An example can be a table of datasets in the CCDI data ecosystem and other datasets that will be integrated, analyzed and visualized.
   - Outline a detailed data analyses plan to be performed and provide a timeline for the development of a process that could support the data and tool deposition to appropriate NCI or NIH databases/repositories on an ongoing basis (e.g., staff involved). It should include milestones (e.g., data standardization and harmonization, tool development and validation, model development, data packaging for transfer, data transfer completion, sharing of data, analysis results and tools) for tracking the progress of the work in the one year period of the supplement.
   - Include a statement of confirmation, by authorized institutional officials (e.g., intellectual property, policy and legal experts), to permit transfer, linkage and use of healthcare data with other data types (e.g., research data) as well as the federation of data ecosystems within and across Cancer Centers and their affiliated partners and CCDI.
   - Include an Institutional Certification for research subject to GDS policy to be submitted to an NIH repository(ies), if applicable.
   - Include an agreement to attend up to two in-person or virtual meetings during the supplement period to establish and participate in relevant working groups to address data harmonization and integration, specific research and clinical questions that can be addressed by CCDI, and other relevant topics.
   - Include a statement that you and your institutions will comply with CCDI program expectations of data management and sharing and provide additional information wherever needed.
   - Describe the qualifications of the individual(s) who will conduct the work including details of the qualifications for the identified lead(s) of the supplement. Note: separate SF424 forms will be needed for biosketches.
   - Inclusion of target diverse population across the spectrum of age, gender, and race is encouraged.
   - Leadership of projects by junior or mid-level investigators is encouraged.

Email confirmation of application receipt must be obtained to be officially considered and evaluated.

2. A detailed budget and budget justification for funding and activities requested using SF424 forms: In addition, the application must include Project Summary/Abstract and Specific Aims as a part of a submission package. No appendix or attachments are allowed.

Evaluation of Supplement Requests

Supplements will be administratively evaluated by NCI staff with appropriate expertise. There will not be a secondary review process. Proposals will be reviewed for quality and responsiveness to application criteria outlined in the requirements for the 6-page summary described above, as well as the following:

- For applications requesting to aggregate, integrate, analyze and visualize data, does the application describe a body of highly relevant pediatric cancer data in the CCDI data ecosystem alone or in combination with other datasets/data types that will maximize the utility of available data and tools?
- Does the supplement application describe a clear and feasible plan for providing the data, analysis results and computational tools or AI models that can be readily shared and assembled with additional datasets through the CCDI ecosystem or other institutional ecosystems that can be federated with the CCDI ecosystem without restrictions?
- Will the applicant's institution leverage the multidisciplinary expertise at the Cancer Centers including pediatric oncology expertise and insight, the existent clinical trial and healthcare data systems and sources to help contribute to the overall goals of improving the understanding of childhood cancer biology, including making relevant rare tumor or molecular target data available to the research community?

Awards

Awards will be based on responsiveness to the goals of this announcement and the availability of funds.

Reporting Requirements

As part of the annual progress report of the parent NCI Cancer Center Support Grants, include information on what has been accomplished via the administrative supplement during the funding period. CCDI expects the reporting of any data management and sharing progress to be included in the annual progress report.

Questions

For inquiries about the scientific objectives and goals of CCDI and data management and sharing policy, please contact NCIChildhoodCancerDataInitiative@mail.nih.gov.

Pre-Submission Informational Webinar:

Date/Time: May 18, 2023, 2-3 pm EDT
Meeting link: https://cbiit.webex.com/cbiit/j.php?MTID=md49156b52bc93c8e03dfc9671e78028f
Meeting number: 2306 035 1795
Meeting password: bXehjtX?827

Join by phone
1-650-479-3207 Call-in toll number (US/Canada)
Access code: 23060351795

Join from a video or application
Dial 23060351795@cbiit.webex.com
You can also dial 173.243.2.68 and enter your meeting number.