CCDI March 2024 Community Forum

CCDI Webinar Series

Presenters: Gregory Reaman, Anthony Kerlavage, Mary Frances Wedekind Malone, Brigitte Widemann

NIH NATIONAL CANCER INSTITUTE

March 18, 2024

March 2024 Community Forum Agenda

1. *Genomic Data Harmonization Taskforce Meeting: Updates*
2. *CCDI Data Use Cancer Center Supplements*
3. *Molecular Characterization Initiative: Updates*
4. *Coordinated Pediatric and Young Adult Rare Cancer Initiative*

Genomic Data Harmonization Taskforce Meeting: Updates

Anthony Kerlavage

Genomic Data Harmonization Taskforce

Problem Statement: NCI funds multiple -omics data analysis pipelines for CCDI and other research programs. This creates an ever-growing expense and complexity in aligning or comparing data sets processed in different ways.

Purpose: Seek insights on current approaches and work towards community alignment on harmonizing standards and pipelines

Goals:

- Minimize reprocessing of primary data
- Predictable and sustainable costs
- Controlled change management, reproducibility, and results comparability

Genomic Data Harmonization Taskforce Meeting

Recommendations:

- Compile potential research goals and foundational processes for consistency, while allowing customization.
- Assess the impact of clinical integration and patient consent on research pipelines.
- Evaluate the potential of cloud computing and establish cost-effective strategies and usage guidelines for bioinformatic workflows.
- Facilitate collaboration among research institutions and promote long-term planning in genomics research.
- Compare costs of alignment, variant, and gene expression pipelines.

CCDI Data Use
Cancer Center Supplements

Gregory Reaman

CCDI Data Use Cancer Center Supplements

Awardee	Project
University of Pennsylvania	**Creating a Childhood Cancer Alternative Isoform Atlas: Informatics Tools and Multiomics Insights for Immunotherapy Targets** • Goal: Map alternative isoforms, and identify potential new immunotherapy targets; all software will be open source
Jackson Lab	**Automated Classification of Pediatric Soft Tissue Sarcoma from Histopathology Images** • Goal: Expand collection of digitized whole slide images and use computational techniques to improve diagnosis and classification
USC and CHLA	**Enhancing Pediatric Cancer Research with AI-Driven Diagnostics** • Goal: Develop an on-line, AI-powered diagnostic resource for solid tumors using whole-slide images and whole genome methylome data
St. Jude	**Enhancing Precision of Pediatric Cancer Molecular Targets by Aggregating CCDI Genomic Data to Pediatric Cancer Knowledgebase** • Goal: Enhance the precision of the CCDI Molecular Targets Platform using the evidence base of genetic changes in childhood cancers available in the St. Jude PeCAN v2

CCDI Funded Projects - NCI (cancer.gov)

CCDI Data Use Cancer Center Supplements cont..

Awardee	Project
Emory and CHOP	**Leveraging ExtractEHR and FHIR Framework for Enhancing Clinical Data Integration** • Goal: Use FHIR to extend ExtractEHR's capability to include structured clinical data for the Ecosystem
University of Nebraska	**Machine Learning Framework for Accurate Childhood Acute Myeloid Leukemia (AML) Subtype Identification** • Goal: Refine risk stratification, diagnosis, and treatment selection for children with AML; potential to identify subtypes of other pediatric and AYA cancers, including ultra-rare
Boston Children's and Dana Farber	**Real-World Molecularly-Targeted Treatment Registry (MaTTeR): A Pilot Study to Enrich CCDI Data using Directed Electronic Medical Record Extraction** • Goal: Implement an "Electronic Medical Record Search Engine" to identify patients who received MTTs outside of clinical trials; create a real-world registry; launch a data visualization platform in the CCDI Ecosystem to explore and apply MaTTeR in clinical care and research
Sanford Burnham	**Unlocking the Potential of Extrachromosomal Circular DNA as Prognostic Markers in Childhood and AYA Cancers** • Goal: Evaluate how extrachromosomal DNA affects development, spread, and prognosis in childhood and AYA cancers

CCDI Funded Projects - NCI (cancer.gov)

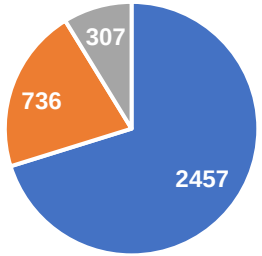
Molecular Characterization Initiative: Updates

Gregory Reaman

Molecular Characterization Initiative (MCI): Extended to Children with Neuroblastoma

- Launched April 2021, in partnership with Children's Oncology Group's (COG) Project:EveryChild (PEC)
  - state-of-the-art molecular characterization at diagnosis (WES, fusions, methylation) at no cost to patients
  - Results returned to participants and treating physicians within 21 days
- Enrolled more than 3,500 participants from all 50 states, Canada, Australia, and New Zealand
- Newly diagnosed children with advanced neuroblastoma at COG hospitals are now eligible
  - Eligibility includes participation in COG high-risk neuroblastoma trial ANBL2131 (enrollment opens soon)
- Learn more: ccdi.cancer.gov/MCI

Enrollment by Diagnosis



Access Data: https://www.ncbi.nlm.nih.gov/projects/gap/cgi-bin/study.cgi?study_id=phs002790

Considerations for Expanding MCI

- Plan to add Ewing sarcoma and expand to include AYAs outside of COG for the Coordinated Pediatric and Young Adult Rare Cancer Initiative
- Prioritize diseases for **research** characterization and determine which assays (WGS, RNA Seq, single cell, proteomics/metabolomics) are appropriate to deepen our understanding of cancer biology
  - Working with COG disease-specific scientific committees and other subject matter experts
- Assess whether specific diagnoses within primary CNS tumors necessitate special considerations or tailored approaches

Flickr

Coordinated Pediatric and Young Adult Rare Cancer Initiative

Mary Frances Wedekind Malone

Brigitte Widemann

CCDI Coordinated Pediatric and Young Adult Rare Cancer Initiative

- A longitudinal observational study for children and young adults with very rare cancers
- A collaboration between:
  - NCI CCDI, Children's Oncology Group (COG), other consortia, advocacy groups, NCI Center for Cancer Research Pediatric Oncology Branch (CCR-POB)
  - Rare tumor efforts nationally and internationally
  - Regulatory agencies
  - EU Beating Cancer Plan and Cancer Moonshot

Rare Cancers: Definition

Definition: Fewer than 15 per 100,000 people/year in U.S.

- All pediatric cancers are rare

Very rare pediatric cancer:

- Fewer than 2 cases per million per year (11% of all pediatric cancers)
- Tumors not considered in clinical trials
- Molecular characterization of rare cancers creates even smaller groups:
  - Rhabdomyosarcoma:
    - Fusion positive (PAX3-FOXO1, PAX7-FOXO1)
    - Fusion negative:
      - TP53 mutation
      - MYOD1 mutation
      - Multiple other mutations

Ferrari A. et al., European Journal of Cancer, 2019

Rare Cancers: Limitations and Ongoing Efforts

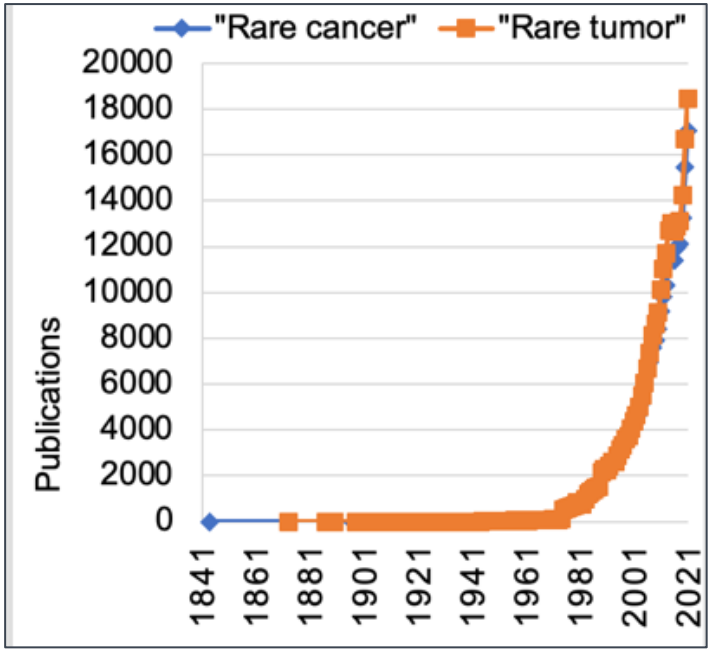
Limitations:

- Focus on few cancers
- Siloed
- Insufficient patient numbers for most cancers
- Data collection limited not standardized/structured

Successful Pediatric Efforts:

- PPB/DICER1
- International pediatric ACC
- ExPERT/Partner

Landscape Analysis: 76 Rare Tumor Programs



Rare tumor/cancer publications

Ferrari A. et al., European Journal of Cancer, 2019 *Vivelo C. et al., The Oncologist 2023*

Objectives

Primary objective:

- Determine feasibility of a longitudinal national/international NCI CCDI coordinated observational protocol for very rare pediatric and AYA solid cancers and in the future hematologic malignancies
  - Collect core clinical data
  - Collect comprehensive clinical data for rare select rare tumors

Secondary objectives:

- Evaluate patient-reported and observer-reported outcomes
- State-of-the-art clinical molecular characterization through CCDI MCI (self-referred participants)
- National-international molecular/clinical tumor boards for specific rare tumors

Eligibility and Diagnosis

Eligibility:

- COG-APEC14B1 participants: ≤25 y/o at diagnosis (exceptions)
- Self-referral, non-COG sites: Age at enrollment ≤39 y/o

Diagnosis:

- Pathology confirmed rare solid tumor with exception of:
  - Solid tumors for which COG conducts interventional trials
- Select molecularly defined rare tumors, TBD
- Rare hematologic malignancies in future

Enrollment and Design

Enrollment:

- COG Project:EveryChild
  - Participants with eligible rare tumors enrolled on the CCDI MCI
- Self-referral
  - Non-COG sites

- Engagement with advocacy groups, other consortia, rare tumor efforts, community hospitals, adult oncology groups

Design:

- Coordination:
  - NCI CCDI through Contract Research Organization (CRO)
  - Overall study PIs: POB and COG
  - Rare cancer cohort PIs (disease experts/champions from any location)

Tumor Boards/Tumor Clinics

Disease-specific national and international molecular/clinical tumor boards:

- Directed by disease champions
- Will be piloted starting with one or few select cancers

NIH rare tumor clinics:

- For select rare tumors
- Allow for focus groups

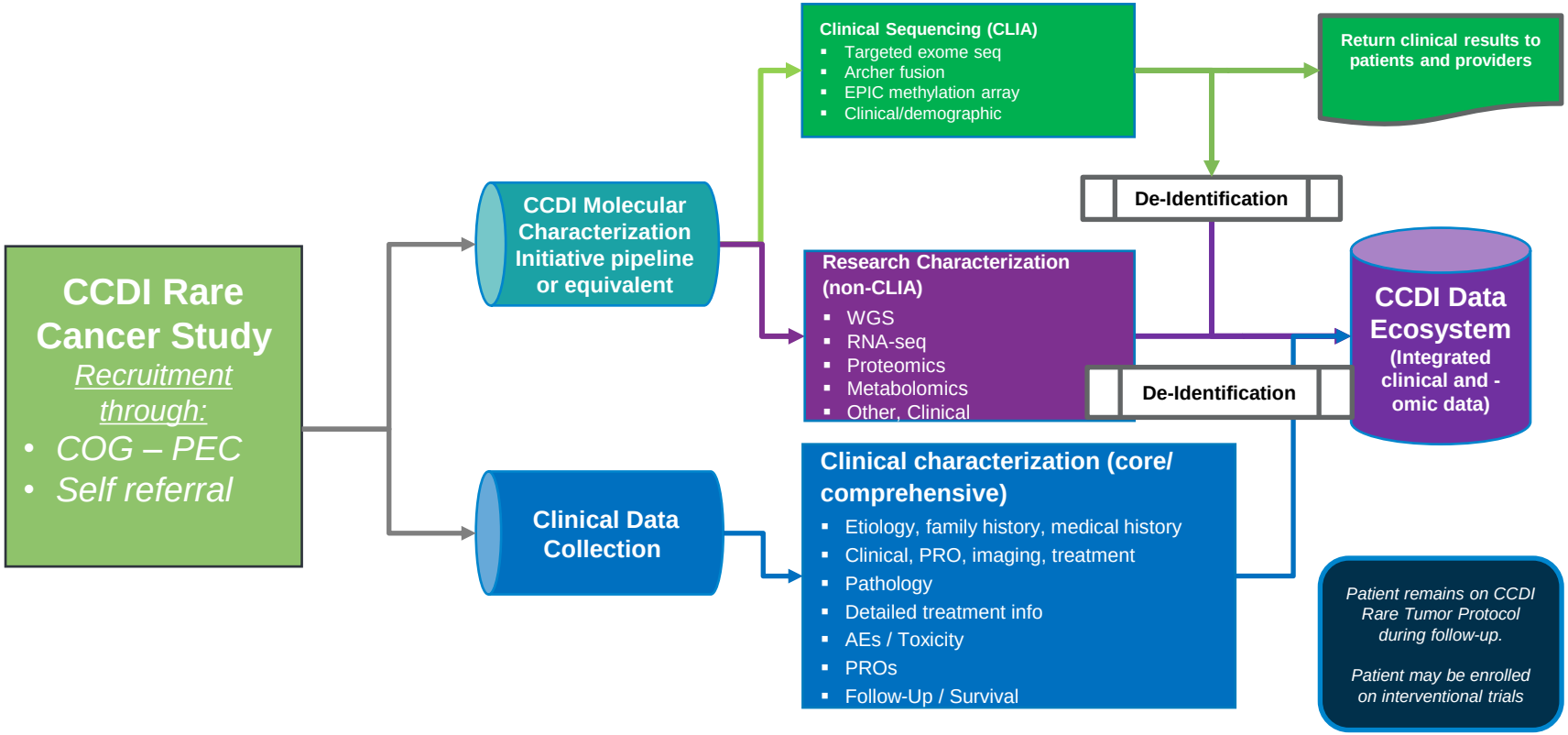
Contract Research Organization (CRO)

- Develop database and forms for core data and comprehensive data
- Screen and enroll participants: Data collection (medical records, imaging, pathology)
- Administer data forms and questionnaires
- Data extraction, entry, quality control, longitudinal follow up
- Interface with COG and collaborating groups and other organizations

Data Collection

- Core data set, including Patient Reported Outcomes (PROs)
- Comprehensive data set (selected rare cancers)
- Clinical molecular characterization through the CCDI MCI
- Research molecular characterization: TBD
- Data for patients enrolled through PEC-MCI will be accessible to the national rare cancer study
- Data sharing with other rare cancer registries to not duplicate efforts

CCDI Coordinated Pediatric and Young Adult Rare Cancer Initiative: Data Flow



Q&A / Open Discussion

Upcoming CCDI AACR Session

Tuesday, April 9, 2024, 2:30 p.m. - 3:30 p.m. PT

- Event: American Association for Cancer Research (AACR) Annual Meeting 2024
- Session Title: Building on the Power of Data and Community
- Location: Room 2 – Upper Level – San Diego Convention Center, San Diego, California

For additional details visit: https://www.abstractsonline.com/pp8/#!/20272/session/635

Find Out More About CCDI

Learn about CCDI and subscribe to our monthly newsletter.
cancer.gov/CCDI

Questions? Email us.
NCIChildhoodCancerDataInitiative@mail.nih.gov

Thank you for attending!

NATIONAL CANCER INSTITUTE

cancer.gov

cancer.gov/espanol