

Cancer Immune Monitoring and Analysis Centers  
& Cancer Immunologic Data Commons

## The CIMAC-CIDC Network

### OVERVIEW

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# CIMAC-CIDC Network

## OVERALL Goals and Structure

- **CIMAC-CIDC Network is a pre-funded, standing laboratory and database resource to support correlative studies in early phase clinical trials involving immunotherapy**
- **Our goal: to help individual trials maximize its translational potential and to enhance the collective power of correlative studies across the NCI trial networks and funded programs**
- **Four (4) CIMACs and one CIDC are funded as U24 Cooperative Agreements**
  - **CIMACs provide assays and data analysis from biospecimens from NCI-funded immunotherapy trials**
  - **CIDC provides overall data integration platform to serve the network and eventually the larger IO research community**

# The CIMAC-CIDC Network

## CIMACs

### 1. The University of Texas MD Anderson Cancer Center

PIs: Ignacio Wistuba and Chantale Bernatchez

### 2. Icahn School of Medicine at Mount Sinai

PI: Sacha Gnjatich

### 3. Dana-Farber Cancer Institute

PIs: Catherine Wu and F. Stephen Hodi

### 4. Stanford University

PIs: Holden Maecker and Sean Bendall

## CIDC

### Dana-Farber Cancer Institute

PIs: Xiaole Shirley Liu and Ethan Cerami

## NCI Staff

### Cancer Diagnostic Program:

- Magdalena Thurin (Program Director)

### CTEP:

- Helen Chen
- Elad Sharon
- Howard Streicher
- Bill Merritt (CITN)
- Minkyung Song (Grant-supported trials)

### CBIIT:

- David Patton

### BRP:

- Yingdong Zhao
- Laura Yee

### TRP:

- Andrew Hruszkewycz (SPORE grants)

**Jeff Abrams**, DCTD Associate Director, CTEP

### Administrative Support:

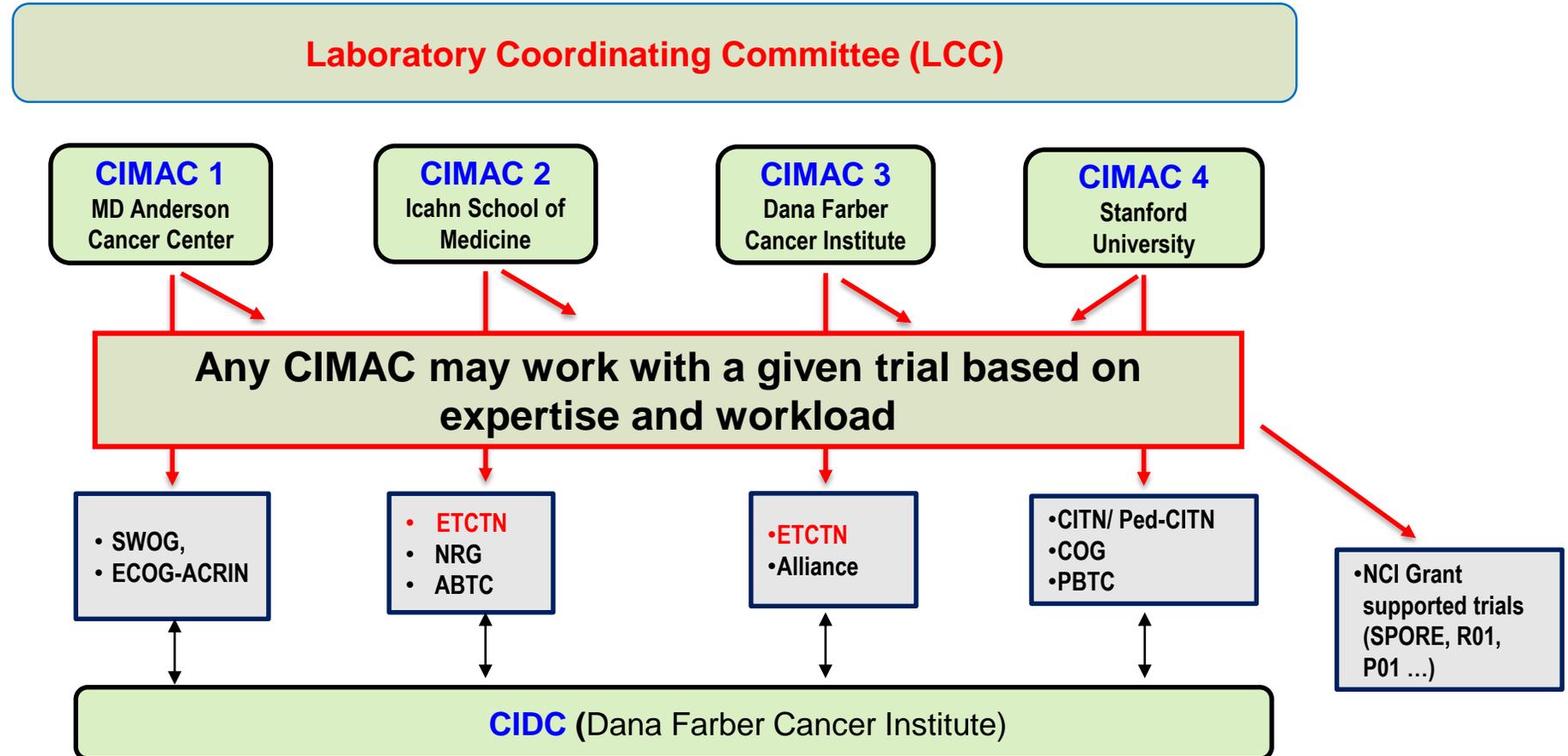
- Rebecca Enos
- Melissa Bowman

# Scope of Work

- Each **CIMAC** is a multidisciplinary team (oncologists, pathologists, lab scientists, bioinformaticians, statisticians).
- In conjunction with **CIDC**, will provide assays AND analysis for immune biomarkers (including genomic, phenotypic and functional characterization) using state-of-the-art, consistent methodologies.
- **All CIMACS will work as a network to collaborate on trials**
  - **Eligible trials** - Early (Phase 1 and Phase 2) immunotherapy trials
    - **CTEP Trial Networks** (NCTN, ETCTN, CITN, ABTC, PBTC)
    - **NCI Grant-supported trials** (eg. P01, R01, SPORE grants)
  - **600 patient-timepoint/year for comprehensive profiling**
    - More patients if not all assays are feasible with available tissues
  - **Can expand with supplemental funding** (e.g. **PACT** or other resources)



# CIMACs-CIDC Network Structure



- **ALL CIMACs can work with any trial networks, depending on specific needs, expertise and work load**
- **Each CIMAC will be in a Primary Alignment with 1-2 trial Networks** – to facilitate scientific planning, Biobank interactions
- **A given CIMAC may perform a specific assay for all trials**

# Oversight of CIMAC-CIDC Functions

## Laboratory Coordinating Committee (LCC)

**Leader:** Ignacio Wistuba

**Co-leaders:** Catherine Wu, Holden Maecker, Sacha Gnjatich, Shirley Liu

**NCI Staff,** Subject experts when appropriate

### Clinical Trials WG

**Network Leads:**

Stephen Hodi

**NCI Leader:**

Helen Chen

### Biobank WG

**Network Leads:**

Ignacio Wistuba

Ethan Cerami

**NCI Leaders:**

David Patton

Irina Lubensky

### Assays/Platforms WG

**Network Leads:**

Holden Maecker

Catherine Wu

Sacha Gnjatich

**NCI Leader:**

Magdalena Thurin

### Database WG

**Network Leads:**

Ethan Cerami

**NCI Leader:**

David Patton

### Bioinformatics/ Statistics WG

**Network Leads:**

Shirley Liu

**NCI Leader:**

Yingdong Zhao

### Non-CTEP Network Trials WG

**NCI Leader:**

Min Song

# Assays/Platforms in CIMACs

(Status as of March 2018)

- Blue text = Tier 1 assays
- Black text = Tier 2 assays

## Tissue-based Imaging

- Multiplex immunohistochemistry
- Conventional immunohistochemistry
- FISH DNA
- Multiplexed Ion-Beam Imaging (MIBI)

## Cell Profiling

- Mass Cytometry (CyTOF)
- High-dimensional flow cytometry
- ELISpot

## Cytokines/Serum Analytes

- O-link serum cytokine analysis
- Luminex
- Seromics – ELISA/Grand serology
- MesoScale Discovery

## Sequencing

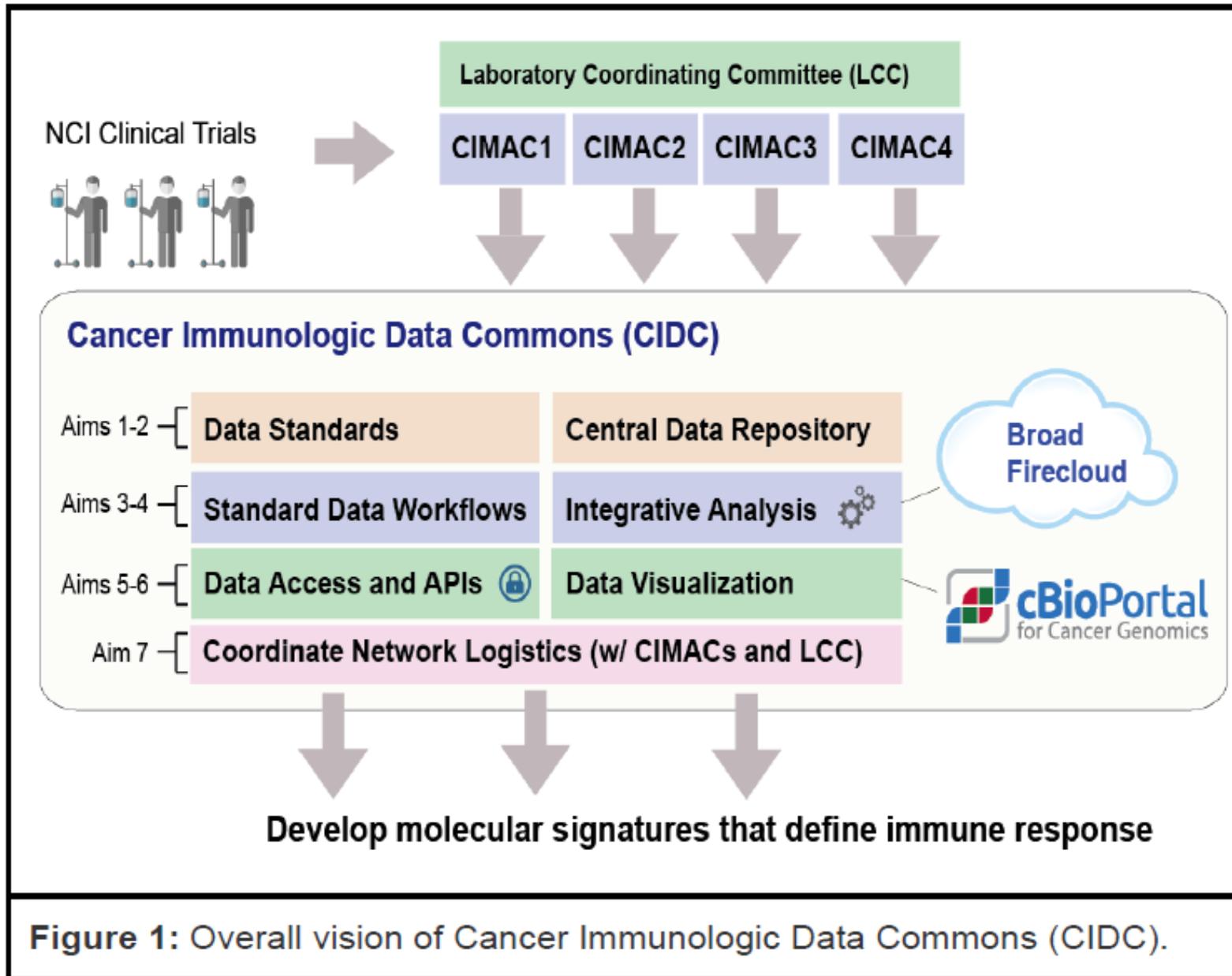
- Whole Exome Sequencing
- RNA-Seq
- NanoString
- TCR/BCR clonality
- Single-cell TCRseq
- HLA-Seq, Epitope prediction
- Cell-free DNA (circulating tumor DNA)
- HTG-EdgeSeq (gene expression)
- Single-cell transcriptome

## Other:

- Neoantigen Prediction
- Mass spectrometry epitope detection
- Epigenomics (ATAC-Seq)
- Microbiome (16S Deep Sequencing)
- CRISPR

- Assays may be standardized and harmonized across Centers, **or** directed to a select center
- All assays must meet analytical characteristics that are fit for purpose

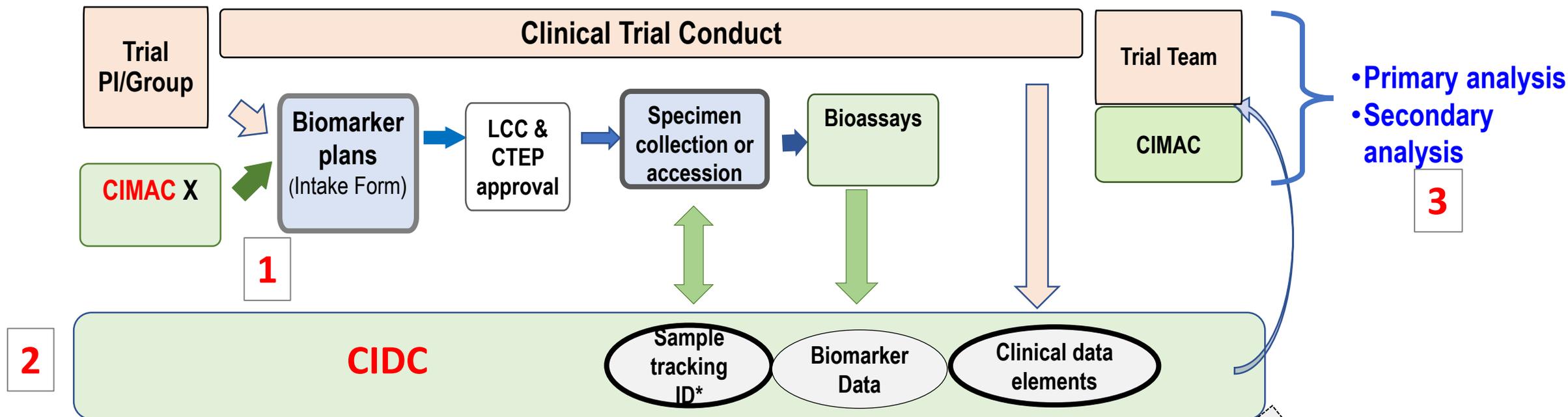
## A. Overall Vision of CIDC



**Figure 1:** Overall vision of Cancer Immunologic Data Commons (CIDC).

- **Central Data Repository** for CIMAC generated biomarker data, using standardized data format
  - Genomics, transcriptomics, proteomics, flow, IHC etc
- Secure **Informatics Platform** for integration of biomarker data and clinical data
- Role-based, time-controlled **data access** with **web visualization** by **collaborating CIMAC and clinical team...** and in the future, outside community
- **Coordination of all network activities for biomarker discovery and validation**

# Work flow for CIMACs/CIDC Studies Linked to Network Clinical Trials



1. **Proposal of Biomarker plans** - to be jointly developed by CIMAC and Clinical trial team → LCC Review/Approval → CTEP approval.

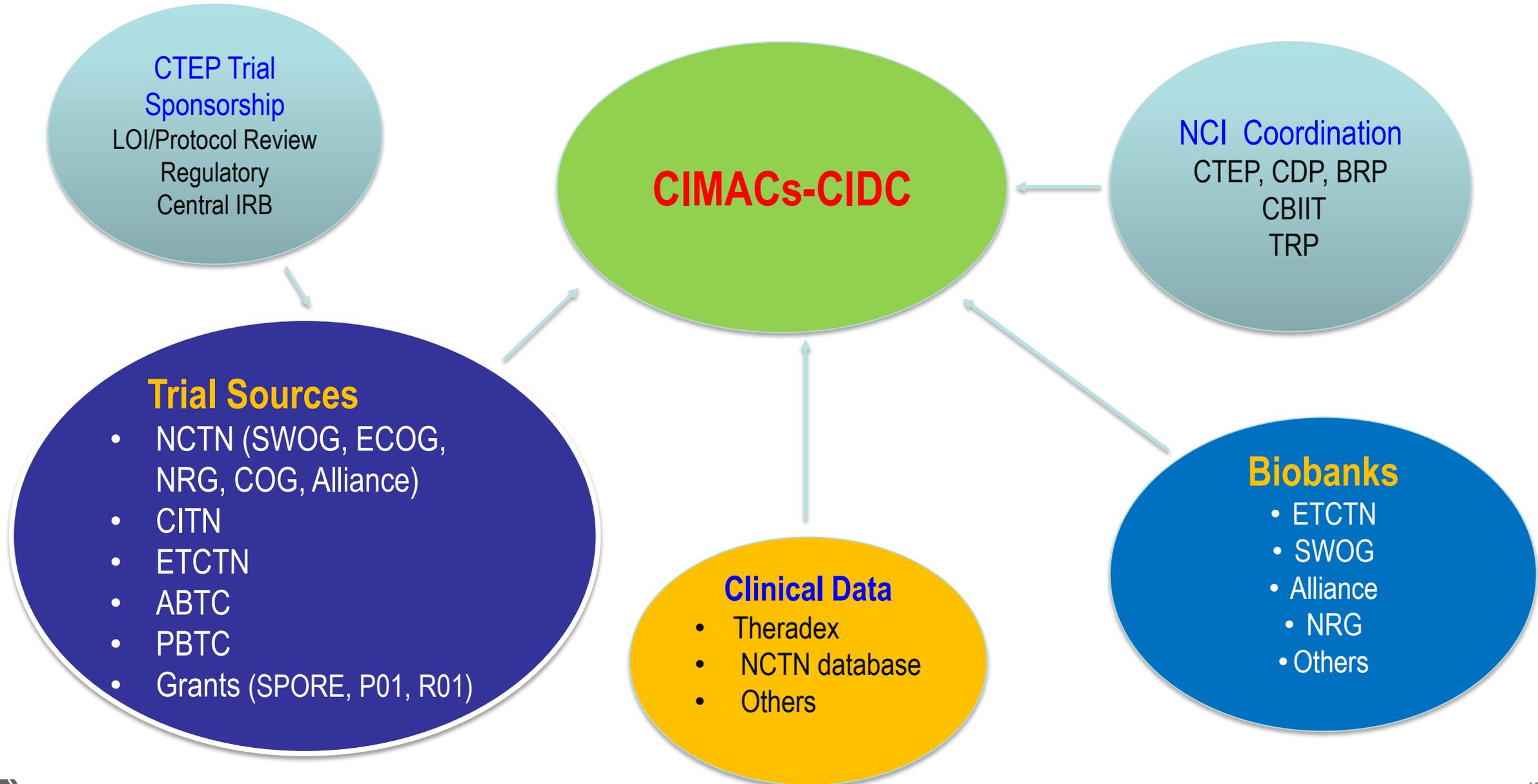
2. **Database at CIDC** - including clinical data elements critical to correlative analysis

3. **Data analysis and Publication** – data analysis will be done collaboratively between the Trial Team and CIMAC

# Current Status

- **Pilot projects** selected to demonstrate the function and optimize the process of CIMAC
- **Harmonization/standardization** for key platforms in progress ... in addition to assay validation documents
- **Database and informatics pipeline** being selected for key platforms
- **Specimen tracking system** across CIMACs and Biobanks and sites
- Various agreements under review (data access, data sharing, MTA, Institutional Certificates, specimen manifest...)

# It Takes a Village!





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