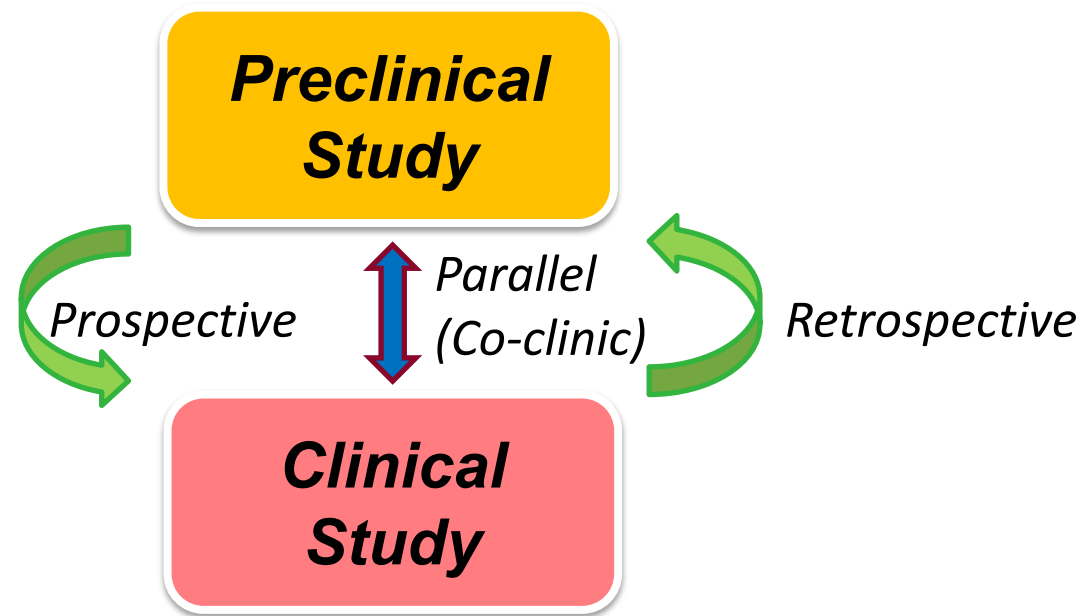


Co-Clinical Imaging Research Resource Program (CIRP)

Huiming Zhang, Ph.D., Cancer Imaging Program, DCTD, NCI

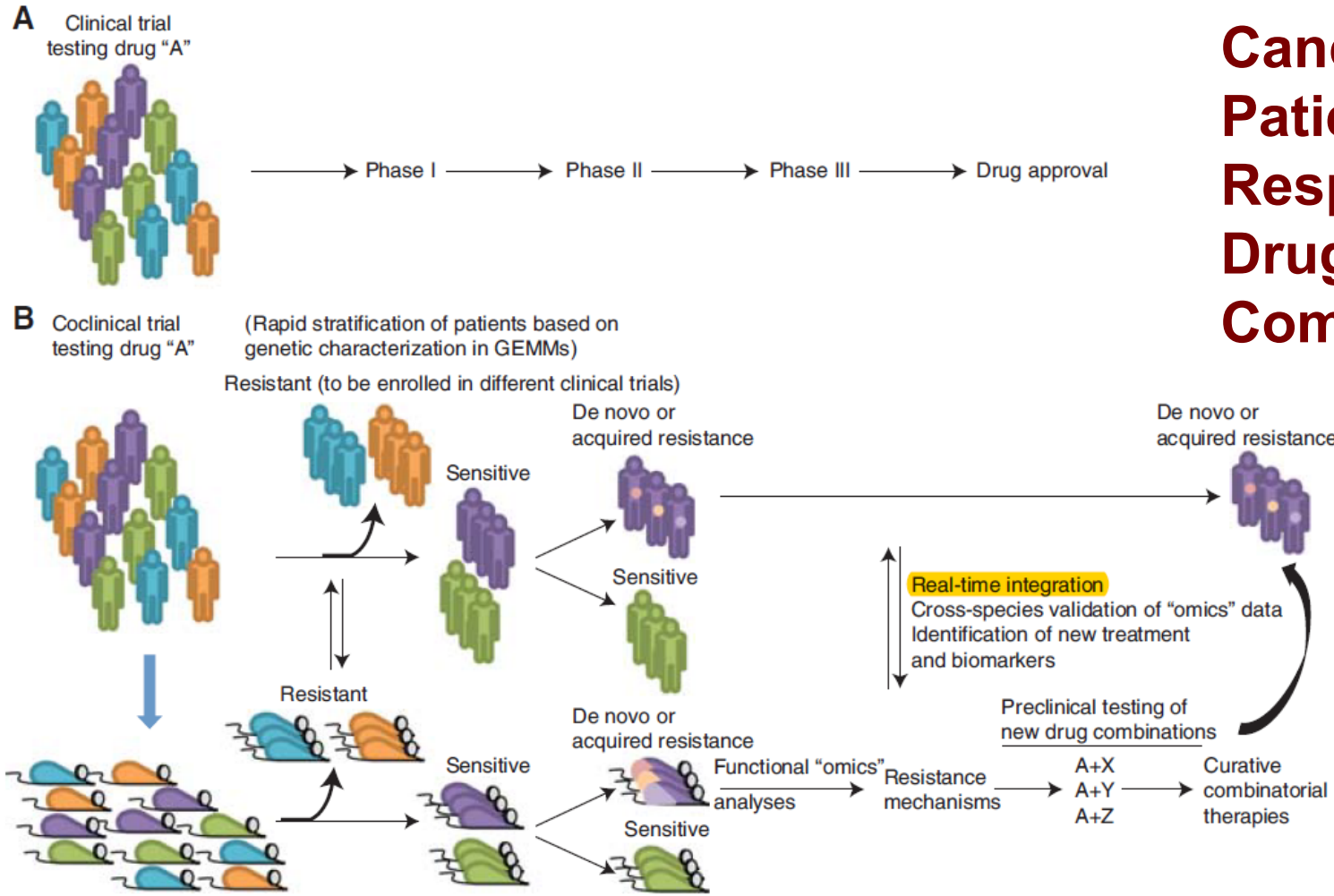
Rationale

- ❑ Precision medicine requires better animal models & novel research,
- ❑ Preclinical study is linked to clinic study via multiple pathways,
- ❑ Quantitative imaging (QI) as a non-invasive tool.



Collins FS, and Varmus H, *A new initiative on precision medicine*, NEJM, 372:793 (2015)

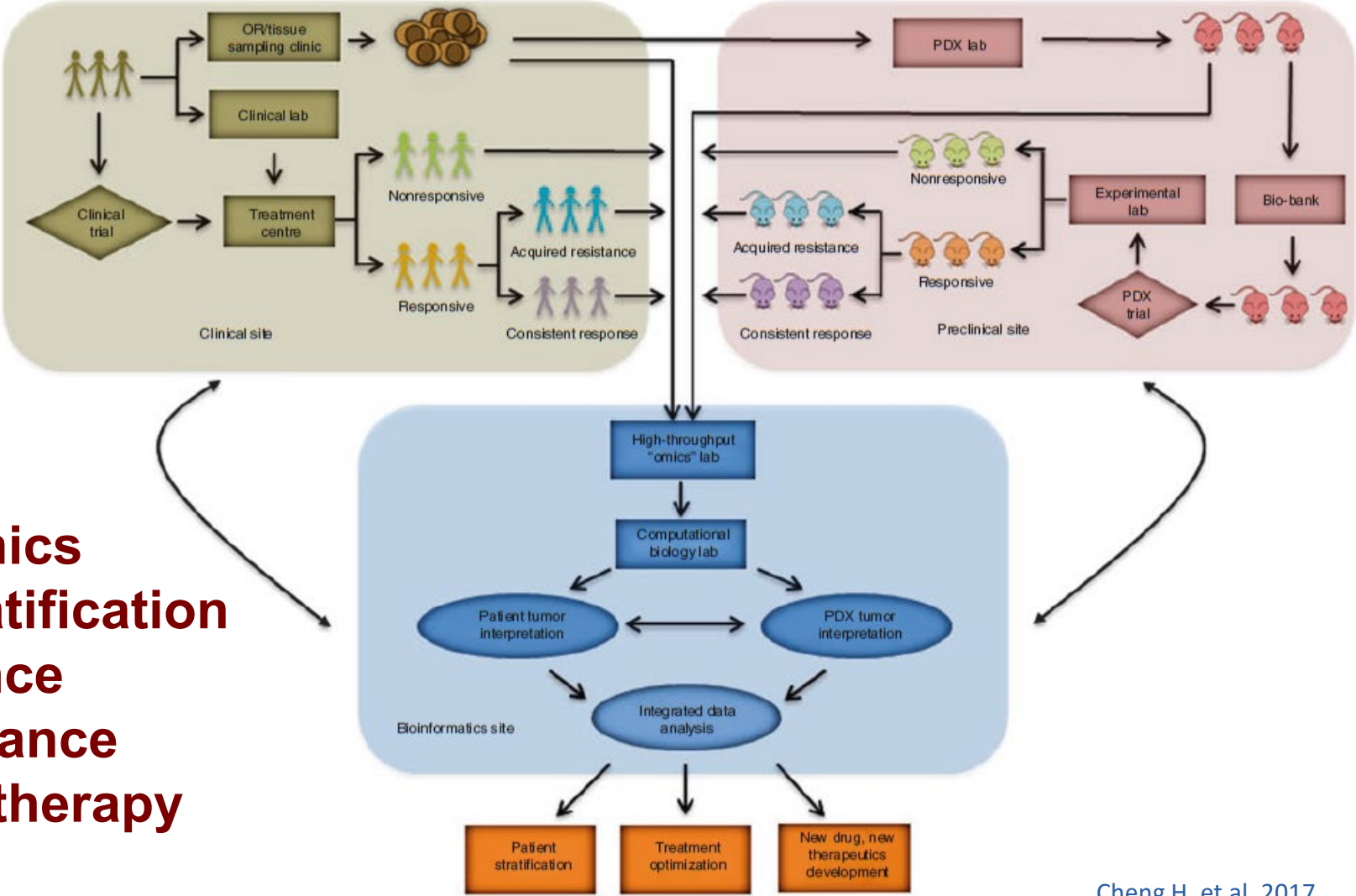
GEMMs-Based Co-Clinical Trial Platform



Cancer -omics
Patient stratification
Response
Drug resistance
Combined therapy

Chen M, et al, Code Spring Harb Perspect Med, 2017

PDX-Based Co-Clinical Trial Platform



Cancer -omics
Patient stratification
Respendence
Drug resistance
Combined therapy

Cheng H, et al, 2017

History & Progress Timeline

2009: *NCI U01s: Integration of Mouse Models into Human Cancer Research,*

2012: first co-clinical trial report on NSCLC,

2015: NCI U24s: Co-clinical Imaging research resources, [PAR-15-266](#), [PAR-16-385](#),

2018: NCI U24s reissued: [PAR-18-841](#)

Related resources: NCI patient-Derived Models Repository (PDMR), EurOPDX consortium, IMODI consortium (France), Co-clinical trials centers, mouse hospitals.

NCI initiatives: PDXnet (2017), PDMC (2016).

PAR-18-841: Scientific Goals

Develop co-clinical imaging research resources that will encourage a consensus on how quantitative imaging (QI) methods are optimized to improve the quality of imaging results for co-clinical trials:

- ❑ Perform optimization of pre-clinical quantitative imaging methods,**
- ❑ Implement optimized methods in co-clinical trials,**
- ❑ Populate a web-accessible research resource with all data, methods, workflow documentation, and results collected from co-clinical investigations.**

PAR-18-841: Required Four Elements

❑ Co-clinical interventions:

Known intervention
Therapeutic or prevention
Prospective or retrospective

❑ GEMMs or PDXs models:

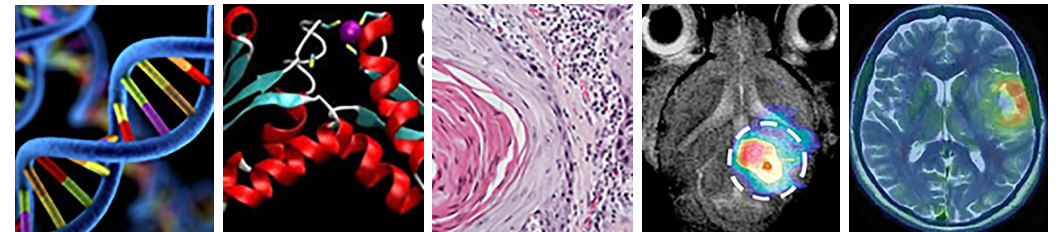
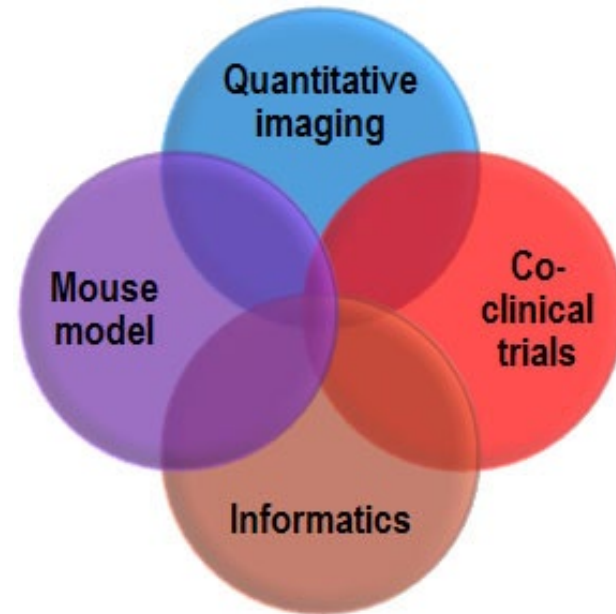
Mice, available, credentialed, validated

❑ Quantitative imaging:

Preclinical identical to clinic one
New methods require IND or IDE
User developed software tools allowed

❑ State-of-art informatics:

Encourage data integration
Encourage to use TCIA, NCIP hub
Encourage to contribute to OMF, QIN, EDRN, etc.



PAR-18-841: Deliverable

Demonstrate the *functionality* of a web-accessible resource before the 3rd quarter of year 5 :

❑ Web-accessible functional information:

- Co-clinical imaging data
- Methods & software tools
- Workflow documentations
- Results from co-clinical investigations

❑ Demonstrating the functionality:

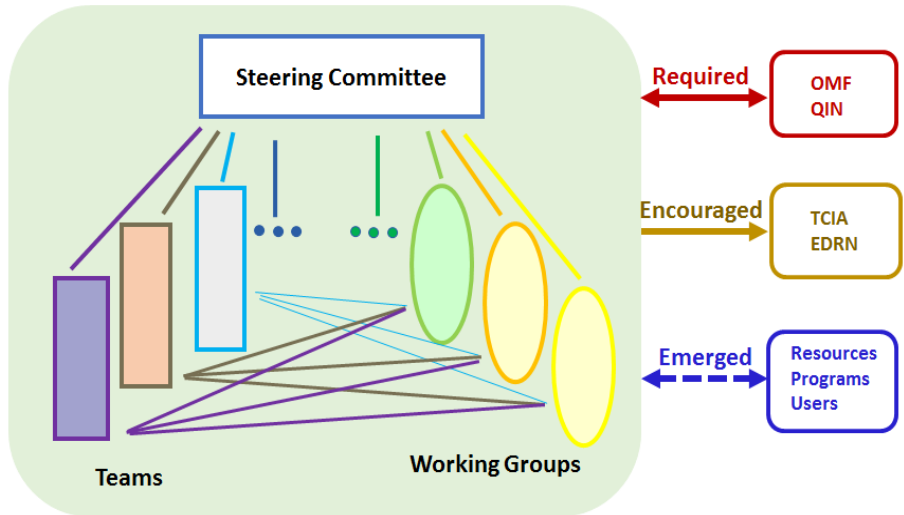
- Strategy to create the resource
- Accessibility by research community,
- Permitting research community to use and improve the proposed QI methods
- Software challenge

CIRP Teams

- ❑ **WUSTL (PI: Kooresh Shoghi):** TNBC, PDXs, Chemotherapy, FDG-EPT, MRI, PET/MRI
- ❑ **Duke (PI: Cristian Badea):** Sarcoma with lung metastasis, GEMMs, Immune check point inhibitors + RT, MRI, CT
- ❑ **Vanderbilt (PI: Charles Manning):** Colorectal cancer, PDXs & Humanized mice, Targeted therapy, 18F-FSPG PET, 11C-Acetate-PET
- ❑ **UPENN (PI: Rong Zhou):** Pancreatic cancer, GEMMs, Stromal targeting therapy, motion resistant MRI

CIRP Network

<https://nciphub.org/groups/cirphub>



Structure:

- Steering Committee**
- Three working Groups:**
 - Animal models and co-clinical trials (AMCT)**
 - Imaging acquisition and data process (IADP)**
 - Informatics and outreach (IMOR)**

Outreach:

- Leverage existing resources**
- Ensure best practices for every CIRP element**
- Address unmet need in cancer community**
- Provide better support to cancer research**
- More...**

CIRP Hub

<https://nciphub.org/groups/cirphub>

The screenshot shows a web browser window displaying the CIRP Hub website. The browser's address bar shows the URL <https://nciphub.org/groups/cirphub>. The website header includes the text "powered by NCIP Hub" and navigation links for "Login", "Register", and "Request Membership". The main heading is "Co-Clinical Imaging Research Resources Program Network (CIRP) [cirphub]". Below this is a teal navigation bar with links for "Overview", "Members", "Resources", "Forum", "Projects", "Calendar", "Announcements", "Collections", and "Activity". The "About CIRP" section contains a paragraph describing the program's goals and a list of "Four essential elements":

- Animal Models**: Represented by a red square with a mouse icon.
- Co-Clinical Trials**: Represented by a green square with a mouse and person icon.
- Quantitative Imaging**: Represented by a blue square with a microscope icon.
- Informatics**: Represented by a purple square with a computer monitor and lightning bolt icon.

Co-Clinical Imaging Research Resources Program (CIRP)

BIOLOGY Meets IMAGING

May 20, 2019

<https://nciphub.org/groups/cirphub>

**Animal
Models**



**Co-Clinical
Trials**



**Quantitative
Imaging**



Informatics



Missions

- Review progress of CIRP program,
- Identify challenges in development of best practices in animal models and co-clinical quantitative imaging,
- Collect suggestions/recommendations for achieving best practices in animal models and co-clinical quantitative imaging.

Questions?



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