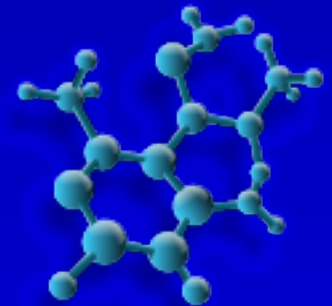


**QUANTITATIVE IMAGING FOR
EVALUATION OF RESPONSE TO CANCER
THERAPIES (QIN)
PAR 11-150**

**Larry Clarke, Ph.D.
Cancer Imaging Program**

DCTD

NCI



The NCI QIN Program Team

- ❖ Robert Nordstrom, Ph.D. Program Director QIN Lead Program Director
- ❖ Larry Clarke, Ph.D. Branch Chief QIN Science Officer
- ❖ Gary Kelloff, M.D. Special Assistant AD Science Officer
- ❖ Lalitha Shankar Branch Chief Imaging Liaison: NCI's NCTN

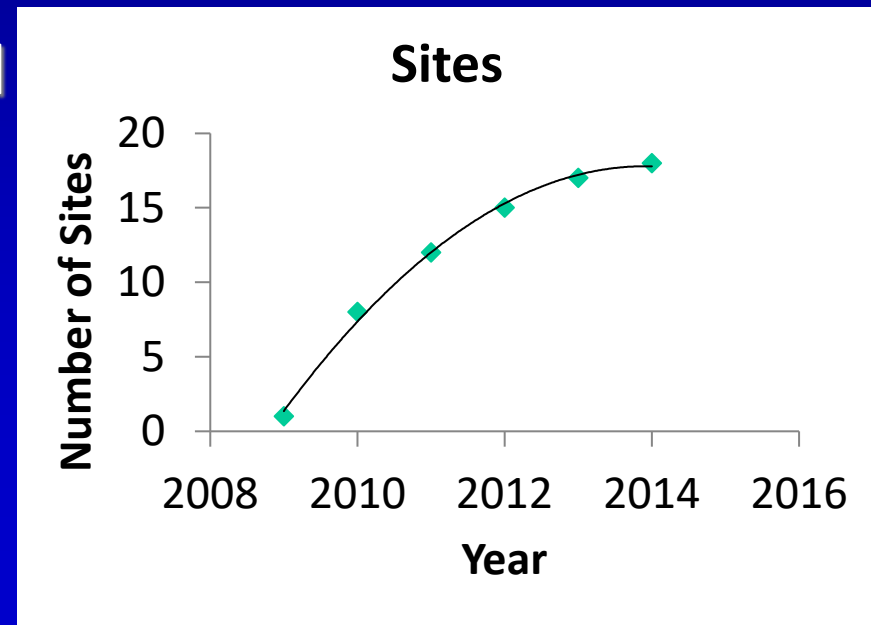
CIP Staff: Working Groups

- ❖ Pushpa Tandon, Ph.D. Program Director Clinical Trials Design & Development
- ❖ Keyvan Farahani, Ph.D. Program Director Image Analysis & Performance Metrics
- ❖ Huiming Zhang, Ph.D. Program Director Image Analysis & performance Metrics
- ❖ Yantian Zhang, Ph.D. Program Director Data Acquisition
- ❖ Lori Henderson, Ph.D. Program Director Clinical Trial Design & Development
- ❖ George Redmond, M.S. Program Director Bioinformatics/IT & Data Sharing
- ❖ John Freymann SAIC Contractor TCIA, Bioinformatics WG
- ❖ Jason Kirby SAIC Contractor TCAI, Bioinformatics WG

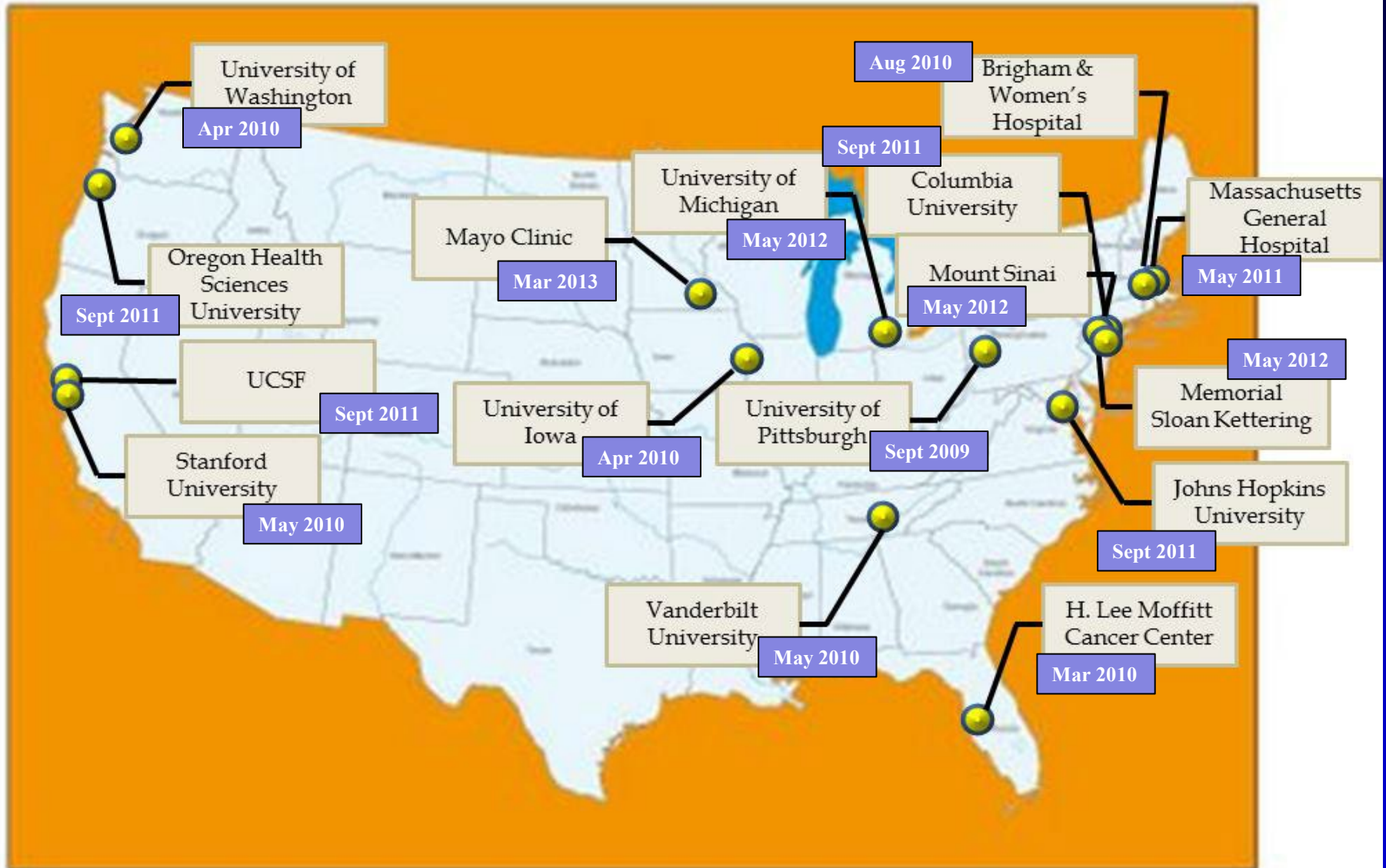
- ❖ James Deye, Ph.D. Program Director Radiation Research Program
- ❖ Jecek Capala, Ph.D. Program Director Radiation Research Program
- ❖ Richard Mazurchuk, Ph.D. Program Director Division of Cancer Prevention

History

- ❖ PAR issued in 2008; first grants awarded in 2009
- ❖ Gradual build up of sites
- ❖ Evolution of governance to accommodate growth of network
- ❖ Reissue in 2011
- ❖ 16 sites currently funded

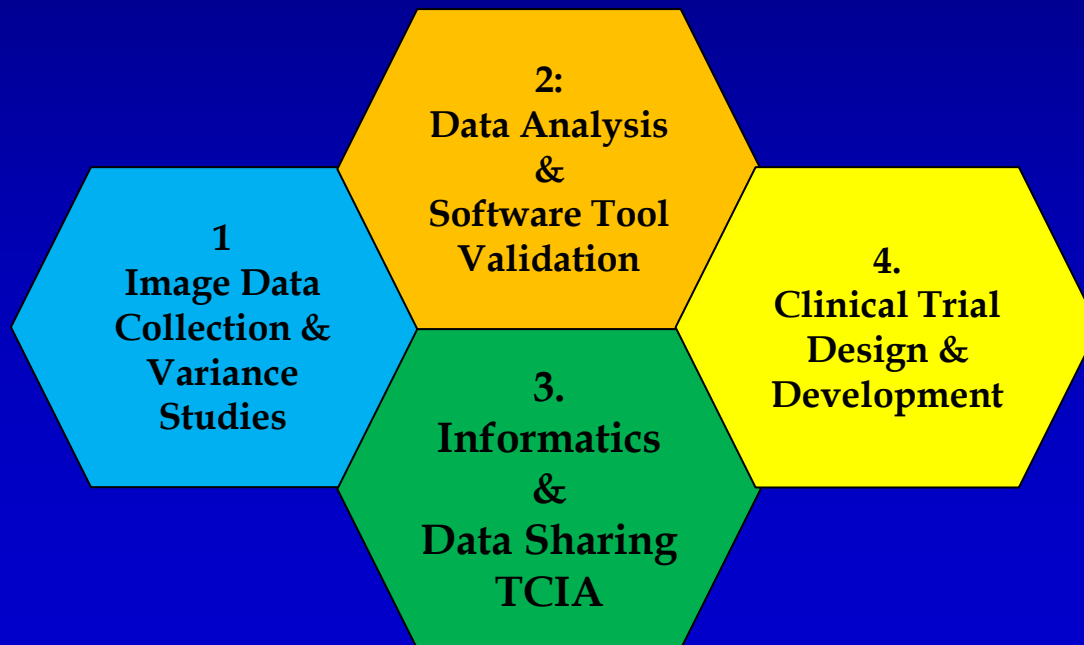


QIN in Year Five: 16 Teams



Quantitative Imaging Network (QIN) Overview

- ❖ Develop quantitative imaging (QI) methods that are automated, platform independent and reproducible to use in therapy trials
- ❖ Share, test, refine, validate, and finally evaluate these methods in therapy trials using four working groups organized across all sites



Why a Cooperative Group?

- ❖ Harmonization of current methods required
- ❖ Coherent data base required for development
 - Data needed from multiple on-going trials
 - Data needed from multiple platforms
- ❖ Ability to test new methods in on-going trials
- ❖ Consensus needed among the stakeholders
 - Imaging device industry
 - Imaging physicians
 - Physicists & informaticists

QIN Clinical Collaborations

- ❖ Incorporation of new imaging calibration methods into ACRIN clinical trials
 - PET CT phantom calibration methods to reduce physical bias and variance
 - (ACRIN 6684 (FMISO); 6687(Dynamic Fluoride); 6697 (FMISO))
 - Diffusion Weighted (DW) MRI phantoms to reduce bias and variance
 - ACRIN (6701) Prostate
 - DWI phantom based QC protocol, site qualification for a multi center breast cancer trial
 - ACRIN (6698) neo-adjuvant treatment response
- ❖ Evaluation of MRI in breast DCIS treatment trial CALGB 40903

QIN Scientific Achievements

- ❖ Development of novel imaging protocols
 - Automated segmentation of lung nodules
 - Using the NLST image database
 - Motion Free (breath hold) dynamic PET protocols
 - Improved compartmental analysis
 - Image analysis methods for all PET CT platforms
 - Initiated in January 2013 (U01-R01 AIP funded)
 - Image analysis methods for DWI MRI
 - To be initiated June 2013
 - Shutter Speed Models for DCE MRI
 - Provides better metabolic and micro vascular information
- ❖ 89 publications to date

On-going Projects

- ❖ Sites contribute data and each analyzes the collective data with custom algorithms
- ❖ Data is shared on TCIA
- ❖ Now Exploring Tool Sharing: Metrology
- ❖ Reviewing resources for tool Sharing
 - ❖ (NITRC, HUB ZERO, BIRN etc)
- ❖ Current efforts across the network
 - Comparison of volume segmentation methods
 - Five QIN sites: (In progress)
 - Comparison of DCE MRI methods
 - 7 QIN sites: (data acquisition in progress)
 - Comparison of DWI MRI methods
 - 10 sites (data acquisition in progress)