

AAPM FOREM on Imaging Genomics

All sessions take place in the Duncan Building, CPB8 conference room on the 8th Floor, Texas Medical Center

Agenda -- September 30 - October 1, 2014, Houston, Texas

Chairs: Maryellen Giger (The University of Chicago), Sandy Napel (Stanford University), John Hazle (MD Anderson), Paul Kinahan (University of Washington)

Tuesday, September 30, 2014

12:15pm – 12:30pm Hotel shuttle departs from the Hilton Houston Plaza/Medical Center

1:00 Registration

1:30 Welcome and Introduction of Goals of FOREM (Giger – 15 minutes)

- To appreciate the field of imaging genomics
- Why imaging genomics
 - To aid in discovery along with our colleagues from biology
 - To aid in developing predictive models with our clinical colleagues
 - To ensure the quality of the image-based phenotypes
 - To ensure the use of the image-based phenotypes
- To determine the role of AAPM in the field of imaging genomics
- Strategic planning & breakout groups

1:45 Overview of current research in radiomics and in imaging genomics/radiogenomics (Robert Gillies – 30 minutes)

2:15 Lessons learned from clinical aspects of genomics research (Lynda Chin – 45 minutes)

3:00 Lessons learned from computational aspects of genomics research (Nancy Cox – 45 minutes)

3:45 Lessons learned from QIBA and quantitative imaging research (Paul Kinahan – 20 minutes)

4:05 Lessons learned from CAD and LIDC research (Sam Armato – 20 minutes)

4:25 15-minute break

4:40 Role of Medical Physicists in Harmonization (“standardization”) (moderated by Kinahan, Gillies)

- What challenges and opportunities exist?
- What is sufficient standardization?
- What evaluation metrics exist?

5:40 20-minute break

6 Dinner & talk - View of imaging genomics from NCI/other funding agencies (Larry Clarke 30 minutes)

7:30 Hotel shuttle returns guests to the Hilton Houston Plaza/Medical Center

Wednesday, October 1, 2014

7:15 – 7:30am Hotel shuttle departs from the Hilton Houston Plaza/Medical Center

8 Breakfast

9-10 Standard of care vs. controlled standardized studies (i.e., Quantity vs. Quality) (moderated by Giger (Grossman), Cox, Napel)

- Harmonization (“standardization”) vs. Standard of care
- Role of idealized datasets
- Need for consensus on standards
- Science of big data vs. science of small data (Bob Grossman)
- What is needed for the field?

10-11 How do/should imaging researchers collaborate with genomic researchers? (Hazle, Chin)

- What value do genomic researchers see in image-based phenotypes?
- Not just another numerical phenotype
- Sharing of data, image-extraction software, association/evaluation software
- Culture

11-12:30 What is the role of AAPM in the field of imaging genomics?
(moderators John Boone, Larry Clarke)

- Accreditation for standardization of image-based phenotypes
- Should medical physicists be “credentialed” like radiologists
- Role & relationships of TAC, QIN, QIBA
- What is needed to have international collaborations?
- Role of industry?
- Role of FDA?
- Medical Physicists are involved in assessing image quality, in setting standards, in development of quantitative image analysis (CAD history), in evaluation, etc
- Will we be able to conduct meta-analysis studies with the collected data?
- How do we get image data from PACS?

12:30-1:30 Lunch

1:30-3:00 Breakout groups to plan role of AAPM in imaging genomics (three groups)

- How to achieve standardization (harmonization) (Napel)
- How to evaluate performance (Giger)
 - of imaging system output
 - of image-based phenotypes
 - of merged phenotypes (i.e., classifier training/testing)
- How to conduct large-scale validation studies (Boone)

3:00-3:15 Break

3:15:-3:45 Report from Breakout Groups (1 slide each; lots of discussion)

3:45-5 Future? White paper?

5 – 5:30pm Hotel shuttle returns guests to the Hilton Houston Plaza/Medical Center