

Outline: Spearhead Clinically Relevant Radiologic Biomarker Discovery in Precision Oncology with Habitat Imaging

Speaker: Jia Wu

Time allotment: 20 min

1. What is the motivation behind habitat imaging?
 - a. Intratumor heterogeneity
 - b. Subclones with differing gene profiling revealed by multiregional gene sequence study
 - c. Imaging provides global view of tumor as well as its surroundings
2. Two existing ways to define habitat regions from imaging
 - a. Filter by empirical threshold, such as MTV in PET
 - b. Define by tumor morphology, such as peri-tumor and intra-tumor regions
 - c. Limitation
3. Discover habitat regions with unsupervised clustering algorithms
 - a. General idea
 - b. Implementation details
 - c. Examples in breast, lung, and head and neck cancer
4. Future work and exciting opportunities

SAMs Questions (2):

1. Habitat imaging aims to investigate how the subclones within a tumor manifests at radiologic scan level.
 - a. True
 - b. False

Answer: A

Reference: Gillies, Robert J., and Yoganand Balagurunathan. "Perfusion MR Imaging of Breast Cancer: Insights Using "Habitat Imaging"." *Radiology* 288 (2018): 36-37.

2. Habitat regions learned with unsupervised clustering can potentially detect intrinsic intratumor heterogeneity with relevant clinical values
 - a. True
 - b. False

Answer: A

Reference: Wu, Jia, et al. "Intratutorial spatial heterogeneity at perfusion MR imaging predicts recurrence-free survival in locally advanced breast cancer treated with neoadjuvant chemotherapy." *Radiology* 288.1 (2018): 26-35.