AbstractID: 2574 Title: Tumor Hypoxia Imaging

Purpose: To develop the methodology for measuring tumor hypoxia and defining the hypoxic volume

Method and Materials: PET imaging with hypoxia-affined radiolabeled tracers is promising as a method to define hypoxic volume in tumors, although validation of the images are still lacking. We evaluate PET imaging with several tracers in rodent tumor models and compare them to direct pO2 probe measurement for validation. In addition, using hypoxia-inducible reporter gene the expression of which can be imaged with PET, we attempt to directly link the molecular event of biological hypoxia to non-invasive imaging.   Extension of the study to the clinic is being planned.

Results: Microscopic distribution of the tracer in tumor sections closely correlates with the hypoxia-induced reporter gene expression. In addition, pO2 data obtained with probes are roughly correlated with PET image information.

Conclusion: Our results validated the use of PET imaging with members of the 2-nitroimidazole family for identifying tumor hypoxia.

Conflict of Interest (only if applicable):

Educational Objectives:
1. **The significance of tumor hypoxia**
2. **PET imaging of tumor hypoxia**
3. **Use of reporter genes in molecular imaging**