

AbstractID: 4421 Title: Functional and Molecular Imaging for Radiotherapy Guidance -
PLEASE UPDATE

Radiation therapy is an image-guided procedure whose success depends strongly on the image modality used for treatment planning and the level of integration of the available imaging information. Advancement in IMRT has provided an unprecedented means to produce highly conformable dose distribution while sparing sensitive structures, which calls for better imaging tools for tumor target definition and for the management of inter- and intra-fractional organ motion. In this talk we will summarize recent advances in functional and molecular imaging techniques and discuss various issues related to the integration of the newly emerged imaging data into radiation therapy planning. It is anticipated that the new imaging modalities will play an important role in radiation oncology practice and make significant impact in cancer diagnosis, staging, treatment planning, and monitoring of therapeutic response. The potential impact of biologically conformal radiation therapy (BCRT) or biologically guided radiation therapy (BGRT) will be discussed. Finally, issues related to the quality assurance of functional and molecular imaging and BCRT will also be addressed.

Educational objectives:

1. Introduce the concept of functional and molecular imaging.
2. Illustrate the steps involved in integrating molecular imaging such as PET and MRSI into treatment planning process.
3. Introduce PET/MRI/MRSI and CT image fusion techniques (including deformable image registration).
4. Provide an overview on recent advances in PET/CT and MRSI, and update on the development of new PET tracers and data acquisition techniques.

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