MEDICAL PHYSICS SEMINAR SERIES

Sydney Jupitz

Development of an Ultrasound-based Image Guidance Radiotherapy System for Motion Management in the Liver

Radiation therapy is a common and effective treatment technique for liver tumors. In this region of the body, motion management strategies often need to be employed to account for patient breathing motion during radiotherapy treatments. Ultrasound offers a promising real-time, non-invasive and non-ionizing imaging solution for motion management. Our team developed a MR-compatible, 3D ultrasound transducer with hands-free operating capabilities. With this transducer, simultaneous ultrasound and MR image acquisition can be utilized for monitoring patient breathing motion during a pre-treatment imaging session. This information can then be used to inform decisions during radiotherapy treatment under ultrasound-guidance alone. In this way we utilize the real-time capabilities of ultrasound while exploiting the complementary soft-tissue contrast mechanisms of ultrasound and MRI. This talk will review key aspects of this image-guidance workflow as implemented during a healthy volunteer liver imaging study.

Christopher Kutyreff

No-carrier-added 69/71Germanium and 61/64Copper for Radiotracer Development

With a growing number of radiotracers approved for clinical use, development of new positron-emitting radionuclides is warranted. Two novel, PET-imageable radionuclides are developed and reported for medical applications.

First, a growing body of literature describing the potential of Auger-electron-emitting radionuclides in TRT. This, combined with the unique emission spectrum of particles from its decay, makes 71Ge an ideal candidate for probing the microdosimetric effects of low energy electrons absent confounding photon dose. Second, automated production of no-carrier-added 61/64Cu was developed for a commercial radiosynthesis platform. The method provides the additional benefit of making 61/64Cu radiotracers more accessible and scalable for routine cyclotron production of copper radiotracers.

Seminar Link:
https://rb.gy/kyi1qd

Monday, April 25
4:00PM (CT) via Webex

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