AbstractID: 12964 Title: Development of a small animal imaging and therapy system: an open source medical devices (OSMD) concept

Purpose: The open source medical devices (OSMD) concept aims to facilitate and promote medical research as an open source technology. The goal is to collaborate among research groups and companies to develop medical technologies that are affordable and available to research groups around the world, especially in those places with limited research resources. We propose implementing the OSMD concept to develop a small animal combined PET/CT/RT system.

Method and Materials: The first phase of the project was to define the technical specifications for a preliminary design of a small animal hybrid PET/CT/RT system. Next, we will collaborate with international research communities to explore potential designs and finalize hardware, software and management of the design. Lastly, we will build the working system and perform necessary checks before open sourcing the technology.

Results: This pioneer PET/CT/RT system is designed with modular systems utilizing both anatomical and functional imaging to guide the intensity modulated radiotherapy. We are developing a computer-aided model of the preliminary design with tentative technical specifications of various components of the system. We are especially vigilant in developing software and management systems up to clinical standards so that they can be directly translated for human use.

Conclusion: The OSMD concept has been initiated. We are planning to host the OSMD Conference in fall 2010 to launch the global proposal of OSMD, mainly focusing on the development of a small animal hybrid PET/CT/RT system. Interested individuals and groups can contribute to finalize the hardware and software design of this multimodality system. Everybody can be benefited from this technology as a freely accessible technology. OSMD projects can promote medical research by facilitating medical instruments to the places with limited research resources.