AbstractID: 7783 Title: Innovations in particle acceleration

This presentation will start the symposium with a brief description of recent developments in particle acceleration techniques with a focus on the acceleration of proton and light ions and its impact on radiation therapy of cancer. Proton/ion therapy has great potential for improving local control and normal tissue sparing because of its superior dose distributions. However, the large cost of a proton/ion facility based on conventional accelerator technology has prevented its widespread use. Significant efforts have been made in recent years to develop compact particle accelerators in order to make proton or ion therapy a commonly available treatment modality. Compact particle accelerators based on dielectric wall accelerator, laser-particle acceleration, and superconductor techniques will be discussed. The educational objectives of this presentation include (1) to describe the physical properties of proton and ion beams and their therapeutic advantages, (2) to analyze the cost-effectiveness of conventional proton/ion therapy versus intensity modulated x-ray therapy, and (3) to introduce recent innovations in particle acceleration and their potential for radiation oncology.