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**Hadron Cancer Therapy - relative merits of X-ray, proton and carbon beams**

OLIVER JAKEL, German Cancer Research Center and Heidelberg University

Heidelberg University has a long experience in radiotherapy with carbon ions, starting with a pilot project at GSI in 1997. This project was jointly run by the Dep. for Radiation Oncology of Heidelberg University, GSI and the German Cancer Research Center (DKFZ). A hospital based heavy ion center at Heidelberg University, the Heidelberg Ion Beam Therapy Center (HIT) was proposed by the same group in 1998 and started clinical operation in late 2009. Since then nearly 2000 patients were treated with beams of carbon ions and protons. Just recently the operation of the world's first and only gantry for heavy ions also started at HIT. Patient treatments are performed in three rooms. Besides that, a lot of research projects are run in the field of Medical Physics and Radiobiology using a dedicated experimental area and the possibility to use beams of protons, carbon, helium and oxygen ions being delivered with the raster scanning technique.