FAKULTÄT für PHYSIK
LUDWIG-MAXIMILIANS-UNIVERSITÄT
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING

MLL-KOLLOQUIUM

Donnerstag, 23.05.2013, 16^{15} Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1
Treffen zum gemeinsamen Kaffee 16 Uhr

Prof. Frank Verhaegen

(Maastro Clinic, Maastricht / The Netherlands)

Small animal precision image-guided radiotherapy research

New technology and treatment strategies have often been implemented in the past without thorough preclinical verification. Examples are intensity modulated radiotherapy, stereotactic body radiotherapy, proton radiotherapy etc. Recently it has been realized that useful knowledge may be gained from conducting preclinical radiotherapy studies in e.g. mice, to fully explore new forms of therapy. In the past radiobiology studies were often performed with non-precise radiation beams, bearing little resemblance to modern highly precise targeted irradiation in clinical practice. To enable more precise preclinical irradiation studies, novel technology has been developed recently. Several groups have developed precision irradiators for small animals, combined with x-ray imaging equipment to provide image-guidance, in analogy with what is available for human radiotherapy. To enable irradiation of small structures with complex spatio-temporal radiation patterns, the development of a dedicated treatment planning system for small animals was necessary. In our department a small animal irradiation system equipped with a high-resolution cone beam CT imaging system was fully commissioned and optimized. A treatment planning system, SmART-Plan was developed, based on Monte Carlo dose calculations. It was verified that planned doses agreed with delivered doses. A dose verification system, based on the onboard imager, was developed. First preclinical studies are now being performed on this system. It is expected this novel equipment will enable studies to help elucidate radiation interaction mechanisms in normal and cancerous tissues. New knowledge may be gained on the efficacy of complex spatio- temporal radiation patterns, the synergy of radiation with drugs, the influence of organ motion, and much more. It is hoped that this knowledge could then be translated to cancer patients; it is herein that the greatest challenge lies.

gez. Peter Thirolf
Tel. 289-14064

gez. Norbert Kaiser
Tel. 289-12367