

Of Mice and Men – Around and In the Beam

Elisabeth Schultke
University of Saskatchewan
Canada

The last three decades have seen the establishment of new technical equipment in the medical field at an unprecedented pace which as a result has revolutionized medical diagnostic. Pathological structures previously known from histological sections only can now be diagnosed in situ, a fact that frequently allows both patients and physicians a choice between invasive and non-invasive treatment. Medical scientists, however, hope to visualize even smaller structures in the future, to explain still unknown or misunderstand pathology and to develop new therapeutic approaches for diseases for which there is no cure available yet. As has been suggested by cell culture studies and in a variety of animal models over the last decades, synchrotron techniques might be able to deliver the technical basis to convert some of those hopes into reality. Spatial resolution for imaging could be increased by two orders of magnitude or more. The fusion of old and tried radiotherapy concepts with synchrotron techniques could significantly change the treatment outcome and entirely new therapeutic approaches based on the unique characteristics of the synchrotron beam could be designed. While such an outlook is enticing for scientists, clinicians and patients alike, our challenges are of technical, ethical and logistical nature. The requirements reach from better detectors with faster readout capability over user-friendly software programs and appropriate safety precautions to collaborative concepts between synchrotron and medical facilities. Some thoughts about the past, followed by an analysis of the present, and dreams of a medical scientist for the future in medical applications of synchrotron radiation.

KEYWORDS: clinical research