GERMAN
CANCER RESEARCH CENTER
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Research for a Life without Cancer

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DFG
Emmy-Noether Programm

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Letter of Support

Dear Ladies and Gentlemen,

I am writing this letter to express my genuine support for the application of Dr. Miriam Katharina Brosi in the Emmy-Noether Programme of DFG with the project entitled *Beam Dynamics and Collective Effects in the Generation and Propagation of Structured Beams for Advanced Accelerator-based Radiotherapy*.

Radiation therapy is a mainstay in the management of oncological diseases. At the same time, radiation therapy is experiencing a tremendous development in terms of novel technical possibilities, like integration of advanced image guidance in the MR-Linac, new high-precision beam modalities like proton and ions beams, but also new ways of beam application, exploring novel temporal and spatial patterns. These latter, in the form of FLASH and micro-beams have been shown to lead to unexpected radiobiological responses, demonstrating significantly better sparing of normal tissue structures in preclinical models.

The project of Mrs. Brosi is addressing the need to explore and develop novel accelerator systems to allow for an efficient and flexible production of beam characteristics, needed for novel devices. These will be required to systematically investigate and understand the radiobiological basis of the effects of ultra-high dose-rate or micro-beam treatments. Our current understanding in both areas is quite limited, as experiments have been carried out with a large variety of existing accelerators, differing largely in their beam characteristics, like pulse length, repetition rate, beam quality as well as the ways to produce different micro- to mini-beams with enormous differences in the spatial patterns. Dedicated accelerator technology is highly desirable to conduct more systematic preclinical work in this area.

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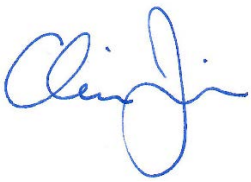
The planned project of Mrs. Brosi is filling this gap and is a timely project to allow a more thorough investigation of novel radiation therapy equipment for the next decades. Moreover, Mrs. Brosi represents the rare case of an accelerator physicists being able and willing to transgress borders to biomedical applications and radiation therapy.

I am convinced, that this is a unique opportunity for both of our centers, KIT and DKFZ, to cooperate more closely in this field. With the resources and experiences in my division for Medical Physics in Radiation Oncology at the German Cancer Research Center (DKFZ) we believe we can support and guide novel accelerator developments towards meaningful applications in radiation oncology. In doing so, I will rely on my personal longstanding experience during the development and clinical translation of particle beam therapy from GSI to the Heidelberg Ion Beam Therapy Center at the University Hospital, where I am currently heading the Medical Physics team. Establishing new tools for radiation therapy from a preclinical stage to clinical application has been the main area of our research division, be it in IMRT, IGRT or particle beam therapy.

Given the outstanding expertise of Mrs. Brosi and the group at KIT, as well as her great scientific achievements, I am absolutely convinced that this application can make an important contribution to improving our radiotherapy toolbox and that we can push this important field of research and its clinical translation further. My groups at DKFZ and HIT will actively support the proposed activities within this proposal, facilitate access to our unique infrastructure in Heidelberg and guide the developments with our experience in radiation oncology.

In conclusion, I would therefore very much like to support the application of Mrs. Brosi and I am excited to see, which new beam characteristics will be developed and how they may be translated to radiation therapy and help us provide better therapy modalities in the future.

Yours sincerely,



Prof. Dr. Oliver Jäkel