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Proton and Light Ion Therapy for Cancer

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Message from the Guest Editor

Proton and light ion beam therapy is undergoing an enormous development. Novel beam delivery technologies are being explored, which may substantially improve therapy. Among them are rotational delivery, delivery at ultra-high dose rates (FLASH), spatial fractionation (mini-beam or grid therapy), and treatment in an upright patient position. In parallel, image guidance for particle therapy is entering the next level, facilitating adaptive concepts. Beyond cone-beam CT, CT, and optical surface guidance, MRI guidance is also being explored. The in vivo monitoring of secondary radiation may support therapy adaption. More recently, novel ion beams have been used clinically, like helium and oxygen, which sparked the idea of multi-ion therapy.

All these technical developments go hand-in-hand with radiobiological investigations, but also to question well-known concepts, like the fixed RBE for proton therapy.

For a more widespread application of proton and light ion therapy, however, clinical studies and comparative trials are needed, trying to create evidence for the efficacy of particle beam therapy and potentially demonstrate superiority compared to conventional concepts.



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Special Issue



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Message from the Editor-in-Chief

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