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Radiotherapy

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Despite remarkable advancements, the tolerance dose of normal tissue continues being the main limitation in radiotherapy. To overcome it, we have recently proposed a novel concept: proton minibeam radiation therapy (pMBRT). It combines the inherent physical advantages of protons with the normal tissue preservation observed when irradiating with submillimetric, spatially fractionated beams (minibeam radiation therapy). The ability of pMBRT to spare normal tissue in rat brains has already been experimentally demonstrated. The existing implementation using a mechanical collimator is suboptimal due to very low dose rates and neutron production in the collimator. One of the main challenges is now the generation of (submillimetric) proton beams intense enough to treat patients in a reasonably short time with minimum neutron contamination. Magnetic beam focussing appears to be an important step to achieve this goal.

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