NSC4DIPG
NANOSONOCHEMOTHERAPY FOR DIFFUSE INTRINSIC PONTINE GLIOMA

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Diffuse Intrinsic Pontine Gliomas (DIPG) are highly aggressive brain tumors which affect hundreds of children in Europe every year. No curative treatments are available for DIPG. Anticancer agents fail because the blood-brain barrier (BBB) prevents drugs and drug delivery systems from reaching the pathological site. In the NSC4DIPG project, we will employ ultrasound and microbubbles to create a temporally and spatially controlled sonoporation-window, during which drug delivery systems loaded with optimized combinations of two different drugs can be shuttled across the BBB. Multiple clinically relevant nanocarrier materials will be used, including 10 nm linear polymers, 50 nm micelles, 100 nm liposomes and 150 nm PACA nanoparticles. Engineered protein capsules with a size of 30-40 nm and an intrinsic ability to cross the BBB will also be employed. These efforts will contribute to the development of novel (nano-) drugs and treatment protocols for (pediatric) patients suffering from brain cancer.