Nanocarriers modified with a protease-resistant BBB shuttle for targeted CNS drug delivery in diffuse intrinsic pontine glioma

Acronym: Cure2DIPG

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"A newly discovered peptide that targets the transferrin receptor"

Diffuse Intrinsic Pontine Glioma (DIPG) is a devastating pediatric cancer of the central nervous system (CNS), with virtually no cures reported in the world. The most likely reason for the therapeutic failure is the poor access of drugs to the tumor, due to the blood-brain barrier (BBB), a formidable physical and biological barrier that tightly controls the passage of molecules from the blood to the brain tissue. We have established several DIPG primary cultures from patient biopsies, from which a very reproducible animal model has been developed. We will use a newly discovered peptide that targets the transferrin receptor and crosses efficiently the BBB that will be chemically linked to anti-DIPG drugs and to novel drug-loaded nanocarrier formulations.

Chemotherapy for diffuse intrinsic pontine glioma (DIPG)		CNS-targeted drug delivery		DIPG xenograft survival
Conventional drug (free)	●	Poor ✗		Poor ✗
Nanoparticle-BBB shuttle-drug (Cure2DIPG project)	⚲	Improved ✓		Improved ✓