

Molecular vectors for drug delivery into the brain and tumours

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The brain is endowed with a unique vascular system known as the blood-brain barrier (BBB) that restricts very effectively the entrance of toxic molecules and infectious agents, but also hampers drug delivery. An estimated 98% of all active drugs and virtually all biotherapeutics do not cross the BBB. The BBB thus represents a real technological barrier to treat brain diseases. Our approach is based on the principle that the BBB is not only physical barrier but also functional barrier whose natural transport mechanisms may be advantageously used for drug delivery. We focus on targeted delivery using peptide-based molecular vectors to specifically target receptors involved in Receptor Mediated Transport (RMT), a physiological process for the transport of endogenous substances into cells. We have established the proof of concept of the technology in in vitro BBB models and in vivo by vectorizing various classes of molecules including imaging agents, peptides and antibodies to tumours and into the brain.

Short biography

Michel KHRESTCHATISKY is Research Director at the CNRS, PhD in cellular and molecular biology from Marseille Luminy, specialized in neurobiology, 4 years research at the University of California Los Angeles (UCLA, USA), 10 years experience as group leader at INSERM, Paris. Director during the last 14 years of the NICN-UMR7259 neurobiology laboratory, and newly appointed since January 2018 Director of the Institute for NeuroPhysiopathology (INP) supported by the CNRS and Aix-Marseille University, leader of the BBB and Neuroinflammation group; has published over 125 peer-reviewed articles in international scientific journals, a dozen book chapters and is co-inventor in 6 families of patents with more than 70 patents delivered worldwide. Co-founder of the VECT-HORUS biotechnology company and scientific counsel of the company.