

15th International Conference on

PHARMACEUTICAL FORMULATIONS & DRUG DELIVERY

September 17-18, 2018 | Philadelphia, USA

Getting large molecules across the blood brain barrier

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The blood-brain barrier (BBB) presents a special challenge to the development of therapeutics for many central nervous systems (CNS) disorders. Far from acting simply as a physical barrier, the BBB is a complex dynamic system involving several cell types, passive and active transport mechanisms and adaptive function to control the exchange of substances between the blood and the CNS. Few therapeutic agents readily traverse the BBB to reach the brain or spinal cord, including most small molecule drugs and the vast majority of large molecules such as proteins. Several research groups are exploiting intrinsic BBB transport mechanisms, such as molecular Trojan horses and exploring technologies, such as chemical modifications and physical disruption, to enhance delivery of therapeutics to the CNS. Such strategies may greatly increase the armamentarium of potential drugs for treating psychiatric and neurological disorders.