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Chemotherapy or biotherapy delivery to the brain: Beyond crossing the blood-brain barrier

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Success in medicine delivery to the brain is bound to the achievement of two key steps: (1) Crossing the blood-brain barrier (BBB) and (2) reaching the molecular targets within the CNS parenchyma. This last step is still too much under-estimated in CNS drug development when compared to the tremendous focus on the question of crossing BBB. Whatever the type of medicines is, chemo-or bio-therapeutics, this presentation aims to emphasize that after crossing the BBB the diffusion and partition of the drug active fraction within the brain compartments have to be carefully investigated. As well as for the BBB, other physiological barriers compartmentalize the brain parenchyma making it heterogeneous in term of drug distribution according to the physicochemical properties of the CNS drug candidate. Nanotechnologies are more and more used to improve the BBB crossing but the question of their fate and disposition within the brain parenchyma remains unresolved. This is also the case with the brain delivery of therapeutic antibodies. Great attention is paid for their BBB crossing but so few information are available considering their intra-cerebral and active fraction disposition near the brain molecular targets. To conclude, crossing BBB and reaching the brain targets have to be considered at equal level of investigation for succeeding CNS development of chemo- or bio-therapeutics.

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