Patented nanomedicines for the treatment of brain tumors.

Caruso G, Raudino G, Caffo M.

Abstract

Patients affected by malignant brain tumors present an extremely poor prognosis, notwithstanding improvements in surgery techniques and therapeutic protocols. Brain tumor treatment has been principally hampered by limited drug delivery across the blood-brain barrier (BBB). An efficacious chemotherapeutic treatment requires a pharmacological agent that can penetrate the BBB and target neoplastic cells. Nanotechnology involves the design, synthesis and characterization of materials that have a functional organization in at least one dimension on the nanometer scale. Nanoparticle systems can represent optimal devices for delivery of various drugs into the brain across the BBB. Nanoparticle drug-delivery systems can also be used to provide targeted delivery of drugs, improve bioavailability and sustain release of drugs for systemic delivery. In this patent review, the recent studies of certain nanoparticle systems in treatment of brain tumors are summarized. Common nanoparticle systems include polymeric nanoparticles, lipid nanoparticles and inorganic nanoparticles. Various patents of nanoparticle systems able to across the BBB to target brain tumors are also reported and discussed.

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