Gliomas rarely metastasize outside the brain but grow and invade exclusively with the brain and spinal cord. They invade along the abluminal side of blood vessels which they use as substrate for invasion. Invading gliomas displace astrocytic endfeet from the vasculature and cause focal breaches in the blood brain barrier. Satellite tumors, forming at vessel branch point release glutamate in excitotoxic concentrations to vacate space for the tumors expansion. Glutamate release also explains tumor associated epilepsy, which is often a presenting feature in newly diagnosed patients. Glutamate is released in conjunction with cysteine uptake via the system Xc, exchanger. It pharmacological inhibition suppresses seizures and slows tumor growth. Data from a early phase clinical trial data suggests feasibility of using an FDA approved system Xc inhibitor to reduce Glu release in glioma patients.

“Gliomas alter glial-neuronal-vascular interactions”
Harald Sontheimer, Ph.D.
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The University of Alabama at Birmingham School of Medicine

Abstract:
Gliomas rarely metastasize outside the brain but grow and invade exclusively with the brain and spinal cord. They invade along the abluminal side of blood vessels which they use as substrate for invasion. Invading gliomas displace astrocytic endfeet from the vasculature and cause focal breaches in the blood brain barrier. Satellite tumors, forming at vessel branch point release glutamate in excitotoxic concentrations to vacate space for the tumors expansion. Glutamate release also explains tumor associated epilepsy, which is often a presenting feature in newly diagnosed patients. Glutamate is released in conjunction with cysteine uptake via the system Xc, exchanger. It pharmacological inhibition suppresses seizures and slows tumor growth. Data from a early phase clinical trial data suggests feasibility of using an FDA approved system Xc inhibitor to reduce Glu release in glioma patients.

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