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# Pediatric Neurology and Neuropathology

## Bionaut™, A Novel Microrobotic Drug-Device Platform for the Local Treatment of Brainstem Gliomas

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Despite the most aggressive surgical and adjuvant therapeutic strategies, treatment of both pediatric and adult brainstem tumors remains problematic. Novel strategies including targeted biologics, immunotherapy and specialized delivery systems such as convection-enhanced delivery (CED) have been proposed. While some of these novel treatments are entering phase I trials, the field is still in need of treatment(s) that exhibits dramatically enhanced potency with optimal therapeutic ratio. Bionaut Labs has developed a modular microrobotic platform for performing localized delivery of diverse therapeutics *in vivo*. Our biocompatible particles (Bionauts™) are externally propelled and visualized in real time. Bionauts™ are specifically designed to enhance the effect of radiation therapy via anatomically precise delivery of a radiosensitizing agent, as exemplified by temozolomide (TMZ) and Avastin™ to brainstem gliomas of diverse origin. The treatment protocol is designed to furnish a better therapeutic outcome due to the localized (vs systemic) delivery of the drug to the neoplastic lesion(s) *for use as a synergistic combination of radiation and radiosensitizing agent*. In addition, the procedure is minimally invasive and is expected to be appropriate for both adult and pediatric patients. Current progress including platform optimization, selection of the lead radiosensitizer as well as *in vivo* safety studies of the Bionauts™ in large animals, specifically the spine and the brain of porcine and ovine models will be discussed.

### Biography

Dr. Alex Kiselyov is an accomplished Biotech R&D expert, with over 25 years of Pharma/Biotech and Foundation experience in drug discovery and preclinical development. He completed his Doctorate in Chemistry at Georgia State University in Atlanta followed by postgraduate studies at the Ben May Institute for Cancer Research (University of Chicago) and Columbia University (New York). He has directly contributed to over 10 clinical programs across multiple therapeutic areas including oncology, CV, dementias, neuromuscular and cognitive disorders. He held senior R&D positions with Amgen, CHDI Foundation, ImClone/Lilly, deCODE, ChemDiv and Genea Biocells.