GLIOSILK
Silk-fibroin interventional nano-trap for the treatment of glioblastoma

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Brain-tumor glioblastoma (GB) is still considered as one of the worst unmet clinical need in spite of implementation of the therapeutic arsenal available and recent developments in nanomedicine and immunotherapy. With inevitable relapse its prognosis remains devastating. The reasons behind this failure are the tumor heterogeneity and the peritumoral infiltrative niche. A complex interaction between the initial tumor location, its attraction by the peritumoral microenvironment defines a heterogeneous pathway that is probably the more relevant target if we want to develop more curative therapies. In contrast with direct targeting of infiltrated cancer cells for their elimination, GLIOSILK aims to evaluate new bio-interactive interventional silk-fibroin (SF)-based nano-implants in their capability to recruit in controlled brain areas the cells submitted to a chemo-attractant SDF-1α signal. By developing biocompatible SF-based nano-scaffold and use of well mastered cross-cutting methods, the capability of newly built bio-interactive deposits to define a confined in situ gradient and to effectively trap GB cells before elimination (e.g. by radiations) while ameliorating the evolution of the disease will be determined. Overall, this multidisciplinary work’s purpose is to make significant breakthrough in overcoming treatment resistance in GB, and other solid tumors toward clinical transfer.