A comprehensive profile of recurrent glioblastoma

In spite of relentless efforts to devise new treatment strategies, primary glioblastomas invariably recur as aggressive, therapy-resistant relapses and patients rapidly succumb to these tumors. Many therapeutic agents are first tested in clinical trials involving recurrent glioblastomas. Remarkably, however, fundamental knowledge on the biology of recurrent glioblastoma is just slowly emerging. Here, we review current knowledge on recurrent glioblastoma and ask whether and how therapies change intra-tumor heterogeneity, molecular traits and growth pattern of glioblastoma, and to which extent this information can be exploited for therapeutic decision-making. We conclude that the ability to characterize and predict therapy-induced changes in recurrent glioblastoma will determine, whether, one day, glioblastoma can be contained in a state of chronic disease.