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Editorial

Glioblastoma: State of the Art and Future Perspectives

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This special issue is dedicated to glioblastoma and elucidates this disease from different perspectives. Despite multimodal therapies, the prognosis is still dismal. Many features contribute to this therapeutic challenge including high intratumoral and intertumoral heterogeneity, resistance to therapy, migration and invasion, and immunosuppression. With the advent of novel high throughput technologies, significant progress has been made to understand molecular and immunological signatures underlying the pathology of glioblastoma. This special issue aimed at updating researchers on current topics and progress made in basic, preclinical, and clinical glioblastoma research.

The original articles in this special issue present novel findings on molecular mechanisms of radiosensitization, radioresistance and acquired resistance to therapy (Kessler et al., Müller-Längle et al., Shah et al., Llaguno-Munive et al.) [1–4], cell migration (Nowicki et al., Hübner et al.) [5,6], intracellular drug levels (Colin et al.) [7], strategies targeting renewal capacities of cancer stem-like cells (Gravina et al., Sansalone et al., Linder et al.) [8–10], mathematic modeling of synergy, machine learning, deep learning (Kim et al., Hana et al., Wong et al.) [11–13], distinct signaling pathways (Barbagallo et al., Akgül et al., Bensalma et al., Saito et al., Liu et al.) [14–18], prognostic and predictive effects of imaging patterns (Jungk et al., Puig et al.) [19,20], tumor-associated epilepsy (Berendsen et al.) [21], and novel models and experimental therapeutic approaches (Berthier et al., Offenhäuser et al., Privat-Maldonado et al., Lozada-Delgado et al.) [22–25].

Moreover, review articles summarize the current state of knowledge in the fields of platelets (Marx et al.) [26], subventricular zone (Altmann et al.) [27] and microenvironment (Schiffer et al.) [28], lentiviral vectors (Del Vecchio et al.) [29], allergic inflammation (Costanza and Finocchiaro) [30], elderly patients (Minniti et al.) [31], EMT and authophagy (Colella et al.) [32], notch signaling and CXCL12 signaling (Bazzoni et al., Giordano et al.) [33,34], protein phosphatases (Tomiyama et al.) [35], nitric oxide antagonism (Fahey and Girotti) [36], virus-based immunotherapy (Martikainen and Essand; Stepanenko et al.) [37,38], tumor-treating fields (Fabian et al.) [39], amino acid PET (Lohmann et al.) [40], cholesterol metabolism (Ahmad et al.) [41], preclinical modeling (Rominiyi et al.) [42], and EGFR as a therapeutic target (Gao et al.) [43].

It becomes clear that a holistic view from different angles is required to understand this complex disease and discover novel therapeutic targets and biomarkers. We are grateful for all the work the authors have included in this special issue.

Finally, we would like to emphasize the most important perspective, i.e., our patients' perspectives. From their point of view, the main readout for success in patient-centered research is prolonged survival with maintained quality of life. A culture of continued collaboration between disciplines and research teams will be necessary to meet this challenge.

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