

# Index

<sup>18</sup>F-FET-PET, 163  
<sup>18</sup>F-Fluorodeoxyglucose PET, 180  
<sup>18</sup>F-Fluoromethylcholine, 185  
<sup>18</sup>F-Fluorothymidine, 186  
1p/19q, 32  
3D reconstruction, 386  
5-ALA, 199, 200, 246–248, 289, 290

## A

Acoustic energy, 416  
Actin rearrangement, 79  
Adhesion complexes, 79  
Age, 145  
Age at recurrence, 287  
Amino-acid PET, 182  
Anatomic prevalence, 29  
Angiogenesis, 5–9, 95–97, 99, 101–104,  
    114, 306, 318, 319, 323–325  
Angiogenesis inhibitors, 20, 306  
Animal trials, 387  
Apoptosis, 118  
Arborizing catheter, 359  
ATRX, 32  
Autophagy, 61  
Axonal guidance molecules, 80  
Axial T2-weighted MRI, 265

## B

Bevacizumab, 203, 207–209, 216  
Biomarkers, 16, 18, 100  
Biopsy, 160  
Bipolar probe, 376  
Blood-brain barrier, 343, 395

Blood-brain barrier disruption, 380  
Blue excitation light, 248  
Brachytherapy, 206

## C

Cadherins, 83  
Catherters, 362  
Cell proliferation, 112, 118  
Cell sorting, 65  
Cell-line xenografts, 132  
Cellular protrusions, 79  
Cerebral gliomas, 263  
Chemotherapy, 223, 292, 305  
Chondroitin sulfate proteoglycans, 78  
Classification, 9, 146  
Clinical features, 302  
Clinical outcome, 283  
Clinical practice, 155  
Clinical trials, 16, 203, 208, 209,  
    211–214, 217–221  
Clinically relevant model, 405  
Combination regimens, 207, 210, 216  
Combination treatment, 206  
Complementary treatment, 200  
Complications, 290  
Confusion, 226  
Contrast-enhanced MRI, 181  
Controllable drug delivery, 397  
Convection-enhanced delivery,  
    359, 411  
Copy number aberrations, 13  
Cortical mapping, 263  
Current standards, 197  
Cytoreduction, 291

Cytoskeleton, 78

Cytotoxic therapy, 341

## D

Depression, 226

Deregulated lncRNAs, 109

Deregulated miRNAs, 101

Differential diagnosis, 157

Differentiation, 178

Diffuse glioma, 74

Direct cortical stimulation, 276

DNA methylation, 44, 63

Dose-fractionation schedule, 201

Drug resistance, 115

## E

EA5-Fc-PE38QQR, 349

ECM, 322

Effect of treatment, 35

EGFR/PTEN/AKT/mTOR pathway, 34

Electric stimulation mapping, 275

Eloquent cortex, 270

EMT, 82

EOL care, 226

Eph receptors, 349

EphA2, 344, 345

EphA3 receptor, 346

Ephrins, 81

Epidemiology, 29, 143, 298

Epigenetic mechanisms, 43

Epigenetic regulation, 62

Epigenome, 10

Epithelial to mesenchymal transition, 8

Ethnicity, 146

Extent of resection, 246, 289

External beam radiation, 201

Extracellular matrix, 76

## F

FET-PET, 163

Fluorescence-guided surgery, 246

Fluorophores, 247

Follow-up, 162

Fractionated radiation, 206

Functional MRI, 266

Functional tests, 64

Future perspectives, 165

## G

Galectins, 78

GBM vasculature, 318

G-CIMP, 33

Gender, 145

Gene ontology, 46

Genetic alterations, 5

Genetically engineered mouse models, 134

Genetics, 34

Genome, 10

Genomic abnormalities, 9

Genomic landscape, 12

Genomics, 3

Gliadel wafer, 19

Glial cell compartment, 320

Glioblastoma, 3, 27, 43, 59, 73, 95, 131, 143, 155, 175, 243

Glioblastoma in the elderly, 222

Glioblastoma models, 327

Glioblastoma therapy, 197

Glioma cell migration, 80

Glioma cell motility, 73

Glioma extent, 159

Glioma initiation, 32

Glioma progression, 34

Glioma stem cells, 319

Glioma subtypes, 12  
 Glioma transformation, 35  
 Gliomagenesis, 31  
 Glutamate signaling, 80  
 Glycoproteins, 78  
 Go or grow, 75  
 Growth factor receptor inhibitors, 19  
 GSC differentiation, 119  
 GSCs, 108

## H

Heterogeneic nature, 316  
 High-frequency irreversible electroporation, 373, 415  
 High-intensity focused ultrasound, 396  
 Histone modifications, 62  
 Hydrodynamic model, 80  
 Hypermethylated genes, 46  
 Hypermethylation, 47  
 Hypomethylation, 48, 53  
 Hypoxia, 75  
 Hypoxia-PET, 186

## I

*IDH*, 32  
 IL-13RA2, 344  
 IL-13RA2, 345  
 Image-guided, 395  
 Immune cells, 321, 331  
 Immune evasion, 115  
 Implantable wafers, 201  
 Improving resection, 290  
 Incidence, 144  
 IncRNAs, 118  
 Indocyanine green, 247  
 Infiltration, 74

Infusion distribution, 367  
 Inherent section bias, 283  
 Intartentorial approaches, 253  
 Integrins, 77  
 Interstitial fluids, 323  
 Intracranial pressure, 226  
 Intraoperative technologies, 246  
 Intraoperative videoangiography, 249  
 Intratumor heterogeneity, 6  
 Intravenous anesthetics, 245  
 Invasion, 114, 119  
 Ion channels, 80  
 Irreversible electroporation, 373, 413

## K

Karnofsky performance scale, 284

## L

LncRNA, 53  
 Long Coding RNAs, 117

## M

MacDonald criteria, 175, 177, 178, 207  
 Magnetic resonance imaging, 264  
 Magnetoencephalography, 267  
 Maintenance therapy, 201  
 MassARRAY, 49  
 Material properties, 385  
 Matrix metalloproteinases, 77  
 Maximizing local access, 341, 357, 373, 395, 405  
 MeDIP-Chip, 46  
 Methylomes, 44  
 Microenvironment, 315  
 MicroRNAs, 97

Microscopic features, 299  
Migration, 114, 119  
Minimal residual disease, 292  
miR-101, 53  
miRNA, 51, 53  
MiRNA biogenesis, 98  
MiRNA deregulation, 97  
miRNA therapeutics, 116  
Miscellaneous agents, 20  
Molecular biology, 299, 300  
Molecular classification, 30  
Molecular genetics, 27  
Molecular landscape, 30  
Molecular mechanisms, 73  
Monopolar probe, 376  
Monotherapy, 207, 210, 216  
Mouse models, 131  
Multimodality, 165  
Muscle relaxants, 246  
Mutated genes, 13

## N

Netrins, 81  
Neuroimaging, 302  
Neuronavigation, 250  
Neuropsychological assessment, 268  
New therapeutic approaches, 405  
Newer drugs, 307  
Nitrosourea, 207–209  
Noncoding RNA, 95  
Novel PET tracers, 187  
Novel Radiotracers, 165

## O

Opening of the BBB, 396  
Optimization of catheters, 361  
Outcome, 143, 149, 307

## P

P16INK4A/RB1 pathway, 35  
Park bench position, 255  
Pathogenesis, 4  
Pathological variants, 300  
Pathology, 299  
Patient position, 250  
Patient-derived xenografts, 133  
Pediatric glioblastoma, 297  
Perioperative evaluation, 245  
PET, 175  
PET imaging, 155  
Pore formation, 376  
Positron emission tomography, 268  
Postoperative care, 257  
Preclinical, 387, 411  
Preoperative planning, 264  
Primary diagnosis, 157  
Primary GBM, 10  
Prognostic factors, 148, 149  
Prognostication, 165  
Progression, 162  
Prone position, 253  
Pseudoprogression, 162

## Q

QUAD-CTX, 350, 351

## R

Radiation, 37, 161  
Radiation therapy, 305  
Radiological diagnosis, 282  
Radionecrosis, 162  
Radiotherapy, 223  
RANO criteria, 175, 178, 185, 283  
Recurrence, 178  
Recurrent glioblastoma, 204

Recurring glioblastoma, 281

Re-irradiation, 205

Remote-controlled, 395

Reoperation, 281

Resection, 160, 263

Resistance, 119

Reversible electroporation, 375

Risk factors, 148

## S

Scales to predict survival, 289

Secondary GBM, 10

Secondary glioblastoma, 27

Second-line chemotherapy, 207

Secreted mRNAs, 100

Sedimentation field-flow fractionation, 65

Seizures, 225

Semaphorins, 81

Seven ports, 365

Shadowgraphy, 364

Single port, 365

Single-port microneedle catheter, 363

Site, 145

Sitting position, 254

SLIT/ROBO, 81

SLUG, 83

Small GTPases, 78

SNAIL, 83

Soluble factors, 323

Somatic mutation, 12

Somatosensory evoked potentials, 275

Spontaneous canine gliomas, 407

Standards of care, 197

Stem cell identification, 61

Stem cells, 397

Stem-like cells, 59

Stemness, 112

Stereostatic glioblastoma ablation, 414

Stereostatic radiosurgery, 205

Stupp protocol, 60, 243

Subclassification, 291

Supine position, 251

Supportive care, 225

Supportive environment, 317

Supratentorial approaches, 251

Surface anatomical landmarks, 269

Surgery, 198, 223, 304

Surgical considerations, 268

Surgical management, 243

Surgical navigation, 274

Surgical risks, 290

Surgical series, 284

Surgical technique, 273

Survival, 148

Syngenic mouse models, 135

Systemic brain tumor therapy,  
395, 396

## T

Targeted therapeutic agents, 17

Targeted therapy, 202, 306

Temozolamide, 18, 19, 36, 200, 201,  
203, 210, 211

Temperature profile, 385

TERT, 33

TGF- $\beta$ , 82

Therapeutic deliveries, 341, 359, 373,  
395, 405

Therapeutic prediction, 16

Therapeutic response, 119

Therapeutic targeting, 330

Therapy, 395

Therapy response assessment, 175, 177

Tissue diagnosis, 291

Tissue mechanics, 322

Tissue phantoms, 359  
TP53, 32  
TP53/MDM2/P14ARF pathway, 35  
Transcortical mangnetic stimulation, 267  
Transcriptome, 10  
Treatment, 176  
Treatment planning, 160, 382  
Treatment response, 162  
Treatment routes, 325  
Treatment-related effects, 178  
Tumor cell, 315  
Tumor microenvironment, 318, 328, 329  
Tumor-treating electric fields, 221  
TWIST, 83

## V

Vascular endothelial growth factor, 301  
Vasculature, 330  
Viability, 112

## W

Whilte light, 248

## X

Xenografts, 132

## Z

ZEB, 83