

**Society for Neuro-Oncology's 28th Annual Scientific
Meeting and Education Day 2023**

Highlights from select abstracts of interest - a patient's perspective

HIGH GRADE GLIOMA / GLIOBLASTOMA – TRIALS FOR NEWLY DIAGNOSED

CTIM-17. ADDITIONAL RESULTS FROM A PHASE 1B STUDY OF IGV-001 IN PATIENTS WITH NEWLY DIAGNOSED GLIOBLASTOMA

Multicenter – IGV-001 is a personalized vaccine that uses a patient's own tumor cells combined with an antisense molecule to induce an immune response. In the Phase 1b study on IGV-001, authors identified two different outcome groups – 14 (42.4%) patients with good outcome (OS \geq 22.0 months) and 19 (57.6%) with poor outcome (OS < 22.0 months). Five of 33 patients (15.2%) had an OS of at least 60 months. Authors identified a certain bloodwork parameter (neutrophil: lymphocyte ratio) which may be an early marker of good response; this will be explored further in the ongoing Phase 2b study.

INN-18. MULTIPHASE COMBINED TREATMENT, INCLUDING INDIVIDUALIZED MULTIMODAL IMMUNOTHERAPY FOR ADULTS WITH GBM: SINGLE INSTITUTE REAL WORLD MEDICAL DATA IN THE LIGHT OF CLINICAL TRIAL RESEARCH DATA

IOZK (Germany) – IOKZ is an immunotherapy treatment center in Germany. Authors report on a multiphase combined treatment regimen for GBM patients, including phase 1/ modulated electrohyperthermia and Newcastle Disease Virus therapy during maintenance TMZ, phase 2/ two autologous DC vaccinations (IO-Vac®), and phase 3/ immunotherapy, long-peptide vaccines and one boost IO-Vac® vaccine. Fifty adults with first-line IDH1wt GBM were retrospectively analyzed: median OS of unmethylated and methylated patients were 22m (2y-OS: 42%) and 38m (2y-OS: 81%). There were no considerable treatment-related adverse reactions.

CTNI-21. PHASE I STUDY OF BTK INHIBITOR IBRUTINIB WITH TEMOZOLOMIDE AND RADIATION IN NEWLY-DIAGNOSED GLIOBLASTOMA (EQUILIBRIUM): FINAL TRIAL REPORT

Case Center (Ohio) – Ibrutinib is a small molecule drug that blocks a protein called Bruton's tyrosine kinase (BTK), which is involved in the formation of cancer cells. Ibrutinib is currently approved to treat several types of cancer, but not GBM. Authors tested the drug in 26 GBM patients. Median OS for MGMT methylated arm was 26.0 (22.0-NA) months and for MGMT unmethylated cohort was 14.0 (8.54-NA) months. Median OS for EGFR-amplified was 29.5 (21.9-NA) months and for EGFR-non-amplified was 21.8 (16.6-NA) months. 2-year OS for MGMT methylated arm was 56% and for MGMT unmethylated arm was 2%.

CTIM-29. FINAL EFFICACY AND CORRELATIVE ANALYSES OF 2-THE-TOP: A PILOT STUDY OF TTFIELDS (OPTUNE) PLUS PEMBROLIZUMAB PLUS MAINTENANCE TEMOZOLOMIDE IN PATIENTS WITH NEWLY DIAGNOSED GLIOBLASTOMA (NDGBM)

University of Florida - Pembrolizumab, also known as Keytruda, is a drug that blocks PD-1, a checkpoint that cancer cells use to escape immune detection. In a study with 26 newly diagnosed GBM patients using Keytruda + Optune, the median overall survival was 24.8 months compared to 14.6 months in matched controls. Six out of 15 patients with measurable disease achieved a partial to complete response. Notably, larger residual tumor size was linked to better response and

survival. The most common serious side effects were thromboses, seizures, and metabolic disturbances in a small percentage of patients.

[LTBK-09. RESULTS OF BMX-HGG STUDY: A MULTI-INSTITUTIONAL, RANDOMIZED PHASE 2 CLINICAL TRIAL OF CONCURRENT CHEMORADIATION WITH OR WITHOUT BMX-001 IN PATIENTS WITH NEWLY DIAGNOSED HIGH GRADE GLIOMA](#)

Multicenter - BMX-001 is a drug that is injected under the skin in order to radiosensitize cancer cells and radioprotect normal tissue. In the Phase 2 trial for newly diagnosed HGG patients, 160 patients were randomized and stratified by tumor grade (72.5% had GBM). Analyses focused on 145 patients who completed standard radiation (RT)/TMZ (74 with BMX-001, 71 without). Median OS for the treatment group (31.3 [95% CI, 21.6, not reached] months) was longer than for the control group (24.7 [95% CI, 19.6-32.6] months). Common toxicities (Grade 1-2) attributed to BMX-001 were injection site reactions (64), tachycardia (24), and itchiness (17). There were no treatment-related Grade 4-5 events.

[CTNI-56. FEASIBILITY AND EFFICACY OF AI-GUIDED PERSONALIZED PRECISION RADIATION THERAPY IN NEWLY DIAGNOSED GLIOBLASTOMA: A MATCHED-CONTROL STUDY](#)

UPenn - In this study, researchers tested personalized precision radiation treatment (PPRT) based on artificial intelligence-guided predictive modeling of recurrence. Seventeen patients received PPRT alongside standard chemotherapy, and their median overall survival was 24.4 months, compared to 17.9 months in a group that received standard treatment. The personalized approach was well-tolerated, with only low-grade adverse events during radiation.

[CTNI-65. INVESTIGATING SAFETY AND EFFICACY OF TTFIELDS PRIOR AND CONCOMITANT TO RADIOTHERAPY IN NEWLY DIAGNOSED GLIOBLASTOMA - FIRST RESULTS OF THE PRICOTT F PHASE I/II TRIAL](#)

Germany – In this trial, 33 newly diagnosed GBM patients started Optune following surgery and continued throughout radiochemotherapy and adjuvant chemotherapy for a total of approximately 9 months. Radiotherapy was conducted with the Optune arrays on the patients' scalp. The combination was safe and well tolerated. High-grade skin toxicity was uncommon. Overall survival data was not mature enough (event rate 48%) to allow for conclusion at the time this abstract was submitted. Median treatment duration was 8.4 months. Statistical analysis showed the number of days with Optune adherence >23 hours was independently associated with OS.

[CTNI-19. RESECTION AND CESIUM-131 RADIATION SOURCES IMBEDDED IN BIO-RESORBABLE COLLAGEN TILES \(GAMMATILE™\) FOLLOWED BY THE STUPP PROTOCOL IN NEWLY-DIAGNOSED GLIOBLASTOMA: GESTALT TRIAL-IN-PROGRESS UPDATE](#)

Multicenter - GammaTiles are small collagen tiles that are placed directly at the tumor site during surgery to deliver targeted radiation therapy. They have mostly been used at recurrence, but this trial tested GammaTiles in newly diagnosed GBM patients, in combination with standard of care treatment. The trial opened in Fall 2022 and had enrolled 16 patients as of abstract submission. Currently, the trial appears feasible and without any unexpected intolerances/toxicities. This trial allows Optune.

[CTNI-62. INTERIM DATA ON DUAL INHIBITION OF POST-RADIOGENIC ANGIO-VASCULOGENESIS BY OLAPTESED PEGOL \(NOX-A12\) AND BEVACIZUMAB IN GLIOBLASTOMA FROM THE FIRST EXPANSION ARM OF THE PHASE 1/2 GLORIA TRIAL](#)

Germany - NOX-A12 (olaptesed pegol) is an intravenously administered targeted therapy that

disrupts tumor growth. Authors tested NOX-A12 together with bevacizumab (trade name Avastin) in six newly diagnosed patients with incompletely resected, MGMT-unmethylated GBM. The combination treatment was well-tolerated. At a median follow-up of 14.6 months, one patient deceased due to distant leptomeningeal spread. Median OS has not yet been reached. One patient achieved a complete response, four patients had partial response, and one patient stable disease.

[CTIM-18. NRG ONCOLOGY STUDY BN007: RANDOMIZED PHASE II/III TRIAL OF IPILIMUMAB \(IPI\) PLUS NIVOLUMAB \(NIVO\) VS. TEMOZOLOMIDE \(TMZ\) IN MGMT-UNMETHYLATED \(UMGMT\) NEWLY DIAGNOSED GLIOBLASTOMA \(NGBM\)](#)

NCI/Multicenter - Ipi+Nivo did not improve progression free survival for MGMT-unmethylated newly diagnosed GBM.

[CTIM-31. CLINICAL IMPACT OF ADDING PEMBROLIZUMAB TO STANDARD OF CARE CHEMORADIATION IN PATIENTS WITH NEWLY DIAGNOSED GLIOBLASTOMA](#)

Study showed no clinical benefit in PFS or OS with the addition of pembrolizumab in patients with newly diagnosed glioblastoma.

[CTNI-58. UPDATED RESULTS AND MOLECULAR SUBGROUP ANALYSES FROM THE RANDOMIZED PHASE 3 MIRAGE TRIAL ON MARIZOMIB IN PATIENTS WITH NEWLY DIAGNOSED GLIOBLASTOMA](#)

EORTC/Multicenter - Addition of marizomib to standard of care was associated with more toxicity but did not confer a survival benefit in newly diagnosed GBM patients, regardless of MGMT methylation status.

HIGH GRADE GLIOMA / GLIOBLASTOMA – TRIALS FOR RECURRENCE

[CTIM-06. A PHASE 2 STUDY OF A NOVEL IMMUNOTHERAPY SL-701 IN ADULTS WITH RECURRENT GLIOBLASTOMA: EXPLORING THE PROGNOSTIC VALUE OF TREATMENT-INDUCED CD8+CD57+ T-CELLS AS A MARKER FOR SURVIVAL](#)

Multicenter - SL-701 is an 'off-the-shelf' peptide vaccine designed to elicit an anti-tumor immune response against three different antigens expressed in GBM. In the Phase 2 study evaluating SL-701+poly-ICLC+bevacizumab in recurrent GBM, 12-month OS was 50%. Authors now present updated findings from the trial showing that certain qualitative differences in immune response may be detectable as early as week 8 post treatment and serve as biomarkers for monitoring and predicting survival.

[CTIM-09. PHASE 1/1B TRIAL OF FC-ENGINEERED ANTI-CD40 AGONIST MONOCLONAL ANTIBODY \(2141-V11\) INFUSED WITH D2C7-IT IN ENHANCING DISEASE BY CONVECTION-ENHANCED DELIVERY \(CED\) FOR RECURRENT MALIGNANT GLIOMA \(RMG\)](#)

Duke - D2C7-IT is a novel immunotoxin that targets wild-type epidermal growth factor receptor (EGFRwt) and mutant EGFR variant III (EGFRvIII) proteins in GBM. Researchers tested D2C7 together with a monoclonal antibody (2141-V11) administered into the tumor via catheter. As of June 5, 2023, 27 patients total (25 with recurrent GBM) were treated, at various dose levels. 13/27 patients remain alive (range 4-22 months after therapy). No grade 4 or 5 adverse events (AEs) related to treatment were observed, while grade 3 related AEs include one each of: dysphasia, encephalopathy, headache, hydrocephalus, paresthesia, and pyramidal tract disorder.

[CTIM-15. T CELL RESPONSE DYNAMICS IN PHASE 3 GLIOBLASTOMA PATIENTS IMMUNIZED WITH AUTOLOGOUS DENDRITIC CELLS PULSED WITH AUTOLOGOUS TUMOR CELL LYSATE](#)

Multicenter (DCVax-L trial) - The Phase 3 clinical trial for DCVax-L, a personalized tumor lysate vaccine, has shown improved overall survival in patients with both newly diagnosed and recurrent GBM. Authors sought to understand the immune responses in patients treated with the vaccine. Results showed expansion of several hundred new T cell clones as well as 700+ previously detected T cell clones over time in both newly diagnosed and recurrent GBM patients treated with the vaccine. Further expansion was triggered by ongoing vaccine administration. Authors conclude the vaccine induced broad spectrum immune responses in GBM patients.

[CTNI-52. SURVIVAL OUTCOMES IN RECURRENT GLIOBLASTOMA \(RGBM\) PATIENTS TREATED WITH A SINGLE INTRA-TUMORAL ADMINISTRATION OF BIZAXOFUSP, AN IL-4R-TARGETING TOXIN, IN A PHASE IIB TRIAL](#)

Multicenter - Bizaxofusp (aka MDNA55) is a targeted treatment administered intratumorally. Forty-four recurrent GBM patients were treated with Bizaxofusp and compared with 81 patients from an external control arm (ECA). The Bizaxofusp group had a significantly longer mOS (12.85 vs 7.7 months). Eleven patients (25%) treated with Bizaxofusp survived >24 months, and 3 were still alive (29.9, 32.8 and 40.1 months) at last follow-up. A follow up Phase 3 trial will use a novel trial design with a propensity-matched ECA comprising two-thirds of the control arm, setting a new precedent for GBM clinical trials.

[CTIM-19. ONCOLYTIC DNX-2401 VIROTHERAPY PLUS PEMBROLIZUMAB IN RECURRENT GLIOBLASTOMA: A PHASE 1/2 TRIAL](#)

Multicenter – This study tested intratumoral delivery of oncolytic virus DNX-2401 followed by intravenous anti-PD-1 antibody pembrolizumab in 49 recurrent GBM patients. There were no dose-limiting toxicities, and full dose combined treatment was well tolerated. OS at 12 months was 52.7% (statistically > prespecified control rate of 20%). Median OS was 12.5 months, and 56.2% of patients had a clinical benefit defined as stable disease or better. Three patients completed treatment with durable responses and remain alive at 45, 48 and 60 months.

[CTIM-22. PHASE I STUDY RESULTS OF THE ANTIBODY-CYTOKINE FUSION PROTEIN L19TNF IN COMBINATION WITH LOMUSTINE FOR PATIENTS WITH RECURRENT GLIOBLASTOMA REVEAL PROMISING SAFETY AND DURABLE TUMOR RESPONSES](#)

Multicenter (all European sites) - L19TNF is a fusion protein made up of a human antibody fragment and human tumor necrosis factor. In a study combining L19TNF and lomustine (aka CCNU) for recurrent GBM, the progression-free survival rate at 6 months was 46% (7/15 patients), and median OS has not been reached after a median follow-up of 11 months. Serial bloodwork demonstrated a treatment-associated increase in C-reactive protein, a peripheral marker for inflammation, which correlated with progression-free survival. One patient, who showed a near-complete response that lasted 12 months relapsed at a different location; subsequent re-challenge with L19TNF and lomustine again led to a partial response. These results justify further investigations within the phase 2 part of the clinical trial that is recruiting patients in four countries.

[CTIM-25. EO2401 PEPTIDE IMMUNOTHERAPY + NIVOLUMAB +/- BEVACIZUMAB IN FIRST RECURRENT GLIOBLASTOMA: THE PHASE 1/2 EOGBM1-18/ROSALIE STUDY \(NCT04116658\)](#)

Dana Farber – E02401 is an ‘off-the-shelf’ peptide vaccine. Authors tested the vaccine in combination with nivolumab (aka Opdivo, a PD1 inhibitor), with or without bevacizumab (aka

Avastin) in recurrent GBM. Immune monitoring showed responses that were early (week 2 after starting trial treatment), durable (up to 23 months), and robust. For the three main dose regimens tested, median progression free survival was 1.6 vs 3.6 vs 5.5 months; median survival was 9.0 vs 12.6 vs too early. In the last group, median follow-up is 8.3 months with maximum survival ongoing up to 2 years.

[CTIM-27. PERIPHERAL BIOMARKER ANALYSIS OF T CELL-MEDIATED COLLAGEN REMODELING CORRELATES WITH TUMOR RESPONSES IN A PHASE IIA TRIAL OF VACCINE IMMUNOTHERAPEUTIC CANDIDATE \(VBI-1901\)](#)

Multiple locations - VBI-1901 is a vaccine that targets two cytomegalovirus (CMV) antigens, gB and pp65. Among 16 recurrent GBM patients treated with the highest dose of VBI-1901 (administered intradermally every 4 weeks), the median overall survival was 12.9 months, with a 12-month OS rate of 62.5%. Authors report on a peripheral biomarker (C4G) that correlates with tumor response; this may help investigators distinguish pseudoprogression from true disease progression during the course of treatment.

[CTIM-41. ONCOLYTIC IMMUNOTHERAPY LINKS IMMUNOACTIVATION TO SUBJECT SURVIVAL IN PHASE I TRIAL OF RECURRENT GLIOBLASTOMA](#)

Dana Farber - CAN-3110 is an engineered herpes simplex virus 1 (HSV1) designed to selectively kill cancer cells. Authors tested intralesional CAN-3110 treatment in 41 patients with recurrent high-grade glioma. For IDHwt recurrent GBM patients with positive HSV1 serology, median post-treatment survival was 14.2 months. There were no observed dose-limiting toxicities.

[CTNI-57. PRELIMINARY RESULTS OF A PHASE 1 TRIAL OF ORAL GALLIUM MALTOLATE IN RECURRENT GLIOBLASTOMA](#)

Medical College Wisconsin – Gallium maltolate is an oral drug that targets iron metabolism in order to inhibit cancer cell growth. In an early phase trial, ten recurrent GBM patients completed treatment at dose levels 1 and 2, and eight patients were evaluable. Four patients enrolled after first recurrence while the other four patients enrolled after their second, third (2 patients) and fourth recurrence. Median progression-free survival (PFS) on treatment was 118 days. Three patients experienced PFS >180 days and two of those patients remain on treatment. To-date, no dose-limiting toxicities at dose levels 1 and 2 have been encountered.

[NCOG-36. IMPACT OF COLLAGEN TILE BRACHYTHERAPY AS TREATMENT FOR RECURRENT GLIOBLASTOMAS ON FUNCTIONAL STATUS AND QUALITY OF LIFE](#)

Multicenter Registry (GammaTile) - GammaTiles are small collagen tiles that are placed directly at the tumor site during surgery to deliver targeted radiation therapy. Of the 57 GBM patients treated with GammaTile at recurrence, 47 remain in the study (5 study exits, 5 deaths), with 21 participants having reached the 6-month time point. Functional status and quality of life scoring measures remained relatively stable at 6 months post-treatment. This interim data analysis supports further investigation of GammaTile as a treatment for recurrent GBM.

[CTNI-18. DESIGNING AND DELIVERING A RANDOMISED CONTROLLED TRIAL OF MEDICINAL CANNABINOIDS IN RECURRENT GLIOBLASTOMA – THE ARISTOCRAT TRIAL](#)

United Kingdom - This cannabinoid trial was crowdfunded with a campaign organized by The Brain Tumour Charity. The study opened recruitment in Feb 2023, and the first patient was recruited in March 2023, so there are no results yet. The study aims to recruit 230+ patients.

[CTNI-85. GBM AGILE PLATFORM TRIAL FOR NEWLY DIAGNOSED AND RECURRENT GBM: RESULTS OF FIRST EXPERIMENTAL ARM, REGORAFENIB](#)

Multicenter - Accrual was stopped for the regorafenib arm of the GBM AGILE trial due to futility. The trial will continue to assess other therapies, including utilizing concurrent and previously accrued controls.

[NCOG-06. BEVACIZUMAB ALONE VERSUS BEVACIZUMAB PLUS IRINOTECAN IN PATIENTS WITH RECURRENT GLIOBLASTOMA: A NATIONWIDE POPULATION-BASED STUDY](#)

Of 846 GBM patients from a national database, 450 received bevacizumab (aka Avastin) alone at recurrence, while 396 received bevacizumab + irinotecan. Median OS from initial surgery was 22.60 months and 20.44 months in the BEV and B+I groups, respectively. The difference was not statistically significant. Considering the additional potential toxicity associated with irinotecan, bevacizumab monotherapy may be a suitable treatment option for recurrent GBM.

HIGH GRADE GLIOMA / GLIOBLASTOMA – GENERAL

[SURG-21. THE PROGNOSTIC ROLE OF RE-RESECTION FOR RECURRENT GLIOBLASTOMA: A REPORT OF THE RANO RESECT GROUP USING A NOVEL CLASSIFICATION FOR EXTENT OF RESECTION](#)

Retrospective analysis of 681 patients with first recurrence of IDH-wildtype GBM, including 310 patients who underwent re-resection. Re-resection was associated with longer survival when stratifying for molecular and clinical confounders. ‘Maximal resection’ had better survival compared to ‘submaximal resection’ (mOS after recurrence: 12 vs. 9 months; $p = 0.003$). Adjuvant chemotherapy further augmented the beneficial effects of re-resection. Conversely, ‘supramaximal resection’ of non-contrast enhancing tumor was not associated with prolonged survival but was frequently accompanied by postoperative deficits, hampering further treatment.

[CTNI-54. A COMBINED ANALYSIS OF TWO RANDOMISED STUDIES EXPLORING THE IMPACT OF EXTENDED POST-RADIATION TEMOZOLOMIDE ON SURVIVAL OUTCOMES IN NEWLY DIAGNOSED GLIOBLASTOMA](#)

Authors conducted a combined analysis of 205 patients from two different studies – 169 from the GEINO14-01 study (2014–2018) and 46 from the EX-TEM study (2019–2022). Analysis showed that, for patients with newly diagnosed glioblastoma, extending post-radiation temozolomide from 6 to 12 months is well tolerated but does not significantly improve 6-month PFS or OS, even for MGMT methylated patients.

[IMMU-39. EFFICACY OF IMMUNE CHECKPOINT INHIBITORS IN GLIOBLASTOMA FROM REAL-WORLD DATA ANALYSIS](#)

726 GBM patients were enrolled in real-world data platform (XCELSIOR); 75 of the GBM patients (10%) received immune checkpoint inhibitors (ICIs) – 53 had pembrolizumab (71%) and 26 had nivolumab (35%) including 12 with ipilimumab (16%). Compared to a propensity matched cohort, ICI vs. no-ICI had a longer mOS of 2.58 years (1.78-NR, $n=62$) vs. 2.05 years (1.76-2.61, $n=113$), but the difference was not statistically significant. The 5-year survival rate was 44% for ICI vs. 16% for no-ICI. Optune use was similar, 39% ICI and 29% no-ICI. Common non-standard treatments used in the ICI cohort were everolimus (11%), osimertinib (8%), lenvatinib (7%), abemaciclib (7%), and neoantigen peptide vaccines (7%). Among unmethylated MGMT patients, mOS was 1.78 years

for ICI vs. 1.8 years for no-ICI. These data suggest activity of ICIs for a subset of GBM patients, but do not support use in patients with unmethylated MGMT. Next steps will focus on examining combination regimens in this evolving data.

[INN-08. LONG-TERM GLOBAL POST-MARKETING SAFETY SURVEILLANCE DATA FROM PEDIATRIC, ADULT AND ELDERLY PATIENTS WITH CENTRAL NERVOUS SYSTEM MALIGNANCIES TREATED WITH TUMOR TREATING FIELDS \(TTFIELDS\) THERAPY](#)

Authors examined surveillance data of 25,898 patients treated with Optune from the US, Europe, Israel, and Japan. The most common Optune-related adverse events were skin reaction (pediatric: 39%; adult: 42%; elderly: 45%), heat (warmth) sensation (pediatric: 14%; adult: 12%; elderly: 12%), and electric (tingling) sensation (pediatric: 10%; adult: 15%; elderly: 10%). No systemic toxicities were reported, regardless of age.

[NCMP-10. DEXAMETHASONE: A TOOL AND A PROBLEM IN GLIOBLASTOMA MANAGEMENT](#)

In a study of 243 GBM patients, authors found that dexamethasone (a corticosteroid commonly used to manage brain swelling in GBM patients) was linked to problems controlling blood sugar levels and to leukocytosis. Avoiding these issues by limiting dexamethasone, when possible, or using metformin may potentially decrease the risk of complications and improve OS.

[BIOS-07. SURVIVAL TIME OF GLIOBLASTOMA PATIENTS ENROLLED IN RANDOMIZED CONTROLLED TRIALS: A NEXT GENERATION META-ANALYSIS OF SURVIVAL CURVES](#)

Authors extracted and aggregated patient data from 14 different randomized controlled GBM trials (total of 2,294 patients). Median survival for patients in the treatment arms was 15.2 months, and 11.2 months for the control arms ($p < 0.0001$). The two-year survival rate was 31.0% for the treatment arms and 15.6% for the control arms. As expected, these results generally show a survival benefit for clinical trial participants receiving investigational treatments.

[EXTH-65. IDENTIFICATION OF LOMERIZINE AS A POTENTIAL ANTI-GLIOBLASTOMA DRUG](#)

Authors identified lomerizine, a prophylactic drug for migraine, as a potential anti-GBM drug from thousands of existing compounds. Lomerizine inhibited proliferation, migration, and invasion dose-dependently in all tested GBM cell lines, especially in glioma stem cell lines. In vivo experiments showed a significant tumor suppression and prolongation of OS in mice treated with lomerizine.

[DDDR-24. SINGLE-CELL FUNCTIONAL TISSUE PROFILING IDENTIFIES PROMISING CANDIDATES FOR DRUG REPURPOSING AGAINST GLIOBLASTOMA](#)

Authors used a novel preclinical testing platform to screen 70 clinically-approved drugs with good blood-brain-barrier penetration in 35 GBM tumor samples freshly obtained from surgery. Among the drugs with potent anti-glioma activity, the antidepressant Vortioxetine stood out as having strong anti-glioma activity across samples, independent of promoter MGMT status. Complementary in vitro testing of Vortioxetine led to a notable fraction of long-term surviving mice.

[EXTH-05. ANTI-TUMOR IMMUNE RESPONSE OF ONCOMAGNETIC MONOTHERAPY IN GLIOBLASTOMA](#)

The Oncomagnetic device generates a spinning oscillating magnetic field (sOMF) which disrupts cancer cell function. In a mouse model, the device showed a significant increase in overall survival. Authors also observed an upregulated immune response, as seen in data obtained from treated GBM cell lines and from mass cytometry analysis of treated mouse tumor sections.

LOW GRADE GLIOMA

[LTBK-06. IMPACT OF VORASIDENIB TREATMENT ON MUTANT IDH1 OR IDH2 DIFFUSE GLIOMA TUMOR GROWTH RATE: RESULTS FROM THE RANDOMIZED, DOUBLE-BLIND, PHASE 3 INDIGO STUDY](#)

Multicenter – Vorasidenib is an oral IDH 1/2 inhibitor. In the Phase 3 randomized trial testing this drug in patients with grade 2 mutant IDH 1/2 glioma, the treatment significantly improved imaging-based progression-free survival and time-to-next-intervention compared with placebo. Tumor growth was observed in patients before receiving vorasidenib. However, treatment with vorasidenib reduced the tumor growth rate and shrunk tumor volume, whereas continued growth in tumor volume was observed in patients receiving placebo.

DIPG / DMG

[EXTH-36. COMBINING ONC201 AND PAXALISIB FOR THE TREATMENT OF DIFFUSE MIDLINE GLIOMA \(DMG\); THE PRECLINICAL RESULTS UNDERPINNING THE INTERNATIONAL PHASE II CLINICAL TRIAL \(NCT05009992\)](#)

ONC201 is an oral drug that has shown potential in treating diffuse midline gliomas (DMGs) with the H3K27M mutation. Paxalisib is another oral drug that acts as a PI3K/mTOR inhibitor. In the first three recorded patients taking a combination of ONC201 and paxalisib (two at progression following re-irradiation, and one at diagnosis following completion of radiation), dramatic reductions in tumor area and dramatically extended OS were observed for all three patients (25 months, 30 and 31 months continuing). The one patient receiving the combination since diagnosis remains in progression free survival. The one patient continuing to receive the combination at progression and following reirradiation experienced a marked decrease in tumor size (~75% reduction), 10 months following radiological detection of progression. These results have prompted further testing of this combination in a phase 2 trial (NCT05009992).

[CTNI-84. PNOC022: A COMBINATION THERAPY TRIAL USING AN ADAPTIVE PLATFORM DESIGN FOR PATIENTS WITH DIFFUSE MIDLINE GLIOMAS \(DMGS\) AT INITIAL DIAGNOSIS, POST-RADIATION THERAPY AND AT TIME OF PROGRESSION](#)

Multicenter - Sixty-eight patients with biopsy-proven DMG were enrolled (median age 9 years [range 3-37]) and received maintenance therapy with weekly ONC201 and daily paxalisib. Median OS from diagnosis was 16.5 months. Most common grade 3 and above treatment-related adverse events were neutrophil count decreased (n=4); mucositis (n=3); and, colitis, DRESS, lymphocyte count decreased, hyperglycemia, hypokalemia (n=2).

[INNV-14. INTERIM REPORT OF A PHASE 1/2 STUDY OF SONODYNAMIC THERAPY \(SDT\) USING AMINOLEVULINIC ACID \(ALA\) AND LOW-INTENSITY FOCUSED ULTRASOUND IN PEDIATRIC PATIENTS WITH DIFFUSE INTRINSIC PONTINE GLIOMA \(DIPG\)](#)

Sonodynamic therapy (SDT) is a non-invasive treatment that uses an intravenous sonosensitizer (e.g. 5ALA) together with focused ultrasound to treat brain tumor. The first cohort studying SDT in DIPG patients enrolled 3 patients. The first subject was treated in 2 sessions: each to half of the pons 30 days apart. Two subsequent subjects had the entire pons treated in a single session. No dose-limiting toxicity (DLT) or related adverse event grade ≥ 3 were observed. Clinical trial

enrollment is ongoing and dose-escalation cohorts will provide additional safety data.

HIGH GRADE MENINGIOMA

[RADT-37. INTERIM RESULTS OF ACCELERATOR-BASED BORON NEUTRON CAPTURE THERAPY, RANDOMIZED CONTROLLED TRIAL FOR RECURRENT AND REFRACTORY HIGH-GRADE MENINGIOMAS](#)

Boron neutron capture therapy (BNCT) involves giving patients a boron drug that selectively concentrates in tumor tissue; when exposed to low-energy neutrons, the boron undergoes a nuclear reaction which releases high-energy particles that destroy the cancer cells. In a study testing BCNT in recurrent high-grade meningioma, authors observed median progression free survival of 90 weeks in the treatment arm versus 8 weeks for the control arm ($p = 0.0004$). OS-2 year rates of BNCT and control arms were 91.7% and 25%, respectively ($p = 0.01$).

EPENDYMOMA

[ANGI-10. METRONOMIC 5 DRUG ANTI-ANGIOGENESIS THERAPY FOR RECURRENT EPENDYMOMA](#)

In a small study of 9 pediatric recurrent ependymoma patients, authors observed improved outcomes and minimal side effects from using a 5-drug metronomic anti-angiogenesis therapy (celecoxib, thalidomide, fenofibrate, and alternating low dose etoposide and cyclophosphamide). The treatment was tolerated well overall, and no patients stopped therapy due to side effects. 2-year survival was 78% (7/9) and 2-year progression free survival was 56% (5/9).

BIOMARKERS / IMPORTANCE OF MOLECULAR TESTING

[CNSC-16. MOLECULAR PROFILING AND ACTIONABLE MUTATIONS IN ADULT PATIENTS WITH IDH WILD TYPE GLIOMAS AND GLIONEURONAL AND NEURONAL TUMORS](#)

Molecular testing (aka next generation sequencing) can help identify genetic alterations that may guide personalized treatment in glioma patients. In reviewing 211 glioma patients, authors noted actionable molecular alterations in 13 patients (6.2%). Seven patients (3.3%) had BRAF V600E mutation, 4 patients (1.9%) had FGFR3-TACC3 fusion, 1 (0.5%) had PIK3CA mutation, and 1 (0.5%) had NTRK1 fusion.

[PATH-61. NGS DATA INFLUENCE ON CLINICIAN DECISION-MAKING ACROSS PRIMARY BRAIN TUMORS AT NORTHWESTERN UNIVERSITY](#)

Next generation sequencing (NGS) was completed in 261 GBM patients and 121 patients with other primary brain tumors. NGS impacted decision-making in 12.6% (33) of GBM patients and 9.1% (11) of other brain tumor patients. Across the 382 patients assessed, EGFR copy number gain or GOF mutations were targeted most often (52.3% of all mutations targeted), followed by BRAF (11.4%) and IDH1 (11.4%) mutations.

[BIOM-20. NEAT1 EXPRESSION IS ASSOCIATED WITH GLIOBLASTOMA PATIENT RESPONSE TO IMMUNE CHECKPOINT INHIBITORS](#)

Authors analyzed the transcriptomic profile of two different cohorts of GBM patients in an effort to understand the molecular basis of clinical response to PD-1/PD-L1 inhibitors. They identified

NEAT1 as a long noncoding RNA upregulated in GBM patients with longer survival upon anti-PD-1/PD-L1 treatment. Thus, GBM tumors with higher expression of NEAT1 may respond better to PD-1/PD-L1 inhibitors.

[BIOM-44. IMPROVED OVERALL SURVIVAL OF RECURRENT GLIOBLASTOMA \(GBM\) PATIENTS WITH EGFR AMPLIFICATION AND EGFR VIII MUTATIONS TREATED WITH OSIMERTINIB: A RETROSPECTIVE REVIEW](#)

Osimertinib is a targeted therapy primarily used in non-small cell lung cancer. Authors retrospectively reviewed 27 recurrent GBM patients with EGFR amplification and EGFRvIII mutations who received osimertinib in addition to other therapies such as bevacizumab, irinotecan, Optune, and salvage radiation at recurrence. All except one of the 27 patients were IDH1-wild type (92.9%). The median time on osimertinib was 5.1 months, and median OS was 28 months. Osimertinib may be a promising targeted therapy for rGBM patients with EGFR amplification and EGFRvIII mutations.

[CNSC-07. USING CRISPR-CAS9 SCREENING TO IDENTIFY BIOMARKERS FOR MMF SENSITIVITY IN GLIOBLASTOMA MULTIFORME](#)

Mycophenolate mofetil (MMF) is an immunosuppressive medication which is often used to prevent organ transplant rejection. Authors used CRISPR-CAS9 screening (knockout gene editing) in six glioma cell lines to show that high SLC1A5 expression appears to correlate with sensitivity to MMF/TMZ, while low expression led to MMF/TMZ resistance. Authors will retrospectively analyze data from their Phase 1 study to validate SLC1A5 as a predictive biomarker for response to MMF/TMZ.