



**Recent References (2019-2020) on Cancer Research
Using ALZET® Osmotic Pumps**

Q8564: K. Kawamoto, *et al.* Cell proliferation analysis is a reliable predictor of lack of carcinogenicity: Case study using the pyrethroid imiprothrin on lung tumorigenesis in mice. *Regul Toxicol Pharmacol* 2020;113(104646)
Agents: uridine, bromodeoxy-; **Vehicle:** DMSO; **Route:** SC; **Species:** Mice; **Pump:** 2001; **Duration:** 7 days;
ALZET Comments: Dose (40 mg BrdU/mL); 10% DMSO used; animal info (Male mice aged 9 weeks); bromodeoxyuridine aka BrdU; cancer (carcinogenicity);

Q8594: T. Kan, *et al.* IL-31 induces antitumor immunity in breast carcinoma. *J Immunother Cancer* 2020;8(2):
Agents: Interleukin-31, recombinant mouse **Vehicle:** Not stated; **Route:** Not stated; **Species:** Mice; **Pump:** Not stated;
Duration: 3 weeks;
ALZET Comments: Dose (14 ug/day); animal info (BALB/c female mice, 10 weeks old); recombinant mouse Interleukin-31 aka IL-31; cancer (Breast Cancer);

Q8469: A. Frisch, *et al.* Apelin Controls Angiogenesis-Dependent Glioblastoma Growth. *Int J Mol Sci* 2020;21(11):
Agents: Apelin-13 **Vehicle:** CSF, Artificial; **Route:** CNS/CSF; **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;
ALZET Comments: Dose (30 µg); Controls received mp w/ vehicle; animal info (APLNKO mice); Apelin-13 aka APLN; ALZET brain infusion kit 3 used; Brain coordinates (1 mm anterior and 1.5 mm right to the bregma); cancer (Glioblastoma);

Q8457: H. Elleaume, *et al.* Radiation therapy combined with intracerebral convection-enhanced delivery of cisplatin or carboplatin for treatment of the F98 rat glioma. *J Neurooncol* 2020;149(2):193-208
Agents: Carboplatin **Vehicle:** Not stated; **Route:** CSF/CNS (intracerebral); IV; **Species:** Rat; **Pump:** Not stated; **Duration:** 7 days;
ALZET Comments: Dose (84 ug/g); animal info (Fischer rats); cancer (Glioma);

Q8447: G. Dolgormaa, *et al.* Mac-2-binding protein glycan isomer enhances the aggressiveness of hepatocellular carcinoma by activating mTOR signaling. *Br J Cancer* 2020;123(7):1145-1153
Agents: M2BPGI **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** 2002; **Duration:** 14 days;
ALZET Comments: Dose (3.6 ug/ml/day); Controls received mp w/ vehicle; animal info (female NOD-SCID mice, 7 weeks old, 19-20 g); M2BPGI aka Mac-2-binding protein; cancer (Carcinoma);

Q8423: H. J. Cho, *et al.* Complex interrelationships between nitro-alkene-dependent inhibition of soluble epoxide hydrolase, inflammation and tumor growth. *Redox Biol* 2020;29(101405)
Agents: nitro-octadec-9-enoic acid, 10- **Vehicle:** Saline, DMSO; **Route:** SC; **Species:** Mice; **Pump:** Not stated; **Duration:** Not stated;
ALZET Comments: Dose (5 mg/kg/day); 50% Saline, 50% DMSO used; Controls received mp w/ vehicle; animal info (KI transgenic mouse, 12-14 weeks); 10-nitro-octadec-9-enoic acid aka nitro-oleate; cancer (tumor proliferation and growth);

Q8404: H. Castillo-Ecija, *et al.* Treatment-driven selection of chemoresistant Ewing sarcoma tumors with limited drug distribution. *J Control Release* 2020;324(440-449)
Agents: Irinotecan **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2001D; **Duration:** 10 days;
ALZET Comments: Dose (130 ug/h); Controls received mp w/ vehicle; animal info (athymic nude mice); cancer (ewing sarcoma);

Q8390: K. A. Bockerstett, *et al.* Interleukin 27 Protects From Gastric Atrophy and Metaplasia During Chronic Autoimmune Gastritis. *Cell Mol Gastroenterol Hepatol* 2020;10(3):561-579
Agents: Interleukin-27, recombinant **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 4 weeks;
ALZET Comments: Dose (800 ng); Controls received mp w/ vehicle; animal info (TxA23 mice, 20 g, 5 weeks of age); recombinant Interleukin-27 aka rIL27; cancer (gastric cancer);



Q8342: R. Ayoub, *et al.* Assessment of cognitive and neural recovery in survivors of pediatric brain tumors in a pilot clinical trial using metformin. *Nat Med* 2020;26(8):1285-1294

Agents: Metformin **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** Not stated; **Duration:** 7 days;

ALZET Comments: Dose (200 mg/kg/day); Controls received mp w/ vehicle; animal info (C57BL/6 Mice); behavioral testing (Y maze, Open field, Novel place recognition, Elevated plus maze); cancer (Brain Tumors);

Q8495: G. Acker, *et al.* The CXCR2/CXCL2 signalling pathway - An alternative therapeutic approach in high-grade glioma. *Eur J Cancer* 2020;126(106-115)

Agents: SB225002 **Vehicle:** DMSO; **Route:** CNS/CSF (parenchyma); **Species:** Mice; **Pump:** 2002; 2001; **Duration:** 14, 7 days;

ALZET Comments: Dose (15, 30 ug/day); Controls received mp w/ vehicle; animal info (Female C57BL6/N mice); SB225002 aka CXCR2-antagonist; Brain coordinates (1 mm anterior and 2 mm lateral to the bregma); cancer (Brain tumour);

Q8326: G. Acker, *et al.* The CXCR2/CXCL2 signalling pathway - An alternative therapeutic approach in high-grade glioma. *Eur J Cancer* 2020;126(106-115)

Agents: SB225002 **Vehicle:** DMSO; **Route:** CNS/CSF (parenchyma); **Species:** Mice; **Pump:** 2002; 2001; **Duration:** 14, 7 days;

ALZET Comments: Dose (15, 30 ug/day); Controls received mp w/ vehicle; animal info (Female C57BL6/N mice); SB225002 aka CXCR2-antagonist; Brain coordinates (1 mm anterior and 2 mm lateral to the bregma); cancer (Brain tumour);

Q7425: X. Zhi, *et al.* Adrenergic modulation of AMPKdependent autophagy by chronic stress enhances cell proliferation and survival in gastric cancer. *Int J Oncol* 2019;54(5):1625-1638

Agents: Propranolol Hydrochloride **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** Not stated; **Duration:** Not stated;

ALZET Comments: Dose (2 mg/kg/day); Controls received mp w/ vehicle; animal info (Male BALB/c nude mice (5weeks old, weighing ~20 g)); cancer (gastric cancer);

Q7037: J. Zhang, *et al.* Neuroinflammation and central PI3K/Akt/mTOR signal pathway contribute to bone cancer pain. *Mol Pain* 2019;15(1744806919830240)

Agents: Rapamycin, LY294002, Interleukin-1Receptor antagonist, SC144, etanercept, **Vehicle:** CSF, artificial; **Route:** CSF/CNS (midbrain periaqueductal gray); **Species:** Rat; **Pump:** Not Stated; **Duration:** Not Stated;

ALZET Comments: animal info (200-250 gr Wistar rats); rapamycin is an mTOR inhibitor; LY294002 is a PI3K inhibitor; IL-1Ra is an IL-1b receptor antagonist, SC144 is a gp130 antagonist, etanercept is a TNF-a receptor antagonist; ALZET brain infusion kit used; Brain coordinates (7.6 mm posterior to the bregma, 0.65mm lateral to the midline, and 4.2 mm ventral to the brain surface); Therapeutic indication (bone cancer pain);

Q7038: G. Zadra, *et al.* Inhibition of de novo lipogenesis targets androgen receptor signaling in castration-resistant prostate cancer. *Proc Natl Acad Sci U S A* 2019;116(2):631-640

Agents: IPI-9119 **Vehicle:** 1-methyl-2-pyrrolidinone; sodium phosphate buffer; **Route:** SC; **Species:** Mice; **Pump:** 2002; **Duration:** 4 weeks;

ALZET Comments: Dose (100 mg/mL); 20% 1-methyl-2-pyrrolidinone used; enzyme inhibitor (fatty acid synthase); cancer (prostate); no stress: Mice did not show any signs of toxicity, stress, weight loss, or changes in feeding behavior. (see pg. 635);

Q7039: X. Yu, *et al.* Synergistic antitumor effects of 9.2.27-PE38KDEL and ABT-737 in primary and metastatic brain tumors. *PLoS One* 2019;14(1):e0210608

Agents: 9.2.27-PE38KDEL immunotoxin, ABT-737 **Vehicle:** PBS, captisol, mouse serum albumin; **Route:** CSF/CNS (intratumoral); **Species:** Mice (nude); **Pump:** 1007D; **Duration:** 3 days;

ALZET Comments: 5% Captisol and 2% mouse serum albumin used; animal info (Nude mice (22–30 g, 6–8 weeks); ALZET brain infusion kit 3 used; cancer (glioblastoma); “Convection-enhanced delivery (CED), utilizing osmotic pumps, has been successfully used to bypass the blood-brain barrier and to deliver ITs directly into brain tumors” pg.12 ;

Q7680: Y. Wang, *et al.* NRG-1 Stimulates Serum DJ-1 Increase in Breast Cancers. *Pathol Oncol Res* 2019;25(1):71-79

Agents: NRG-1 **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 24 hours;

ALZET Comments: Dose (10 ug/d); Controls received mp w/ vehicle; post op. care (carprofen); cancer (breast);



Q7678: W. Wang, *et al.* Targeted Metabolomics Identifies the Cytochrome P450 Monooxygenase Eicosanoid Pathway as a Novel Therapeutic Target of Colon Tumorigenesis. *Cancer Research* 2019;79(8):1822-1830

Agents: Epoxyoctadecenoic acid, 12,13- **Vehicle:** DMSO, PEG 400; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks;

ALZET Comments: Dose (2 mg/kg/day); 1:1 DMSO:PEG 400 used; Controls received mp w/ vehicle; animal info (C57BL/6 male mice (age = 6 weeks)); cancer (colon);

Q6792: G. M. Shackelford, *et al.* Continuous and bolus intraventricular topotecan prolong survival in a mouse model of leptomeningeal medulloblastoma. *PLoS One* 2019;14(1):e0206394

Agents: Topotecan **Vehicle:** Saline; **Route:** CSF/CNS (ventricle); **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;

ALZET Comments: Dose (5.28 µg/day); Controls received mp w/ vehicle; animal info (J:NU mice (homozygous for the Foxn1nu mutation)); comparison of bolus dosing vs mp; cancer (Leptomeningeal medulloblastoma);

Q8369: G. Pirovano, *et al.* 2019;

Agents: (Iodine-123 Meitner-Auger PARP1 inhibitor **Vehicle:** PEG; PBS; **Route:** CNS/CSF; **Species:** Mice; **Pump:** 1003D; **Duration:** 3 days;

ALZET Comments: 30% PEG/PBS used; (Iodine-123 Meitner-Auger PARP1 inhibitor aka 123 I-MAPi; enzyme inhibitor ((Iodine-123 Meitner-Auger PARP1 inhibitor); ALZET brain infusion kit 3 used; cancer (Glioblastoma);

Q8286: T. Miladinovic, *et al.* Spinal microglia contribute to cancer-induced pain through system xC (-)-mediated glutamate release. *Pain Rep* 2019;4(3):e738

Agents: Sulfasalazine **Vehicle:** Ammonium Hydroxide; **Route:** IP; **Species:** Mice; **Pump:** 1002; **Duration:** 14 days;

ALZET Comments: Dose (6.6 mg/kg/day); Controls received mp w/ vehicle; animal info (BALB/c, 4-6 weeks old); behavioral testing (Nociception Test); Sulfasalazine aka SSZ; cancer (Cancer-induced pain);

Q8278: S. I. Masunaga, *et al.* Effect of a change in reactor power on response of murine solid tumors in vivo, referring to impact on quiescent tumor cell population. *Int J Radiat Biol* 2019;95(5):635-645

Agents: 5-bromo-20-deoxyuridine **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** Not stated; **Duration:** 5 days;

ALZET Comments: Dose (200-250 mg/ml); animal info (C3H/He, 8-11 weeks old, 22.1 g); 5-bromo-20-deoxyuridine aka BrdU; cancer (Tumor Cells);

Q7065: G. Mastrella, *et al.* Targeting APLN/APLNR improves anti-angiogenic efficiency and blunts pro-invasive side effects of VEGFA/VEGFR2-blockade in glioblastoma. *Cancer Research* 2019;79(9):2298-2313

Agents: apelin-F13A, DC101, Antibody,anti-VEGFR2 **Vehicle:** CSF, artificial; **Route:** CSF/CNS (intratumoral); **Species:** Mice; **Pump:** 1002; 2004; **Duration:** 14 and 28 days;

ALZET Comments: Dose (30 or 60 µg of apelin-F13A, 0.8 mg of DC101); apelin-F13A is a mutant APLNR ligand, DC101 is a VEGFR2-blocking antibody; ALZET brain infusion kit 3 used; cancer (glioblastoma);

Q8274: A. MacDonald, *et al.* Necuparanib, A Multitargeting Heparan Sulfate Mimetic, Targets Tumor and Stromal Compartments in Pancreatic Cancer. *Mol Cancer Ther* 2019;18(2):245-256

Agents: Necuparanib **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** Not stated;

ALZET Comments: Dose (40 mg/kg/day); Controls received mp w/ vehicle; animal info (C57bl/6/FVB); cancer (Pancreatic);

Q7578: S. Lux, *et al.* The antinociceptive effect of resveratrol in bone cancer pain is inhibited by the Silent Information Regulator 1 inhibitor selisistat. *J Pharm Pharmacol* 2019;71(5):816-825

Agents: Selistate **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 10074D; **Duration:** 1 week;

ALZET Comments: Dose (0.5 lg/h); Controls received mp w/ vehicle; animal info (Male BALB/c mice (20–30 g)); cancer (pain); Therapeutic indication (cancer pain (nociception));

Q8271: R. Luwor, *et al.* Targeting Glioma Stem Cells by Functional Inhibition of Dynamin 2: A Novel Treatment Strategy for Glioblastoma. *Cancer Invest* 2019;37(3):144-155



Agents: Cydn-4-36, Temozolomide, or both **Vehicle:** DMSO; **Route:** SC; **Species:** Mice; **Pump:** Not stated; **Duration:** 14 days; **ALZET Comments:** Dose (Cydn- 150 mg/kg/day or TMZ-20 mg/kg/day); animal info (8-10 weeks old, BALB/c nu/nu); Cydn-4-36 aka dynamin inhibitor, TMZ aka temozolomide aka DNA-alkylating prodrug; enzyme inhibitor (Dynamin inhibitor); cancer (Glioma);

Q7069: Y. P. Li, *et al.* p300 mediates muscle wasting in Lewis lung carcinoma. *Cancer Research* 2019; **Agents:** C646 **Vehicle:** PBS, DMSO; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 14 days; **ALZET Comments:** Dose (10 mg/kg/day); 50% DMSO used; animal info (8-week-old male C57BL/6 mice); C646 is a specific pharmacological inhibitor of p300; cancer (Lewis lung carcinoma); Therapeutic indication (Muscle wasting);

Q6964: X. Li, *et al.* Suppression of Angiotensin-(1-7) on the Disruption of Blood-Brain Barrier in Rat of Brain Glioma. *Pathol Oncol Res* 2019;25(1):429-435 **Agents:** Angiotensin (1-7) **Vehicle:** CSF, artificial; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 14 days; **ALZET Comments:** Dose (1 pmol/0.5 µl/h, 100 pmol/0.5 µl/h or 10 nmol/0.5 µl/h per 3 times/week); Controls received mp w/ vehicle; animal info (Male Sprague–Dawley rats of 280–320 g); cancer (Brain Glioma);

Q8233: Y. V. Kucheryavykh, *et al.* Targeted Delivery of Nanoparticulate Cytochrome C into Glioma Cells Through the Proton-Coupled Folate Transporter. *Biomolecules* 2019;9(4): **Agents:** Folic acid-conjugated cytochrome c-containing nanoparticles **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2004; **Duration:** 14 days; **ALZET Comments:** Dose (100 mg/mL); Controls received mp w/ vehicle; animal info (C57BL/6, 12-16 weeks old); Folic acid-conjugated cytochrome c-containing nanoparticles aka FA-CytC NPs ; ALZET brain infusion kit 3 used; Brain coordinates (2 mm lateral, 1 mm caudal and 3 mm ventral a small burr hole); cancer (Glioma);

Q7080: S. Krishnamurthy, *et al.* Hyperosmotic intraventricular drug delivery of DV1 in the management of intracranial metastatic breast cancer in a mouse model. *J Clin Neurosci* 2019;62(207-211 **Agents:** DV1 **Vehicle:** Saline; **Route:** CSF/CNS (left ventricle); **Species:** Mice (nude); **Pump:** 1007D; **Duration:** 7 days; **ALZET Comments:** Dose (50 mg/kg/day); Controls received mp w/ vehicle; animal info (female athymic nude mice, 8 weeks old.); DV1 is a synthetic inhibitor of Chemokine receptor 4 (CXCR4); ALZET brain infusion kit 3 used; cyanoacrylate adhesive; cancer (breast); the skin incision was closed with Vetbond; Brain coordinates (skull at 0.3 mm posterior, 1.0 mm lateral to the bregma, 3.0mm deep);

Q6967: M. Kondo, *et al.* Involvement of peroxisome proliferator-activated receptor-alpha in liver tumor production by permethrin in the female mouse. *Toxicol Sci* 2019; **Agents:** Uridine, Bromodeoxy **Vehicle:** DMSO; **Route:** SC; **Species:** Mice; Rat; **Pump:** 2001; 2ML2; **Duration:** 7 days; 14 days; **ALZET Comments:** Dose (8.4 mgBrdU/mouse.; 33.6 mg BrdU/rat); 10% DMSO used; cancer (liver); stress/adverse reaction: One animal was dead due to anesthesia at implantation of osmotic pump;

R0376: R. G. Kenny, *et al.* Toward Multi-Targeted Platinum and Ruthenium Drugs-A New Paradigm in Cancer Drug Treatment Regimens? *Chemical Reviews* 2019; **Agents:** Chloridotetrakis (ibuprofenato)diruthenium-(II,III) **Vehicle:** Not Stated; **Route:** Not Stated; **Species:** Rat; **Pump:** Not Stated; **Duration:** Not Stated; **ALZET Comments:** cancer (glioma);

Q8567: H. Kawasaki, *et al.* Nerve growth factor (NGF) has an anti-tumor effects through perivascular innervation of neovessels in HT1080 fibrosarcoma and HepG2 hepatitis tumor in nude mice. *J Pharmacol Sci* 2019;140(1):1-7 **Agents:** Nerve growth factor, human **Vehicle:** Saline, sterile; **Route:** SC; **Species:** Mice; **Pump:** Not stated; **Duration:** 14 days; **ALZET Comments:** Dose (40 or 80 ng/h); Controls received mp w/ vehicle; animal info (Five-week-old BALB/c Slc nu/nu mice); human nerve growth factor aka NGF; cancer (Tumor growth);



Q7625: T. Kanemitsu, *et al.* Folate receptor-targeted novel boron compound for boron neutron capture therapy on F98 glioma-bearing rats. *Radiat Environ Biophys* 2019;58(1):59-67

Agents: pteroyl–closo-dodecaborate conjugate **Vehicle:** Not Stated; **Route:** CSF/CNS (surface of brain); **Species:** Rat; **Pump:** 2001D; **Duration:** 2 hours, 6 hours, 24 hours;

ALZET Comments: Dose (200 µl/24 h); Controls received no treatment; animal info (male, Fischer, F98 glioma-bearing, 200-240g); PBC is a novel boron compound that interacts with the folate receptor containing a pteroyl group and closo-dodecaborate; Brain coordinates (1-mm posterior and 4-mm right lateral positions to the bregma, 5 mm from the dura); cancer (glioma); “In addition, CED offers a great pharmacokinetic advantage over systemic administration due its convective effects (i.e., CED uses pressure-driven bulk flow of infusate to deliver therapeutic agents directly into the solid tissue. The bulk flow is created by a small pressure gradient from a pump that pushes the solute through a catheter) (Bobo et al. 1994). It is noted that it is possible to have a high concentration and extensive drug distribution in the brain tumor, while only a small amount of drug is distributed to other systemic organs resulting in very little systemic toxicity.” pg.65 ; Therapeutic indication (boron-delivery agent for boron neutron capture therapy of tumor cells);

Q7630: H. Y. Jang, *et al.* Schedule-dependent synergistic effects of 5-fluorouracil and selumetinib in KRAS or BRAF mutant colon cancer models. *Biochemical Pharmacology* 2019;160(110-120

Agents: fluorouracil, 5- **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

ALZET Comments: Dose (10, 30 mg/kg/day); Controls received mp w/ vehicle; animal info (5.5 weeks, male, athymic, Balb-c/nu); cancer (colorectal); “An equivalent dose of 5-FU (JW Pharmaceutical, Seoul, Korea) was continuously delivered by osmotic pumps (Durect, Cupertino, CA, USA) over 7 days, to minimize possible side effects of severe weight loss by repeated bolus injections of 5-FU [26].” pg.112; Therapeutic indication (improved effectiveness of capecitabine (5-FU precursor) monotherapy due to synergistic effect with MEK inhibitor);

R0378: B. Halle, *et al.* Convection-enhanced Drug Delivery for Glioblastoma: A Systematic Review Focused on Methodological Differences in the Use of the Convection-enhanced Delivery Method. *Asian-Australasian Journal of Animal Sciences* 2019;14(1):5-14

Agents: Etoposide, Bevacizumab, IMCA12, Interleukin-13-PE38, Tetrakis Chlorin **Vehicle:** Not Stated; **Route:** CSF/CNS (intratumoral); **Species:** Mice, Rat; **Pump:** 2001D, 1003D, 1007D, 1004, 2004; **Duration:** 24 hours, 3, 7, 21, 28 days;

ALZET Comments: ALZET brain infusion kit 1,2, and 3 used; cancer (Glioblastoma);

Q8008: M. M. Gilligan, *et al.* Aspirin-triggered proresolving mediators stimulate resolution in cancer. *Proc Natl Acad Sci U S A* 2019;116(13):6292-6297

Agents: Aspirin-triggered specialized pro-resolving mediators **Vehicle:** Not stated; **Route:** SC; **Species:** Mice; **Pump:** Not stated; **Duration:** 14 days;

ALZET Comments: Dose (0.6 µg/kg/day); animal info (6-8 weeks old, C57BL/6); Aspirin-triggered specialized pro-resolving mediators aka AT-SPMs ; cancer (Tumor growth);

Q7082: Gartung A, *et al.* Suppression of chemotherapy-induced cytokine/lipid mediator surge and ovarian cancer by a dual COX-2/sEH inhibitor. *Proceedings of the National Academy of Sciences* 2019;116(5):1698-1703

Agents: PTUPB **Vehicle:** Not Stated; **Route:** IP; **Species:** Mice (SCID); **Pump:** Not Stated; **Duration:** 4 weeks;

ALZET Comments: Dose (30 mg/kg/d); animal info (6-wk-old female C57BL/6 or SCID mice); PTUPB aka 4-(5-phenyl-3-{3-[3-(4-trifluoromethyl-phenyl)-ureido]-propyl}-pyrazol-1-yl) benzenesulfonamide is a dual COX-2/sEH inhibitor; enzyme inhibitor (cyclooxygenase-2 and soluble epoxide hydrolase); cancer (ovarian);

Q7083: G. Gampa, *et al.* Brain Distribution and Active Efflux of Three panRAF Inhibitors: Considerations in the Treatment of Melanoma Brain Metastases. *J Pharmacol Exp Ther* 2019;368(3):446-461

Agents: CCT196969, LY3009120, MLN2480; **Vehicle:** DMSO; **Route:** IP; **Species:** Mice (knockout); **Pump:** 1003D; **Duration:** 48 hours;

ALZET Comments: Dose: CCT196969 (5 mg/ml), LY3009120 (3 mg/ml), MLN2480 (5 mg/ml); animal info (WT and Mdr1a/b -/- Bcrp1-/- mice, 8–16-week-old, approx. 15–35 grams); panRAF inhibitors; brain tissue distribution (p. 458); cancer (melanoma);



Q7638: J. Enriquez Perez, *et al.* The effect of locally delivered cisplatin is dependent on an intact immune function in an experimental glioma model. *Sci Rep* 2019;9(1):5632

Agents: Cisplatin **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1003D; **Duration:** 3 days;

ALZET Comments: Dose (1080, 120, or 12 ug/kg/day); 0.9% Saline used; animal info (C57BL/6, NSG, 8-10 weeks old, 18-21 weeks old); ALZET brain infusion kit 3 used; cyanoacrylate adhesive; cancer (Glioma);

R0380: A. Clavreul, *et al.* Nanocarriers and nonviral methods for delivering antiangiogenic factors for glioblastoma therapy: the story so far. *Int J Nanomedicine* 2019;14(2497-2513

Agents: Bevacizumab; RNA, small interfering (anti-HIF-1 α /PEG); Immunotoxin, DTAT/DTATEGF; Endostatin; 17-ODYA; Miconazole; **Vehicle:** Not Stated; **Route:** CSF/CNS (intratumoral), IV; **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;

ALZET Comments: enzyme inhibitor (CYP epoxygenase); cancer (glioblastoma); This review describes methods (including convection-enhanced delivery devices, implantable polymer devices, nanocarriers, and cellular vehicles) to deliver antiangiogenic factors to intracranial tumors.

Q8022: L. M. Cher, *et al.* Biomarkers and smart intracranial devices for the diagnosis, treatment, and monitoring of high-grade gliomas: a review of the literature and future prospects. *Neuro-Oncology Advances* 2019;1(1):

Agents: Bortezomib **Vehicle:** Not stated; **Route:** CSF/CNS; **Species:** Not stated; **Pump:** Not stated; **Duration:** Not stated; **ALZET Comments:** Dose (200 ul); cancer (Glioblastoma);

Q7957: Z. Chen, *et al.* USP9X deubiquitinates ALDH1A3 and maintains mesenchymal identity in glioblastoma stem cells. *J Clin Invest* 2019;129(5):2043-2055

Agents: WP1130 **Vehicle:** Not stated; **Route:** CSF/CNS (caudate nucleus); **Species:** Mice; **Pump:** Not stated; **Duration:** 7 days;

ALZET Comments: Dose (25 mg/kg at 0.5 μ l/h); Controls received mp w/ vehicle; animal info (NOD/SCID); WP1130 is a USP9X inhibitor; enzyme inhibitor (USP9X); Brain coordinates (2 mm anterior, 2 mm lateral, 3 mm depth from the dura); Cannula placement verified via MRI after removal of the pump system.; cancer (glioblastoma); MRI; vehicle use stated but identity not listed in paper.; Therapeutic indication (promotes robust polyubiquitylation of ALDH1A3, which results in a marked reduction in ALDH1A3 protein levels and functional activity, leading to attenuation of the tumor-initiating ability of MES GSCs);

Q6985: E. Binda, *et al.* Drug Delivery in an Orthotopic Tumor Stem Cell-Based Model of Human Glioblastoma. *Methods Mol Biol* 2019;1869(197-205

Agents: Not Stated **Vehicle:** Saline; **Route:** CSF/CNS (nucleus striatum); **Species:** Mice (SCID); **Pump:** Not Stated; **Duration:** 2 weeks;

ALZET Comments: ALZET brain infusion kit 3 used; cyanoacrylate adhesive; cancer (glioblastoma multiforme); good method; Methods paper describing local intracranial delivery of drugs by osmotic mini-pumps.

Q8166: N. Ben-Jonathan, *et al.* Activation of the cGMP/protein kinase G system in breast cancer by the dopamine receptor-1. *Cancer Drug Resist* 2019;

Agents: Fenoldopam **Vehicle:** Not stated; **Route:** SC; **Species:** Mice; **Pump:** Not stated; **Duration:** 3 weeks;

ALZET Comments: animal info (Athymic nude mice); Fenoldopam mesylate aka fenoldopam; cancer (Breast);

Q8161: M. L. Bacigalupo, *et al.* Growth hormone upregulates the pro-tumorigenic galectin 1 in mouse liver. *Endocr Connect* 2019;8(8):1108-1117

Agents: Porcine **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1007D; **Duration:** 5 days;

ALZET Comments: Dose (1mg/kg per day); Controls received mp w/ vehicle; animal info (Adult (3–4 months old) Swiss-Webster female and male mice); cancer (Transgenic mice overexpressing growth hormone (GH) spontaneously develop liver tumors);

Q7943: H. M. Babiker, *et al.* E6201, an intravenous MEK1 inhibitor, achieves an exceptional response in BRAF V600E-mutated metastatic malignant melanoma with brain metastases. *Invest New Drugs* 2019;37(4):636-645



Agents: E6201 **Vehicle:** Water, sterile; **Route:** IP; **Species:** Mice; **Pump:** 1003D; **Duration:** 7 hours;
ALZET Comments: Dose (6 µg/h); Controls received mp w/ agent; animal info (8-15 weeks, FVB and Mdr1a/b(-/-)Bcrp1(-/-)); Resultant plasma level ((26.54±4.60 ng/mL in WT; 18.57±2.46 ng/mL in Mdr1a/b(-/-)Bcrp1(-/-)); E6201 is an ATP-competitive MEK1 inhibitor that has demonstrated preclinical activity in BRAF V600E mutant melanoma cell lines; enzyme inhibitor (MEK1); cancer (Malignant melanoma); The half-life for E6201 in mice is approximately 45 min and so an infusion lasting for 7 h was considered sufficient to attain steady-state E6201 levels in both plasma and brain. Brain concentration levels of E601 measured at 48.22±20.99 ng/g in WT and 82.32 ± 21.59 ng/g in Mdr1a/b(-/-)Bcrp1(-/-); Therapeutic indication (E6201 has promising brain distribution properties for the treatment of brain metastases and has demonstrated effectiveness in cell lines with known MAPK pathway resistance, including the MEK1-C121S resistance mutation);