Recent References (2016-Present) on the Administration of Peptides to the CNS Using ALZET® Osmotic Pumps

Agents: Amyloid protein, beta (1-42) Vehicle: Acetonitrile; Trifluoroacetic Acid; Route: CSF/CNS (right lateral ventricle); Species: Rat; Pump: 2002; Duration: 2 weeks;
ALZET Comments: Dose (160 pmol/day); 35% Acetonitrile; 0.1% Trifluoroacetic Acid used; animal info (Wistar rats, 200-250 g, 7 weeks old); behavioral testing (Y-maze test, object-in-place task (OPT), novel object recognition task (NOR), object location task); peptides; ALZET brain infusion kit 2 used; Brain coordinates (anteroposterior, −0.3; lateral, 1.2; vertical, 4.5); neurodegenerative (Hearing loss);

Agents: Interleukin 2 Vehicle: Not Stated; Route: CSF/CNS; Species: Mice; Pump: Not Stated; Duration: Not Stated;
ALZET Comments: animal info: C57BL/6 miceInterleukin-2 aka (lL-2); peptides; immunology;

Agents: NERP-1; HHPD-41; TLQP-21; PGH-NH2; NERP-2; TLQP-62; Glucagon-like peptide-1 (7-37); Ghrelin Vehicle: Not Stated; Route: CSF/CNS (intracerebral); IV; Species: Mice; Pump: 1007D; Duration: 7 days;
ALZET Comments: Dose (2 nmol/mouse/day Glucagon-like peptide-1 (7-37); 3 nmol/mouse/day Ghrelin); Controls received mp w/ vehicle; animal info (male and female C57BL/6J mice, 13 weeks old); Glucagon-like peptide-1 aka GLP-1 (7-37); peptides; Brain coordinates (-0.7 mm posterior, -1.2 mm lateral [left], and -2.0 mm ventral); dependence;

Agents: Leptin Vehicle: Not Stated; Route: CSF/CNS (intracerebral); IV; Species: Rat; Pump: 2001; Duration: 7 days;
ALZET Comments: Dose (0.62 ug/h); animal info (male and female Sprague-Dawley rats, 12 weeks old); Blood pressure measured via BP telemeter device;95 mmHg - 110 mmHg;peptides; diabetes;

Agents: Apelin-36 Vehicle: Saline; Route: CSF/CNS (substantia nigra); Species: Mice; Pump: 1007D; Duration: 7 days;
ALZET Comments: Dose (0.1, 0.3 and 0.5 μg/ mice/day); Controls received mp w/ vehicle; animal info (Nine- to eleven-week old male C57BL/6 mice, 23–27 g); peptides; ALZET brain infusion kit 2 used; Brain coordinates (AP: −3.1 mm; ML: 1.3 mm; DV: −4.25 mm); neurodegenerative (Parkinson’s disease);

Agents: GK23; GK13; Conotoxin, w-; Vehicle: CSF, Artificial; Route: CSF/CNS (intracerebral); IV; Species: Mice; Pump: 1003D; Duration: 3 days;
ALZET Comments: Dose (2 mg/kg/day GK23, GK13; 2.28 ng/kg/day w-Conotoxin); animal info (Adult male C57Bl/6 mice (3-months-old)); behavioral testing (Open field test; Morris water maze; Y-maze test); peptides; ALZET brain infusion kit 3 used; Brain coordinates (coordinates from bregma: anterior-posterior = −0.5 mm; lateral = 1.0 mm); dental cement used;ischemia (cerebral ischemia);
**Agents:** NEP1-40 **Vehicle:** PBS; **Route:** CSF/CNS (right lateral ventricle); **Species:** Rat; **Pump:** Not Stated; **Duration:** 3 days;  
**ALZET Comments:** Dose (270 μg/kg); Controls received mp w/ vehicle; animal info (male Sprague–Dawley rats, weighing 60–90 g); behavioral testing (adhesive removal test); NEP1-40 aka Nogo-66 receptor antagonist peptide; peptides; Brain coordinates (relative to bregma: -1.0 mm anteroposterior, 1.4 mm lateral, and -4.0 mm dorsoventral); ischemia (cerebral);

Q8370: M. Popek, et al. Physiology and Morphological Correlates of Excitatory Transmission are Preserved in Glutamine Transporter SN1-Depleted Mouse Frontal Cortex. Neuroscience 2020;446(124-136)
**Agents:** Anti-SN1 vivo-morpholinos oligonucleotides **Vehicle:** Saline; **Route:** CNS/CSF; **Species:** Mice; **Pump:** 1002; **Duration:** Not stated;  
**ALZET Comments:** Dose (1.2 mg/kg/day); Controls received mp w/ vehicle; animal info (Male, C57Bl6, 30 g); peptides; Brain coordinates (AP + 2.0, ML 0.8, DV 1.5)); neurodegenerative (Glutamatergic transmission);

**Agents:** Amyloid Beta 1-42 **Vehicle:** CSF, Artificial; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004; **Duration:** 8 weeks;  
**ALZET Comments:** Dose (10 nmol/kg/h); Controls received mp w/ vehicle; animal info (Twelve-month-old transgenic mice); pumps replaced every 4 weeks; Amyloid Beta 1-42 aka AB peptide; peptides; neurodegenerative (Alzheimer’s Disease);

**Agents:** Glucagon-like peptide-1 **Vehicle:** Saline; **Route:** CNS/CSF (third ventricle); **Species:** Mice; **Pump:** 1002D; **Duration:** 26 days;  
**ALZET Comments:** Dose (16.01 nmol/d); 0.9% Saline used; Controls received mp w/ vehicle; animal info (5 to 6-week-old male C57BL6/ mice); Glucagon-like peptide-1 aka GLP-1; peptides; Brain coordinates (1.79 mm caudal to bregma); dental cement used;dependence;

**Agents:** NU335; Epigallocatechin-3-O-gallate **Vehicle:** Not stated; **Route:** CSF/CNS (right lateral ventricle); **Species:** Rat; **Pump:** 1003D; 1007D; **Duration:** 3 days;  
**ALZET Comments:** Dose (50 μM Epigallocatechin-3-O-gallate; 1 uM NU335); Controls received mp w/ vehicle; animal info (Adult male Sprague-Dawley rats, 7 weeks old); Epigallocatechin-3-O-gallate; NU335 aka pigment epithelium-derived factor-derived peptide; peptides; ALZET brain infusion kit 1 used; Brain coordinates (1 mm posterior; 1.5 mm lateral; –3.5 mm depth to the bregma); neurodegenerative (Epilepsy);

**Agents:** Ghrelin; JMV2959 **Vehicle:** Saline; **Route:** CSF/CNS (dorsomedial hypothalamus); **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;  
**ALZET Comments:** Dose: Ghrelin (10 μg/day); JMV2959 (20 μg/day) Controls received mp w/ vehicle; animal info (adult male C57BL6 mice); “post op. care: Polysporin and Lidocaine were administered to the surgical site to prevent bacterial infection and limit pain. Mice were then allowed to recover in a clean cage supplied with a heating pad, and Meloxicam (2 mg/kg) was injected subcutaneously once per day for three days to provide postoperative analgesia.”; JMV2959 aka growth hormone secretagoge receptor antagonist; peptides; ALZET brain infusion kit used; Brain coordinates (AP 1.6 mm, ML 0.4 mm, and DV 5.25 mm); dental cement used; replacement therapy (Ghrelin infusion); “stress/adverse reaction: (see pg.4 ); Three mice did not survive the surgery and their baseline data were removed from the analyses. Six additional mice were removed from the data analyses due to incorrect cannula placements, and one mouse was removed because of abnormal cage behavior.”
Q10183: S. Hirose, et al. Type 2 Innate Lymphoid Cells Induce CNS Demyelination in an HSV-IL-2 Mouse Model of Multiple Sclerosis. iScience 2020;23(10):101549

Agents: Interleukin-2 Vehicle: Not Stated; Route: CSF/CNS; Species: Mice; Pump: Not Stated; Duration: Not Stated;
ALZET Comments: animal info: wild-type (WT) HSV-1 Interleukin -2 aka (IL-2) peptides; immunology;


Agents: Kisspeptin; RFamide Peptide Vehicle: Saline; Route: CSF/CNS (intracerebral); IV; Species: Rat; Pump: Not stated; Duration: 10 days;
ALZET Comments: Dose (1 nmol Kisspeptin and 20 nmol RF9); Controls received mp w/ vehicle; animal info (male Sprague Dawley rats (21-day-old) weighing 40 ± 2 g ); RFamide Peptide aka RF9; peptides; Brain coordinates (according to the bregma, in the anterior–posterior plane: 0.90 mm; in the lateral plane: 1.4 mm; and 4 mm on the vertical plane); dependence;


Agents: CPM / PM1 Vehicle: Saline; Route: CSF/CNS; Species: Mice; Pump: 1004; Duration: Not Stated;
ALZET Comments: Dose (0.5 mg/kg/day); animal info (Female); behavioral testing (Open Field Test, Rotarod and Footprint Test, Grip Strength Test, Barnes Maze Test); cPM or PM1 aka Inhibitory Peptide; peptides; neurodegenerative (Alzheimer’s Disease);


Agents: APY-d3 Vehicle: CSF, artifical; Route: CSF/CNS (ipsilesional lateral ventricle); Species: Mice; Pump: 1002; Duration: 2 weeks;
ALZET Comments: Dose (5 mm); animal info (In-bred C57BL/6J male mice, 10–12 weeks of age); behavioral testing (accelerating rotarod; horizontal ladder task); APY-d3 aka peptide solution, β APYCVYR β ASWSC; peptides; ALZET brain infusion kit 3 used; Brain coordinates (0.1 mm caudal and 1.0 mm lateral of bregma); cyanoacrylate adhesive; gene therapy;


Agents: Amyloid beta 1-42 Vehicle: Saline; Route: CNS/CSF (right hippocampus); Species: Rat; Pump: 2002; Duration: 14 days;
ALZET Comments: Dose (300 pmol/day); 0.9% NaCl saline used; Controls received mp w/ vehicle; animal info (Adult female Sprague-Dawley rats, 6-month-old; Amyloid beta 1-42 aka AB 1-42; peptides; Brain coordinates (coordinates from bregma: −3.60 mm anteroposterior; −2.00 mm lateral; −4.00 mm vertical); dental cement used; neurodegenerative (Alzheimer’s Disease);


Agents: (1-42) AB Peptide; (1--42) AB Peptide; Methyllycaconitine Vehicle: CSF/CNS; Species: Mice; Pump: 1004; Duration: 4 weeks;
ALZET Comments: Dose (0.11 ul/hr); Controls received mp w/ vehicle; animal info (C57BL/6, 2 months old); post op. care (Indomethacin); Methyllycaconitine aka MLA; peptides; ALZET brain infusion kit 1 used; Brain coordinates (−0.8 mm anteroposterior, −1.4 mm mediolateral to the bregma, and −3.5 mm dorsoventral to the cranium ()); bilateral cannula used; neurodegenerative (Alzheimer’s Disease);


Agents: miR-155 Inhibitor Vehicle: Not Stated; Route: CNS/CSF; Species: Rat; Pump: Duration: 24, 96 hours;
ALZET Comments: Dose (0.25 ul/hr); animal info (Male, Sprague Dawley, 200-250 g); peptides; ALZET brain infusion kit Not Stated used; Brain coordinates (3.7 mm posterior to the bregma, 4.1 mm lateral to the midline, and 3.5 mm under the dura); bilateral cannula used; dental cement used; ischemia (Global);

**Agents**: Amyloid B (1-40)  
**Vehicle**: Not stated  
**Route**: CSF/CNS  
**Species**: Rat  
**Pump**: 2004  
**Duration**: 4 weeks  
**ALZET Comments**: Dose (10, 50, or 100 mg/kg/day); Controls received mp w/ vehicle; animal info (Male, Wistar, 8 weeks old, 200-300g); behavioral testing (Morris Water Maze Test, Spatial Memory Test, Working Memory Test); Alpha B (1-40) aka AB; peptides; ALZET brain infusion kit 3 used; Brain coordinates (relative to bregma: 0.8 mm posterior, 1.4 mm lateral); dental cement used; neurodegenerative (Alzheimer’s Disease);  


**Agents**: Peptide, beta-amyloid (1-42)  
**Vehicle**: Saline  
**Route**: CSF/CNS  
**Species**: Rat  
**Pump**: Not Stated  
**Duration**: 14 days  
**ALZET Comments**: Dose (300 pmol/day); Controls received mp w/ vehicle; animal info (Male, Sprague-Dawley, 250-300 g); behavioral testing (Morris Water Maze Test, ); B-amyloid (1-42) peptide aka AB amyloid (1-42); peptides; Brain coordinates (Relative to bregma: A, 0.8; L, 1.4; V, 4.5); neurodegenerative (Alzheimer’s Disease);  


**Agents**: peptide, intracellular LAR; peptide, intracellular sigma  
**Vehicle**: saline, BSA buffered  
**Route**: CSF/CNS (intrathecal)  
**Species**: Rat  
**Duration**: 1, 3, 5, 7, 14, 28 days  
**ALZET Comments**: Dose ((ILP 10 μg/day), (ISP 10 μg/day)); 0.1% BSA in saline used; Controls received mp w/ vehicle; animal info (female, Sprague-Dawley, 250g); ILP (NH2-GRKKRRQRRRCDLADNIERLKANDGLKFSQEYESI-NH2) and ISP (NH2-GRKKRRQRRRCDMAEHMERLKANDSLKLSQEYESI-NH2) are peptides against LAR and PTPsigma; enzyme inhibitor (LAR and PTPsigma receptor); peptides; spinal cord injury; Therapeutic indication (inhibition of PTPsigma and LAR receptors promotes oligodendrogenesis by endogenous precursor cells, attenuates caspase 3-mediated cell death in mature oligodendrocytes, and preserves myelin);  

Q7052: I. Rossetti, et al. Calcitonin gene-related peptide decreases IL-1beta, IL-6 as well as Ym1, Arg1, CD163 expression in a brain tissue context-dependent manner while ameliorating experimental autoimmune encephalomyelitis. J Neuroimmunol 2018;323(94-104

**Agents**: Calcitonin gene-related peptide  
**Vehicle**: CSF, artificial  
**Route**: CSF/CNS (intrathecal)  
**Species**: Mice  
**Pump**: 2002  
**Duration**: 2 weeks  
**ALZET Comments**: Controls received mp w/ vehicle; animal info (7-8 week old C57BL/6 female mice); peptides;  


**Agents**: PrRP palmitoylated analogs, Leptin, Amylin, Cyclic AC253, Exendin 4  
**Vehicle**: Not Stated  
**Route**: SC, CSF/CNS (lateral ventricle)  
**Species**: Mice  
**Pump**: Not Stated  
**Duration**: 2 months; 28 days; 5 weeks, 5 months, 16 weeks  
**ALZET Comments**: Dose: Palm11-PrRP (5 mg/kg/day), Leptin (2.4 nmol/day), Amylin (0.24 mg/kg/day), Exendin-4 (3.5 pmol/kg/min); animal info (7 month old THY-Tau22 mice; 5 month old APP/PS1 mice; 6 month old AMP8 mice ); behavioral testing (Y-maze); neurodegenerative (Alzheimer’s); This review summarizes current information on the potential neuroprotective properties of food intake-lowering (anorexigenic) peptides that have been tested in experimental models of AD-like pathology.  


**Agents**: Recombinant human IGF-1  
**Vehicle**: PBS; Acetic acid  
**Route**: CSF/CNS (intracerebroventricular)  
**Species**: Rat  
**Pump**: 1007D  
**Duration**: 7 days  
**ALZET Comments**: Dose, (10 ug/day); Controls received mp w/ vehicle; Sham surgery; animal info (Adult male C57BL/6J 10 wks, 25–30 g); Recombinant human IGF-1 aka (hIGF); peptides; Alzet brain infusion kit 3 used; Brain coordinates (anteroposterior AP -0.5mm bregma, mediolateral ML -1.0 mm, dorsoventral DV -3.0mm53); bilateral cannula used; dental cement used; neurodegenerative (Traumatic brain injury);

**Agents:** Exendin-9  
**Vehicle:** Saline;  
**Route:** CSF/CNS (left ventricle);  
**Species:** Rat;  
**Pump:** 2ML2;  
**Duration:** 11 days;  
**ALZET Comments:** Dose EX-9 (100 ug/day); Controls received mp w/ vehicle; Animal info: (Male Buffalo 250-280g); GLP-1R antagonist Exendin 9 aka (EX-9); peptides; Brain coordinates (bregma-11.6 mm, latera l0.0 mm, dorsoventral-7.2 mm); Cancer; anorexia-cachexia syndrome (CACS);

Q10094: N. A. Benton, et al. Food restriction-induced changes in motivation differ with stages of the estrous cycle and are closely linked to RFamide-related peptide-3 but not kisspeptin in Syrian hamsters. Physiology & Behavior 2018;190(43-60)

**Agents:** Peptide, Rat RF amide-related  
**Vehicle:** Saline;  
**Route:** CNS/CSF (lateral ventricle);  
**Species:** Hamster;  
**Pump:** 2002;  
**Duration:** 14 days;  
**ALZET Comments:** Dose (50 ng/h); Controls received mp w/ vehicle; animal info (Adult, female Syrian hamsters); behavioral testing (food consumption); RFRP-3 aka Rat RFamide-related peptide; peptides; Brain coordinates (1.1 mm anterior to bregma, 1.0 mm lateral to the midline, and 4.0 mm ventral to dura); dental cement used;


**Agents:** Peptide, amyloid beta 1-42  
**Vehicle:** Water, distilled; Acetonitrile; TFA;  
**Route:** SC; CSF/CNS (right lateral cerebral ventricle);  
**Species:** Rat;  
**Pump:** Not Stated;  
**Duration:** 4 weeks;  
**ALZET Comments:** Dose (250 pmol/day); 64.9% distilled water, 35% acetonitrile, 0.1% trifluoroacetate (TFA) used; 2 control groups, 1 mp w/ agent, 1 mp w/ vehicle; animal info (adult male Wistar rats, 7 weeks, 200-225 g); post op. care (wound clips used and triple antibiotic ointment); Amyloid beta 1-42 aka Aβ 1-42; peptides; Brain coordinates (AP, −0.3, L, 1.2, V, 4); Cannula placement verified via rat brain atlas; dental cement used; neurodegenerative (alzheimers); “Since our AD model was created by infusion of Aβ 1-42, we wanted to ascertain the possible effects of exogenous introduction of Aβ peptide on the endogenous system that produces AD-related peptides and whether regular exercise would be able to prevent these changes. The current and recent experiments showed that exercise might be beneficial for managing the ravages of AD probably through increasing endogenous BDNF.”  
**Therapeutic indication** (exercise to increase production of BDNF);


**Agents:** Amyloid peptide, beta (1-40); Amyloid peptide, beta (1-42)  
**Vehicle:** Acetonitrile, Trifluoacetic acid;  
**Route:** CSF/CNS (lateral ventricle);  
**Species:** Rat;  
**Pump:** Not Stated;  
**Duration:** 14 days;  
**ALZET Comments:** Dose (300 pmol peptides/day); 35% acetonitrile, 0.1% trifluoroacetic acid (TFA); animal info (Adult male Wistar rats, 7 weeks old, 200-225 g); dependence;

Q6531: C. Wang, et al. IL-17 induced NOTCH1 activation in oligodendrocyte progenitor cells enhances proliferation and inflammatory gene expression. Nat Commun 2017;8(15508)

**Agents:** Interleukin 17 receptor A  
**Vehicle:** CSF, artificial;  
**Route:** CSF/CNS;  
**Species:** Mice (knockout);  
**Pump:** Not Stated;  
**Duration:** Not Stated;  
**ALZET Comments:** Controls received mp w/ decoy peptide; animal info (8-12 week old female B6.129X1-Notch1tm2Rko/GridJ, Jag1tm2Grid/J and B6.Cg-Tg BAkik/J mice); Interleukin 17 receptor A aka IL-17RA; peptides; Brain coordinates (1mm lateral, 0.3mm posterior and 2mm deep to the bregma); Therapeutic indication (multiple sclerosis);


**Agents:** Neuregulin-1, human recombinant  
**Vehicle:** CSF, artificial; BSA;  
**Route:** CSF/CNS (intrathecal);  
**Species:** Rat;  
**Pump:** 1003D;  
**Duration:** 3 days, 7 days, 14 days, 28 days;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (female, Sprague Dawley, 250g); Dose (500ng/day); 1% BSA used; comparison of microparticles vs mp; spinal cord injury; peptides; Dose (500ng/day); Comparison of PLGA Microparticles with ALZET pumps;
Agent: kisspeptin-10, RFamide-related peptide Vehicle: CSF, artificial; Route: CSF/CNS (lateral ventricle); Species: Hamster; Pump: 1004; Duration: 4 weeks;
ALZET Comments: Dose (0.25 nmol/h); animal info (4-6 month old Djungarian hamsters); peptides;

Agent: Pirenzepine; Scopolamine hydrobromide; Metyrapone; luteinizing hormone; ACTH Vehicle: PBS; Route: CSF/CNS (Third ventricle); Species: Mice (knockout); Pump: 1002; Duration: Not Stated;
ALZET Comments: Dose (0.6 mg/kg/day Pirenzepine; 1.0 mg/kg Scopolamine hydrobromide; 100mg/kg/day Metyrapone; 2.8 mg/kg/day ACTH; 16ug/day LH); Controls received mp w/ vehicle; animal info (wild-type and Chrm1−−/−); luteinizing hormone aka LH and adrenocorticotropic hormone aka ACTH; peptides; Brain coordinates (A/P −1.6 mm posterior to bregma, D/V −4.7 mm);

Agent: Angiotensin (1-7); A-779 Vehicle: CSF, artificial; Route: CSF/CNS; Species: Mice; Pump: 1004; Duration: 4 weeks;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, 5XFAD, 17 months old); ALZET brain infusion kit 3 used; neurodegenerative (Alzheimer’s Disease); behavioral testing (Morris water maze); cardiovascular; peptides; used ALZET CSF formulation; Dose (Ang 1-7 500 ng/kg/h; A-779 5.0 ug/kg/h); Brain coordinates (relation to bregma 1.0mm lateral and 0.5 mm posterior);

Agent: Angiotensin II Vehicle: Not Stated; Route: CSF/CNS (ventricle); Species: Cat; Pump: 2ML4; Duration: 30 days;
ALZET Comments: Controls received mp w/ saline; animal info (adult, male cat, 4-5 kg); dose-response (pg 6205, 6206); behavioral testing (rotating beam experimental device test); peptides;

Agent: Brain-derived neurotrophic factor, K252a Vehicle: Saline; CSF, artificial; Route: CSF/CNS (ventricles); Species: Cat; Pump: 2ML4; Duration: 30 days;
ALZET Comments: Controls received mp w/ saline; animal info (adult, male cat, 4-5 kg); dose-response (pg 6205, 6206); behavioral testing (rotating beam experimental device test); peptides;

Q4900: P. Q. H. Renjun Wang, MD; Rui Zhou, BSc; Zengxiang Dong, PhD, et al. Sympathoexcitation in Rats With Chronic Heart Failure Depends on Homeobox D10 and MicroRNA-7b Inhibiting GABBR1 Translation in Paraventricular Nucleus. Circulation: Heart Failure 2016;9(1-10
Agent: AntagomiR-7b; RNA, small interfering GABBR1; angiotensin II Vehicle: Not Stated; Route: CSF/CNS (paraventricular nucleus); Species: Rat; Pump: 1004; 1002; Duration: 4 weeks; 2 weeks;
ALZET Comments: animal info (male, Wistar, 180-200g); pumps replaced after 4 weeks; bilateral cannula used; tissue perfusion (paraventricular nucleus); cardiovascular; peptides; bilateral infusion; Dose (AntagomiR-7b or Ad-siGABBR1 40 ng/h; antiotensin II 1 ng/kg/min);

Agent: Amyloid protein, beta Vehicle: HEPES; Route: CSF/CNS; Species: Mice; Pump: 1004; Duration: 35 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (Male C57Bl/6 mice); peptides; Brain coordinates (0.8 mm anteroposterior and 1.0 mm mediolateral to bregma and 2.0 mm dorsoventral to cranium);
**Agents:** HSP70, human recomb.  **Vehicle:** Not Stated;  **Route:** CSF/CNS (intratumoral);  **Species:** Rat;  **Pump:** Not Stated;  **Duration:** Not Stated;
**ALZET Comments:** comparison of intracranial injections vs mp; cancer (Glioma); peptides; “Such injections, particularly those done using an osmotic pump, caused a significant delay in tumor growth and increase the survival of tumor-bearing animals.” pg 2532; Therapeutic indication (Cancer, Glioma);

**Agents:** Apelin  **Vehicle:** CSF, artificial;  **Route:** CSF/CNS (lateral ventricle);  **Species:** Mice;  **Pump:** 2004;  **Duration:** 2 weeks;
**ALZET Comments:** Controls received mp w/ vehicle; animal info (C57Bl6/J mice, 13-15 week old); animal info (C57Bl6/J mice, 13-15 week old); “stability of apelin and the duration of the treatment were compatible with the stability of the molecule” (pg. 8); peptides; anesthetised mice with isoflurane; Brain coordinates – 1 mm lateral, – 0.2 mm anteroposterior from the bregma and – 1.7 mm deep; Dose (20 nM);

**Agents:** Pentoxifylline; irbesartan; minocycline; angiotensin II  **Vehicle:** CSF, artificial; Na sodium bicarbonate; saline;  **Route:** CSF/CNS;  **Species:** Rat;  **Pump:** 2004; 2002; 2001;  **Duration:** 4 weeks; 2 weeks; 1 week;
**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 10-12 weeks old); cardiovascular; peptides; Dose (ICV - Pentoxifylline 10 ug/hr; irbesartan 125 ug/day; minocycline 5 ug/hr; SC AngII 120 ng/kg/min); brain coordinates;