



**Recent References (2013-2019) on Cerebral Ischemia Research
Using ALZET® Osmotic Pumps**

Q4964: S. Bake, *et al.* Insulin-like Growth Factor (IGF)-1 treatment stabilizes the microvascular cytoskeleton under ischemic conditions. *Exp Neurol* 2019;311(162-172)

ALZET Comments: Insulin-like growth factor-I, recomb. Human; JB-1; CSF, artificial; CSF/CNS (right lateral ventricle); Rat; 1003D; 1007D; 1 day; 5 days; Dose (100 µg/ml rhIGF-1; 20 µg/ml JB-1); Controls received mp w/ vehicle; animal info (Female Sprague Dawley rats; 10–12 months; weight range 325–350 g); JB-1 is an IGFR inhibitor; Brain coordinates (–1.0mm posterior to bregma, –1.4mm medial lateral, –3.5mm from dural surface); cyanoacrylate adhesive; ischemia (cerebral);.

Q7244: R. Thakkar, *et al.* 17beta-Estradiol Regulates Microglia Activation and Polarization in the Hippocampus Following Global Cerebral Ischemia. *Oxid Med Cell Longev* 2018;2018(4248526)

ALZET Comments: Estradiol, 17b; Cyclodextrin, B-; SC; Rat; Pump model not stated; 14 days; Dose (0.0167 mg); 20% β-cyclodextrin used; animal info (3 month old, female, Sprague Dawley); ischemia (Cerebral);.

Q7249: L. Nusrat, *et al.* Cyclosporin A-Mediated Activation of Endogenous Neural Precursor Cells Promotes Cognitive Recovery in a Mouse Model of Stroke. *Front Aging Neurosci* 2018;10(93)

ALZET Comments: Cyclosporin A; Ethanol, Cremaphor; SC; Mice; 10.3389/fnagi.2018.00093; Dose (15 mg/kg/day); Dose (15 mg/kg/day); animal info (adult male C57BL/6 mice 6–8 weeks of age; 20–25 g); pumps replaced; ischemia (cerebral);.

Q7115: S. Y. Cheon, *et al.* Apoptosis Signal-regulating Kinase 1 Silencing on Astroglial Inflammasomes in an Experimental Model of Ischemic Stroke. *Neuroscience* 2018;390(218-230)

ALZET Comments: RNA, small interfering (ASK1); siPORTNeoFX Transfection agent; CSF/CNS (left lateral ventricle); Mice; 1003D; 3 days; Dose (1 IL/h/ day); animal info (Adult, C57BL/6, male); enzyme inhibitor (apoptosis signal-regulating kinase 1); ALZET brain infusion kit used; ALZET brain infusion kit used; ischemia (Cerebral);.

Q7098: M. Aleksandrowicz, *et al.* Effect of vasopressin-induced chronic hyponatremia on the regulation of the middle cerebral artery of the rat. *Pflugers Arch* 2018;470(7):1047-1054

ALZET Comments: Vasopressin; SC; Rat; 2002; 3.5 days; Dose (2.4 µg/24 h); animal info (Male Wistar rats weighing 250–300 g); ischemia (cerebral); cardiovascular; Minipumps used administer asopressin to induce prolonged hyponatremia;.

Q6801: W. Xu, *et al.* Chloride Co-transporter NKCC1 Inhibitor Bumetanide Enhances Neurogenesis and Behavioral Recovery in Rats After Experimental Stroke. *Mol Neurobiol* 2017;54(4):2406-2414

ALZET Comments: Bumetanide; Saline; CSF/CNS (lateral ventricle); Rat; 2004; 21 days; Dose (0.2 mg/kg/day); animal info (Adult male Wistar rats); enzyme inhibitor (selective Na⁺-K⁺-Cl⁻-co-transporter inhibitor,); ALZET brain infusion kit used; Brain coordinates (AP-0.9 mm, ML+ 1.9 mm); ischemia (cerebral);.

Q6534: Y. C. Wang, *et al.* Post-acute delivery of memantine promotes post-ischemic neurological recovery, peri-infarct tissue remodeling, and contralesional brain plasticity. *J Cereb Blood Flow Metab* 2017;37(3):980-993

ALZET Comments: Memantine; Saline; SC; Mice; 2004; 28 days; Dose (4 or 20 mg/kg/d); animal info (8-12 week old C57BL6/j male mice weighing 23-28g); ischemia (cerebral); "...we decided to use a subcutaneous delivery strategy for memantine in this study using miniosmotic pumps, given that miniosmotic pumps allowed to achieve most stable plasma memantine levels " pg.981 ; Therapeutic indication (stroke);.

Q6481: T. Shiromoto, *et al.* The Role of Endogenous Neurogenesis in Functional Recovery and Motor Map Reorganization Induced by Rehabilitative Therapy after Stroke in Rats. *J Stroke Cerebrovasc Dis* 2017;26(2):260-272

ALZET Comments: Cytosine-β-Darabinofuranoside; Saline; CSF/CNS (lateral ventricle); Rat; 2001; 7 days; 0.9% Saline used; Controls received mp w/ vehicle; Brain coordinates (1.6 mm lateral to the midline, .8 mm posterior to the bregma, and 4.0 mm deep); Therapeutic indication (cerebral ischemia);.



Q6027: D. Desposito, *et al.* Neuroprotective effect of kinin B1 receptor activation in acute cerebral ischemia in diabetic mice. *Sci Rep* 2017;7(1):9410

ALZET Comments: Bradykinin B1 receptor agonist; Bradykinin B2 receptor agonist;; Saline; SC; Mice; 1007D; Controls received mp w/ vehicle; animal info (C57/BL6, 18weeks old); ischemia (cerebral); Compound AKA: SarLys[Hyp3, Igl5, DPhe8]desArg9-bradykinin and [Hyp(3),Thi(5),(N)Chg(7),Thi(8)]-bradykinin; Dose (720 nmol/kg/day and 240 nmol/Kg/day);.

Q5509: N. Zhang, *et al.* MicroRNA-378 Alleviates Cerebral Ischemic Injury by Negatively Regulating Apoptosis Executioner Caspase-3. *Int J Mol Sci* 2016;17(9):

ALZET Comments: miR-378; CSF/CNS; Mice; 1003D; Controls received mp w/ vehicle; animal info (male, C57BL6J, 18-22g); ischemia (cerebral); pumps primed overnight at 37C; Brain coordinates (Bregma: - 2.2 mm, dorsoventral: 3 mm, lateral: 1 mm);.

Q5508: F. Zhang, *et al.* In Vivo Targeted MR Imaging of Endogenous Neural Stem Cells in Ischemic Stroke. *Molecules* 2016;21(9):

ALZET Comments: Ara-C; CSF/CNS; mice; 1007D; 7 days; animal info (C57BL6J, 8-10 weeks old, 20-25g); ischemia (cerebral);.

Q5102: W. S. Xu, *et al.* Bumetanide promotes neural precursor cell regeneration and dendritic development in the hippocampal dentate gyrus in the chronic stage of cerebral ischemia. *Neural Regen Res* 2016;11(5):745-51

ALZET Comments: Bumetanide; Water, sterile; CSF/CNS; Rat; 2004; 21 days; animal info (male, Wistar, 200-250g); ischemia (cerebral); behavioral testing (Morris water maze); pumps primed overnight in 37C saline; used dental cement; Dose (200 ug/kg/day); Brain coordinates (anteroposterior -0.9, mediolateral +1.5);.

Q5099: J. Xing, *et al.* HIF-1alpha Activation Attenuates IL-6 and TNF-alpha Pathways in Hippocampus of Rats Following Transient Global Ischemia. *Cell Physiol Biochem* 2016;39(2):511-20

ALZET Comments: SC144; etanercept; CSF, artificial; CSF/CNS; Rat; 24 hours; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 200-300g); ALZET brain infusion kit used; ischemia (cerebral); used polycarbonate tubing; SC144 is a gp130 inhibitor; Brain coordinates (3.7 mm posterior to the bregma, 4.1 mm lateral to the midline, and 3.5 mm under the dura);.

Q5711: H. Xiao, *et al.* Effect of ephrin-B2 on the expressions of angiopoietin-1 and -2 after focal cerebral ischemia/reperfusion. *Neural Regen Res* 2016;11(11):1784-1789

ALZET Comments: Ephrin-B2-Fc, recombinant murine chimera; Saline; CSF/CNS; Rat; 1003D; 3 days; animal info (male, Sprague Dawley, 8-10 weeks old, ~280g); ischemia (cerebral); Brain coordinates;.

Q5689: R. Thakkar, *et al.* NLRP3 Inflammasome Activation in the Brain after Global Cerebral Ischemia and Regulation by 17beta-Estradiol. *Oxid Med Cell Longev* 2016;2016(8309031)

ALZET Comments: Estradiol, 17B-; Cyclodextrin, B-; SC; Rat; Mice; 2002; 14 days; animal info (Rats female, Sprague Dawley, 3 months old, OVX; Mice C27BL/6 PELP1, young adult, OVX); 20% Cyclodextrin used; ischemia (cerebral); replacement therapy (estradiol infusion); immunology; Resultant plasma level (10-15 pg/mL);.

Q5676: E. G. Sozmen, *et al.* Nogo receptor blockade overcomes remyelination failure after white matter stroke and stimulates functional recovery in aged mice. *Proc Natl Acad Sci U S A* 2016;113(52):E8453-E8462

ALZET Comments: Protein, NgR(OMNI)-Fc; SC; Mice; 1002; 28 days; pumps replaced every 14 days; ischemia (cerebral); behavioral testing (pasta matrix task); Dose (0.77 mg/28 days);.

Q6660: J. H. Seo, *et al.* In Situ Pluripotency Factor Expression Promotes Functional Recovery From Cerebral Ischemia. *Mol Ther* 2016;24(9):1538-49

ALZET Comments: Doxycycline; PBS; CSF/CNS (right lateral ventricle); Mice (transgenic); 1007D; 7 days; Dose ((12 ng/day or 1,200 ng/day); Controls received mp w/ vehicle; animal info (transgenic mice expressing Pou5f1 (Oct4), Sox2, Myc, and Klf4); Doxycycline aka DOX; ALZET brain infusion kit 3 used; Brain coordinates ((AP +0.3 mm from Bregma; ML -0.7 mm from Bregma; DV -2.0 mm from Dura); ischemia (cerebral); Therapeutic indication (Cerebral ischemia);.



Q4880: E. H. Sanchez-Mendoza, *et al.* Implantation of Miniosmotic Pumps and Delivery of Tract Tracers to Study Brain Reorganization in Pathophysiological Conditions. *Journal of Visualized Experiments* 2016;107(1-9)

ALZET Comments: Erythropoietin, recombinant human; CSF/CNS; Mice; 30 days; Controls received mp w/ vehicle; animal info (C57BL6); good methods (Jove Video; picture of pump and implantation pg. 4); ischemia (cerebral); post op. care (Carprofen 4 mg/kg); behavioral testing (rotarod test; hand grip strength); cyanoacrylate adhesive; "In this work we have shown the method of implantation of minipumps with a cannula connected to the skull in order to deliver the plasticity promoting protein rhEpo directly into the ventricle, thus circumventing the BBB." pg 8; Cannula placement verified via histologic analysis "The are no evident severe tissue alterations based on Nissl staining as compared to the corresponding contralateral area";

Q6631: J. D. Nicholson, *et al.* SUR1-Associated Mechanisms Are Not Involved in Ischemic Optic Neuropathy 1 Day Post-Injury. *PLoS One* 2016;11(8):e0148855

ALZET Comments: Glibenclamide; DMSO; SC; Rat; 2001; 1 day; Dose (10 µg/kg); Controls received mp w/ vehicle; animal info (male Sprague-Dawley rats); ischemia (cerebral);

Q5411: X. Liu, *et al.* Interleukin-4 Is Essential for Microglia/Macrophage M2 Polarization and Long-Term Recovery After Cerebral Ischemia. *Stroke* 2016;47(2):498-504

ALZET Comments: Interleukin-4; Saline; CSF/CNS (ventricle); Mice (knockout); 2001; 7 days; Controls received mp w/ vehicle; animal info (C57/BL6 mice; 8-10 weeks, 25-30 g); ischemia (cerebral; stroke model); behavioral testing (Rotarod, corner, foot fault, and Morris water maze tests); healing, recovery; learning, memory; Therapeutic indication (Cerebral ischemia); Dose (60 ng/day); Brain coordinates: -0.20 mm anterior and 1.00 mm lateral to bregma;

Q4852: C. Li, *et al.* Chronic nicotine exposure exacerbates transient focal cerebral ischemiainduced brain injury. *J Appl. Physiol* 2016;120(328-333)

ALZET Comments: Nicotine; Saline; SC; Rat; 4 weeks; Controls received mp w/ saline; animal info (male, Sprague Dawley, 250-300g); ischemia (cerebral); "The subcutaneous osmotic minipump releases nicotine at a constant rate, which resulted in stable plasma nicotine and cotinine levels that match the chronic smokers. The doses of nicotine used in the present study have been reported to result in stable plasma nicotine levels corresponding reasonably well with plasma levels in habitual light (0.5–1 pack/day) and moderate (2 packs/day) smokers" pg 331; traumatic brain injury; Dose (2 or 4 mg/kg/day);

Q5284: J. Tu, *et al.* Cell-Permeable Peptide Targeting the Nrf2-Keap1 Interaction: A Potential Novel Therapy for Global Cerebral Ischemia. *J Neurosci* 2015;35(44):14727-39

ALZET Comments: Tat Peptide, DEETGE-CAL; Saline; SC; Rat; 2002; 14 days; Controls received mp w/ vehicle; animal info (Adult male Sprague Dawley rat, 250-300 g); functionality of mp verified by assays pg. 14737; ischemia (global cerebral); behavioral testing (Morris Water Maze); brain tissue distribution; peptides; Dose (120, 240 µg/d); Brain coordinates; anteroposterior, 0.8 mm; lateral, 1.5 mm; depth, 3.5 mm; from bregma.

Q4623: M. Trotman, *et al.* The dichotomy of memantine treatment for ischemic stroke: dose-dependent protective and detrimental effects. *JOURNAL OF CEREBRAL BLOOD FLOW AND METABOLISM* 2015;35(230-239)

ALZET Comments: Memantine; DMSO; saline; SC; Mice; 1003D; 3 days; Controls received mp w/ vehicle; animal info (male, C57BL6, 22-32g); 10% DMSO used; dose-response (237); ischemia (cerebral); memantine is a NMDA Glur antagonist;

Q4110: J. Song, *et al.* The effect of ASK1 on vascular permeability and edema formation in cerebral ischemia. *Brain Research* 2015;1595(143-155)

ALZET Comments: RNA, ASK1-small interfering; siPORTNeoFX; CSF/CNS; Mice; 3 days; Controls received mp w/ scrambled si-RNA; animal info (male, C57BL6, 8-12 weeks old); ischemia (transient focal cerebral);

Q5069: M. Rupal I. Mehta, Cigdem Tosun, PhD, Svetlana Ivanova, PhD, Natalia Tsybalyuk, MD,, *et al.* Sur1-Trpm4 Cation Channel Expression in Human Cerebral Infarcts. *Journal of Neuropathology and Experimental Neurology* 2015;74(8):835-849



ALZET Comments: Glibenclamide; DMSO; SC; Rat; 1 week; Controls received mp w/ vehicle; animal info (male, Wistar, 275-325g); ischemia (cerebral); Dose (200 ng/hr);.

Q5242: S. Okuyama, *et al.* Auraptene Acts as an Anti-Inflammatory Agent in the Mouse Brain. *Molecules* 2015;20(11):20230-9

ALZET Comments: Auraptene; DMSO, Polyethylene Glycol; SC; mice; 1007D; 8 days; Controls received mp w/ vehicle, sham operation; animal info (Nine-week-old male C57BL/6 mice); 10% DMSO used; ischemia (cerebral); brain tissue distribution; Dose (10 mg/kg/day, 25 mg/kg/day);.

Q4559: W. Lv, *et al.* Bone marrow mesenchymal stem cells transplantation promotes the release of endogenous erythropoietin after ischemic stroke. *Neural Regen Res* 2015;10(8):1265-70

ALZET Comments: sEPOR; PBS; BSA; CSF/CNS; Rat; 1007D; 13 days; animal info (male, Sprague Dawley, 2 month old, 250-300g); 0.1% BSA used; ischemia (cerebral); behavioral testing (somatosensory test; balance, motor testing); pumps primed in 37C sterile saline overnight; Dose (3 ug/day);.

Q4499: R. H. Lin, *et al.* Neurogenesis is enhanced by stroke in multiple new stem cell niches along the ventricular system at sites of high BBB permeability. *NEUROBIOLOGY OF DISEASE* 2015;74(229-239

ALZET Comments: Basic fibroblast growth factor, recombinant human; CSF, artificial; CSF/CNS; Rat; 14 days; Animal info (male, Sprague Dawley, adult, 275-300g, MCAO); ischemia (cerebral); cardiovascular;.

Q5036: M. Liguz-Leczna, *et al.* Inhibition of Tnf-alpha R1 signaling can rescue functional cortical plasticity impaired in early post-stroke period. *Neurobiol Aging* 2015;36(10):2877-84

ALZET Comments: Tumor necrosis factor- α receptor 1, soluble; CSF/CNS; Mice; 1007D; 1 weeks; Controls received mp w/ saline; animal info (female, C57BL/6J, 1 year old); ALZET brain infusion kit 3 used; ischemia (cerebral); Dose (1 ug/day); brain coordinates;.

Q4469: Y. Jiang, *et al.* miR-210 mediates vagus nerve stimulation-induced antioxidant stress and anti-apoptosis reactions following cerebral ischemia/reperfusion injury in rats. *JOURNAL OF NEUROCHEMISTRY* 2015;134(173-181

ALZET Comments: miR-210 antagomir; CSF, artificial; CSF/CNS; Rat; 5 days; Controls received mp w/ antagomir control; animal info (male, Sprague Dawley, 250-300g); ALZET brain infusion kit used; ischemia (cerebral); behavioral testing (neurological deficit);.

R0354: D. Han, *et al.* Attenuation of mitochondrial and nuclear p38 α signaling: a novel mechanism of estrogen neuroprotection in cerebral ischemia. *Mol Cell Endocrinol* 2015;400(21-31

ALZET Comments: Estradiol, 17 β -; Cyclodextrin, B-; SC; Rat; 1002; 14 days; Controls received mp w/ vehicle; animal info (3-month old female Sprague-Dawley rats); 20% beta cyclodextrin ; replacement therapy (estradiol); This dose of E2 (0.017 mg) was used to mimic low, physiological E2 levels produced during Diestrus I (10–15 pg/mL serum E2);.

Q4505: W. S. A. der Guenne, *et al.* Omapatrilat: penetration across the blood-brain barrier and effects on ischaemic stroke in rats. *NAUNYN-SCHMIEDEBERG ARCHIVES OF PHARMACOLOGY* 2015;388(939-951

ALZET Comments: Omapatrilat; Saline; NaOH; CSF/CNS; Rat; 2002; 5 days; Controls received mp w/ vehicle; animal info (male, Wistar, 300-320g); ischemia (cerebral); cardiovascular;.

Q4372: C. Cheyuo, *et al.* Milk Fat Globule-EGF Factor VIII Attenuates CNS Injury by Promoting Neural Stem Cell Proliferation and Migration after Cerebral Ischemia. *PLoS One* 2015;10(U1788-U1804

ALZET Comments: Milk fat globule-EGF factor 8, recombinant human; Tris buffer; CSF/CNS; Mice; 2004; 14 days; Controls received mp w/ vehicle; animal info (Mfge8^{-/-} or WT); ALZET brain infusion kit used; ischemia (cerebral); behavioral testing (neurological function); cyanoacrylate adhesive; Cannula placement verified via Evan's blue dye postmortem; pumps primed in normal saline for 40 hours;.



Q4357: C. Z. Chang, *et al.* Valproic acid attenuates intercellular adhesion molecule-1 and E-selectin through a chemokine ligand 5 dependent mechanism and subarachnoid hemorrhage induced vasospasm in a rat model. *Journal of Inflammation-London* 2015;12(U1-U11)

ALZET Comments: Valproic acid; PBS; Rat; 5 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 300-400g); ischemia (cerebral); dose-response (pg 4-6); behavioral testing (modified limb-placing test); cardiovascular; bp measured using tail cuff;.

Q4329: J. C. Bihl, *et al.* Angiotensin-(1-7) counteracts the effects of Ang II on vascular smooth muscle cells, vascular remodeling and hemorrhagic stroke: Role of the NFkappaB inflammatory pathway. *VASCULAR PHARMACOLOGY* 2015;73(115-123)

ALZET Comments: Angiotensin II; angiotensin (1-7); A-779; IP; Mice; 1004; 4 weeks; Controls received mp w/ vehicle; animal info (C57BL6, 8-10 weeks old, 25-32g); ischemia (cerebral); behavioral testing (gait, circling/climbing behavior, body and front limb symmetry, compulsory circling); cardiovascular; peptides; bp measured using radiotelemetry (DSI); pumps primed for 48h at 37C sterile isotonic saline; used IP catheter; "Ang II and Ang-(1-7) infusions led to a significant increase in plasma Ang II and Ang-(1-7) levels, which indicate the success of minipump infusions".

Q4262: M. Zille, *et al.* Influence of Pigment Epithelium-Derived Factor on Outcome after Striatal Cerebral Ischemia in the Mouse. *PLoS One* 2014;9(U2334-U2353)

ALZET Comments: Pigment epithelium-derived factor; CSF/CNS; Mice; 1007D; 7 days; Controls received mp w/ vehicle; animal info (male, C57BL6/N, 8-11 weeks old, 19-24g, MCAO); ischemia (cerebral); post op. care (lidocaine gel; 0.5 ml ringer lactate solution; 37C warm bead for 2 hours); behavioral testing (open field testing, pole test, rotarod testing, morris water maze); cardiovascular; cyanoacrylate adhesive; "In our study, we decided to use infusion via osmotic pumps because we wanted to directly influence the neurogenic zone. Osmotic pump infusion was previously used successfully for delivery of various trophic factors" pg 16; pumps removed after 7 days;.

Q4180: R. Wong, *et al.* Evaluating the translational potential of progesterone treatment following transient cerebral ischaemia in male mice. *BMC NEUROSCIENCE* 2014;15(U1-U10)

ALZET Comments: Progesterone; DMSO; SC; Mice; 1003D; 7 days; Controls received mp w/ vehicle; animal info (male, C57BL6 or BPH2/2, 15-25 weeks old, 25.9-41.2g); 100% DMSO used; ischemia (cerebral); behavioral testing (Foot fault test, t-maze test); "...mini-pump delivery could offer a more suitable dosing method with the advantages of reducing peaks and troughs in drug levels, the stress associated with repeated injections, and diminishing levels of release over time as seen with pellet implants. Infusion methods are commonly used clinically to maintain drug concentrations and osmotic mini-pump release of agents at a constant rate mimics this approach." pg 2; "Our previous pharmacokinetic study demonstrated that progesterone delivered via i.p. injection has a very short half-life in both plasma and brain but high progesterone concentrations in the brain can be achieved via mini pump infusion." pg 6; pumps primed overnight in 37C saline;.

Q3324: R. F. Shi, *et al.* Lose dose genistein inhibits glucocorticoid receptor and ischemic brain injury in female rats. *NEUROCHEMISTRY INTERNATIONAL* 2014;65(;):14-22

ALZET Comments: Genistein; DMSO; water, distilled; SC; Rat; 1002; 14 days; Controls received mp w/ vehicle; animal info (female, ovariectomized); 50% DMSO used; ischemia (cerebral); cardiovascular;.

Q4091: E. L. Scott, *et al.* Surgical menopause enhances hippocampal amyloidogenesis following global cerebral ischemia. *JOURNAL OF SPORT AND HEALTH SCIENCE* 2014;3(206-216)

ALZET Comments: Estradiol, 17B-; Cyclodextrin, B-; SC; Rat; 2002; 1 week; Controls received mp w/ vehicle; animal info (female, ovariectomized); 20% cyclodextrin used; ischemia (cerebral); replacement therapy (estradiol infusion); cardiovascular;.

Q3618: N. Sachewsky, *et al.* Primitive Neural Stem Cells in the Adult Mammalian Brain Give Rise to GFAP-Expressing Neural Stem Cells. *STEM CELL REPORTS* 2014;2(810-824)

ALZET Comments: Ganciclovir; Ara-C; PBS; saline; CSF/CNS; Mice (transgenic); 1007D; 21 days; 7 days; Animal info (GFAP-TK); ischemia (cerebral); 2% AraC; 200uM GCV;.



Q4077: N. Sachewsky, *et al.* Cyclosporin A enhances neural precursor cell survival in mice through a calcineurin-independent pathway. *Disease Models & Mechanisms* 2014;7(953-961)

ALZET Comments: Cyclosporin; FK506; NIM811; Saline; SC; Mice; 2002; 7 days; 25 days; 32 days;; Controls received mp w/ vehicle; animal info (male, C57BL6J, 6-8 weeks old, 25-30g); pumps replaced every 2 weeks; ischemia (cerebral); post op. care (SC injection of warmed saline); behavioral testing (foot fault task);.

Q3609: M. Rahman, *et al.* The beta-hydroxybutyrate receptor HCA(2) activates a neuroprotective subset of macrophages. *Nature Communications* 2014;5(U16-U26)

ALZET Comments: Hydroxybutyrate, B-; Saline; SC; Mice; 2001D; Controls received mp w/ vehicle; animal info (male, HCA2 or C57BL6, 8-15 weeks old, MCAO); ischemia (cerebral); behavioral testing (sensorimotor testing, latency-to-move, sticky-tape removal); cardiovascular; "we administered BHB by implanting subcutaneous pumps because of its short half-life" pg 2; B-hydroxybutyrate aka BHB; BHB is a ligand of HCA2 receptors;.

Q3590: S. Okuyama, *et al.* 3,5,6,7,8,3',4'-Heptamethoxyflavone, a citrus flavonoid, on protection against memory impairment and neuronal cell death in a global cerebral ischemia mouse model. *NEUROCHEMISTRY INTERNATIONAL* 2014;70(30-38)

ALZET Comments: Heptamethoxyflavone, 3,5,6,7,8,3',4'-; DMSO; PEG 300; SC; Mice; 1003D; 3 days; Controls received mp w/ vehicle; animal info (male, C57BL6, 9 weeks old); dose-response (pg31); ischemia (cerebral); behavioral testing (y maze); cardiovascular; immunology; Heptamethoxyflavone aka HMF; HMF is a citrus flavonoid;.

Q4004: K. Miyamoto, *et al.* PACAP38 Suppresses Cortical Damage in Mice with Traumatic Brain Injury by Enhancing Antioxidant Activity. *Journal of Molecular Neuroscience* 2014;54(370-379)

ALZET Comments: PACAP38; Saline; BSA; IV (femoral); Mice; 24 hours; Controls received mp w/ vehicle; animal info (male, C57BL6J, 10-12 weeks old, 21-26g); 0.1% BSA used; ischemia (cerebral); cardiovascular; peptides; used PE-10;.

Q3562: C. A. McCarthy, *et al.* Direct Angiotensin AT2 Receptor Stimulation Using a Novel AT2 Receptor Agonist, Compound 21, Evokes Neuroprotection in Conscious Hypertensive Rats. *PLoS One* 2014;9(U1238-U1247)

ALZET Comments: Compound 21; PD123319; Saline; CSF/CNS; Rat; 2ML2; 8 days; Controls received mp w/ vehicle; animal info (male, spontaneously hypertensive, 330-350g); ischemia (cerebral); cardiovascular; Compound 21 aka C21 aka M024; C21 is a nonpeptide AT2R agonist.

Q3553: P. Lyden, *et al.* Direct Thrombin Inhibitor Argatroban Reduces Stroke Damage in 2 Different Models. *Stroke* 2014;45(3):896-899

ALZET Comments: Argatroban; Saline; IV; Rat; 2001D; 1 day; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 290-310g); ischemia (cerebral); behavioral testing (morris water maze, barnes maze task, spatial probe task);.

Q3551: K. P. Loh, *et al.* TRPM4 inhibition promotes angiogenesis after ischemic stroke. *PFLUGERS ARCHIV-EUROPEAN JOURNAL OF PHYSIOLOGY* 2014;466(3):563-576

ALZET Comments: RNA, small interfering TRPM inhibiting; IV (jugular); Rat; 24 hours; Controls received mp w/ vehicle; animal info (male, Wistar, 300g); ischemia (cerebral); behavioral testing (rotarod apparatus); gene therapy; cardiovascular; TRPM4 aka transient receptor potential melastatin 4;.

Q3783: E. Kilic, *et al.* HMG-CoA reductase inhibition promotes neurological recovery, peri-lesional tissue remodeling, and contralesional pyramidal tract plasticity after focal cerebral ischemia. *Frontiers in Cellular Neuroscience* 2014;8(U1-U10)

ALZET Comments: Rosuvastatin; NaCl; CSF/CNS; Mice; 2004; 4 weeks; Control animals received mp w/ vehicle; animal info (C57BL6/J, 23-25 g); ALZET brain infusion kit 3 used; enzyme inhibitor (HMG-CoA reductase).

Q3524: J. P. Joseph, *et al.* The angiotensin type 2 receptor agonist Compound 21 elicits cerebroprotection in endothelin-1 induced ischemic stroke. *Neuropharmacology* 2014;81(134-141)



ALZET Comments: Compound 21; PD123319; CSF, artificial; CSF/CNS; Rat; 2002; 10 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 8 weeks old, 250-275g, MCAO); ALZET brain infusion kit 1 used; ischemia (cerebral); post op. care (buprenorphine 0.05 mg/kg SC); cannula implanted 7 days prior to pump implantation;.

Q3518: M. S. Jeffers, *et al.* Epidermal Growth Factor and Erythropoietin Infusion Accelerate Functional Recovery in Combination With Rehabilitation. *Stroke* 2014;45(185-+

ALZET Comments: Epidermal Growth Factor; erythropoietin; CSF, artificial; CSF/CNS; Rat; 2001; 14 days; Animal info (male, Sprague Dawley); pumps replaced every 7 days; ischemia (cerebral); behavioral testing (staircase test); pumps removed 7 days after serial implantation;.

Q3472: U. Fronz, *et al.* Continuous adenosine A(2A) receptor antagonism after focal cerebral ischemia in spontaneously hypertensive rats. *NAUNYN-SCHMIEDEBERGS ARCHIVES OF PHARMACOLOGY* 2014;387(2):165-173

ALZET Comments: Caffeine, 8-(3-chlorostyryl); DMSO; SC; Rat; 2ML1; 3 days; Controls received mp w/ vehicle; animal info (Spontaneously hypertensive; 12 weeks old); functionality of mp verified by residual volume; ischemia (cerebral); no stress (see pg.168); stress/adverse reaction: (see pg.168); Caffeine, 8-(3-chlorostyryl) aka CSC;.

Q3457: G. Ding, *et al.* MRI EVALUATION OF BBB DISRUPTION AFTER ADJUVANT AcSDKP TREATMENT OF STROKE WITH tPA IN RAT. *Neuroscience* 2014;271(1-8

ALZET Comments: Ac-SDKP; Saline; SC; Rat; 72 hours; Controls received mp w/ vehicle; animal info (male, Wistar, 8-12 weeks old, 300-350g); ischemia (cerebral; MCAO); N-acetyl-seryl-aspartyl-lysyl-proline aka AcSDKP; peptides;.

Q3292: X. R. Chen, *et al.* Neuroprotective effect of chondroitinase ABC on primary and secondary brain injury after stroke in hypertensive rats. *Brain Research* 2014;1543(,):324-333

ALZET Comments: Chondroitinase ABC; Penicillinase; CSF/CNS; Rat; 1007D; 7 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 360-480g); functionality of mp verified after sacrifice; ALZET brain infusion kit 3 used; ischemia (cerebral); post op. care (heating pad); behavioral testing (mNSS); Chondroitinase ABC aka ChABC;.

Q3291: J. Chen, *et al.* Neuronal over-expression of ACE2 protects brain from ischemia-induced damage.

Neuropharmacology 2014;79(,):550-558

ALZET Comments: Norepinephrine; A-779; CSF, artificial; CSF/CNS; Mice (transgenic); 7 days; Controls received mp w/ vehicle; animal info (male, SARA or RA transgenic, 6-10 weeks); ALZET brain infusion kit used; ischemia (cerebral); cardiovascular; Pumps primed overnight in 37C saline;.

Q3432: M. Castello-Ruiz, *et al.* The selective estrogen receptor modulator, bazedoxifene, reduces ischemic brain damage in male rat. *Neuroscience Letters* 2014;575(53-57

ALZET Comments: Estradiol, 17B-; bazedoxifene; DMSO; IP; Rat; 2ML1; Controls received mp w/ vehicle; animal info (male, Wistar, 300-350g); functionality of mp verified by plasma levels; 100% DMSO used; ischemia (cerebral, MCAO); cardiovascular;.

Q3181: T. L. Briones, *et al.* Chronic neuroinflammation and cognitive impairment following transient global cerebral ischemia: role of fractalkine/CX3CR1 signaling. *Journal of Neuroinflammation* 2014;11(,):U1-U13

ALZET Comments: RNA, small interfering CX3CR1; RNA, scrambled; Transfection medium; CSF/CNS; Rat; 1002; 28 days; Animal info (male, Wistar, 350-375g); ALZET brain infusion kit 2 used; ischemia (cerebral); post op. care (heating pad); behavioral testing (Morris water maze); gene therapy; immunology; Cannula stabilized using dental cement. Pumps primed in sterile saline 37C overnight.

Q3412: S. Bake, *et al.* Blood Brain Barrier and Neuroinflammation Are Critical Targets of IGF-1-Mediated Neuroprotection in Stroke for Middle-Aged Female Rats. *PLoS One* 2014;9(3):U897-U907

ALZET Comments: Insulin-like growth factor, human recombinant; CSF, artificial; CSF/CNS; Rat; 1003D; 24 hours; Controls received mp w/ vehicle; animal info (Female, Sprague Dawley, 9-11 months, 325-350g); ischemia (Cerebral); immunology; cyanoacrylate adhesive; "Previous studies have shown that IGF-1 is stable in Alzet minipumps for upto 7 days and the dose



of IGF-1 was found to be effective" pg e91427; Pump and cannula primed overnight; cannula implanted one week prior to MCAO and pump implantation;.

Q3645: L. Zhang, *et al.* Sonic Hedgehog Signaling Pathway Mediates Cerebrolysin-Improved Neurological Function After Stroke. *Stroke* 2013;44(7):1965-U437

ALZET Comments: Cyclopamine;; Cyclodextrin, 2-hydroxypropyl-b-; PBS, sterile; CSF/CNS; Rat; 28 days; Controls received mp w/ vehicle; animal info (male, Wistar rat, 350-400g); ischemia (cerebral);.

Q2881: A. Zechariah, *et al.* Vascular Endothelial Growth Factor Promotes Pericyte Coverage of Brain Capillaries, Improves Cerebral Blood Flow During Subsequent Focal Cerebral Ischemia, and Preserves the Metabolic Penumbra. *Stroke* 2013;44(6):1690-U393

ALZET Comments: Vascular endothelial growth factor; Saline; CSF/CNS; Mice; 2004; 3, 10 days; Controls received mp w/ saline; animal info (male C57BL6/j, 20-25g); ischemia.

Q2546: J. Uden, *et al.* Post-ischemic continuous infusion of erythropoietin enhances recovery of lost memory function after global cerebral ischemia in the rat. *BMC NEUROSCIENCE* 2013;14(;):U1-U8

ALZET Comments: Erythropoietin; Saline; IV (jugular); Rat; 2001D; 1003D; 72 hours; Control animals received mp w/ vehicle; animal info (Wistar, male, 300-350 g); silastic tubing used.

Q6741: Z. Peng, *et al.* Downregulation of miR-181b in mouse brain following ischemic stroke induces neuroprotection against ischemic injury through targeting heat shock protein A5 and ubiquitin carboxyl-terminal hydrolase isozyme L1. *J Neurosci Res* 2013;91(10):1349-62

ALZET Comments: RNA, micro-181b antagomir; CSF/CNS (left lateral ventricle); mice; 1003D; 24 hours; 72 hours; Dose (5 pmol/hr); Controls received mp w/ vehicle; animal info (Adult (8–10 weeks of age), male Bagg albino inbred "c" strain (BABL/c) mice (weighing 18–22 g)); Brain coordinates (Bregma -0.22 mm, dorsoventral 3 mm, lateral 1 mm); ischemia (cerebral);.

Q3353: K. Ohira, *et al.* Fluoxetine-Induced Cortical Adult Neurogenesis. *Neuropsychopharmacology* 2013;38(6):909-920

ALZET Comments: Ara-C; PBS; CSF/CNS (frontal lobe); Mice; 1004; 4 weeks; Controls received mp w/ vehicle; animal info (male, 3 months old, C57BL/6J); ALZET brain infusion kit 3 used; ischemia (cerebral); Multiple pumps per animal (two 1004 pumps, two Brain infusion kits); tissue perfusion (frontal lobe); brain tissue distribution;.

Q3240: X. S. Liu, *et al.* MicroRNA-17-92 Cluster Mediates the Proliferation and Survival of Neural Progenitor Cells after Stroke. *Journal of Biological Chemistry* 2013;288(18):12478-12488

ALZET Comments: Sonic hedgehog protein, recombinant mouse; PBS; BSA; CSF/CNS; Mice; 2001; 7 days; Controls received mp w/ vehicle; animal info (male, C57BL6, 3-4 months old); ischemia (cerebral); cardiovascular; Sonic hedgehog protein aka Shh;.

Q2981: J. Knapp, *et al.* Effects of intracerebroventricular application of insulin-like growth factor 1 and its N-terminal tripeptide on cerebral recovery following cardiac arrest in rats. *RESUSCITATION* 2013;84(5):684-689

ALZET Comments: Insulin-like growth factor-1; SC; Rat; 7 days; Peptides; functionality of mp verified by counting Nissl-positive neurons and TUNEL positive cells; half-life (12 min); ischemia (cerebral ischemia); neurodegenerative (cerebral); mp were used to infuse IGF-1 to study its neuroprotective role on cerebral recovery following cardiac arrest;.

Q4737: I. Kazanis, *et al.* The late response of rat subependymal zone stem and progenitor cells to stroke is restricted to directly affected areas of their niche. *EXPERIMENTAL NEUROLOGY* 2013;248(;):387-397

ALZET Comments: Ara-C; Saline; CSF/CNS; Rat; 1007D; 7 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley); ALZET brain infusion kit 2 used; ischemia (cerebral);.

Q2918: T. R. Doeppner, *et al.* MicroRNA-124 protects against focal cerebral ischemia via mechanisms involving Usp14-dependent REST degradation. *Acta Neuropathologica* 2013;126(2):251-265



ALZET Comments: IU-1; DMSO; ethanol; PBS; CSF/CNS; Mice; 1007D; 4 days; Controls received mp w/ PBS; animal info (male, C57BL6/N, 11-13 weeks); ischemia (cerebral); 5% DMSO used; 50% ethanol used; IU-1 is a Usp14 inhibitor.

Q3334: Y. Chin, *et al.* Involvement of glial P2Y(1) receptors in cognitive deficit after focal cerebral stroke in a rodent model. *Journal of Neuroinflammation* 2013;10(1):U1-U12

ALZET Comments: MRS2500; CSF/CNS; Mice; 1007D; 4 days; Controls received sham surgery, no mp; animal info (mice: P2Y1KO (C57/BL6)); ALZET brain infusion kit 3 used; ischemia (cerebral, middle artery occlusion (MCAO)); behavioral testing (Fear Conditioning);