



### Recent References (2016-2020) on Spinal Cord Injury Research Using ALZET® Osmotic Pumps

**Q8617:** J. M. Kwiecien, *et al.* Neuroprotective Effect of Subdural Infusion of Serp-1 in Spinal Cord Trauma. *Biomedicines* 2020;8(10):

**Agents:** Serp-1 **Vehicle:** Saline; **Route:** CSF/CNS (spinal cord); **Species:** Rat; **Pump:** 2ML1; 2ML4; **Duration:** 7 days; 14 days; 28 days; 56 days;

**ALZET Comments:** Dose (0.008 mg, 0.04 mg, 0.2 mg, 0.2 mg/week,); dose-response (p. 3); animal info (male, 16 weeks old Long Evan rats, 370-410 g); spinal cord injury;

**Q8526:** K. Hamamura, *et al.* Behavioral Effects of Continuously Administered Bergamot Essential Oil on Mice With Partial Sciatic Nerve Ligation. *Front Pharmacol* 2020;11(1310)

**Agents:** Naloxone HCl **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1007D; **Duration:** 1 week;

**ALZET Comments:** Dose (1 mg/100 uL); 0.9% NaCl used; animal info (four-week-old male ddY-strain mice, 24 g); behavioral testing (double activity monitoring system; Von Frey Test); spinal cord injury;

**Q7641:** P. Yan, *et al.* A Causal Relationship in Spinal Cord Injury Rat Model Between Microglia Activation and EGFR/MAPK Detected by Overexpression of MicroRNA-325-3p. *J Mol Neurosci* 2019;68(2):181-190

**Agents:** agomir-325-3p **Vehicle:** Saline; **Route:** CSF/CNS (spinal cord); **Species:** Rat; **Pump:** Not Stated; **Duration:** 7 days;

**ALZET Comments:** Dose (60 nmol/mL at 1 µL/h); Controls received mp w/ vehicle; animal info (male, Sprague-Dawley, 225-260g); post op. care (IM injection of 30,000-U penicillin twice/day, manual urination and defecation 1-2 times/day); behavioral testing (BBB scale); agomir-325-3p is an oligonucleotide based on miR-325-3p mimics with more stable expressions of miR-325-3p; spinal cord injury; agomir-325-3p sequence is 5'-UACAG GUUAGAUUAUGUACU-3'; Therapeutic indication ("overexpression of miR-325-3p inhibited microglial activation and the release of inflammatory cytokines by inhibition of EGFR/MAPK signaling to alleviate the secondary injury after SCI." p189);

**Q7660:** M. P. Schneider, *et al.* Anti-Nogo-A Antibodies As a Potential Causal Therapy for Lower Urinary Tract Dysfunction after Spinal Cord Injury. *J Neurosci* 2019;39(21):4066-4076

**Agents:** Antibody, anti-Nogo-A **Vehicle:** Not Stated; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 2ML2; **Duration:** 14 days;

**ALZET Comments:** Dose (5 µl/h, 3 mg of antibody/ml); Controls received mp w/ inactive control antibody; animal info (4+/-1 months, female, Lewis, 210+/-20g); spinal cord injury; Pump and catheter were removed 15-16 d after implantation under 5% isoflurane; Therapeutic indication (reduction of the impairment of several key urodynamic functions such as recovery of the physiological EUS function during voiding after induced SCI);

**Q8359:** K. Pajer, *et al.* Neuroectodermal Stem Cells Grafted into the Injured Spinal Cord Induce Both Axonal Regeneration and Morphological Restoration via Multiple Mechanisms. *J Neurotrauma* 2019;36(21):2977-2990

**Agents:** Function-blocking antibodies against GDNF, IL-6, MIP-1a, IL-10 **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 1002; **Duration:** 2 weeks;

**ALZET Comments:** animal info (Sprague Dawley, Female, 180-220 g); behavioral testing (Catwalk Analysis); spinal cord injury;

**Q8292:** H. Nakagawa, *et al.* Treatment With the Neutralizing Antibody Against Repulsive Guidance Molecule-a Promotes Recovery From Impaired Manual Dexterity in a Primate Model of Spinal Cord Injury. *Cereb Cortex* 2019;29(2):561-572

**Agents:** Angti-RGMa antibody **Vehicle:** Saline; **Route:** CNS/CSF; **Species:** Monkey; **Pump:** 2ML4; **Duration:** 4 weeks;

**ALZET Comments:** Dose (50 ug/kg/day); animal info (Rhesus, 3-5 years old, 2.8-5.4 kg); spinal cord injury;

**Q7560:** K. P. Melo, *et al.* Mild Exercise Differently Affects Proteostasis and Oxidative Stress on Motor Areas During Neurodegeneration: A Comparative Study of Three Treadmill Running Protocols. *Neurotox Res* 2019;35(2):410-420

**Agents:** Rotenone **Vehicle:** DMSO, Polyethylene glycol; **Route:** SC; **Species:** Rat; **Pump:** 2ML4; **Duration:** 4 weeks; 8 weeks;

**ALZET Comments:** Dose (1 mg/kg/day); 50% DMSO:50% PEG used; Controls received mp w/ vehicle; animal info (Male, Lewis, 8 or 9 months old); pumps replaced every 4 weeks; spinal cord injury; neurodegenerative (Motorcortex);



**Q7679:** P. Liu, *et al.* Inhibitory effect of hyaluronidase-4 in a rat spinal cord hemisection model. *Cancer Translational Medicine* 2019;5(1):10-16

**Agents:** Antibody, anti-Hyal-4; IgG **Vehicle:** Not Stated; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 1004; **Duration:** 4 weeks;

**ALZET Comments:** animal info (Female Sprague–Dawley (SD) rats); spinal cord injury;

**Q8234:** A. F. Kullmann, *et al.* Acute spinal cord injury is associated with mitochondrial dysfunction in mouse urothelium. *NeuroUrol Urodyn* 2019;38(6):1551-1559

**Agents:** MitoTempo **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1007D; **Duration:** 3 days;

**ALZET Comments:** Dose (1 mg/kg/day); 0.9% Saline used; animal info (Female, C57BL/6, 15-20 g, 5-8 weeks old); MitoTempo aka mitochondrially targeted antioxidant ; spinal cord injury;

**Q8006:** M. J. Gerald, *et al.* Continuous infusion of an agonist of the tumor necrosis factor receptor 2 in the spinal cord improves recovery after traumatic contusive injury. *CNS Neurosci Ther* 2019;25(8):884-893

**Agents:** EHD2-sc-mTNFR2 **Vehicle:** Not stated; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004, 1002, 1003D; **Duration:** 28 days, 14 days, or 3 days;

**ALZET Comments:** Dose (10 mg/ml- 28 days, 4.4 mg/ml-14 days, 1.1 mg/ml-3 days); animal info (Adult, Female, C57Bl/6, 3 months old); post op. care (buprenorphine); Agonistic specific for TNFR2 aka EHD2-sc-mTNFR2 ; ALZET brain infusion kit 3 used; bilateral cannula used; spinal cord injury;

**Q7472:** K. Farrell, *et al.* Systemic Inhibition of Soluble Tumor Necrosis Factor with XPro1595 Exacerbates a Post-Spinal Cord Injury Depressive Phenotype in Female Rats. *J Neurotrauma* 2019;

**Agents:** XPro1595 **Vehicle:** Saline; **Route:** CSF/CNS (left lateral ventricle); **Species:** Rat; **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** Dose (10 mg/kg); Controls received mp w/ vehicle; animal info (Female, Sprague Dawley, 223-250 g); post op. care (); behavioral testing (Sucrose Preference, Novel Object Recognition, Open Field, Social Exploration, Modified forced swim test, Basso Beattie Bresnahan open field, Automated von Frey, Hargreaves' Thermal Testing, ); ALZET brain infusion kit 2 used; Brain coordinates (AP: -1.0 ML, +2.0, DV: -4.0- to -3.5); bilateral cannula used; cyanoacrylate adhesive; spinal cord injury;

**Q7987:** S. Dyck, *et al.* LAR and PTPsigma receptors are negative regulators of oligodendrogenesis and oligodendrocyte integrity in spinal cord injury. *Glia* 2019;67(1):125-145

**Agents:** peptide, intracellular LAR; peptide, intracellular sigma **Vehicle:** saline, BSA buffered; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 2001D, 1003D, 2001, 2002, and 2004; **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-GRKKRRQRRRCDLADNIERLKDGLKFSQEYESI-NH2) and ISP (NH2-GRKKRRQRRRCDMAEHMERLKDANDSLKLSQEYESI-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);

**Q7270:** L. S. Almeida, *et al.* Amylin, a peptide expressed by nociceptors, modulates chronic neuropathic pain. *Eur J Pain* 2019;23(4):784-799

**Agents:** Amylin **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;

**ALZET Comments:** Dose (2 µg/kg/hr); Controls received mp w/ vehicle; animal info (male Wistar rats, 175 and 225 g); behavioral testing (von Frey, pinprick and acetone tests); spinal cord injury;

**Q7542:** Q. Wu, *et al.* Human menstrual blood-derived stem cells promote functional recovery in a rat spinal cord hemisection model. *Cell Death & Disease* 2018;9(9):882

**Agents:** TrkB-IgG; immunoglobulin G, human **Vehicle:** PBS; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 2002; **Duration:** 4 weeks;



**ALZET Comments:** Dose (3 µg/day); Controls received mp w/ vehicle; animal info (adult, female, Sprague-Dawley, 220-250g); behavioral testing (BBB locomotion scale); pumps replaced at 3 weeks; enzyme inhibitor (BDNF-TrkB signaling); spinal cord injury;

**Q7243:** N. Tanabe, *et al.* Matrine Directly Activates Extracellular Heat Shock Protein 90, Resulting in Axonal Growth and Functional Recovery in Spinal Cord Injured-Mice. *Front Pharmacol* 2018;9(446)

**Agents:** Anti-HSP90a/b monoclonal antibody, mouse IgG **Vehicle:** CSF, artificial; **Route:** CSF/CNS (right lateral ventricle); **Species:** Mice; **Pump:** 1004; **Duration:** 14 days;

**ALZET Comments:** Dose (164 ng/mL-HSP90, IgG); aCSF: 148.3mM NaCl, 3mM KCl, 1.4mM CaCl<sub>2</sub>, 0.8mM MgCl<sub>2</sub>, 0.75mMNa<sub>2</sub>HPO<sub>4</sub>, and 0.195mMNaH<sub>2</sub>PO<sub>4</sub> used; animal info (8 wanimal info (8 weeks old, 28-33 g, female, ddY); weeks old, 28-33 g, female, ddY); ALZET brain infusion kit 3 used; Brain coordinates (anteroposterior: -0.22mm, mediolateral: +1mm, dorsoventricular:-2.5mm); bilateral cannula used; cyanoacrylate adhesive; spinal cord injury;

**Q7045:** N. Shimizu, *et al.* Effects of nerve growth factor neutralization on TRP channel expression in laser-captured bladder afferent neurons in mice with spinal cord injury. *Neurosci Lett* 2018;683(100-103)

**Agents:** Antibody, anti Nerve growth factor **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 1002; **Duration:** 2 weeks;

**ALZET Comments:** Dose (10 µg/Kg/hour); Controls received mp w/ vehicle; animal info (9-10-week-old female C57BL/6 N mice weighing 18-22 g); spinal cord injury;

**Q7264:** C. Rivat, *et al.* Inhibition of neuronal FLT3 receptor tyrosine kinase alleviates peripheral neuropathic pain in mice. *Nat Commun* 2018;9(1):1042

**Agents:** RNA, small interfering (Flt3, scrambled) **Vehicle:** Not Stated; **Route:** CSF/CNS(Intrathecal); **Species:** Mice; **Pump:** 1002; **Duration:** 6 days;

**ALZET Comments:** Dose (12.53 ng/ml); animal info (C57BL/6 naive mice, Flt3KO mice 25–30 g.); behavioral testing (reflexive tail flick); spinal cord injury; stress/adverse reaction: (see pg. 10);

**Q7263:** L. Riemann, *et al.* Transplantation of Neural Precursor Cells Attenuates Chronic Immune Environment in Cervical Spinal Cord Injury. *Front Neurol* 2018;9(428)

**Agents:** Platelet-Derived Growth Factor, Epidermal Growth Factor, Basic Fibroblast Growth Factor **Vehicle:** Platelet-Derived Growth Factor, Epidermal Growth Factor, Basic Fibroblast Growth Factor; **Route:** CSF/CNS(Intrathecal); **Species:** Rat; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Dose (PDGF-AA, 1 µg/100 µL; EGF, 3 µg/100 µL; bFGF, 3 µg/100mL); 0.1% rat serum albumin used; animal info (female Wistar rats 250 g); post op. care (moxifloxacin, buprenorphine); spinal cord injury;

**Q7205:** L. Madaro, *et al.* Denervation-activated STAT3-IL-6 signalling in fibro-adipogenic progenitors promotes myofibres atrophy and fibrosis. *Nat Cell Biol* 2018;20(8):917-927

**Agents:** Interleukin-6 **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 15 days;

**ALZET Comments:** Dose (1.0 mg/ml); Dose (1.0 mg/ml); Interleukin-6 aka IL-6; spinal cord injury;

**Q7202:** W. Liu, *et al.* Dextran-based biodegradable nanoparticles: an alternative and convenient strategy for treatment of traumatic spinal cord injury. *Int J Nanomedicine* 2018;13(4121-4132)

**Agents:** Taxol **Vehicle:** Cremophor EL; **Route:** CSF/CNS (Intrathecal); **Species:** Rat; **Pump:** 2004; **Duration:** 7 days;

**ALZET Comments:** Dose (256 ng/day); animal info (Sprague Dawley rats); behavioral testing (Locomotor capacity, BBB open field 21 point scale); ALZET rat intrathecal catheter used; spinal cord injury; stress/adverse reaction: (see pg. 4130 );

**Q7216:** G. Li, *et al.* MiR-103 alleviates autophagy and apoptosis by regulating SOX2 in LPS-injured PC12 cells and SCI rats. *Iran J Basic Med Sci* 2018;21(3):292-300

**Agents:** miR-103 agomir **Vehicle:** Saline; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 1003D; **Duration:** 3 days;

**ALZET Comments:** Dose (1 ul/hr/day); Controls received mp w/ vehicle; animal info (Male, Sprague-Dawley, 180-220 g); post op. care (Penicillin G); spinal cord injury;



**Q7892:** K. Kanekiyo, *et al.* Effects of Intrathecal Injection of the Conditioned Medium from Bone Marrow Stromal Cells on Spinal Cord Injury in Rats. *J Neurotrauma* 2018;35(3):521-532

**Agents:** Bone marrow Stromal Cells **Vehicle:** Saline; **Route:** CSF/CNS (lateral ventricle); **Species:** Rat; **Pump:** Not Stated; **Duration:** 2 weeks;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (Sprague Dawley, Female, 8 week old); Bone marrow stromal cells aka BMSCs; Brain coordinates (3mm caudal to bregma and 2mm to the left of midline); bilateral cannula used; spinal cord injury;

**Q7813:** T. Fuhrmann, *et al.* Combined delivery of chondroitinase ABC and human induced pluripotent stem cell-derived neuroepithelial cells promote tissue repair in an animal model of spinal cord injury. *Biomedical Research* 2018;13(2):024103

**Agents:** Cyclosporin A **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2ML1; 2ML4; **Duration:** 2 weeks; 8 weeks; **ALZET Comments:** Dose (10 mg/kg/day); animal info (female, Sprague-Dawley, 300g); post op. care (Buprenorphine (0.05 mg/kg) every 12 h for 48 h); behavioral testing (BBB locomotor rating scale, ladder walk test); pumps replaced every 4 weeks; spinal cord injury; mp used to deliver cyclosporin A to aid transplant survival, implanted one day prior to cell transplantation.;

**Q7131:** S. Dyck, *et al.* Perturbing chondroitin sulfate proteoglycan signaling through LAR and PTPsigma receptors promotes a beneficial inflammatory response following spinal cord injury. *J Neuroinflammation* 2018;15(1):90

**Agents:** Intracellular leukocyte common antigen-related peptide (ILP), Intracellular sigma peptide (ISP), TAT- conjugated peptides **Vehicle:** Saline; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 2001D, 1003D, 2001, 2002, 2004; **Duration:** 1, 3, 5, 7, or 14 days;

**ALZET Comments:** Dose (10 ug/day); Controls received mp w/ vehicle; animal info (Sprague-Dawley, adult, female, 250 g); animal info (Sprague-Dawley, adult, female, 250 g); spinal cord injury;

**Q7097:** A. Alastrue-Agudo, *et al.* FM19G11 and Ependymal Progenitor/Stem Cell Combinatory Treatment Enhances Neuronal Preservation and Oligodendrogenesis after Severe Spinal Cord Injury. *Int J Mol Sci* 2018;19(1):

**Agents:** FM19G11 **Vehicle:** DMSO; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 1007D; **Duration:** 3 days; **ALZET Comments:** Controls received mp w/ vehicle; animal info (2-month-old Sprague Dawley rats weighing ~200 g); FM19G11 is an inhibitor of Hypoxia inducible factor-alpha protein expression; spinal cord injury;

**Q6555:** Z. Zhao-Bo, *et al.* Anti-inflammatory and anti-apoptotic effect of *Rhodiola crenulata* extract on spinal cord injury in rats. *Tropical Journal of Pharmaceutical Research* 2017;16(3):605-612

**Agents:** *Rhodiola crenulata* extract; Plant extract **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2002; **Duration:** Not Stated;

**ALZET Comments:** Dose (10, 20 and 50 mg kg<sup>-1</sup>); Controls received mp w/ vehicle; post op. care (buprenorphine injection 0.03 mg kg<sup>-1</sup> for 3 days); spinal cord injury;

**Q5714:** W. Xu, *et al.* Myelin Basic Protein Regulates Primitive and Definitive Neural Stem Cell Proliferation from the Adult Spinal Cord. *Stem Cells* 2017;35(2):485-496

**Agents:** Ganciclovir **Vehicle:** Not Stated; **Route:** CSF/CNS (lateral ventricle); **Species:** Mice; **Pump:** 1007D; **Duration:** 5 days; **ALZET Comments:** animal info (GFAP-TK); spinal cord injury; Brain Coordinates (0.2 mm AP from bregma, 0.7 mm ML, and 2.5 mm DV below the dura);

**Q5992:** H. Suzuki, *et al.* Neural stem cell mediated recovery is enhanced by Chondroitinase ABC pretreatment in chronic cervical spinal cord injury. *PLoS One* 2017;12(8):e0182339

**Agents:** Chondroitinase AB **Vehicle:** CSF, artificial; **Route:** CSF/CNS (intrathecal); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (female, 15-20g); spinal cord injury; Therapeutic indication (Spinal cord injury); Dose (2.64 mU/mL);

**Q6181:** R. Simeoli, *et al.* Exosomal cargo including microRNA regulates sensory neuron to macrophage communication after nerve trauma. *Nat Commun* 2017;8(1):1778



**Agents:** miR-21-5p antagomir **Vehicle:** in vivo transfection reagent; **Route:** SC; CSF/CNS (intrathecal); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Dose (12 pmol/day); Controls received mp w/ vehicle and scrambled oligomer; functionality of mp verified (Catheter and pump were checked at the end of treatment to ascertain efficient delivery) ; spinal cord injury;

**Q5891:** K. T. Santhosh, *et al.* Design and optimization of PLGA microparticles for controlled and local delivery of Neuregulin-1 in traumatic spinal cord injury. *J Control Release* 2017;261(147-162

**Agents:** Neuregulin-1, human recombinant **Vehicle:** CSF, artificial; BSA; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 1003D; 2001; 2002; 2004; **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;

**Q6751:** J. Qian, *et al.* D-beta-hydroxybutyrate promotes functional recovery and relieves pain hypersensitivity in mice with spinal cord injury. *British Journal of Pharmacology* 2017;174(13):1961-1971

**Agents:** Hydroxybutyrate, D-β- **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** 2001; **Duration:** 24 hours;

**ALZET Comments:** Dose (0.4, 0.8 and 1.6 mmol/kg/day,); Controls received mp w/ vehicle; animal info (C57BL/6J (male, 12-weekold) mice); spinal cord injury;

**Q6043:** V. Hernandez-Torres, *et al.* BDNF effects on functional recovery across motor behaviors after cervical spinal cord injury. *J Neurophysiol* 2017;117(2):537-544

**Agents:** Brain-derived neurotrophic factor **Vehicle:** CSF, artificial; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 2002; **Duration:** 14 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (280-300g); spinal cord injury; Dose (180 ng/day);

**Q6471:** S. Gu, *et al.* Long Coding RNA XIST Contributes to Neuronal Apoptosis through the Downregulation of AKT Phosphorylation and Is Negatively Regulated by miR-494 in Rat Spinal Cord Injury. *Int J Mol Sci* 2017;18(4):

**Agents:** AgomiR-494; AntagomiR-494 **Vehicle:** Saline; **Route:** CSF/CNS (spinal cord); **Species:** Rat; **Pump:** 1003D; **Duration:** Not Stated;

**ALZET Comments:** animal info (male Sprague–Dawley rats weighing 180–220 g); spinal cord injury;

**Q6402:** K. Chen, *et al.* Sequential therapy of anti-Nogo-A antibody treatment and treadmill training leads to cumulative improvements after spinal cord injury in rats. *Experimental Neurology* 2017;292(135-144

**Agents:** Immunoglobulin G1, anti-Nogo-A antibody 11C7; Immunoglobulin G1, anti-cyclosporin A **Vehicle:** Not Stated;

**Route:** CSF/CNS; **Species:** Rat; **Pump:** 2ML2; **Duration:** 2 weeks;

**ALZET Comments:** animal info (female Sprague–Dawley rats weighing 200-250 g); Therapeutic indication (spinal cord injury);

**Q5759:** Y. Cao, *et al.* Synchrotron radiation micro-CT as a novel tool to evaluate the effect of agomir-210 in a rat spinal cord injury model. *Brain Research* 2017;1655(55-65

**Agents:** Agomir-210 **Vehicle:** Saline; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 1002; **Duration:** 3 days;

**ALZET Comments:** Controls received mp w/ vehicle saline, and Agomir-negative; animal info (180-220 g); spinal cord injury; Therapeutic indication (spinal cord injury);

Dose (agomir-NC (1 μL/h, 20 nmol/ mL) or agomir-210 (1 μL/h, 20 nmol/mL));

**Q5734:** X. Biardeau, *et al.* Early Fesoterodine Fumarate Administration Prevents Neurogenic Detrusor Overactivity in a Spinal Cord Transected Rat Model. *PLoS One* 2017;12(1):e0169694

**Agents:** fesoterodine fumarate **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2006; **Duration:** 42 days;

**ALZET Comments:** animal info (350±400 g) ; spinal cord injury; Therapeutic indication (Spinal cord injury, transection);

**Q5514:** K. Zweckberger, *et al.* Self-assembling peptides optimize the post-traumatic milieu and synergistically enhance the effects of neural stem cell therapy after cervical spinal cord injury. *Acta Biomaterialia* 2016;42(77-89



**Agents:** Basic fibroblast growth factor; epidermal growth factor; brain-derived growth factor **Vehicle:** CSF; artificial; gentamycin; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (Wistar, 250g); spinal cord injury; post op. care (0.05 mg/kg buprenorphine SC; QD SC injection of cyclosporine A (10 mg/kg); QD minocycline 50 mg/kg); “catheter tip was located sub-durally at the epicenter of the lesion. It was fixed with several sutures in the paraspinous muscles to avoid any movement-associated dislocation and finally connected to the pump located in a subcutaneous recess.” pg 79; behavioral testing (Grip strength test, Basso, Beattie, Bresnahan Locomotor Rating Scale, Inclined plane test); Therapeutic indication (spinal cord injury); Dose (Gentamycin: 50ug/mL);

**Q5487:** D. Wei, *et al.* Inhibiting cortical protein kinase A in spinal cord injured rats enhances efficacy of rehabilitative training. *Experimental Neurology* 2016;283(Pt A):365-74

**Agents:** Rp-cAMPS **Vehicle:** Saline; **Route:** CSF/CNS (forelimb motor cortex); **Species:** Rat; **Pump:** 2002; **Duration:** 4 weeks; 6 weeks;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (female, Lewis, 180-200g); pumps replaced every 2 weeks; spinal cord injury; post op. care (SC injection of buprenorphine 0.05 mg/kg; SC injection of 4 ml saline; animals kept on heating blanket until fully awake); behavioral testing (single pellet skilled reaching); cyanoacrylate adhesive; Brain coordinates;

**Q6179:** M. Shinozaki, *et al.* Combined treatment with chondroitinase ABC and treadmill rehabilitation for chronic severe spinal cord injury in adult rats. *Neurosci Res* 2016;113(37-47)

**Agents:** Chondroitinase ABC **Vehicle:** Not Stated; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;

**ALZET Comments:** Dose (40 U/200 ul); Controls received mp w/ vehicle and inactivated C-ABC; animal info (Adult female Sprague-Dawley rats weighing 200–220 g); behavioral testing (Open field hindlimb locomotor activity test); Chondroitinase-ABC is a CSPG-digesting enzyme; enzyme inhibitor (chondroitin sulfate proteoglycans); ALZET Rat Intrathecal Catheter used; spinal cord injury;

**Q5203:** M. Shigyo, *et al.* Extracellular vimentin is a novel axonal growth facilitator for functional recovery in spinal cord-injured mice. *Sci Rep* 2016;6(28293)

**Agents:** Vimentin, recombinant human **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 1004; **Duration:** 21 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (female, ddY, 6-7 weeks old); ALZET brain infusion kit 3 used; spinal cord injury; behavioral testing (open field locomotion); cyanoacrylate adhesive; Therapeutic indication (spinal cord injury); Brain coordinates (bregma –0.22 mm, lateral to the left +1 mm and –2.5 mm depth);

**Q6685:** J. Y. Lee, *et al.* Jmjd3 mediates blood-spinal cord barrier disruption after spinal cord injury by regulating MMP-3 and MMP-9 expressions. *Neurobiol Dis* 2016;95(66-81)

**Agents:** Virus, adeno-associated shjmd3 **Vehicle:** Not Stated; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 1003D; **Duration:** Not Stated;

**ALZET Comments:** Controls received mp w/ control adeno-associated virus; animal info (adult male Sprague-Dawley rats weighing 250-270g); spinal cord injury;

**Q4843:** B. Koenig, *et al.* Long term study of deoxyribozyme administration to XT-1 mRNA promotes corticospinal tract regeneration and improves behavioral outcome after spinal cord injury. *Experimental Neurology* 2016;276(51-58)

**Agents:** DNAXT-1as **Vehicle:** Not Stated; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 1007D; **Duration:** 2 weeks;

**ALZET Comments:** Controls received mp w/ control enzyme or PBS; animal info (female, Wistar, 200-250g); pumps replaced every week; pumps replaced every week; spinal cord injury; post op. care (Baytril; manual bladder emptying; Rimadyl); behavioral testing (horizontal ladder task); used self-made intrathecal catheter from 32-gauge polyurethane; enzyme inhibitor (DNA enzyme of mRNA of xylosyltransferase-1);

**Q5348:** J. D. Figueroa, *et al.* Fatty Acid Binding Protein 5 Modulates Docosahexaenoic Acid-Induced Recovery in Rats Undergoing Spinal Cord Injury. *J Neurotrauma* 2016;33(15):1436-49



**Agents:** Oligonucleotides, scramble nontargeting; siRNA **Vehicle:** Ethanol; **Route:** CSF/CNS (Intrathecal); **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (Young adult female Sprague-dawley rats); good methods (pg 1443); spinal cord injury; "Pumps were primed with DHA-albumin complex (DHA), FABP5 siRNA, and vehicle controls" (pg 1443); ALZET rat intrathecal catheter used;

**Q4823:** E. E. Ewan, *et al.* Intrathecal Acetyl-L-Carnitine Protects Tissue and Improves Function after a Mild Contusive Spinal Cord Injury in Rats. *Journal of Neurotrauma* 2016;33(269-277

**Agents:** Carnitine, acetyl-L- **Vehicle:** PBS; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 2001; **Duration:** 6 days;

**ALZET Comments:** animal info (female, Sprague Dawley, 200g); spinal cord injury; post op. care (wound rinsed in steril saline, bacitracin applied topically, gentamicin IM 0, 2 or 4 days later, buprenorphine IM every 12 hours, bladders manually expressed BID); behavioral testing (locomotor function, grid walking, open field); pumps primed overnight; pumps removed after 6 days; Dose (1 mg/day);

**Q6096:** R. De Gasperi, *et al.* The Signature of MicroRNA Dysregulation in Muscle Paralyzed by Spinal Cord Injury Includes Downregulation of MicroRNAs that Target Myostatin Signaling. *PLoS One* 2016;11(12):e0166189

**Agents:** Not Stated **Vehicle:** Propylene glycol; **Route:** SC; **Species:** Rat; **Pump:** 56 days; **Duration:**

10.1371/journal.pone.0166189;

**ALZET Comments:** animal info (Male Wistar-Hannover rats); post op. care (carprofen daily for 3 days, Baytril for 5 days); pumps replaced after 28 days to continue vehicle administration; spinal cord injury; stress/adverse reaction: (see pg.9 );

**Q5309:** M. M. Clancy, *et al.* Management of Osteomyelitis Caused by Salmonella Enterica Subsp. Houtenae in a Taylor's Cantil (*Agkistrodon Bilineatus Taylori*) Using Amikacin Delivered Via Osmotic Pump. *J Zoo Wildl Med* 2016;47(2):691-4

**Agents:** Amikacin **Vehicle:** Not Stated; **Route:** SC; **Species:** snake; **Pump:** 2002; **Duration:** 10 months;

**ALZET Comments:** animal info (adult female Taylor's cantil, 6 yr old); good methods; spinal cord injury; long-term study; "This study demonstrates that the infection can be suppressed and the animal's life extended by long-term continuous infusion of amikacin and that such treatment did not result in renal compromise in this individual." pg 694; Veterinary Application; temperature adjusted pumping rate for snake; Industry authored (American Association of Zoo Veterinarians); Interesting (Veterinary use presented for treating animal with antibiotics for extended duration; minimizing need for animal handling); Dose (26ug/kg/hr);