Recent References (2014-2018) on Spinal Cord Injury Research
Using ALZET® Osmotic Pumps

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
ALZET Comments: Anti-HSP90a/b monoclonal antibody, mouse IgG; CSF, artificial; CSF/CNS (right lateral ventricle); Mice; 1004; 14 days; Dose (164 ng/mL-HSP90, IgG); aCSF: 148.3mM NaCl, 3mM KCl, 1.4mM CaCl2, 0.8mM MgCl2, 0.75mMNa2HPO4, and 0.195mMNaH2PO4 used; animal info (8 wanimal info (8 weeks old, 28-33 g, female, ddY); eeks 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
ALZET Comments: Antibody, anti Nerve growth factor; SC; Mice; 1002; 2 weeks; 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
ALZET Comments: RNA, small interfering (Flt3, scrambled); CSF/CNS(Intrathecal); Mice; 1002; 6 days; 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
ALZET Comments: Platelet-Derived Growth Factor, Epidermal Growth Factor, Basic Fibroblast Growth Factor; Platelet-Derived Growth Factor, Epidermal Growth Factor, Basic Fibroblast Growth Factor; CSF/CNS(Intrathecal); Rat; 1007D; 7 days; 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
ALZET Comments: Interleukin-6; SC; Mice; 15 days; 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
ALZET Comments: Taxol; Cremophor EL; CSF/CNS (Intrathecal); Rat; 2004; 7 days; 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
ALZET Comments: miR-103 agomir; Saline; CSF/CNS (intrathecal); Rat; 1003D; 3 days; 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;.

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
ALZET Comments: Intracellular leukocyte common antigen-related peptide (ILP), Intracellular sigma peptide (ISP), TAT-conjugated peptides; Saline; CSF/CNS (intrathecal); Rat; 2001D, 1003D, 2001, 2002, 2004; 1, 3, 5, 7, or 14 days; 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):
ALZET Comments: FM19G11; DMSO; CSF/CNS (intrathecal); Rat; 1007D; 3 days; 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
ALZET Comments: Rhodiola crenulata extract; Plant extract; Saline; SC; Rat; 2002; Dose (10, 20 and 50 mg kg-1); Controls received mp w/ vehicle; post op. care (buprenorphine injection 0.03 mg kg-1 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
ALZET Comments: Ganciclovir; CSF/CNS; Mice; 1007D; 5 days; animal info (GFAP-TK); spinal cord injury;.

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
ALZET Comments: Chondroitinase AB; CSF, artificial; CSF/CNS (intrathecal); Mice; 1007D; 7 days; 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
ALZET Comments: miR-21-5p antagomir; in vivo transfection reagent; SC; CSF/CNS (intrathecal); Mice; 1007D; 7 days; 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
ALZET Comments: Neuregulin-1, human recombinant; CSF, artificial; BSA; CSF/CNS (intrathecal); Rat; 1003D; 2001; 2002; 2004; 3 days, 7 days, 14 days, 28 days; 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. Br J Pharmacol 2017;174(13):1961-1971
ALZET Comments: Hydroxybutyrate, D-β-; PBS; SC; Mice; 2001; 24 hours; 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
ALZET Comments: Brain-derived neurotrophic factor; CSF, artificial; CSF/CNS (intrathecal); Rat; 2002; 14 days; 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):
ALZET Comments: AgomiR-494; AntagomiR-494; Saline; CSF/CNS (spinal cord); Rat; 1003D; 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. Exp Neurol 2017;292(135-144
ALZET Comments: Immunoglobulin G1, anti-Nogo-A antibody 11C7; Immunoglobulin G1, anti-cyclosporin A; CSF/CNS; Rat; 2ML2; 2 weeks; 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 Res 2017;1655(55-65
ALZET Comments: Agomir-210; Saline; CSF/CNS (intrathecal); Rat; 1002; 3 days; 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
ALZET Comments: fesoterodine fumarate; SC; Rat; 2006; 42 days; 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 Biomater 2016;42(77-89
ALZET Comments: Basic fibroblast growth factor; epidermal growth factor; brain-derived growth factor; CSF; artificial; gentamycin; CSF/CNS (intrathecal); Rat; 1007D; 7 days; 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 paraspinal 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 e fficacy of rehabilitative training. Exp Neurol 2016;283(Pt A):365-74
ALZET Comments: Rp-cAMPS; Saline; CSF/CNS (forelimb motor cortex); Rat; 2002; 4 weeks; 6 weeks; 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
ALZET Comments: Chondroitinase ABC; CSF/CNS (intrathecal); Rat; 2001; 7 days; 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
ALZET Comments: Vimentin, recombinant human; CSF, artificial; CSF/CNS; Mice; 1004; 21 days; 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
ALZET Comments: Virus, adeno-associated shjmjd3; CSF/CNS (intrathecal); Rat; 1003D; 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
ALZET Comments: DNAXT-1as; CSF/CNS (intrathecal); Rat; 1007D; 2 weeks; 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
ALZET Comments: Oligonucleotides, scramble nontargeting; siRNA; Ethanol; CSF/CNS (Intrathecal); Rat; 2001; 7 days; 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
ALZET Comments: Carnitine, acetyl-L-; PBS; CSF/CNS (intrathecal); Rat; 2001; 6 days; animal info (female, Sprague Dawley, 200g); spinal cord injury; post op. care (wound rinced 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
ALZET Comments: Propylene glycol; SC; Rat; 56 days; 10.1371/journal.pone.0166189; 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
ALZET Comments: Amikacin; SC; snake; 2002; 10 months; 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);.

Q4264: Y. Zhu*, et al.* Hematogenous macrophage depletion reduces the fibrotic scar and increases axonal growth after spinal cord injury. NEUROBIOLOGY OF DISEASE 2015;74(114-125
ALZET Comments: Sunitinib malate; DMSO; CSF/CNS (intrathecal); Mice; 1002; 2 weeks; enzyme inhibitor (tyrosine kinase);Animal info (female, 8 weeks old); functionality of mp verified by use of evans blue dye; 2.5% DMSO used; spinal cord injury; immunology; used ALZET mouse IT catheter;.

Q4191: C. Xu*, et al.* Pharmacologically inhibiting kinesin-5 activity with monastrol promotes axonal regeneration following spinal cord injury. Experimental Neurology 2015;263(172-176
ALZET Comments: Chondroitinase ABC; Trehalos; PBS; monastrol; DMSO; CSF/CNS (intrathecal); Rat; 2002; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, 225-250g, adult); spinal cord injury; behavioral testing (open field testing); use ReCathCo IT catheter;.

Q4940: D. Wu*, et al.* Expressing Constitutively Active Rheb in Adult Neurons after a Complete Spinal Cord Injury Enhances Axonal Regeneration beyond a Chondroitinase-Treated Glial Scar. J Neurosci 2015;35(31):11068-80
ALZET Comments: Chondroitinase ABC; PBS; trehalos; CSF/CNS (intrathecal); Rat; 2002; 2 weeks; Controls received mp w/ vehicle; animal info (female, Wistar, adult, 225-250g); spinal cord injury; post op. care (buprenorphine, cefazolin, Lactated Ringer's solution, bladders manually expressed BID); "Because ChABC alone is thermolabile, we mixed it with the sugar trehalos to thermostabilize it" pg 11069; pumps primed in 37C saline evernight;.

Q4632: J. Wang*, et al.* Hyaluronan Tetrasaccharide Exerts Neuroprotective Effect and Promotes Functional Recovery After Acute Spinal Cord Injury in Rats. NEUROCHEMICAL RESEARCH 2015;40(98-108
ALZET Comments: Hyaluronan tetrasaccharide; CSF/CNS (intrathecal); Rat; 4 weeks; Controls received mp w/ vehicle; animal info (Sprague Dawley, 12 weeks old, 250-300g); spinal cord injury; post op. care (Baytril antibacterial applied SC for 3 days); behavioral testing (locomotor activity); immunology;.

Q5458: C. F. Vogelaar*, et al.* Pharmacological Suppression of CNS Scarring by Deferoxamine Reduces Lesion Volume and Increases Regeneration in an In Vitro Model for Astroglial-Fibrotic Scarring and in Rat Spinal Cord Injury In Vivo. PLoS One 2015;10(7):e0134371
ALZET Comments: cAMP, BPY-DCA; DFo; PBS; CSF/CNS (intrathecal); Rat; 1007D, 2001, 2002; 1 week, 2 weeks; Controls received mp w/ vehicle; animal info (female Wistar rats (200–250 g)); spinal cord injury, complete laminectomy of T8, T9, T11; post op. care (manual bladder emptying, antibiotics, pain relief);Individually housed until animal recovered from anesthesia; scar reduction; healing, recovery; Therapeutic indication (Spinal Cord Injury); Dose (cAMP 50, 100 ug/day; DFO 10, 50 ug/day; BPY-DCA 1.1, 7.8 ug/day);.

Q5282: Y. Tsenkina*, et al.* EphB3 receptors function as dependence receptors to mediate oligodendrocyte cell death following contusive spinal cord injury. Cell Death Dis 2015;6(e1922
ALZET Comments: EphrinB3; PBS; CSF/CNS (intrathecal); Mice; 1007D; 1 week; Controls received mp w/ vehicle; animal info (Female wild type (WT), EphB3 knockout EphB3−/−55), PLP-GFP-WT, PLP-GFP-EphB3−/− mice (2–3 months of age, weighing 26±6 g)); ALZET brain infusion kit 3 used; good methods (pg. 8); spinal cord injury; behavioral testing (locomotor behavior); Dose (100 ug/ml);.

Q4607: S. Tashiro*, et al.* BDNF Induced by Treadmill Training Contributes to the Suppression of Spasticity and Allodynia After Spinal Cord Injury via Upregulation of KCC2. NEUROREHABILITATION AND NEURAL REPAIR 2015;29(677-689
ALZET Comments: TrkB/Fc, recombinant human; PBS; CSF/CNS (intrathecal); Rat; 2002; 2 weeks; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, 8-9 weeks old, 190-220g); spinal cord injury; used ALZET intrathecal cathters; pumps removed after 2 weeks;.

Q5223: R. Li*, et al.* Antinociceptive effects of dexmedetomidine via spinal substance P and CGRP. Transl Neurosci 2015;6(1):259-264
ALZET Comments: Dexmedetomidine, BRL44408; CSF, artificial; CSF/CNS (intrathecal); Rat; 2001; 1 week; Controls received mp w/ vehicle; animal info: Wistar rats (both male and female) weighing 200-250 g; functionality of mp verified by levels of behavior from rats; dose-response (xpg 260-261); spinal cord injury; behavioral testing (mechanical sensitivity of the hindpaw); Intrathecal catheter used; BRL44408 is an α2-AR antagonist; Dose: 20, 50 µM (DEX); 15,50 µM (BRL44408).

Q3950: J. M. Kwiecien*, et al.* Subdural infusion of dexamethasone inhibits leukomyelitis after acute spinal cord injury in a rat model. FOLIA NEUROPATHOLOGICA 2015;53(41-51
ALZET Comments: Dexamethasone; PBS; CSF/CNS (intrathecal); Rat; 2ML2; 7 days; Controls received mp w/ vehicle; animal info (Long Evans); spinal cord injury; post op. care (ketoprofen 0.3 ml of 10 mg/ml injection, saline administration 1-2 times daily); behavioral testing (Open field testing); "Subdural infusion of dexamethasone, a powerfully anti-inflammatory, stable, synthetic analogue of glucocorticoids, allowed for circumvention of the blood-brain barrier and apparently for achieving a sufficiently high concentration of this drug in the cerebrospinal fluid in proximity of the crush lesion to prevent severe, phagocyte-rich inflammation." pg 48; used rat IT catheter; dose: 2 mg/ml.

Q4461: Y. Ishikawa*, et al.* A combination of keratan sulfate digestion and rehabilitation promotes anatomical plasticity after rat spinal cord injury. NEUROSCIENCE LETTERS 2015;593(13-18
ALZET Comments: Keratanase II; chondroitinase ABC; Saline; CSF/CNS (intrathecal); Rat; 2006; 6 weeks; Controls received mp w/ vehicle; animal info (female, Sprague Dalwey, 200-230g); spinal cord injury; behavioral testing (single pellet reaching task); used silicone tubing; long-term study;.

Q5015: J. B. Iorgulescu*, et al.* Acute Putrescine Supplementation with Schwann Cell Implantation Improves Sensory and Serotonergic Axon Growth and Functional Recovery in Spinal Cord Injured Rats. Neural Plast 2015;2015(186385

ALZET Comments: Putrescine; Saline; SC; Rat; 2001; 2 weeks; Controls received mp w/ vehicle; animal info (female, Fischer, adult, 180-200g); pumps replaced every week; spinal cord injury; behavioral testing (locomotor activity);.

Q4457: J. Z. Hu*, et al.* miR-126 promotes angiogenesis and attenuates inflammation after contusion spinal cord injury in rats. BRAIN RESEARCH 2015;1608(191-202
ALZET Comments: miR-126; Saline; CSF/CNS (intrathecal); Rat; 1003D; Controls received mp w/ control agomir; animal info (male, Sprague Dawley, 180-220g); spinal cord injury; post op. care (Ringer's solution administered IP 5 ml, penicillin G 40000 U IM QD for 3 days, bladders manually expressed BID); behavioral testing (locomotor testing, open field); immunology; pumps primed overnight at 37C.

R0345: A. R. Harvey*, et al.* Neurotrophic factors for spinal cord repair: Which, where, how and when to apply, and for what period of time? Brain Res 2015;1619(36-71
ALZET Comments: Neurotrophic factors; CSF/CNS (intrathecal); 14-28 days; spinal cord injury; behavioral testing (done for 2-3 months); “using minipumps or via extracellular matrix or cellular delivery has been reported to enhance the sprouting and local growth of CST axons” pg 57; “Improved tissue sparing has been seen in most contusion studies with FGF2 infusions” pg. 58; “…these approaches have generally been found to be effective” pg. 60; Comparison of various delivery mechanisms for administering neurotrophic factors to the spinal cord.

Q3903: B. Frias*, et al.* The Role of Brain-Derived Neurotrophic Factor (BDNF) in the Development of Neurogenic Detrusor Overactivity (NDO). Journal of Neuroscience 2015;35(2146-2160
ALZET Comments: Brain-derived neurotropic factor; TrkB-Ig2; Tris buffer; glycerol; CSF/CNS (intrathecal); Rat; 2001; 2004; 7 days; 28 days; Controls received mp w/ saline; animal info (female, Wistar, 250-275g); 10% glycerol used; spinal cord injury; no stress (see pg. 2154); post op. care (ciprofloxacin 1 mg/kg IP injection; bladders manually emptied twice a day); used silicone catheter;.

Q5139: W. Dabrowski*, et al.* Prolonged Subdural Infusion of Kynurenic Acid Is Associated with Dose-Dependent Myelin Damage in the Rat Spinal Cord. PLoS One 2015;10(11):e0142598
ALZET Comments: Kynurenic Acid; PBS; CSF/CNS (intrathecal); Rat; 2ML1; 1 week; Controls received mp w/ vehicle; animal info: 42 healthy adult rats; spinal cord injury; post op. care (ketoprofen); Rat intrathecal catheter used; Dose: 0.0002 pmol/min, 0.01 nmol/min, 0.1 nmol/min, 1 nmol/min and 10 nmol/min of Kynurenic acid.

Q5135: P. Cheng*, et al.* Protein phosphatase 2A (PP2A) activation promotes axonal growth and recovery in the CNS. J Neurol Sci 2015;359(1-2):48-56
ALZET Comments: Sphingosine, D-erythro; saline; SC; Rat; 2002; 2 weeks; Controls received mp w/ vehicle; sham operation; animal info: adult Sprague–Dawley (SD) male rats, 240 - 260 g; spinal cord injury; tissue perfusion (spinal cord); D-erythro-sphingosine aka DES; Dose: DES (200 µl 1 µg/ml solution).

Q4237: B. Zoerner*, et al.* Chasing central nervous system plasticity: the brainstem's contribution to locomotor recovery in rats with spinal cord injury. Brain 2014;137(1716-1732
ALZET Comments: Antibody, anti-Nogo-A; CSF/CNS (intrathecal); Rat; 2ML2; 2 weeks; Animal info (female, Lewis, 10 weeks old, 200-250g); spinal cord injury; behavioral testing (locomotor tasks);.

Q4164: X. X. Wang*, et al.* Human NgR-Fc Decoy Protein via Lumbar Intrathecal Bolus Administration Enhances Recovery from Rat Spinal Cord Contusion. Journal of Neurotrauma 2014;31(1955-1966
ALZET Comments: NgR1(310)-Fc, human; PBS; CSF/CNS; CSF/CNS (intrathecal); Rat; 2ML4; 4 weeks; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, 10-11 weeks old, 220-240g); spinal cord injury; behavioral testing (BBB locomotor scale, grid walking); cyanoacrylate adhesive; used Rat IT catheter for IT infusion; PBS pumps initially implanted, and then replaced 3 days after SCI with vehicle or agent;.

Q4132: N. G. Tassew*, et al.* Modifying Lipid Rafts Promotes Regeneration and Functional Recovery. CELL REPORT 2014;8(1146-1159

ALZET Comments: Neogenin; PBS; CSF/CNS (intrathecal); Rat; 2002; 14 days; Controls received mp w/ vehicle; animal info (female, Wistar, adult); spinal cord injury; post op. care (bladders evacuated manually 3 times daily; Clavomax PO BID 62.5 mg); behavioral testing (locomotor function, ladder walk analysis); used ALZET IT catheter; pumps primed in 37C sterile saline overnight; "catheter and pump were sutured extensively to the subcutaneous tissues" pg 11 of supplement;.

Q5442: F. Streijger*, et al.* Combinatorial treatment of acute spinal cord injury with ghrelin, ibuprofen, C16, and ketogenic diet does not result in improved histologic or functional outcome. J Neurosci Res 2014;92(7):870-83
ALZET Comments: Ibuprofen; PBS; SC; Rat; Controls received mp w/ vehicle; animal info (male Sprague-Dawley rats, 278-315 g); spinal cord injury; behavioral testing (grooming test, cylinder rearing test, Montoya staircase test, horizontal ladder test); Healing/recovery after spinal cord injury study; Dose (2.5 mL/hour);.

Q5562: P. G. Popovich*, et al.* Independent evaluation of the anatomical and behavioral effects of Taxol in rat models of spinal cord injury. Exp Neurol 2014;261(97-108
ALZET Comments: Paclitaxel; Cremophor; ethanol; CSF/CNS (intrathecal); Rat; 2004; 28 days; Controls received mp w/ vehicle; animal info (Female Sprague-dawley rats, 10 weeks old, 215 g); functionality of mp verified by (pg. 100); good methods (pg. 99); spinal cord injury; post op. care (wound clips used; cages maintained at 37 degrees during recovery; daily injections of Gentocin (5 mg/kg) and saline for 7 days); Taxol aka Paclitaxel; Taxol is an anti-neoplastic microtubule stabilizing agent; reduces fibrogliotic scarring caused by dorsal spinal hemisection; injury recovery; ALZET rat intrathecal catheter used for custom designed catheter; Therapeutic indication (spinal cord injury); Dose (256 ng/day);.

Q4042: S. P. Patel*, et al.* N-acetylcysteine amide preserves mitochondrial bioenergetics and improves functional recovery following spinal trauma. Experimental Neurology 2014;257(95-105
ALZET Comments: Acetylcysteine amide, N-; Saline; SC; Rat; 2ML1; 7 days; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, 225-250g); spinal cord injury; behavioral testing (locomotor activity, gait analysis); pumps removed after 7 days;.

Q5462: S. P. Patel*, et al.* N-acetylcysteine amide preserves mitochondrial bioenergetics and improves functional recovery following spinal trauma. Exp Neurol 2014;257(95-105
ALZET Comments: Acetylcysteine amide, N-; SC; Rat; 2ML1; 24 hours; 7 days; animal info (female Sprague-Dawley rats; 225-250 g); functionality of mp verified by analysis of spinal cord tissue; good methods (pg. 96);
spinal cord injury, dorsal laminectomy performed at 12th thoracic vertebra; post op. care (hydrogen peroxide and betadine used to clean wound area; injected with pre-warmed Ringer's solution and Cefazolin); behavioral testing (BBB LRS [Basso, Beattie, Bresnahan Locomotor Rating Scale], Gait analysis); Rats anesthesized with ketamine (80 mg/kg) and xylazine (10 mg/kg); wound clips used; Therapeutic indication (spinal cord injury);
Dose (150 mg/kg, 300 mg/kg);.

Q3743: H. C. Pan*, et al.* TEGASEROD, A SMALL COMPOUND MIMETIC OF POLYSIALIC ACID, PROMOTES FUNCTIONAL RECOVERY AFTER SPINAL CORD INJURY IN MICE. Neuroscience 2014;277(356-366
ALZET Comments: Tegaserod; DMSO; PBS; CSF/CNS (intrathecal); Mice; 1002; Control animals received mp w/ vehicle; animal info (female, 3-4 mo old, C57BL/6J); 0.3% DMSO used: "The pump was placed subcutaneously and the catheter was fixed to the tissue with a 6-0 filament"; spinal cord injury; no stress or adverse effects "During the six-week experimental time period, no infections, overall paralyses or abnormal behavior of implanted mice were observed." pg 358.

Q4026: H. G. Novrup*, et al.* Central but not systemic administration of XPro1595 is therapeutic following moderate spinal cord injury in mice. Journal of Neuroinflammation 2014;11(U13-U26
ALZET Comments: XPro1595; etanercept; Saline; CSF/CNS (intrathecal); Mice; 1003D; 3 days; Controls received mp w/ vehicle; animal info (female, C57BL6J, adult); ALZET brain infusion kit 3 used; spinal cord injury; post op. care (SC injection of 1 ml lactated Ringer's Fluid; manual bladder expression twice a day; gentamicin 40 mg/kg for 7 days); behavioral testing (catwalk test, gridwalk test, thermal hyperalgesia, open field test); used methylcyano acrylate to affix catheter to T10;.

Q3707: G. Loers*, et al.* A Fab fragment directed against the neural cell adhesion molecule L1 enhances functional recovery after injury of the adult mouse spinal cord. Biochemical Journal 2014;460(437-446

ALZET Comments: alpha, L1 Fab; PBS; CSF/CNS (intrathecal); Mice; 1002; 14 days; animal info (female, C57BL6J, 3-4 months old); spinal cord injury; behavioral testing (locomotor activity); used flame streteched vinyl catheter tubing; no stress "During the 6-week behavioural observation period, no adverse effects of the pump implantation, such as infection, paralysis or aberrant behaviour, were observed." pg 439; post op. care (tacrolimus PO IP injection 1 mg/kg 6 weeks);.

Q3975: P. Liang*, et al.* Neural Stem Cell-Conditioned Medium Protects Neurons and Promotes Propriospinal Neurons Relay Neural Circuit Reconnection After Spinal Cord Injury. CELL TRANSPLANTATION 2014;23(S45-S56
ALZET Comments: Neural stem cell-conditioned medium, human fetal; CSF/CNS (intrathecal); Rat; 2001; 4 weeks; Controls received mp w/ NSC culture medium; animal info (female, Wistar, 8-10 weeks old, 260-300g); pumps replaced every week; spinal cord injury; post op. care (Bicillin injection 20000 U/day, bladder massage); behavioral testing (locomotor activity); pumps primed in 37C saline overnight; pumps removed after 4 weeks of infusion;.

Q3547: Z. W. Li*, et al.* Epidermal growth factor receptor inhibitor ameliorates excessive astrogliosis and improves the regeneration microenvironment and functional recovery in adult rats following spinal cord injury. Journal of Neuroinflammation 2014;11(U1-U16
ALZET Comments: PD168393; DMSO; Hank's balanced salt solution; CSF/CNS (intrathecal); Rat; 14 days; Controls received mp w/ vehicle or surgery only; animal info (adult, Sprague Dawley, adult, 220-250g); 5% DMSO used; spinal cord injury; post op. care (bladders expressed twice daily); used 32g catheter; pumps removed after 14 days;.

Q3529: A. Karalija*, et al.* THE EFFECTS OF N-ACETYL-CYSTEINE AND ACETYL-L-CARNITINE ON NEURAL SURVIVAL, NEUROINFLAMMATION AND REGENERATION FOLLOWING SPINAL CORD INJURY. Neuroscience 2014;269(143-151
ALZET Comments: N-acetyl-cysteine ; acetyl-l-carnitine hydrochloride; Saline; CSF/CNS (intrathecal); Rat; 2002; 2 weeks; 8 weeks; Controls received mp w/ vehicle; animal info (adult, 10-12 week female Sprague-Dawley rats); pumps replaced every 2 weeks; spinal cord injury; post op. care (given analgesic Finadyne, normal saline, and benzylpenicillin; each animal housed alone); Peptides ALC, NAC; NAC aka N-Acetyl-cysteine; ALC aka acetyl-L-carnitine; Dose: 2.4 mg/day for NAC, 0.9 mg/day for ALC; good methods (p144).

Q4722: G. W. J. Hawryluk*, et al.* An Examination of the Mechanisms by Which Neural Precursors Augment Recovery Following Spinal Cord Injury: A Key Role for Remyelination. CELL TRANSPLANTATION 2014;23(3):365-380
ALZET Comments: Epithelial growth factor; fibroblast growth factor; platelet-derived growth factor; CSF/CNS (intrathecal); Rat; 1007D; 7 days; Animal info (female, Wistar, 10-12 weeks old); spinal cord injury; post op. care (bladders manually evacuated TID, Minocycline 50 mg/kg 10 days, cyclosporine 10 mg/kg); behavioral testing (open field test); immunology;.

Q3746: M. J. Grosso*, et al.* Effects of an Immunomodulatory Therapy and Chondroitinase After Spinal Cord Hemisection Injury. Neurosurgery 2014;75(461-471
ALZET Comments: Rolipram; SC; Rat; 1007D; 2 weeks; Control animals received mp w/ PBS; animal info (adult, female, Sprague Dawley, 250-300 g); spinal cord injury; pumps replaced after one week.

Q3833: F. Chehrehasa*, et al.* An Acute Growth Factor Treatment that Preserves Function after Spinal Cord Contusion Injury. Journal of Neurotrauma 2014;31(1807-1813
ALZET Comments: Vascular endothelial growth factor; platelet-derived growth factor-BB; PBS; CSF/CNS (intrathecal); Rat; 2001; 7 days; Controls received mp w/ saline; animal info (female, Wistar, 20-25 weeks, 300g); spinal cord injury; post op. care (cephalothin; buprenorphine; manual bowel and bladder expression BID); behavioral testing (locomotor behavior; gaid and footprint analysis); used Rat intrathecal catheter; pumps primed in 37C saline overnight;.

Q3799: O. Alluin*, et al.* Examination of the Combined Effects of Chondroitinase ABC, Growth Factors and Locomotor Training following Compressive Spinal Cord Injury on Neuroanatomical Plasticity and Kinematics. PLoS One 2014;9(U603-U621
ALZET Comments: Chondroitinase ABC; platelet-derived growth factor-AA; basic fibroblast growth factor; epidermal growth factor;; Saline; rat serum albumin; CSF/CNS (intrathecal); Rat; 1007D; 7 days; Controls received mp w/ vehicle; animal info (female, Wistar, adult, 250-275g); spinal cord injury; behavioral testing (treadmill locomotion; coordination); used ALZET rat intrathecal catheter;.