



**Recent References (2017-Present) on Transplantation Research  
Using ALZET® Osmotic Pumps**

- Q10668:** P. J. Ruchaya, *et al.* Transplantation of Skeletal Muscle-Derived Sca-1(+)/PW1(+)/Pax7(-) Interstitial Cells (PICs) Improves Cardiac Function and Attenuates Remodeling in Mice Subjected to Myocardial Infarction. *Cells* 2022;11(24):  
**Agents:** Uridine, bromodeoxy- **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 14 days;  
**ALZET Comments:** Dose (0.2 M); Controls received mp w/ vehicle; animal info (8-week old male C57BL/6 mice); cardiovascular;
- Q10602:** O. Mashinchian, *et al.* An Engineered Multicellular Stem Cell Niche For The 3D Derivation of Human Myogenic Progenitors From iPSCs. *Embo Journal* 2022;41(14):e110655  
**Agents:** Tacrolimus **Vehicle:** EtOH; **Route:** SC; **Species:** Mice; **Pump:** 1002; **Duration:** Not Stated;  
**ALZET Comments:** Dose: (2.5 mg/kg/day)70% EtOH; 0.9% NaCl vehicle used Controls received mp w/ vehicle; animal info: Male C57BL/10ScSn-Dmdmdx/J (Mdx mice) 4 and 8 weeks, tacrolimus aka FK-506
- Q10755:** J. Hu, *et al.* Exosomal miR-17-5p From Adipose-Derived Mesenchymal Stem Cells Inhibits Abdominal Aortic Aneurysm By Suppressing TXNIP-NLRP3 Inflammasome. *Stem Cell Research and Therapy* 2022;13(1):349  
**Agents:** Angiotensin II **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;  
**ALZET Comments:** Dose: (1550 ng/kg per minute)Controls received mp w/ vehicle; animal info: 12-week-old male ApoE-/-C57BL/6 mice; Angiotensin II aka (Ang II)cardiovascular; Abdominal aortic aneurysm
- Q10547:** S. M. Hosseini, *et al.* Suppressing CSPG/LAR/PTPsigma Axis Facilitates Neuronal Replacement and Synaptogenesis by Human Neural Precursor Grafts and Improves Recovery after Spinal Cord Injury. *Journal of Neuroscience* 2022;42(15):3096-3121  
**Agents:** ILP; ISP **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2006; **Duration:** 6 weeks;  
**ALZET Comments:** Dose (20 ug/d); Controls received mp w/ vehicle; animal info (Female; 250-300 g; 50 total); behavioral testing (BBB Open Field Locomotor Score; Grid-walking analysis; Assessment of pain response after SCI); peptides; spinal cord injury; Therapeutic indication (Neuronal replacement; Synaptic re-connectivity; Neurologic recovery;
- Q10479:** A. Freuchet, *et al.* IL-34 deficiency impairs FOXP3(+) Treg function in a model of autoimmune colitis and decreases immune tolerance homeostasis. *Clinical and Translational Medicine* 2022;12(8):e988  
**Agents:** Interleukin-34, recombinant human **Vehicle:** Not Stated; **Route:** IP; **Species:** Mice; **Pump:** 1004; **Duration:** 14 days;  
**ALZET Comments:** Dose: (.42 µg/h); animal info: NOD/SCID/Il2rg-/- (NSG) 8-12-week-old; peptide; immunology;
- Q10890:** H. Zhao, *et al.* Role of IgE-FcεpsilonR1 in Pathological Cardiac Remodeling and Dysfunction. *Circulation* 2021;143(10):1014-1030  
**Agents:** Angiotensin II **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2002; **Duration:** 14 days;  
**ALZET Comments:** Dose: (1000 ng/kg per min); Controls received mp w/ vehicle; animal info: 9-week old WT male mice Angiotensin II aka (Ang II); cardiovascular;
- Q10860:** A. E. Yuko, *et al.* LIN28a Induced Metabolic and Redox Regulation Promotes Cardiac Cell Survival in the Heart After Ischemic Injury. *Redox Biology* 2021;47(102162)  
**Agents:** Deoxyuridine, 5-ethynyl-2' **Vehicle:** DMSO; Water, double distilled; **Route:** SC; **Species:** Mice; **Duration:** 1 week;  
**ALZET Comments:** Dose: (39.0625 mg/mL); 50/50% DMSO/ddH2O vehicle used; Controls received mp w/ vehicle; animal info: (C57BL/6; 8-12 weeks old male mice)ischemia (Myocardial);
- Q10834:** Z. Xu, *et al.* A Combination of Lycopene and Human Amniotic Epithelial Cells Can Ameliorate Cognitive Deficits and Suppress Neuroinflammatory Signaling by Choroid Plexus in Alzheimer's Disease Rat. *Journal of Nutritional Biochemistry* 2021;88(108558)  
**Agents:** Amyloid beta 1-42 **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Rat; **Pump:** Not Stated; **Duration:** 14 days;  
**ALZET Comments:** Dose: 3 nmol/3ml; Controls received mp w/ vehicle; animal info: adult male Wistar rats (SPF class, weighing 250-300 g); post op. care: daily application of Neosporin; behavioral testing: Morris water maze; Brain coordinates (anteroposterior 0.8 mm from bregma, mediolateral 1.5 mm, dorsoventral 3.6 mm); dental cement used;



**Q10825:** C. Li, *et al.* Prognostic Value of Elevated Levels of Plasma N-Acetylneuraminic Acid in Patients With Heart Failure. *Circulation Heart Failure* 2021;14(11):e008459

**Agents:** Angiotensin II **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;

**ALZET Comments:** Dose (2.16 mg/kg per day); animal info C57BL/6 (8 to 10 weeks; weigh about 24 g; male); peptides; cardiovascular; Therapeutic indication (Heart failure);

**Q10647:** S. P. Persaud, *et al.* Antibody-Drug Conjugates Plus Janus Kinase Inhibitors Enable MHC-Mismatched Allogeneic Hematopoietic Stem Cell Transplantation. *Journal of Clinical Investigation* 2021;131(24):

**Agents:** Baricitinib **Vehicle:** DMSO; Polyethylene glycol: PEG 400; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** Dose: 400 ug/day; 50% DMSO; 50% Polyethylene glycol vehicle used Controls received mp w/ vehicle; animal info: BALB/c or DBA/2 mice, 6 to 12 weeks of age; post op. care: skin closure was done using 9 mm wound clips and buprenorphine (0.1mg/kg) provided for postoperative analgesia; Baricitinib is a JAK1/2 inhibitor;

**Q10333:** S. K. Sinha, *et al.* Local M-CSF (Macrophage Colony-Stimulating Factor) Expression Regulates Macrophage Proliferation and Apoptosis in Atherosclerosis. *Arteriosclerosis Thrombosis and Vascular Biology* 2021;41(1):220-233

**Agents:** Uridine, bromodeoxy- **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 1002; **Duration:** 2 weeks;

**ALZET Comments:** Dose: (50 µg per day); animal info: 8- to 10-week-old female and male mice WT background; bromodeoxyuridine aka (BrdU); cardiovascular

**Q10200:** A. Jacob, *et al.* Human adrenomedullin and its binding protein attenuate tissue injury and inflammation following hepatic ischemia reperfusion in rabbits. *Heliyon* 2021;7(8):e07845

**Agents:** Adrenomedullin **Vehicle:** Not Stated; **Route:** Not Stated; **Species:** Rabbit; **Pump:** Not Stated; **Duration:** 20 hours;

**ALZET Comments:** Dose: (12 µg/kg) Controls received mp w/ vehicle; animal info: New Zealand white rabbits (4-month old males weighing approximately 3.0 kg) post op. care: buprenorphine; Adrenomedullin aka (AM) is a 52 amino-acid peptide; peptides; ischemia (Hepatic ischemia reperfusion);

**Q10191:** J. Hu, *et al.* Angiotensin II receptor blockade alleviates calcineurin inhibitor nephrotoxicity by restoring cyclooxygenase 2 expression in kidney cortex. *Acta Physiologica* 2021;232(1):e13612

**Agents:** Cyclosporine A; Candesartan; Celecoxib **Route:** SC; **Species:** Rat; **Pump:** 2ML4; **Duration:** 3 weeks;

**ALZET Comments:** Dose: Cyclosporine (25 mg/kg); Candesartan (5 mg/kg); Celecoxib ((50mg/kg) Controls received mp w/ vehicle; animal info: Adult (10 to 12 weeks) male Wistar rats; Cyclosporine A aka (CsA); Candesartan aka (RAS); Celecoxib aka (COX-2)

**Q10272:** L. Fluhr, *et al.* Gut microbiota modulates weight gain in mice after discontinued smoke exposure. *Nature* 2021;600(7890):713-719

**Agents:** DMG; Varenicline; Trigonelline **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** Dose (DMG 100 mg/kg/day; Varenicline 0.5 mg/kg/day; Trigonelline 70 mg/kg/day); dose-response (weight change during smoke exposure and cessation graph d pg 15); (weight change in HFD-fed mice administered with PBS or nicotine graph j page 18); Controls received mp w/ vehicle; control mice received mp w/ PBS; animal info (8-week old male mice, fed a high-fat or normal chow diet, exposed to cigarette smoke and given 4 antibiotics through their drinking water); Resultant plasma level (plasma DMG levels in HFD-fed mice exposed to smoke reduced after antibiotic treatment); (higher plasma DMG levels in HFD-fed mice that received FMT from donors that underwent cessation of smoke exposure; dependence;

**Q10113:** P. Bonilla, *et al.* Human-Induced Neural and Mesenchymal Stem Cell Therapy Combined with a Curcumin Nanoconjugate as a Spinal Cord Injury Treatment. *International Journal of Molecular Sciences* 2021;22(11):

**Agents:** Polyacetal-curcumin nanoconjugate **Vehicle:** Saline; **Route:** CSF/CNS (intrathecal); **Species:** Rat; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Saline 0.9% vehicle used; Controls received mp w/ vehicle; animal info: Female Sprague–Dawley weighing 300g; post op. care: buprenorphine; behavioral testing: open-field BBB locomotor scale and video-based system for automated gait analysis; PA-C aka polyacetal-curcumin nonconjugate; spinal cord injury



**Q9194:** W. Bazzar, *et al.* Pharmacological inactivation of CDK2 inhibits MYC/BCL-XL-driven leukemia in vivo through induction of cellular senescence. *Cell Cycle* 2021;20(1):23-38

**Agents:** CVT2584 **Vehicle:** DMSO; **Route:** IP; **Species:** Mice; **Pump:** Not Stated; **Duration:** 16 days;

**ALZET Comments:** Dose (2.5 mg/kg/hour); Controls received mp w/ vehicle; animal info (Transplanted BALB/c or C57BL/6 mice); CVT2584 aka CDK2 inhibitor; cancer (cancer therapy; MYC-driven tumors);

**Q9884:** A. Younsi, *et al.* Three Growth Factors Induce Proliferation and Differentiation of Neural Precursor Cells In Vitro and Support Cell-Transplantation after Spinal Cord Injury In Vivo. *Stem Cells International* 2020;2020(5674921

**Agents:** Platelet-derived growth factor, human recombinant; Epidermal Growth Factor; Basic fibroblast growth factor, recombinant human; **Vehicle:** Not Stated; **Route:** CSF/CNS (spinal cord); **Species:** Rat;

**ALZET Comments:** Dose (1 ug/ml Platelet-derived growth factor, human recombinant; 30 ug/ml Epidermal Growth Factor; 30 ug/ml Basic fibroblast growth factor, recombinant human); Controls received mp w/ vehicle; animal info (female Wistar rats (250 g); Platelet-derived growth factor, human recombinant aka PDGF-AA; Epidermal Growth Factor aka EGF; Basic fibroblast growth factor, recombinant human aka bFGF; spinal cord injury;

**Q9889:** S. Yoshida, *et al.* Syngeneic Mesenchymal Stem Cells Reduce Immune Rejection After Induced Pluripotent Stem Cell-Derived Allogeneic Cardiomyocyte Transplantation. *Scientific Reports* 2020;10(1):4593

**Agents:** Tacrolimus **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 1002; **Duration:** 15 days;

**ALZET Comments:** Dose (1.5 mg/kg body weight); animal info (Adult male BALB/c mice (6–7 weeks old, 17–22 g)); pumps replaced every 13 days; immunology;

**Q9566:** H. Xu, *et al.* Limited efficacy of rapamycin monotherapy in vascularized composite allotransplantation. *Transplant Immunology* 2020;61(101308

**Agents:** Rapamycin; Tacrolimus **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 28 days;

**ALZET Comments:** Dose (0.5-2 mg/kg/day Rapamycin; 2 mg/kg/day Tacrolimus); animal info (Inbred male mice); Rapamycin aka RPM, Tacrolimus aka FK506; cardiovascular;

**Q9560:** J. Xiao, *et al.* Experimental abdominal aortic aneurysm growth is inhibited by blocking the JAK2/STAT3 pathway. *International Journal of Cardiology* 2020;312(100-106

**Agents:** Angiotensin II **Vehicle:** DMSO; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** Dose (1000 ng/kg/min); 0.5% DMSO used; Controls received mp w/ vehicle; animal info (Sixteen-week-old male ApoE<sup>-/-</sup> mice weighing 25 to 30 g); Angiotensin II aka Ang II; cardiovascular;

**Q9537:** L. Wang, *et al.* Donor bone-marrow CXCR4+ Foxp3+ T-regulatory cells are essential for costimulation blockade-induced long-term survival of murine limb transplants. *Scientific Reports* 2020;10(1):9292

**Agents:** Rapamycin **Vehicle:** Not Stated; **Route:** Not Stated; **Species:** Mice; **Pump:** Not Stated; **Duration:** 4 weeks;

**ALZET Comments:** Dose (2 mg/kg/d); animal info (WT BALB/c and WT C57BL/6 mice, 8-12 weeks old); dependence;

**Q9500:** W. M. Tierney, *et al.* Transplanted Human Neural Progenitor Cells Attenuate Motor Dysfunction and Lengthen Longevity in a Rat Model of Ataxia. *Cell Transplantation* 2020;29(963689720920275

**Agents:** Cyclosporine **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2ML4; **Duration:** 28 days;

**ALZET Comments:** Dose (15 mg/kg/d); animal info (spastic Han Wistar rat); behavioral testing (Motor Activity Testing); pumps replaced every 23 days; gene therapy;

**Q10054:** L. Pandolfi, *et al.* Loading Imatinib inside targeted nanoparticles to prevent Bronchiolitis Obliterans Syndrome. *Scientific Reports* 2020;10(1):20726

**Agents:** Imatinib **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (Pathogen-free, male C57BL/6 and Balb/c mice, 20-24 g); Imatinib aka GNP-HCI; toxicology;



**Q8908:** X. Ni, *et al.* C-peptide and islet transplantation improve glomerular filtration barrier in diabetic nephropathy rats. *Transplant Immunology* 2020;62(101322

**Agents:** C-peptide **Vehicle:** Saline; **Route:** Abdomen; **Species:** Rat; **Pump:** 2ML4; **Duration:** 4 weeks;

**ALZET Comments:** Dose (50 pmol/kg/min); Controls received mp w/ vehicle; animal info (male Sprague-Dawley rats, 180-200 g); diabetes;

**Q8642:** H. Li, *et al.* Alterations of gut microbiota contribute to the progression of unruptured intracranial aneurysms. *Nat Commun* 2020;11(1):3218

**Agents:** Angiotensin II **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 4 weeks;

**ALZET Comments:** Dose (1 ug/kg/min); animal info (Male, 8-week-old mice); Angiotensin II aka Ang II; cardiovascular;

**Q9275:** M. Honda, *et al.* Inhibition of receptor activity-modifying protein 1 suppresses the development of endometriosis and the formation of blood and lymphatic vessels. *Journal of Cellular and Molecular Medicine* 2020;24(20):11984-11997

**Agents:** CGRP8-37 **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 14 days;

**ALZET Comments:** Dose (80 ug/d); Controls received mp w/ vehicle; animal info (Female C57BL/6 WT mice (8-week-old)); CGRP8-37 aka Calcitonin gene-related peptide antagonist; peptides; dependence;

**Q8455:** T. R. Eijgenraam, *et al.* The phospholamban p.(Arg14del) pathogenic variant leads to cardiomyopathy with heart failure and is unresponsive to standard heart failure therapy. *Scientific Reports* 2020;10(1):9819

**Agents:** Isoproterenol **Vehicle:** Not stated; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 4 weeks;

**ALZET Comments:** Dose (30 mg/kg/day); animal info (adult (10-week-old) PLN-R14Δ/+ mice); cardiovascular;

**Q9202:** C. Dai, *et al.* Tacrolimus- and sirolimus-induced human beta cell dysfunction is reversible and preventable. *JCI Insight* 2020;5(1):

**Agents:** Adrenomedullin **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2004; **Duration:** 4 weeks;

**ALZET Comments:** Dose (300 ng/kg/hour); Controls received mp w/ vehicle; animal info (male Sprague-Dawley rats, 200-250 g); Adrenomedullin aka ADM; dependence;

**Q8432:** C. Dai, *et al.* Tacrolimus- and sirolimus-induced human beta cell dysfunction is reversible and preventable. *JCI Insight* 2020;5(1):

**Agents:** Tacrolimus **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks;

**ALZET Comments:** Dose (0.25 mg/kg/day); Controls received mp w/ vehicle; animal info (Male NSG mice, age 12–18 weeks); Tacrolimus aka TAC; dependence;

**Q7672:** D. Verma, *et al.* Vitamin K antagonism impairs the bone marrow microenvironment and hematopoiesis. *Blood Pressure* 2019;134(3):227-238

**Agents:** Warfarin **Vehicle:** PBS; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;

**ALZET Comments:** Dose (0.5 mg/kg/d or 0.05 mg/kg/d);

**Q9091:** B. Ulmasov, *et al.* An Inhibitor of Arginine-Glycine-Aspartate-Binding Integrins Reverses Fibrosis in a Mouse Model of Nonalcoholic Steatohepatitis. *Hepatology Communications* 2019;3(2):246-261

**Agents:** Integrin antagonist **Vehicle:** DMSO; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 4 weeks;

**ALZET Comments:** Dose (100 mg/kg/day); 50% DMSO used; Controls received mp w/ vehicle; animal info (C57BL/6J, 5 weeks old, Male); Integrin antagonist aka CWHM-12; dependence;

**Q7494:** B. Ulmasov, *et al.* An Inhibitor of aArginine-Glycine-Aspartate-Binding Integrins Reverses Fibrosis in a Mouse Model of Nonalcoholic Steatohepatitis. *Hepatol Commun* 2019;3(2):246-261

**Agents:** Propanoic acid,

(3S)-3-(3-bromo-5-(tert-butyl)phenyl)-3-(2-(3-hydroxy-5-((5-Hydroxy-1,4,5,6-tetrahydropyrimidin-2-yl)amino)benzamido)acetic acid) **Vehicle:** DMSO, Water; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 4 weeks;

**ALZET Comments:** Dose (100 mg/kg/day); 50% DMSO used; animal info (C57BL/6J 5-week-old male mice); enzyme inhibitor (integrin inhibitor); Therapeutic indication (nonalcoholic steatohepatitis; liver fibrosis);



**Q7663:** G. Shetty, *et al.* Effect of hormone modulations on donor-derived spermatogenesis or colonization after syngeneic and xenotransplantation in mice. *Anesthesia & Analgesia* 2019;7(2):257-265

**Agents:** Follicle stimulating hormone, recomb. human **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 2002; **Duration:** 2 weeks;

**ALZET Comments:** Dose (5 IU/day); Controls received sham surgery; animal info (7-9 weeks, male, C57BL/6Law and nude); replacement therapy (FSH);

**Q8814:** L. E. Ragle, *et al.* Long-label-retaining mammary epithelial cells are created early in ductal development and distributed throughout the branching ducts. *Mechanisms of Development* 2019;159(103565

**Agents:** 5-bromodeoxyuridine **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 14 days;

**ALZET Comments:** Dose (0.1 mg); animal info (3 weeks old); 5-bromodeoxyuridine aka 5BrdU; dependence;

**Q6954:** S. L. Payne, *et al.* Initial cell maturity changes following transplantation in a hyaluronan-based hydrogel and impacts therapeutic success in the stroke-injured rodent brain. *Biomaterials* 2019;192(309-322

**Agents:** Cyclosporine A **Vehicle:** Ethanol, Cremophor; **Route:** SC; **Species:** Rat; **Pump:** 2ML4; **Duration:** 56 days;

**ALZET Comments:** Dose (15 mg/kg/day); animal info (male Sprague-Dawley rats, 350 g); post op. care (3 mg/kg- ketoprofen); behavioral testing (Montoya staircase and tapered beam test); long-term study; ischemia (stroke);

**Q7606:** T. Okamoto, *et al.* Microbiome potentiates endurance exercise through intestinal acetate production. *American Journal of Physiology Endocrinology and Metabolism* 2019;316(5):E956-E966

**Agents:** Acetate; Butyrate **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Mice; **Pump:** 2001; **Duration:** 7 days;

**ALZET Comments:** Dose (1 ul/h); Controls received mp w/ vehicle; animal info (Male, 10 week old, C57BL/6J); dependence;

**Q7562:** G. Merlen, *et al.* Oxaloacetate Protects Rat Liver From Experimental Warm Ischemia/Reperfusion Injury by Improving Cellular Energy Metabolism. *Liver Transpl* 2019;25(4):627-639

**Agents:** Oxaloacetate **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2001D; **Duration:** Not stated;

**ALZET Comments:** Dose (100 mg/kg); animal info (Male, Sprague Dawley, ); ischemia (Liver);

**Q8598:** N. Kashiyama, *et al.* Vasculogenically conditioned peripheral blood mononuclear cells inhibit mouse immune response to induced pluripotent stem cell-derived allogeneic cardiac grafts. *PLoS One* 2019;14(5):e0217076

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

**ALZET Comments:** Dose (0.5 mg/kg/day); animal info (C57BL/6 male mice, 10 weeks old, 20-25 g); cardiovascular;

**Q8031:** H. W. He, *et al.* Soluble Nogo receptor 1 fusion protein protects neural progenitor cells in rats with ischemic stroke. *Neural Regen Res* 2019;14(10):1755-1764

**Agents:** Soluble Nogo66 receptor-Fc protein **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 1003D; **Duration:** 3 days;

**ALZET Comments:** Dose (400 ug/kg); Controls received mp w/ vehicle; animal info (Sprague Dawley, 250-350 g, 10-12 weeks old); behavioral testing (Morris Water Maze Test); Soluble Nogo66 receptor-Fc protein aka sNGR-Fc; ischemia (Stroke);

**Q8028:** Y. Hayashi, *et al.* Stem Cell-Induced Pulp Regeneration Can Be Enhanced by Administration of CCL11-Neutralizing Antibody in the Ectopic Tooth Transplantation Model in the Aged Mice. *Rejuvenation Res* 2019;22(1):51-59

**Agents:** Porphyromonas gingivalis lipopolysaccharide **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;

**ALZET Comments:** Dose (2 ug/day); Controls received mp w/ vehicle; animal info (6 or 13 months old); ALZET brain infusion kit 3 used; bilateral cannula used; cyanoacrylate adhesive; neurodegenerative (Alzheimer's Disease);

**Q8737:** V. Hartwig, *et al.* Human skin-derived ABCB5(+) stem cell injection improves liver disease parameters in Mdr2KO mice. *Archives of Toxicology* 2019;93(9):2645-2660

**Agents:** Tacrolimus **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1002, 2004; **Duration:** 2, 4 weeks;

**ALZET Comments:** Dose (1 mg/kg/day); 0.9% Saline used; Controls received mp w/ vehicle; animal info (Balb/c, 16 weeks old);





**Q8024:** M. Hanoun, *et al.* Nestin(+)NG2(+) Cells Form a Reserve Stem Cell Population in the Mouse Prostate. *Stem Cell Reports* 2019;12(6):1201-1211

**Agents:** Testosterone **Vehicle:** Not stated; **Route:** SC; **Species:** Mice; **Pump:** Not stated; **Duration:** 3-4 weeks;  
**ALZET Comments:** Dose (1:875 g/hour); animal info (Male, C57BL6);

**Q7941:** I. Aquila, *et al.* c-kit Haploinsufficiency impairs adult cardiac stem cell growth, myogenicity and myocardial regeneration. *Cell Death Dis* 2019;10(6):436

**Agents:** Uridine, 5-bromo-2'-deoxy-; Uridine, 5-Ethynyl-2'-deoxy-; Uracil, 5-fluoro- **Vehicle:** Water, Deionized, DMSO buffered;  
**Route:** SC; **Species:** Mice; **Pump:** Not stated; **Duration:** 7, 25, 28 days;  
**ALZET Comments:** Dose ((BrdU 50 mg/kg/day), (EdU 50 mg/kg/day), (5-FU 15 mg/kg/day)); 50% deionized water and 50% DMSO used; Controls received mp w/ vehicle; animal info (12 weeks, male, C57BL/6J, Tg-myh6(MCM), and Tg-myh6MCM: R26(mT-mG/+)); cardiovascular; mp used for BrdU and EdU labeling or for ISO + 5-FU induced cardiomyopathy;

**Q7938:** J. E. Ahlfors, *et al.* Examining the fundamental biology of a novel population of directly reprogrammed human neural precursor cells. *Stem Cell Res Ther* 2019;10(1):166

**Agents:** Cyclosporin A **Vehicle:** Ethanol, Cremophor buffered; **Route:** SC; **Species:** Mice; **Pump:** 1002; **Duration:** 1, 2 weeks;  
**ALZET Comments:** Dose (10 mg/kg/day); 65% ethanol: 35% Cremaphor used; Controls received mp w/ vehicle; animal info (8 weeks, Shi(-/-)); mp with CsA used to induce immunosuppression in Shiverer mice;

**Q7885:** C. Vandenbussche, *et al.* Tacrolimus-induced nephrotoxicity in mice is associated with microRNA deregulation. *Archivos de Zootecnia* 2018;92(4):1539-1550

**Agents:** Tacrolimus **Vehicle:** Serum, physiological; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;  
**ALZET Comments:** Dose (1 mg/kg/d); Controls received mp w/ vehicle; animal info (4 weeks, male, CD-1, 30-40g); enzyme inhibitor (Calcineurin); toxicology; Tacrolimus actively participates to chronic allograft dysfunction through miR-21-5p modulation;

**Q8837:** H. Xu, *et al.* Utility of IL-2 Complexes in Promoting the Survival of Murine Orthotopic Forelimb Vascularized Composite Allografts. *Transplantation* 2018;102(1):70-78

**Agents:** Rapamycin **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 28 days;  
**ALZET Comments:** Dose (2 mg/kg/day); Controls did not receive mp; animal info (male, C57BL/6 and BALB/c); comparison of IP injection of FK506 vs mp; immunology; RPM monotherapy was about as effective as post-Tx IL-2C in prolonging survival. Co-administration of IL-2C and post-Tx RPM had additional benefits, with pre-Tx IL-2C plus RPM causing a fivefold increase in survival, and post-Tx IL-2C plus RPM causing a threefold increase in survival;

**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;

**Q7507:** E. J. White, *et al.* Sialidase down-regulation reduces non-HDL cholesterol, inhibits leukocyte transmigration, and attenuates atherosclerosis in ApoE knockout mice. *J Biol Chem* 2018;293(38):14689-14706

**Agents:** acetylneuraminic acid, 2,3-dehydro-2-deoxy-N- **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 6 weeks;  
**ALZET Comments:** Dose (0.06 µg/h); Controls received mp w/ vehicle; animal info (8 months, male, Apoe-/-); enzyme inhibitor (sialidase); cardiovascular;



**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;

**Q8157:** S. L. Payne, *et al.* In Vitro Maturation of Human iPSC-Derived Neuroepithelial Cells Influences Transplant Survival in the Stroke-Injured Rat Brain. *Tissue Eng Part A* 2018;24(3-4):351-360

**Agents:** Cyclosporine A **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2ML4; **Duration:** 7 days;

**ALZET Comments:** Dose (15 mg/kg/day); Controls received mp w/ vehicle; animal info (10 weeks old, Male, Sprague Dawley); post op. care (ketoprofen); Cyclosporine A aka CsA ; neurodegenerative (Stroke);

**Q7059:** J. Patel, *et al.* Effect of irradiation and bone marrow transplantation on angiotensin II-induced aortic inflammation in ApoE knockout mice. *Atherosclerosis* 2018;276(74-82)

**Agents:** Angiotensin II **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice (knockout); **Pump:** Not Stated; **Duration:** 14 days;

**ALZET Comments:** Dose (0.8, 1.5, or 3 mg/kg/day); animal info (BMT or non BMT male mice); cardiovascular;

**Q8312:** L. A. Orci, *et al.* Effects of the gut-liver axis on ischaemia-mediated hepatocellular carcinoma recurrence in the mouse liver. *J Hepatol* 2018;68(5):978-985

**Agents:** Tlr4 competitive inhibitor **Vehicle:** Not stated; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 2 weeks;

**ALZET Comments:** Dose (15 mg/kg/week); animal info (Male, C57BL/6J); CyP aka cyanobacterial LPS-like Tlr4 inhibitor; enzyme inhibitor (Tlr4 inhibitor); ischemia (liver);

**Q8307:** G. Oldani, *et al.* Chimeric liver transplantation reveals interspecific graft remodelling. *J Hepatol* 2018;69(5):1025-1036

**Agents:** Tacrolimus **Vehicle:** Not stated; **Route:** SC; **Species:** Mice; Rat; **Pump:** 1002 or 2002; **Duration:** 14 days or 28 days;

**ALZET Comments:** Dose (0.3, 0.6, or 1.2 mg/kg); animal info (C57BL/6J, 23-31 g, Male; Lewis. Male, 47-60 g ); pumps replaced every 2 weeks; dependence;

**Q7215:** H. Li, *et al.* Fibroblast growth factor 21 increases insulin sensitivity through specific expansion of subcutaneous fat. *Nat Commun* 2018;9(1):272

**Agents:** Fibroblast growth factor 21, mouse recomb. **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Duration:** 4 weeks;

**ALZET Comments:** Dose (0.1 mg/kg/day); Controls received mp w/ vehicle; animal info (8 week old, FGF21KO); Resultant plasma level (1.5 ng/ml, which was 2–3 times of the 8-week HFD-induced endogenous FGF21 level of 0.6 ng/ml (Fig. 3f)); dependence;

**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;

**Q7755:** R. W. Holdcraft, *et al.* A model for determining an effective in vivo dose of transplanted islets based on in vitro insulin secretion. *Xenotransplantation* 2018;25(6):e12443

**Agents:** Insulin, recomb. human **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 3-5 days;

**ALZET Comments:** Dose ((female 1.5-2.0 U/day), (males 3.0-4.5 U/day)); Controls consisted of rats that did not become diabetic during the initial study period; animal info (male and female, BioBreeding diabetes-prone); Multiple pumps per animal (2 if hyperglycemic state observed. see p.4); comparison of macrobead implant vs mp; diabetes; Pilot study for CGM calibration 3-5 days followed by 1 or 3 month study using microbeads. Pump models not stated but duration length was listed at 7 or 14 days;



**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;

**Q7808:** S. Fabbiano, *et al.* Functional Gut Microbiota Remodeling Contributes to the Caloric Restriction-Induced Metabolic Improvements. *Cell Metabolism* 2018;28(6):907-921 e7

**Agents:** lipopolysaccharide **Vehicle:** Not stated; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** Dose (200, 300 µg/kg/day); Controls received ad libitum diet and mp w/ agent; animal info (8 weeks, male, C57BL/10J, C57BL/10ScNJ, or C57BL/6JRj); Lipopolysaccharides (LPS) from *Escherichia coli* 0127:B8;

**Q7128:** L. Detti, *et al.* Xenotransplantation of pre-pubertal ovarian cortex and prevention of follicle depletion with anti-Müllerian hormone (AMH). *J Assist Reprod Genet* 2018;35(10):1831-1841

**Agents:** anti-Müllerian hormone, recomb. **Vehicle:** Saline; **Route:** IP; **Species:** Mice (nude); **Pump:** 1002; **Duration:** 2 weeks;

**ALZET Comments:** Dose (1.23 µg/d); Controls received mp w/ vehicle; animal info (10-week-old NU/J mice, or nude mice.); functionality of mp verified by residual volume;

**Q7790:** A. Citro, *et al.* Anti-Inflammatory Strategies in Intrahepatic Islet Transplantation: A Comparative Study in Preclinical Models. *Transplantation* 2018;102(2):240-248

**Agents:** Reparixin **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

**ALZET Comments:** Dose (5.4 mg/h/kg); animal info (Male, C57BL/6, Balb/c, 8-9 weeks old, 24-6 g); Reparixin aka CXCR1/2 inhibitor; enzyme inhibitor (CXCR1/2 inhibitor); diabetes;

**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;

**Q5919:** K. M. Williams, *et al.* FLT3 ligand regulates thymic precursor cells and hematopoietic stem cells through interactions with CXCR4 and the marrow niche. *Experimental Hematology* 2017;52(40-49)

**Agents:** FLT3L, recombinant human **Vehicle:** Not Stated; **Route:** Not Stated; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ PBS; animal info (male, C57BL/6(B6)-Ly5.1 or B6, post-pubertal); Dose (5 µg/day);

**Q5695:** T. L. Uhlendorf, *et al.* Efficacy of Two Delivery Routes for Transplanting Human Neural Progenitor Cells (NPCs) Into the Spastic Han-Wistar Rat, a Model of Ataxia. *Cell Transplantation* 2017;26(2):259-269

**Agents:** Cyclosporine **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2004; **Duration:** Not Stated;

**ALZET Comments:** animal info (spastic Han-Wistar, 30 days); no stress (see pg. 268); behavioral testing (locomotor activity); cardiovascular; "This method of chronic delivery prevents painful daily injection and subsequent behavioral changes in treated animals. We did not detect any negative effects of cyclosporine, and no behavioral alterations were observed in treated mutants other than natural disease progression" pg 268; Dose (15 mg/kg/day);

**Q6772:** S. Seiler, *et al.* Antagonization of the Nogo-Receptor 1 Enhances Dopaminergic Fiber Outgrowth of Transplants in a Rat Model of Parkinson's Disease. *Front Cell Neurosci* 2017;11(151)

**Agents:** NEP1-40 **Vehicle:** Saline; **Route:** CSF/CNS (right lateral ventricle); **Species:** Rat; **Pump:** 2ML2; **Duration:** 2 weeks;

**ALZET Comments:** Dose (75 mg/kg/day); Controls received mp w/ vehicle; animal info (Adult female hemi-parkinsonian Wistar rats); ALZET brain infusion kit 2 used; Brain coordinates (posterior 0.8 mm, lateral 1.6 mm and 3.5 mm ventral to the dura, the incisor bar was set at 0.0 mm.); neurodegenerative (Parkinson's disease);





**Q5890:** T. Sakaue, *et al.* Perivascular Adipose Tissue Angiotensin II Type 1 Receptor Promotes Vascular Inflammation and Aneurysm Formation. *Hypertension* 2017;70(4):780-789

**Agents:** Angiotensin II **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (ApoE 12-14 weeks old); cardiovascular; immunology; peptides; BP measured using tail cuff; Dose (1000 ng/kg/min);

**Q5818:** I. C. L. Pillai, *et al.* Cardiac Fibroblasts Adopt Osteogenic Fates and Can Be Targeted to Attenuate Pathological Heart Calcification. *Cell Stem Cell* 2017;20(2):218-232 e5

**Agents:** SYL-001, ARL67156 Trisodium Salt **Vehicle:** Propylene Glycol; **Route:** Not Stated; **Species:** Mouse; **Pump:** 1007D; **Duration:** Not Stated;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (8-10 weeks old); 10% Propylene Glycol; cardiovascular; enzyme inhibitor (ectonucleotide pyrophosphatase/phosphodiesterase-1 (ENPP1)); Therapeutic indication (Heart calcification); Dose (SYL-001: 10 mg/kg/day, ARL67156 Trisodium Salt: 1 mg/kg/day);

**Q7248:** R. L. Nuryyev, *et al.* Transplantation of Human Neural Progenitor Cells Reveals Structural and Functional Improvements in the Spastic Han-Wistar Rat Model of Ataxia. *Cell Transplantation* 2017;26(11):1811-1821

**Agents:** Cyclosporine **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** Dose (15 mg/kg/day); animal info (30 days of age, male SHW mutant rats); neurodegenerative (replacement/augmentation);

**Q6583:** Y. C. Lin, *et al.* Simultaneously Targeting Myofibroblast Contractility and Extracellular Matrix Cross-Linking as a Therapeutic Concept in Airway Fibrosis. *American Journal of Transplantation* 2017;17(5):1229-1241

**Agents:** Relaxin-2, recomb. human **Vehicle:** Saline; **Route:** Not Stated; **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;

**ALZET Comments:** Dose (0.5mg/kg); Controls received mp w/ vehicle; animal info (wild type or B6.126-Ptger2tm1Brey/J C57BL/6J mice); cardiovascular;

**Q6264:** T. Feridooni, *et al.* Effects of beta-adrenergic receptor drugs on embryonic ventricular cell proliferation and differentiation and their impact on donor cell transplantation. *American Journal of Physiology Heart and Circulatory Physiology* 2017;312(5):H919-H931

**Agents:** Isoproterenol; Metoprolol **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 2001; **Duration:** 3 days;

**ALZET Comments:** Dose (Isoproterenol: 0.025 g/ml; Metoprolol: 0.0684 g/ml); animal info (CD1 and C57BL/6 (BL6) mice);

**Q6022:** Y. Dai, *et al.* The paracrine effect of cobalt chloride on BMSCs during cognitive function rescue in the HIBD rat. *Behavioural Brain Research* 2017;332(99-109

**Agents:** Vascular Endothelial Growth Factor **Vehicle:** Saline; **Route:** CSF/CNS (Left Lateral Ventricle); **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (17 weeks); behavioral testing (Morris water maze); Therapeutic indication (Hypoxia-inducible factor-1 $\alpha$  Cobalt chloride Hypoxic-ischemic encephalopathy);

**Q6314:** M. M. Adil, *et al.* Engineered hydrogels increase the post-transplantation survival of encapsulated hESC-derived midbrain dopaminergic neurons. *Biomaterials* 2017;136(1-11

**Agents:** Cyclosporine **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** Not Stated;

**ALZET Comments:** Dose (10 mg/kg/day); animal info (adult female Fischer 344 rats); pumps replaced every 2 weeks;