



Recent References (2008-Present) on Micro Perfusion of Solid Tissue  
Using ALZET® Osmotic Pumps

**Q10754:** J. Hu, *et al.* Trimethylamine N-Oxide Promotes Abdominal Aortic Aneurysm Formation by Aggravating Aortic Smooth Muscle Cell Senescence in Mice. *Journal of Cardiovascular Translational Research* 2022;15(5):1064-1074

**Agents:** Angiotensin II **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 4 weeks;

**ALZET Comments:** Dose (1000 ng/kg/min); Controls received mp w/ vehicle; animal info (Male; apoe-/- 8 weeks old); peptides; tissue perfusion (Brain tissue); cardiovascular;

**Q10278:** D. B. Mangarova, *et al.* Microscopic multifrequency magnetic resonance elastography of ex vivo abdominal aortic aneurysms for extracellular matrix imaging in a mouse model. *Acta Biomaterialia* 2022;140(389-397)

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

**ALZET Comments:** Dose (1000 ng/kg/min); animal info (8-weeks old B6.129P2- Apoetm1Unc/J (ApoE-/-) male mice); tissue perfusion (cardiac); cardiovascular;

**Q7861:** S. Ruoss, *et al.* Inhibition of calpain delays early muscle atrophy after rotator cuff tendon release in sheep. *Physiol Rep* 2018;6(21):e13833

**Agents:** calpeptin **Vehicle:** DMSO; **Route:** intramuscular (infraspinatus); **Species:** Sheep; **Pump:** 2ML4; **Duration:** 6 weeks;

**ALZET Comments:** Dose (0.75 mg/day); animal info (26.7+/-1.4 months, female, Swiss Alpine); pumps replaced at 2 weeks; calpeptin is a synthetic calpain inhibitor; enzyme inhibitor (calpain); tissue perfusion (m. infraspinatus); good methods (detailed pump implantation procedure on page 3.); Therapeutic indication (calpain inhibition prevented the early unloading adaptations, but not the subsequent initiation of rotator cuff disease); 75% DMSO used;

**Q5909:** L. Wang, *et al.* Sodium butyrate suppresses angiotensin II-induced hypertension by inhibition of renal (pro)renin receptor and intrarenal renin-angiotensin system. *J Hypertens* 2017;35(9):1899-1908

**Agents:** Angiotensin II; sodium butyrate **Vehicle:** Not Stated; **Route:** SC; Intrarenal (medulla); **Species:** Rat; **Pump:** 2002;

**Duration:** 14 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 250-300g); Multiple pumps per animal (2); replacement therapy (uniphrectomy); tissue perfusion (renal medulla); cardiovascular;

antihypertensive; peptides; Bp measured using radio telemetry (DSI); Dose (Ang II 200 ng/kg/min; NaBu 1 ug/kg/min); good bp comparison curve (pg4);

**Q5080:** J. Urra, *et al.* In vivo blockade of acetylcholinesterase increases intraovarian acetylcholine and enhances follicular development and fertility in the rat. *Sci Rep* 2016;6(30129)

**Agents:** Huperzine A **Vehicle:** Not Stated; **Route:** Intraovarian (ovarian bursa); **Species:** Rat; **Pump:** 2004; **Duration:** 4 weeks;

**ALZET Comments:** Controls received mp w/ saline; animal info (female, Sprague Dawley, 250-300g, hemi-OVX); tissue perfusion (ovarian bursa); enzyme inhibitor (acetylcholine esterase);

**Q5395:** T. H. Lin, *et al.* NF-kappaB decoy oligodeoxynucleotide mitigates wear particle-associated bone loss in the murine continuous infusion model. *Acta Biomaterialia* 2016;41(273-81)

**Agents:** Ultra-high molecular weight polyethylene particles; oligodeoxynucleotide, decoy; oligodeoxynucleotide, scrambled; Endotoxin, LPS; Brain-derived neurotrophic factor; **Vehicle:** Saline; **Route:** In Vitro (cell culture); Bone (Femur); **Species:** Mice (nude); **Pump:** 2006; **Duration:** 4 weeks;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (Male athymic nude mice, 10-15 weeks old); stability verified by (in vitro experiment); dose-response (pg. 277); good methods (pg. 276); tissue perfusion (bone); Dose (15 mg/ml UHMWPE, 50uM decoy, 1 ug/ml LPS); Therapeutic indication (Bone loss, chronic inflammation);

**Q5311:** L. Chen, *et al.* 20-HETE contributes to ischemia-induced angiogenesis. *Vascular Pharmacology* 2016;83(57-65)

**Agents:** DDMS; 6,15-20-HEDGE **Vehicle:** Not Stated; **Route:** Intramuscular (hindlimb gracilis); **Species:** Mice; **Pump:** 2002, 2004; **Duration:** 32 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (Balb/c mice, 12 wk old); functionality of mp verified by blood pressure and blood perfusion scans; dose-response (pg. 61); good methods (pg. 58); ischemia (peripheral); tissue perfusion (intramuscular); Polyethylene catheter tubing used (inner ID 0.8 mm); Dose (5 mg/kg/day);



**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

**Agents:** Sphingosine, D-erythro **Vehicle:** saline; **Route:** SC; **Species:** Rat; **Pump:** 2002; **Duration:** 2 weeks;

**ALZET Comments:** 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)

**Q4141:** Y. Tona, *et al.* Therapeutic potential of a gamma-secretase inhibitor for hearing restoration in a guinea pig model with noise-induced hearing loss. *BMC Neuroscience* 2014;15(U1-U8)

**Agents:** MDL28170 **Vehicle:** DMSO; PBS; **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** 1002; **Duration:** 14 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (Hartley strain, 350-400g); 0.3% DMSO used; tissue perfusion (cochlea); used Teflon tube with inner diameter of 180 µm to cannulate cochlea; MDL28170 is a gamma-secretase inhibitor;

**Q4135:** E. Tavares, *et al.* Immunoneutralization of Endogenous Aminoprocaltinin Attenuates Sepsis-Induced Acute Lung Injury and Mortality in Rats. *American Journal of Pathology* 2014;184(3069-3083)

**Agents:** Antibody, anti-aminoprocaltinin **Vehicle:** Saline; **Route:** IP; **Species:** Rat; **Pump:** 2001D; **Duration:** 18 hours;

**ALZET Comments:** Controls received mp w/ control antibody; animal info (male, Wistar, 280-300g); tissue perfusion (peritoneum); immunology; peptides; Catheter used to cannulate peritoneum;

**Q3963:** J. Lee, *et al.* Intrauterine Coadministration of ERK1/2 Inhibitor U0126 Inhibits Interferon TAU Action in the Endometrium and Restores Luteolytic PGF(2alpha) Pulses in Sheep. *Biology of Reproduction* 2014;91(U177-U185)

**Agents:** U0126; serum protein, ovine; interferon tau, recombinant ovine **Vehicle:** DMSO; **Route:** Intrauterine (uterine horn);

**Species:** Sheep (ewe); **Pump:** 2ML1; **Duration:** 6 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (female, Suffolk Ovis aries); 3% DMSO used; tissue perfusion (uterine horn); cyanoacrylate adhesive; used cyanoacrylate glue to anchor pump; interferon tau aka IFNT;

**Q5009:** M. D. Kritzer, *et al.* The scaffold protein muscle A-kinase anchoring protein beta orchestrates cardiac myocyte hypertrophic signaling required for the development of heart failure. *Circulation: Heart Failure* 2014;7(4):663-72

**Agents:** Isoproterenol **Vehicle:** Not Stated; **Route:** Not Stated; **Species:** mice; **Pump:** Not Stated; **Duration:** 2 weeks;

**ALZET Comments:** animal info (C57BL/76 mice; 8-week-old mAKAPfl/fl); ischemia (cardiac); behavioral testing (physiological hypertrophy induced with 5-wk swimming regimen, Hargreaves test); tissue perfusion (heart); cardiovascular; Iso aka Isoproterenol; Dose: 60 mg/kg/day

**Q3405:** I. Armando, *et al.* Dopamine D3 receptor inhibits the ubiquitin-specific peptidase 48 to promote NHE3 degradation. *FASEB Journal* 2014;28(1422-1434)

**Agents:** GR103691; RNA, small interfering **Vehicle:** Transfection reagent (TransIT); **Route:** SC; kidney (subcapsular space);

**Species:** Mice; **Pump:** 1007D; **Duration:** 4 days; 7 days;

**ALZET Comments:** Controls received mp w/ vehicle or nonsilencing "mock siRNA"; animal info (male, C57BL6J, adult); tissue perfusion (subcapsular space; kidney); gene therapy; antihypertensive; GR103691 is a D3R antagonist; used PE tubing #0007701; pump sutured to abdominal wall; surgical glue applied at puncture site to hold catheter tubing in place and to prevent leakage;

**Q3795:** Y. Aghazadeh, *et al.* Induction of Androgen Formation in the Male by a TAT-VDAC1 Fusion Peptide Blocking 14-3-3epsilon Protein Adaptor and Mitochondrial VDAC1 Interactions. *MOLECULAR THERAPY* 2014;22(1779-1791)

**Agents:** TVG167; TVS167 **Vehicle:** Water; **Route:** IP; intratesticular; **Species:** Rat; **Pump:** Not Stated; **Duration:** 24 hours;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, Sprague Dawley); tissue perfusion (testis); peptide; TVS167 and TVG167; pump infused at 1.0 µl/hr;

**Q2471:** V. M. Villar, *et al.* Sorting Nexin 1 Loss Results in D(5) Dopamine Receptor Dysfunction in Human Renal Proximal Tubule Cells and Hypertension in Mice. *Journal of Biological Chemistry* 2013;288(1):152-163

**Agents:** RNA, small interfering **Vehicle:** Not Stated; **Route:** Kidney; **Species:** Mice; **Pump:** Not Stated; **Duration:** 7 days;

**ALZET Comments:** Control animals received mp w/ vehicle or non-silencing mock siRNA; animal info (C57BL/6, BALB/c, nephrectomized, adult, male); Snx-1 specific siRNA; infusion rate of 0.5 µl/hr; tissue perfusion (kidney); PE catheter used



**Q3106:** C. O. Lemley, *et al.* Uterine Infusion of Melatonin or Melatonin Receptor Antagonist Alters Ovine Feto-Placental Hemodynamics During Midgestation. *Biology of Reproduction* 2013;89(2):U24-U32

**Agents:** Melatonin; Luzindole **Vehicle:** DMSO; water; **Route:** Intrauterine (uterine horn); **Species:** Sheep (ewe); **Pump:** 2ML4; **Duration:** 28 days;

**ALZET Comments:** Controls received mp w/ vehicle; functionality of mp verified by serum levels of melatonin taken; 45% DMSO used; stress/adverse reaction: (see pg.2); post op. care (For two days: flunixin meglumine 50 mg/ml IM twice a day; Penicillin G procain 300,000 u/ml once per day); tissue perfusion (uterus mesometrium); cardiovascular;

**Q3105:** T. G. Landry, *et al.* Chronic neurotrophin delivery promotes ectopic neurite growth from the spiral ganglion of deafened cochleae without compromising the spatial selectivity of cochlear implants. *Journal of Comparative Neurology* 2013;521(12):2818-2832

**Agents:** Neurotrophin; Brain-derived neurotrophic factor **Vehicle:** Not Stated; **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** Controls received mp w/ artificial perilymph; animal info (young adult, 300-600g); tissue perfusion (cochlea); peptides;

**Q2832:** Y. Yang, *et al.* Paraoxonase 2 decreases renal reactive oxygen species production, lowers blood pressure, and mediates dopamine D(2) receptor-induced inhibition of NADPH oxidase. *Free Radical Biology and Medicine* 2012;53(3):437-446

**Agents:** RNA, small interfering, D2R; RNA, small interfering, PON2 **Vehicle:** Not Stated; **Route:** Kidney (renal capsule); **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Control animals received mp w/ nonsilencing control RNA; animal info (D2R deficient, 6-8 mo old, uniphrectomy); PE tubing used (item #0007701); "The body of the minipump was placed in the area previously occupied by the kidney that was removed; stabilization was achieved by suturing (4-0 ethilon) the minipump to the lateral abdominal musculature close to it."; tissue perfusion (renal capsule)

**Q2425:** H. Toyota, *et al.* A novel treatment for vestibular disorder with FGLM-NH<sub>2</sub> plus SSSR. *Neuroscience Letters* 2012;526(2):128-132

**Agents:** FGLM-NH<sub>2</sub>; SSSR **Vehicle:** Not Stated; **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** 2002; **Duration:** 14 days;

**ALZET Comments:** Control animals received mp w/ artificial perilymph; animal info (male, Hartley); FGLM-NH<sub>2</sub> also known as Phenylalanine-Glycine-Leucine-Methionine-Amide; SSSR also known as Serine-Serine-Serine-Arginine; tissue perfusion

**Q1915:** D. J. Sly, *et al.* Brain-Derived Neurotrophic Factor Modulates Auditory Function in the Hearing Cochlea. *JARO-JOURNAL OF THE ASSOCIATION FOR RESEARCH IN OTOLARYNGOLOGY* 2012;13(1):1-16

**Agents:** Brain-derived neurotrophic factor **Vehicle:** Not Stated; **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** 2004; **Duration:** 4 weeks;

**ALZET Comments:** Controls received mp w/ Ringers solution; animal info (adult, male, Dunkin-Hartley pigmented, 233-815 g); post op. care (buprenorphine); "Polymers, particularly hydrogels that may be applied directly to the round window, were considered... However, most have a release profile that varies over time, so instead we chose to place a cannula attached to a mini-osmotic pump directly onto the round window." pg 2; tissue perfusion (cochlea, round window niche)

**Q2347:** M. A. Ricu, *et al.* Evidence for a Celiac Ganglion-Ovarian Kisspeptin Neural Network in the Rat: Intraovarian Anti-Kisspeptin Delays Vaginal Opening and Alters Estrous Cyclicity. *Endocrinology* 2012;153(10):4966-4977

**Agents:** P234 **Vehicle:** Not Stated; **Route:** Intraovarian; **Species:** Rat; **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** Control animals received mp w/ saline; animal info (Sprague Dawley, male, 30, 60 days old); P234 is a kisspeptin antagonist; "the pumps were left in the animal for a total of 50 d to control the estrous cycling activity." pg 4968; tissue perfusion (ovary)



**Q2301:** K. Nishijima, *et al.* Interactions among pulmonary surfactant, vernix caseosa, and intestinal enterocytes: intra-amniotic administration of fluorescently liposomes to pregnant rabbits. *American Journal of Physiology Lung Cellular and Molecular Physiology* 2012;303(3):L208-L214

**Agents:** Liposomes, fluorescently labeled; coatasome EL-01-C, hydrated **Vehicle:** DMSO; water, distilled; **Route:** Intrauterine; **Species:** Rabbit (fetus); **Pump:** 2ML1; **Duration:** 1 week;

**ALZET Comments:** Control animals received mp w/ liposome alone; animal info (Japanese, White, 4.2-5.4 kg, teen); tissue perfusion (fetus); "5-cm sterile PE 60 silicone catheter with silicone flange was attached to each pump" pg L209; Fig 2, image of pump and catheter placement; multiple pumps used (2); teratology

**Q2166:** F. P. Ganchou, *et al.* Effect of Chronic Administration of Endothelin Receptor Type A Antagonist (BQ-610) on Functional Lifespan of the Corpus Luteum in Sheep. *Revista Científica-Facultad De Ciencias Veterinarias* 2012;22(4):321-331

**Agents:** BQ610 **Vehicle:** Methanol; saline; **Route:** Intraovarian (corpus luteum); **Species:** Sheep (ewe); **Pump:** 2002; **Duration:** 14 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (nonpregnant, Suffolk); tissue perfusion (corpus luteum); BQ-610 is an endothelin receptor type A antagonist

**Q2056:** P. Dorniak, *et al.* Endometrial HSD11B1 and Cortisol Regeneration in the Ovine Uterus: Effects of Pregnancy, Interferon Tau, and Prostaglandins. *Biology of Reproduction* 2012;86(4):U106-U115

**Agents:** Interferon, tau, recomb. ovine; meloxicam; PGE2, ovine serum; PGF2a, ovine serum; PGI2, ovine serum **Vehicle:** Ethanol; saline; **Route:** Intrauterine (uterine horn); **Species:** Sheep (ewe); **Pump:** 2ML1; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (Mature Rambouillet); good methods (pg 2); vinyl tubing used (0007760); 2% ethanol used; enzyme inhibitor (prostaglandin synthase two); tissue perfusion (intrauterine)

**Q2057:** P. Dorniak, *et al.* Conceptus-Derived Prostaglandins Regulate Endometrial Function in Sheep. *Biology of Reproduction* 2012;87(1):U80-U86

**Agents:** Interferon, tau, recomb. ovine; meloxicam; PGE2, ovine serum; PGF2a, ovine serum; PGI2, ovine serum **Vehicle:** Ethanol; saline; **Route:** Intrauterine (uterine horn); **Species:** Sheep (ewe); **Pump:** 2ML1; **Duration:** 5 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (Mature Rambouillet); tissue perfusion (intrauterine); multiple pumps used (2); enzyme inhibitor (prostaglandin synthase two)

**Q1903:** S. Cuevas, *et al.* Role of Renal DJ-1 in the Pathogenesis of Hypertension Associated With Increased Reactive Oxygen Species Production. *Hypertension* 2012;59(2):446-452

**Agents:** RNA, small interfering, DJ-1 **Vehicle:** In vivo transfection agent; **Route:** Kidney; **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ non-silencing RNA; animal info (F1 hybrid; wt, 6-8 mo old, uninephrectomized, adult, male, C57BL/6J); ALZET polyethylene tubing set used (0007701); tissue perfusion (kidney); "The osmotic pump was sutured to the abdominal wall to prevent excessive movement of the pump" pg 447

**Q2327:** H. Chim, *et al.* Stromal-cell-derived factor (SDF) 1-alpha in combination with BMP-2 and TGF-beta1 induces site-directed cell homing and osteogenic and chondrogenic differentiation for tissue engineering without the requirement for cell seeding. *Cell and Tissue Research* 2012;350(1):89-94

**Agents:** Stromal-cell-derived factor-1, alpha; bone morphogenic protein 2; transforming growth factor-1, beta **Vehicle:** Not Stated; **Route:** IP (abdominal wall); **Species:** Rat; **Pump:** 2004; **Duration:** 4 weeks;

**ALZET Comments:** Negative control animals received no cytokines; animal info (Sprague Dawley, adult); "A custom-made apparatus for the constant delivery of cytokines was assembled consisting in a microneedle system and Alzet osmotic pump" pg 90; fig 1b, image of custom-made cytokine delivery apparatus; tissue perfusion (anterior abdominal wall)

**Q2262:** A. Casazza, *et al.* Tumour growth inhibition and anti-metastatic activity of a mutated furin-resistant Semaphorin 3E isoform. *EMBO Molecular Medicine* 2012;4(3):234-250

**Agents:** Semaphorin 3E **Vehicle:** Not Stated; **Route:** IP; **Species:** Mice; **Pump:** 2002; **Duration:** 2 weeks;

**ALZET Comments:** Controls received mp w/ mock saline; animal info (12-14 wks old, RT2); tissue perfusion (pancreas); catheter placement verified post mortem; "(silastic tubing) was passed into the peritoneal cavity and sutured to the abdominal wall to reach directly the pancreas." data supplement; protein



**Q1394:** J. M. Wen, *et al.* A(2B) adenosine receptor contributes to penile erection via PI3K/AKT signaling cascade-mediated eNOS activation. *FASEB Journal* 2011;25(8):2823-2830

**Agents:** Not Stated **Vehicle:** Not Stated; **Route:** Intrapenile; **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;

**ALZET Comments:** Animal info (A2BR-deficient, C57CL/6); tissue perfusion (corpus cavernosum); ALZET mouse jugular catheter used; 25-gauge needle inserted into the right corpus cavernosum was connected to a pressure transducer and an amplifier unit; intracavernosal pressure (ICP) measurement

**Q1236:** E. A. Miyasaka, *et al.* In vivo growth of a bioengineered internal anal sphincter: comparison of growth factors for optimization of growth and survival. *Pediatric Surgery International* 2011;27(2):137-143

**Agents:** Fibroblast growth factor-2; Vascular endothelial growth factor-2; Platelet-derived growth factor **Vehicle:** Not Stated;

**Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;

**ALZET Comments:** Controls received mp with no growth factors; animal info (C57BL/6); good methods, pg 138; tissue perfusion (internal anal sphincter); silicone catheter used; "the osmotic pumps we used completed delivery of the growth factors by 28 days, which would clearly limit the duration of exposure to the growth factor, lessening the risk of malignancy" pg 143

**Q1509:** X. Li, *et al.* Protective Role of Hydrogen Sulfide against Noise-Induced Cochlear Damage: A Chronic Intracochlear Infusion Model. *PLoS One* 2011;6(10):U487-U492

**Agents:** Sodium hydrosulfide; propargylglycine, DL- **Vehicle:** Not Stated; **Route:** Ear (cochlea); **Species:** Rat; **Pump:** 2002; **Duration:** Not Stated;

**ALZET Comments:** Controls received mp w/ artificial perilymph; animal info (Sprague Dawley, 250-350 g); tissue perfusion (cochlear); ALZET mouse jugular catheter used (#0007700); stress/adverse effects, pg e26728 "Two rats died of post-surgical infection, and one rat died of hemorrhage."

**Q1195:** P. A. Leake, *et al.* Brain-Derived Neurotrophic Factor Promotes Cochlear Spiral Ganglion Cell Survival and Function in Deafened, Developing Cats. *Journal of Comparative Neurology* 2011;519(8):1526-1545

**Agents:** Brain-derived neurotrophic factor, human **Vehicle:** Perilymph, artificial; **Route:** Ear (cochlea); **Species:** Cat; **Pump:** 1002; 2004; **Duration:** 10 weeks;

**ALZET Comments:** Controls received mp w/ vehicle; long-term study; animal info (adult, 4 wks old, deafened); functionality of mp verified via residual volume; pumps replaced after two weeks then after 28 days; tissue perfusion (cochlea); "The drug-delivery cannula within the cochlear implant... was connected to vinyl tubing..., which was connected to the regulator of the osmotic pump, which was implanted behind the right pinna."; artificial perilymph recipe

**Q1178:** T. Kondo, *et al.* Wnt Signaling Promotes Neuronal Differentiation from Mesenchymal Stem Cells Through Activation of Tlx3. *Stem Cells* 2011;29(5):836-846

**Agents:** Wnt1; brain-derived neurotrophic factor **Vehicle:** Not Stated; **Route:** Ear (cochlea); **Species:** Gerbil; **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** Controls received mp w/ saline or BDNF only; animal info (Mongolian, 4 mo old); pumps replaced after 72 hours; tissue perfusion (intracochlea)

**Q0856:** J. Q. Huang, *et al.* Renal (pro)renin receptor contributes to development of diabetic kidney disease through transforming growth factor-beta1 - connective tissue growth factor signalling cascade. *Clinical and Experimental Pharmacology and Physiology* 2011;38(4):215-221

**Agents:** Handle region peptide; valsartan **Vehicle:** Not Stated; **Route:** Kidney (renal cortex); **Species:** Rat; **Pump:** Not Stated; **Duration:** 14 days;

**ALZET Comments:** Controls received sham mp w/ saline; animal info (male, Sprague-Dawley, 230-260 g); tissue perfusion (renal cortex); peptides





**Q0954:** L. Abamrane, *et al.* Intracochlear perfusion of leupeptin and z-VAD-FMK: influence of antiapoptotic agents on gunshot-induced hearing loss. *European Archives of Oto-Rhino-Laryngology* 2011;268(7):987-993

**Agents:** Leupeptin; z-VAD-FMK **Vehicle:** Not Stated; **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** 2001; **Duration:** 7 days;  
**ALZET Comments:** Controls received no treatment; animal info (albino, 400-600 g); enzyme inhibitor (caspase); artificial perilymph solution recipe; "A miniature glass pipette with a ring of glue placed next to the tip to provide a leak-proof seal protecting the cochlea from contamination was connected to the catheter." pg 988; tissue perfusion

**Q1665:** F. Watanabe, *et al.* Signaling through erbB receptors is a critical functional regulator in the mature cochlea. *European Journal of Neuroscience* 2010;32(5):717-724

**Agents:** PD153035; 4557W **Vehicle:** DMSO; artificial perilymph; **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** 2002;  
**ALZET Comments:** Controls received mp w/ artificial perilymph; animal info (female, pigmented, 250-500 g); functionality of mp verified by residual volume; tissue perfusion (intracochlear); 0.1% DMSO used; enzyme inhibitor (tyrosine kinase)

**Q1391:** A. Warnecke, *et al.* Artemin improves survival of spiral ganglion neurons in vivo and in vitro. *NeuroReport* 2010;21(7):517-521

**Agents:** Artemin; brain-derived neurotrophic factor **Vehicle:** Not Stated; **Route:** Ear (scala tympani); **Species:** Guinea pig;  
**Pump:** 2002; **Duration:** 28 days;  
**ALZET Comments:** Negative controls received mp w/ artificial perilymph; animal info (deafened, pigmented, 250-450 g); pumps replaced after 14 days; tissue perfusion (scala tympani); pump connected to silicone-polyimide tubing

**Q1551:** J. R. A. Sherwin, *et al.* The Endometrial Response to Chorionic Gonadotropin Is Blunted in a Baboon Model of Endometriosis. *Endocrinology* 2010;151(10):4982-4993

**Agents:** Chorionic gonadotropin hormone, human recomb. **Vehicle:** Saline; **Route:** SC; intrauterine; **Species:** Monkey (baboon); **Pump:** 2ML1; **Duration:** Not Stated;  
**ALZET Comments:** Animal info (30 mo old, spontaneous endometriosis); tissue perfusion (oviductal lumen)

**Q1605:** M. P. Robich, *et al.* Effects of neuropeptide Y on collateral development in a swine model of chronic myocardial ischemia. *Journal of Molecular and Cellular Cardiology* 2010;49(6):1022-1030

**Agents:** Neuropeptide Y (3-36) **Vehicle:** Heparin; BSA; PBS; **Route:** Intramyocardial; **Species:** Pig (miniswine); **Pump:** Not Stated; **Duration:** 4 weeks;  
**ALZET Comments:** Controls received mp w/ placebo; animal info (Intact, adult, male, Yorkshire, miniswine); 2ML sized pump used; tissue perfusion (myocardium)

**Q0308:** S. Raghavan, *et al.* Successful implantation of physiologically functional bioengineered mouse internal anal sphincter. *American Journal of Physiology Gastrointestinal and Liver Physiology* 2010;299(2):G430-G439

**Agents:** Fibroblast growth factor-2, human, recomb **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 21 days;  
**ALZET Comments:** Animal info (C57BL/6J female, specific pathogen-free, 8 wk old); ALZET PE catheter used; catheter connected to physiologically functional bioengineered mouse internal anal sphincter; tissue perfusion (internal anal sphincter)

**Q1229:** L. C. Matavelli, *et al.* (Pro)renin receptor contributes to diabetic nephropathy by enhancing renal inflammation. *Clinical and Experimental Pharmacology and Physiology* 2010;37(3):277-282

**Agents:** Handle region peptide; valsartan **Vehicle:** Saline; **Route:** Kidney (renal cortical interstitium); **Species:** Rat; **Pump:** 2002; **Duration:** 14 days;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (Sprague Dawley. STZ-induced diabetes, male 230-260 g); peptides; good methods, pg 278; tissue perfusion (interstitium); HRP, also known as handle region peptide, is the decapeptide NH<sub>3</sub>-RILLKKMP<sub>5</sub>SVCOOH; good methods, pg 278; "The osmotic minipump was implanted subcutaneously in the subscapular region of all rats. Thereafter, a midline laparotomy was performed and the left kidney was isolated. A PE-10 catheter connected to each minipump was tunneled subcutaneously through a bevel-tipped stainless-steel tube to emerge into the abdominal cavity and the distal end of the catheter was placed under the left renal capsule and glued onto the surface of the kidney using Vetbond." pg 278



**Q1616:** H. N. Lang, *et al.* Chronic Reduction of Endocochlear Potential Reduces Auditory Nerve Activity: Further Confirmation of an Animal Model of Metabolic Presbycusis. *JARO-JOURNAL OF THE ASSOCIATION FOR RESEARCH IN OTOLARYNGOLOGY* 2010;11(3):419-434

**Agents:** Furosemide **Vehicle:** Not Stated; **Route:** Ear (round window niche); **Species:** Gerbil; **Pump:** 2004; **Duration:** 4 weeks; **ALZET Comments:** Controls were untreated; animal info (3-6 mo old, young adult); good methods, pg 421; tissue perfusion (round window)

**Q0063:** M. Hashish, *et al.* Surgical implantation of a bioengineered internal anal sphincter. *Journal of Pediatric Surgery* 2010;45(1):52-58

**Agents:** Fibroblast growth factor-2, recomb. **Vehicle:** PBS, sterile; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 25 days; **ALZET Comments:** Controls received mp w/ vehicle; tissue perfusion (internal anal sphincter); no stress (see pg. 57); good methods (pg. 53); animal info (female, C57BL/6, 8 wks old); "use of such pumps provided constant infusion over the postimplantation period without observed evidence of systemic effects and allowed increased efficiency of the drug owing to its proximity" pg. 57; operative photographs (pg. 54)

**Q1685:** A. Fransson, *et al.* Post-Treatment Effects of Local GDNF Administration to the Inner Ears of Deafened Guinea Pigs. *Journal of Neurotrauma* 2010;27(9):1745-1751

**Agents:** Glial-derived neurotrophic factor **Vehicle:** Not Stated; **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** 2002; **Duration:** 4 weeks; **ALZET Comments:** Controls received mp w/ artificial perilymph; animal info (deafened); silicone tube used; tissue perfusion (cochlea); pump replaced after 2 weeks; post op. care (lidocaine)

**Q1005:** J. J. Brosens, *et al.* Proteomic analysis of endometrium from fertile and infertile patients suggests a role for apolipoprotein A-I in embryo implantation failure and endometriosis. *MOLECULAR HUMAN REPRODUCTION* 2010;16(4):273-285

**Agents:** Chorionic gonadotropin hormone, human recomb. **Vehicle:** Not Stated; **Route:** Oviductal; **Species:** Monkey (baboon); **Pump:** Not Stated; **Duration:** 5 days; **ALZET Comments:** Animal info (cycling, female, 7-12 years old, 12-18 kg); tissue perfusion (oviduct)

**P9515:** V. Scheper, *et al.* Effects of Delayed Treatment With Combined GDNF and Continuous Electrical Stimulation on Spiral Ganglion Cell Survival in Deafened Guinea Pigs. *Journal of Neuroscience Research* 2009;87(6):1389-1399

**Agents:** Glial-derived neurotrophic factor **Vehicle:** Not Stated; **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** 2002; **Duration:** 48 days; **ALZET Comments:** Controls received mp w/artificial perilymph; tissue perfusion (cochlea); long-term study; pumps replaced after 13 days; good methods (pg. 1391); animal info (male, pigmented, 250-450 g.); pumps primed; image of pump and electrode cannula device used on fig. 1

**P9844:** H. Orita, *et al.* Unilateral intra-perilymphatic infusion of substance P enhances ipsilateral vestibulo-ocular reflex gains in the sinusoidal rotation test. *Neuroscience Letters* 2009;449(3):207-210

**Agents:** Substance P; neurokinin-1 receptor antagonist **Vehicle:** Not Stated; **Route:** Ear (round window); **Species:** Guinea pig; **Pump:** 2002; **Duration:** Not Stated; **ALZET Comments:** Post op. care (piperacillin sodium); animal info (Hartley); pump was connected to a PE catheter filled with artificial perilymph for a 12-hour delayed infusion; tissue perfusion (round window)

**Q0333:** Y. Nguyen, *et al.* An animal model of cochlear implantation with an intracochlear fluid delivery system. *Acta Otolaryngologica* 2009;129(11):1153-1159

**Agents:** Saline **Vehicle:** Not Stated; **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** 1007D; **Duration:** Not Stated; **ALZET Comments:** Controls received pump without electrode implant; animal info (albino, male, 3 to 7 months old, 290-1030 g.); good methods pg 1154; post op. care (enrofloxacin); "the pump was fixed subcutaneously between the scapulae using a vicryl 3/0 suture (Ethicon)" pg 1154; image of pump-electrode device, Fig. 1; tissue perfusion (cochlea)



- P9613:** T. Ma, *et al.* In Vivo Murine Model of Continuous Intramedullary Infusion of Particles-A Preliminary Study. JOURNAL OF BIOMEDICAL MATERIALS RESEARCH PART B-APPLIED BIOMATERIALS 2009;88B(1):250-253  
**Agents:** Polystyrene particles, blue dyed **Vehicle:** PBS; **Route:** Bone (femur); **Species:** Mice; **Pump:** 2004; **Duration:** 4 weeks;  
**ALZET Comments:** Functionality of mp verified by gross inspection of retrieved femora; animal info (9 wks old, male, C57BL/6); Fig. 1, X-ray image of pump and delivery system; tissue perfusion (femur)
- P9426:** Y. H. Liu, *et al.* N-acetyl-seryl-aspartyl-lysyl-proline prevents cardiac remodeling and dysfunction induced by galectin-3, a mammalian adhesion/growth-regulatory lectin. American Journal of Physiology Heart and Circulatory Physiology 2009;296(2):H404-H412  
**Agents:** Galectin-3; Ac-SDKP **Vehicle:** Saline; **Route:** Intrapericardial; **Species:** Rat; **Pump:** 2004; **Duration:** 2, 4 weeks;  
**ALZET Comments:** Controls received mp w/ vehicle; tissue perfusion (heart); no stress (see pg. H407); cardiovascular; peptides; animal info (male, Sprague Dawley, 275-300 g.); "We used intrapericardial administration of Gal-3 and/or Ac-SDKP in rats. This method allows us to target the heart and obtain site-selective drug efficiency with low-level systemic effects." (p. H404-H405)
- Q1126:** Z. Q. Hu, *et al.* Functional Evaluation of a Cell Replacement Therapy in the Inner Ear. Otology & Neurotology 2009;30(4):551-558  
**Agents:** Nerve growth factor **Vehicle:** Hank's based salt solution; albumin, guinea pig serum; **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** 2002; **Duration:** Not Stated;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (pigmented, adult, 270-470 g); pumps replaced after 13 days; post op. care (daily injections of cyclosporin and doxycycline); tissue perfusion
- P9866:** J. L. Haylor, *et al.* Inhibition of compensatory renal growth by the N-terminus of a sheep-derived peptide. REGULATORY PEPTIDES 2009;152(1-3):48-53  
**Agents:** EPL001; antibody, EPL001, mouse, monoclonal **Vehicle:** Not Stated; **Route:** Kidney; **Species:** Rat; **Pump:** 2002;  
**Duration:** Not Stated;  
**ALZET Comments:** Tissue perfusion (renal); replacement therapy (unilateral nephrectomy); peptides; animal info (male, Wistar, 250-300 g.); EPL001 is a novel sheep derived 14 amino acid peptide
- P9871:** C. Gillio-Meina, *et al.* Expression patterns and role of prostaglandin-endoperoxide synthases, prostaglandin E synthases, prostacyclin synthase, prostacyclin receptor, peroxisome proliferator-activated receptor delta and retinoid x receptor alpha in rat endometrium during artificially-induced decidualization. REPRODUCTION 2009;137(3):537-552  
**Agents:** Carbaprostacyclin; cicaprost; AFP-07; L-165041; docasahexanoic acid **Vehicle:** Ethanol; cyclodextrin, beta-; Tris; DMSO; indomethacin; **Route:** Intrauterine (uterine horn); **Species:** Rat; **Pump:** 2001; **Duration:** Not Stated;  
**ALZET Comments:** Controls received mp w/ vehicle; replacement therapy (ovariectomy); good methods (pg. 551); animal info (female, Sprague Dawley, 7 wks old, 200-225 g., OVX); 50% DMSO used; AFP-07 and cicaprost are high-affinity ligands for prostacyclin receptor; carbaprostacyclin is a ligand for both prostacyclin receptor and peroxisome proliferatoractivated receptor delta; tissue perfusion (uterus); 3 mg/ml beta-cyclodextrin used
- P9796:** A. Fransson, *et al.* In Vivo Infusion of UTP and Uridine to the Deafened Guinea Pig Inner Ear: Effects on Response Thresholds and Neural Survival. Journal of Neuroscience Research 2009;87(7):1712-1717  
**Agents:** Uridine triphosphate; uridine **Vehicle:** Not Stated; **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** 2002; **Duration:** 25 days;  
**ALZET Comments:** Controls received mp w/ artificial perilymph; pumps replaced on day 13; animal info (pigmented, 280-440 g); tissue perfusion
- Q0453:** M. J. H. Agterberg, *et al.* Enhanced Survival of Spiral Ganglion Cells After Cessation of Treatment with Brain-Derived Neurotrophic Factor in Deafened Guinea Pigs. JARO-Journal of the Association for Research in Otolaryngology 2009;10(3):355-367  
**Agents:** Brain-derived neurotrophic factor **Vehicle:** BSA; **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** 2004; **Duration:** 4 weeks;  
**ALZET Comments:** Controls were untreated; animal info (albino, female, 250-350 g); pump connected to Cochlear (R) electrode array; tissue perfusion (cochlea)





**P9335:** A. Abbaspour, *et al.* Optimal increase in bone mass by continuous local infusion of alendronate during distraction osteogenesis in rabbits. *Bone* 2009;44(5):917-923

**Agents:** Alendronate **Vehicle:** PBS; **Route:** Bone (tibia); **Species:** Rabbit; **Pump:** 2ML2; **Duration:** 14 days;

**ALZET Comments:** Controls received mp w/ vehicle; tissue perfusion (tibia); animal info (male, Japanese White rabbits); disphosphonate; the pump was connected to polyvinyl catheter leading to a hole drilled on the tibia (lengthened segment)

**P9687:** J. Yatabe, *et al.* Effects of Decreased Renal Cortical Expression of G Protein-Coupled Receptor Kinase 4 and Angiotensin Type 1 Receptors in Rats. *HYPERTENSION RESEARCH* 2008;31(7):1455-1464

**Agents:** Oligodeoxynucleotide, antisense; oligodeoxynucleotide, scrambled; G-protein-coupled receptor kinase 4 **Vehicle:** Ringer's solution, lactated; **Route:** Kidney; **Species:** Rat; **Pump:** Not Stated; **Duration:** 5 weeks;

**ALZET Comments:** Controls received mp w/ vehicle; pumps replaced following 1 week recovery period; antisense (GRK4, AT<sub>1</sub>R); animal info (4 wks old, male, WKY, SHR, uninephrectomized); tissue perfusion (kidney)

**P9292:** R. J. Vivero, *et al.* Dexamethasone Base Conserves Hearing from Electrode Trauma-Induced Hearing Loss. *Laryngoscope* 2008;118(11):2028-2035

**Agents:** Dexamethasone base **Vehicle:** Perilymph, artificial; **Route:** Ear (scala tympani); **Species:** Guinea pig; **Pump:** 2001; **Duration:** 8 days;

**ALZET Comments:** Controls received mp w/ vehicle; replacement therapy (cochleostomy); tissue perfusion (scala tympani); animal info (pigmented, 250-300 g.)

**R0266:** E. E. L. Swan, *et al.* Inner ear drug delivery for auditory applications. *Advanced Drug Delivery Reviews* 2008;60(15):1583-1599

**Agents:** Cisplatin; Sodium thiosulfate; Brain-derived neurotrophic factor; Fibroblast growth factor; D-JNKI-1; BN82270; Tetrodotoxin; Perilymph, artificial; Dexamethasone; Methylprednisone; Caroverine; Methionine, D-; Thiourea; Liposome, cationic; Neomycin **Vehicle:** Not Stated; **Route:** SC; Ear (round window membrane); Ear (cochlea); Ear (scala tympani); Ear; **Species:** Guinea pig; **Pump:** Not Stated; **Duration:** 3, 7, 14, 28 days;

**ALZET Comments:** Gene therapy; peptides; no stress; enzyme inhibitor (peroxidase); stress/adverse reaction (see pg 1593) "Ref #161 found local trauma and inflammatory responses"; tissue perfusion (scala tympani, cochlea, round window membrane); comparison of middle ear injections vs. mp; Review, see pgs. 1587 - 1589, 1591, 1593 - 1595, refs #49, 50, 60, 63, 72, 75, 102, 104,180, 181, 194-201

**P9051:** B. N. Song, *et al.* Effects of delayed brain-derived neurotrophic factor application on cochlear pathology and auditory physiology in rats. *Chinese Medical Journal* 2008;121(13):1189-1196

**Agents:** Brain-derived neurotrophic factor, recomb. human **Vehicle:** Albumin, rat; Ringer's solution; **Route:** Ear (cochlea); **Species:** Rat; **Pump:** 2004; **Duration:** 28 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, albino, Sprague Dawley, 10-12 wks old, 220-250 g.); tissue perfusion (cochlea); functionality of mp verified by residual volume; good methods pg. 1191; pumps were primed in sterile saline at 37 degree Celsius for 48 hours; 1-cm len

**P9217:** G. B. Silva, *et al.* Angiotensin II-Dependent Hypertension Increases Na Transport-Related Oxygen Consumption by the Thick Ascending Limb. *Hypertension* 2008;52(6):1091-1098

**Agents:** Angiotensin II; dye, Coomassie blue R250; G86976; Tempol **Vehicle:** Not Stated; **Route:** SC; Kidney (outer medulla); **Species:** Rat; **Pump:** 1007D; **Duration:** 4, 7 days;

**ALZET Comments:** Controls received mp w/ vehicle; tissue perfusion (kidney); functionality of mp verified by residual volume and dye infusion; enzyme inhibitor (PKC a/b); cardiovascular; antihypertensive; peptide; cyanoacrylate adhesive; animal info (Sprague Dawley, 7 wks old, 200-250 g.); catheter fenestrated in one side 10 mm from the tip



**P9218:** R. K. Shepherd, *et al.* Neurotrophins and electrical stimulation for protection and repair of spiral ganglion neurons following sensorineural hearing loss. *Hearing Research* 2008;242(1-2):100-109

**Agents:** Brain-derived neurotrophic factor, recomb. human **Vehicle:** Ringer's solution; Albumin, guinea pig; **Route:** Ear (scala tympani); **Species:** Guinea pig; **Pump:** 2004; **Duration:** 4 weeks;

**ALZET Comments:** Controls received no treatment to contralateral cochlea; functionality of mp verified by residual volume and intact connections; peptides; post op. care (Carprofen, Baytril); tissue perfusion (scala tympani); animal info (pigmented, 400-844 g., kanamycin/furosemide deafened)

**P9224:** J. H. Reyes, *et al.* Glutamatergic Neuronal Differentiation of Mouse Embryonic Stem Cells after Transient Expression of Neurogenin 1 and Treatment with BDNF and GDNF: In Vitro and In Vivo Studies. *Journal of Neuroscience* 2008;28(48):12622-12631

**Agents:** Doxycycline; Brain-derived neurotrophic factor; Glial cell line-derived neurotrophic factor **Vehicle:** Not Stated; **Route:** Ear (scala tympani); **Species:** Guinea pig; **Pump:** 2002; **Duration:** 27 days;

**ALZET Comments:** Controls received no treatment to contralateral ear; pumps replaced; peptides; tissue perfusion (scala tympani); animal info (NIH strain, 275-315 g., deafened); cannula and catheter contained doxycycline, mp contained BDNF/GDNF (delayed delivery) to follow, thus providing 2 days Dox, 25 days BDNF/GDNF

**P9121:** Y. W. Qiang, *et al.* Wnt3a signaling within bone inhibits multiple myeloma bone disease and tumor growth. *Blood* 2008;112(2):374-382

**Agents:** Gene, Wnt3a, recomb. **Vehicle:** Not Stated; **Route:** Bone; **Species:** Mice (SCID); **Pump:** 1004; **Duration:** 4 weeks;

**ALZET Comments:** Controls received mp w/ PBS; animal info (Myelomatous SCID-hu); tissue perfusion (myelomatous bone); Wnt3a is a human gene; ALZET pump was "directly connected to the open side of the implanted bone, allowing continual exposure of the myelomatous bone to rWnt3a"

**P9306:** R. Panford-Walsh, *et al.* Midazolam reverses salicylate-induced changes in brain-derived neurotrophic factor and Arg3.1 expression: Implications for tinnitus perception and auditory plasticity. *MOLECULAR PHARMACOLOGY* 2008;74(3):595-604

**Agents:** Midazolam **Vehicle:** Not Stated; **Route:** Ear (round window niche); **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ artificial perilymph; comparison of systemic injections vs. mp; animal info (female, Wistar, 200-300 g., cochlear trauma); behavioral testing (tinnitus perception via sound/reward); tissue perfusion (round window niche)

**P9212:** S. G. Ortiz, *et al.* Continuous Intramedullary Polymer Particle Infusion Using a Murine Femoral Explant Model. *Journal of Biomedical Materials Research Part B-Applied Biomaterials* 2008;87B(2):440-446

**Agents:** Polystyrene; Polyethylene, high molecular weight **Vehicle:** Serum, mouse; **Route:** Bone (femur); **Species:** Mice; **Pump:** 2004; **Duration:** 2, 4 weeks;

**ALZET Comments:** Controls received mp w/ vehicle; functionality of mp verified by blue-dyed polystyrene particles; tissue perfusion (femur); dose-response (fig. 4); no stress (see pg. 443); animal info (male, C57BL/6, 12-16 wks old); mp connected to hollow titanium rod by vinyl catheter; titanium rod inserted into femur ex vivo; femur/pump assemblies placed in sterile flasks at 37 degree for 2, 4 wks; "There were no cases of infection or malfunction of the pumps apparatus over the course of the experiment." (p. 443)

**P9760:** E. M. Keithley, *et al.* Tumor necrosis factor alpha can induce recruitment of inflammatory cells to the cochlea. *OTOLOGY & NEUROTOLOGY* 2008;29(6):854-859

**Agents:** Tumor necrosis factor-alpha **Vehicle:** Not Stated; **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** 2001; **Duration:** 2-4 days;

**ALZET Comments:** Controls received mp w/vehicle; animal info (Hartley albino); tissue perfusion

**P9239:** J. A. Harris, *et al.* Afferent Deprivation Elicits a Transcriptional Response Associated with Neuronal Survival after a Critical Period in the Mouse Cochlear Nucleus. *Journal of Neuroscience* 2008;28(43):10990-11002

**Agents:** Tetrodotoxin **Vehicle:** Citrate buffer; **Route:** Ear (round window niche); **Species:** Mice; **Pump:** 1003D; **Duration:** 24 hours;

**ALZET Comments:** Controls received mp w/ saline or no treatment to contralateral side; tissue perfusion (round window niche); comparison of cochlear removal vs. mp; animal info (male, female, C57BL/6J, 21 days old)



**P9200:** M. D. Doerr, *et al.* Effects of endothelin receptor type-A and type-B antagonists on prostaglandin F<sub>2α</sub>-induced luteolysis of the sheep corpus luteum. *Biology of Reproduction* 2008;78(4):688-696

**Agents:** BQ123; BQ610; BQ788 **Vehicle:** Methanol; saline; **Route:** Intraovarian (corpus luteum); **Species:** Sheep; **Pump:** 2002; **Duration:** 14 days;

**ALZET Comments:** Controls received mp w/ vehicle; tissue perfusion (corpus luteum); good methods (pg. 689); post op. care (penicillin); animal info (female); pumps were primed overnight prior to surgery; vinyl catheter tubing (0007760) used; catheter stabilized to connective tissue capsule and ovarian tunica albuginea using nylon monofilament; all compounds are EDNRA type-A endothelin antagonists

**P8833:** M. Boodhwani, *et al.* Comparison of vascular endothelial growth factor and fibroblast growth factor-2 in a swine model of endothelial dysfunction. *European Journal of Cardio-Thoracic Surgery* 2008;33(4):645-650

**Agents:** Vascular endothelial growth factor 165, recomb. human **Vehicle:** Heparin; **Route:** Intramyocardial; **Species:** Pig (miniswine); **Pump:** 2ML4; **Duration:** 4 weeks;

**ALZET Comments:** Tissue perfusion (myocardial); half-life (p. 649) "short"; cardiovascular; peptides; ischemia (cardiac); animal info (Yucatan mini-swine, 20-30 kg).