References on the Administration to the Ear
Using ALZET® Osmotic Pumps

ALZET Comments: Fluvastatin; DMSO, Ringer’s Solution; Ear (cochlea); Guinea Pig; 2004; 28 days; Dose (fluvastatin 50 μM); Dose (fluvastatin 50 μM); animal info (Outbred Hartley guinea pigs of both sexes 200–500 g); post op. care (Buprenex); Cannula used;

Q6165: C. K. Kandathil, et al. Effects of brain-derived neurotrophic factor (BDNF) on the cochlear nucleus in cats deafened as neonates. Hear Res 2016;342(134-143
ALZET Comments: Brain-derived neurotrophic factor, recomb. human; Perilymph, artificial; Ear (cochlea); Cat; 1002, 2004; 10 weeks; Dose (94 mg/ml; 0.25 ml/hr); pumps replaced after 2 and 4 weeks; BDNF stability verified by neuronal cell culture survival assay (28 days);

Q4838: H. JIA, et al. PREVENTION OF TRAUMA-INDUCED COCHLEAR FIBROSIS USING INTRACOCHLEAR APPLICATION OF ANTI-INFLAMMATORY AND ANTI-PROLIFERATIVE DRUGS. neuroscience 2016;316(261-278
ALZET Comments: Dexamethasone; Ara-C; Perilymph, artificial; Ear (cochlea); Rat; 2001; 7 days; Controls received mp w/ vehicle; animal info (Wistar, adult); stability verified by (incubation in 37°C saline for 7 days see pg 268); one cochlea received vehicle only, while other recieved drug;

ALZET Comments: Dexamethasone; Saline; Ear (cochlea); Guinea pig; 1007D; 7 days; Dose (4 mg/ml); Controls received mp w/ vehicle; animal info (female Harley Albino guinea pigs, 255–455 g, 7–9 weeks old); dependence;

ALZET Comments: MDL28170; DMSO; PBS; Ear (cochlea); Guinea pig; 1002; 14 days; Controls received mp w/ vehicle; animal info (Hartley strain, 350-400g); 0.3% DMSO used; tissue perfusion (cochlea); used Tefron tube with inner diameter of 180 um to cannulate cochlea; MDL28170 is a gamma-secretase inhibitor;

ALZET Comments: Dexamethasone; Saline; Ear (round window); Rat; 14 days; Controls received mp w/ vehicle; animal info (female, Albino, 250-33g, adult); used ALZET IT catheter to cannulate round window; "Dexamethasone infusion given after implantation of the intracochlear model electrode was more effective for preventing hearing loss than the administration of just one dose of dexamethasone" pg 702;

Q6784: L. Waaijer, et al. The Peripheral Processes of Spiral Ganglion Cells After Intracochlear Application of Brain-Derived Neurotrophic Factor in Deafened Guinea Pigs. OTOTOLOGY & NEUROTOLOGY 2013;34(570-578
ALZET Comments: Brain-derived neurotrophic factor; PBS; Ear (right cochlea); Guinea pig; 2004; 4 weeks; Dose (100 μg/ml); Controls received mp w/ vehicle; animal info (10 healthy albino female guinea pigs (strain: Dunkin Hartley; weighing 250-350 g).

ALZET Comments: Brain-derived neurotrophic factor, recomb. human; Perilymph, artificial; Ear (cochlea); Cat; 1002; 2004; 10 weeks; Dose (3.75 μg/day); animal info (deafened cats weighing 520-610g); pumps replaced every 2,4 weeks; long-term study; Because the animals were small at the time of implantation (mean body weight, 560 g; range, 520–610 g), a smaller osmotic pump (model #1002) that delivered 14 days of BDNF was implanted initially. Two weeks later, a brief surgical
procedure was performed to replace the initial pump with a larger one containing a 28-day supply of BDNF; this was replaced 1 month later with a final 28-day pump.

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

**ALZET Comments:** Neurotrophin; Brain-derived neurotrophic factor; Ear (cochlea); Guinea pig; 2004; 28 days; Controls received mp w/ artificial perilymph; animal info (young adult, 300-600g); tissue perfusion (cochlea); peptides.


**ALZET Comments:** FGLM-NH₂; SSSR; Ear (cochlea); Guinea pig; 2002; 14 days; Control animals received mp w/ artificial perilymph; animal info (male, Hartley); FGLM-NH₂ also known as Phenylalanine-Glycine-Leucine-Methionine-Amide; SSSR also known as Serine-Serine-Serine-Arginine; tissue perfusion.


**ALZET Comments:** Brain-derived neurotrophic factor; Ear (cochlea); Guinea pig; 2004; 4 weeks; 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).


**ALZET Comments:** Gentamicin; dexamethasone; melatonin; Ear (round window); Rat; 2001; 7 days; Controls received mp w/ saline; animal info (Wistar, male, 220-250 g); stability verified after 7 days (data not shown).


**ALZET Comments:** Sodium hydrosulfide; propargylglycine, DL-; Ear (cochlea); Rat; 2002; 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."


**ALZET Comments:** Brain-derived neurotrophic factor, human; Perilymph, artificial; Ear (cochlea); Cat; 2002; 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."


**ALZET Comments:** Wnt1; brain-derived neurotrophic factor, human; Perilymph, artificial; Ear (cochlea); Gerbil; 2004; 28 days; Controls received mp w/ saline or BDNF only; animal info (Mongolian, 4 mo old); pumps replaced after 72 hours; tissue perfusion (intracochlea).


**ALZET Comments:** Leupeptin; z-VAD-FMK; Ear (cochlea); Guinea pig; 2001; 7 days; 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.

ALZET Comments: PD153035; 4557W; DMSO; artificial perilymph; Ear (cochlea); Guinea pig; 2002; 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).

ALZET Comments: Artemin; brain-derived neurotrophic factor; Ear (scala tympani); Guinea pig; 2002; 28 days; 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.

ALZET Comments: Furosemide; Ear (round window niche); Gerbil; 2004; 4 weeks; Controls were untreated; animal info (3-6 mo old, young adult); good methods, pg 421; tissue perfusion (round window).

ALZET Comments: Glial-derived neurotrophic factor; Ear (cochlea); Guinea pig; 2002; 4 weeks; Controls received mp w/artificial perilymph; animal info (deafened); silicone tube used; tissue perfusion (cochlea); pump replaced after 2 weeks; post op. care (lidocaine).

ALZET Comments: Glial-derived neurotrophic factor; Ear (cochlea); Guinea pig; 2002; 48 days; 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.

ALZET Comments: Substance P; neurokinin-1 receptor antagonist; Ear (round window); Guinea pig; 2002; 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).

ALZET Comments: Saline; Ear (cochlea); Guinea pig; 1007D; 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 (enrofloxacine); "the pump was fixed subcutaneously between the scapulae using a vicryl 3/0 suture (Ethicon)" pg 1154; image of pump-electrode cannula device, Fig. 1; tissue perfusion (cochlea).

ALZET Comments: Nerve growth factor; Hank's based salt solution; albumin, guinea pig serum; Ear (cochlea); Guinea pig; 2002; Controls received mp w/vehicle; animal info (pigmented, adult, 270-470 g); pumps replaced afer 13 days; post op. care (daily injections of cyclosporin and doxycycline); tissue perfusion.
ALZET Comments: Uridine triphosphate; uridine; Ear (cochlea); Guinea pig; 2002; 25 days; Controls received mp w/ artificial perilymph; pumps replaced on day 13; animal info (pigmented, 280-440 g); tissue perfusion.

ALZET Comments: Brain-derived neurotrophic factor; BSA; Ear (cochlea); Guinea pig; 2004; 4 weeks; Controls were untreated; animal info (albino, female, 250-350 g); pump connected to Cochlear (R) electrode array; tissue perfusion (cochlea).

ALZET Comments: Amikacin; Ear; Antelope (bongo); 2ML4; 24 days; Functionality of mp verified by residual volume; animal info (10 years old, male, 326 kg); "An osmotic pump was beneficial for antibiotic delivery in case 2 and may be an effective therapy for low-grade infections or for continued therapy once a severe infection is under control." pg. 340.

ALZET Comments: Dexamethasone base; Perilymph, artificial; Ear (scala tympani); Guinea pig; 2001; 8 days; Controls received mp w/ vehicle; replacement therapy (cochleostomy); tissue perfusion (scala tympani); animal info (pigmented, 250-300 g.).

ALZET Comments: 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; SC; Ear (round window membrane); Ear (cochlea); Ear (scala tympani); Ear; Guinea pig; 3, 7, 14, 28 days; 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.

ALZET Comments: Brain-derived neurotrophic factor, recomb. human; Albumin, rat; Ringer’s solution; Ear (cochlea); Rat; 2004; 28 days; 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.

ALZET Comments: Brain-derived neurotrophic factor, recomb. human; Ringer’s solution; Albumin, guinea pig; Ear (scala tympani); Guinea pig; 2004; 4 weeks; 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).

ALZET Comments: Doxycycline; brain-derived neurotrophic factor; glial cell line-derived neurotrophic factor; Ear (scala tympani); Guinea pig; 2002; 27 days; 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.

ALZET Comments: Midazolam; Ear (round window niche); Rat; 2001; 7 days; 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).

ALZET Comments: Tumor necrosis factor-alpha; Ear (cochlea); Guinea pig; 2001; 2-4 days; Controls received mp w/vehicle; animal info (Hartley albino); tissue perfusion.

ALZET Comments: Tetrodotoxin; Citrate buffer; Ear (round window niche); Mice; 1003D; 24 hours; 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).

ALZET Comments: Jun, c-, N-Terminal kinase Inhibitor-1, D-; peptide, D-TAT; Jun, c-, N-Terminal kinase Inhibitor-1-mutant; Perilymph, artificial; PBS; Ear (round window membrane); Guinea pig; 2001; 7 days; Controls received mp w/ vehicle, or inactive JNKI-1-mutant or TAT-empt peptide or contralateral untreated ear; dose-response (fig 6); comparison of acute infusion vs. hyaluronic acid gel vs.; enzyme inhibitor (c-Jun N-terminal kinase); peptides; animal info (pigmented, 250-300g.; sound trauma); D-JNKI-1 peptide contains a 10-amino acid HIV-TAT transporter sequece to facilitate its entry into cells; tissue perfusion (round window membrane).

ALZET Comments: Gentamicin; Ear (round window); Chinchilla; 2002; 1, 3, 6, 14 days; 4, 8 hours; Comparison of transtympanic injections vs. mp; tissue perfusion (round window); animal info (male, female, chinchilla langier).

ALZET Comments: Kallidinogenase; Saline; IV (marginal ear vein); Rabbit; 4 weeks; Controls received mp w/ vehicle; ischemia (retinal); animal info (male, New Zealand, 2.5-3.5 kg.).

ALZET Comments: Brain-derived neurotrophic factor; fibroblast growth factor-1; Perilymph, artificial; albumin, guinea pig serum; Ear (scala tympani); Guinea pig; 2002; 26 days; Controls received mp w/ vehicle; pumps replaced at day 13; peptides; tissue perfusion (scala tympani); animal info (male, female, pigmented, 250-300g, deafened).

ALZET Comments: Trolox; neomycin; ascorbic acid; Perilymph, artificial; sodium bicarbonate; Ear (cochlea); Guinea pig; 2002; 26 days; Controls received mp w/ vehicle; pumps replaced after 14 days; post op. care (doxycycline); animal info
(male, pigmented, 250-400g., neomycin deafening); cannula primed with 10% neomycin solution followed by a small air bubble spacer to allow neomycin infusion for first 2 days; trolox, a vitamin F analogue, and ascorbic acid delivered together in 1 mp; tissue perfusion (cochlea).

ALZET Comments: MDL 28170; DMSO; PBS; Ear (cochlea); Guinea pig; 1002; 14 days; Tissue perfusion (cochlea); enzyme inhibitor (gamma secretase); peptides; animal info (Hartley strain, 350-400g); MDL 28170 is a gamma-secretase inhibitor; 0.3% DMSO used; "a silicon tube (180 micron OD) connected to a micro-osmotic minipump...".

ALZET Comments: Erythropoietin; Ear (round window); Guinea pig; 1007D; 1 week; Controls received mp w/ saline; replacement therapy (noise-induced hearing impairment); comparison of acute admin. vs. mp; peptides; animal info (male, Dunkin-Hartley); tissue perfusion (round window); mp primed 6 hours in 37 Celsius saline; correct catheter placement confirmed.

ALZET Comments: Uridine, bromodeoxy-; PBS; Ear (perilymphatic fluid); Bird (chicken); 2002; 8 days; No stress (see p. 167); Alzet brain infusion kit used; animal info (White Legorn, 5-10 days old).

ALZET Comments: Methylprednisolone; perilymph, artificial; Perilymph, artificial; Ear (scala tympani); Guinea pig; 2001; 14 days; Controls received mp w/ vehicle, or non-implanted ear; dose-response (fig. 1); pumps replaced after 7 days of artificial perilymph; animal info (pigmented, 400-500g., acoustic trauma, gunshot); tissue perfusion (scala tympani).

ALZET Comments: Nerve growth factor; NT-3; adenovirus; brain-derived neurotrophic factor; perilymph, artificial; glial-derived neurotrophic factor; ciliary neurotrophic factor; fibroblast growth factor, acidic; fibroblast growth factor-1; fibroblast growth factor-2; fibroblast growth factor, basic; Ear (cochlea); ear (scala tympani); Guinea pig; 1,2,4,8 weeks; 15-60, 11-12, 26 days; Comparison of polymers, hydrogels, gene therapy, cell-based therapy, and injections vs. mp; long-term study; pumps replaced; no stress (see pg. 350); half-life (p. 344), short in blood; gene therapy; peptides; animal info (deafened); Table 2; "The mini-osmotic pump device is ideally suited to studying the effects of neurotrophic factors in the cochlea experimentally." (p. 350); tissue perfusion.

ALZET Comments: Brain-derived neurotrophic factor, recomb. human; PBS; albumin, chicken; Hank's solution; Ear (scala tympani); Bird (pigeon); 2002; 8 weeks; Controls received mp w/ vehicle or no treatment to contralateral ear; long-term study; pumps replaced every 14 days; ALZET brain infusion kit used; peptides; animal info (Columba livia, 6 months old, 320-580 grams); deafening of both ears; tissue perfusion (scala tympani).

ALZET Comments: Peptide, D-JNK inhibitor 1; Perilymph, artificial; Ear (cochlea); Guinea pig; 2001; 1 week; Controls received mp w/ vehicle; no stress (see pg.507); enzyme inhibitor (c-Jun N-terminal kinases); peptides; mp primed overnight in 37 celsius ringer solution; "the specificity of this molecule is high and therefore should limit the occurrence of any unwanted side effects." (pg.510); tissue perfusion.
ALZET Comments: Brain-derived neurotrophic factor, recomb. human; NT-3; Ear (scala tympani); Guinea pig; 2004; 28 days; Controls received mp w/ Ringer's solution; cannula patency ascertained by visual inspection; tissue perfusion (scala tympani).

ALZET Comments: Edaravone; saline; Water; NaOH; Ear (cochlea); Guinea pig; 2002; 12 hours; Controls received no treatment to left ear; pumps replaced, mp w/ saline used then replaced with mp with agent; stability verified for 24 hours; post op. care (antibiotic ointment); animal info (male, Hartley, 300-450 g); tissue perfusion (cochlea).

ALZET Comments: Brain-derived neurotrophic factor, recomb. human; perilymph, artificial; Ringer's solution; albumin, recomb. guinea-pig; Ear (scala tympani); Guinea pig; 2004; 28 days; Controls received mp w/ artificial perilymph or untreated contralateral cochlea; functionality of mp verified by residual fluid, cannula connection and patency; no stress (see pg. 155); good methods; peptides; post op. care (carprofen, Baytril); mp primed 36-48 hours in 37 degrees celsius Ringer's solution; Electrode array also inserted into scala tympani; "We observed no evidence of mechanical trauma to cochlea following long-term implantation and AP or BDNF delivery." (p. 155); tissue perfusion (scala tympani).

ALZET Comments: NT-3, recomb. human; brain-derived neurotrophic factor; Ringer's solution; Ear (scala tympani); Guinea pig; 2004; 28 days; Comparison of bolus infusion vs. mp; peptides; animal info (adult, pigmented Dunkin-Hartley, 455g.); tissue perfusion (scala tympani).

ALZET Comments: Tetrodotoxin; Ear (cochlea perilymphatic space); Guinea pig; 2002; 7 days; Controls received mp w/ sterile saline; post op. care (piperacillin sodium); animal info (male, Hartley, 600g.); tissue perfusion (cochlea).

ALZET Comments: Methionine, D-; filoblast growth factor 2; thiosulfate, sodium petahydrate; brain-derived neurotrophic factor; Water; PBS; Ear (round window membrane); Guinea pig; 2001; 6 days; Controls received mp w/ saline; mp primed > 12 hours in saline; tissue perfusion (round window membrane).

ALZET Comments: Edaravone; saline; NaOH; water; HCL; Ear (cochlea); Guinea pig; 2002; 17 days; Controls received no treatment to contralateral ear; animals received mp w/ saline for 3 days; then pumps replaced for mp w/edaravone; no stress (see pg. 115); post op. care (antibiotic ointment); edaravone is a free radical scavenger; tissue perfusion (cochlea).

ALZET Comments: Adenosine triphosphate; PPADS; Ear (cochlea); Guinea pig; 2002; Post op. care (antibiotic ointment applied); PE-10 used to target the inner ear and fixed with dental cement; for recover period, pumps and catheters were filled with saline, then pumps replaced with reagent filled pumps; infusion of agents was 12 hours post pump replacement.
to allow for saline in catheter to be infused; PPADS is pyridoxal-phosphate-6-azophenyl-2',4'-disulfonic acid solution; tissue perfusion (cochlea).


**ALZET Comments**: Thiosulfate, sodium; Ear (middle ear space); Guinea pig; 2002; 18 days; Controls received no treatment to right ear; comparison of daily middle ear space injections vs. mp; pumps replaced after 7 days; multiple pumps per animal (2); "Continuous infusion of STS is the preferred method of administration." (p. 118) "STS continuously infused into the middle ear system provides a greater protective function than daily injection." (p. 119); tissue perfusion (middle ear space).


**ALZET Comments**: Uridine, bromodeoxy-; Ear (cochlea); Bird (chicken); 2002; 3-11 days; Controls received untreated contralateral ear; functionality of mp verified by (epithelial immunohistochemistry); stability verified by epithelial immunohistochemistry; tissue perfusion (cochlea).

**P6458**: P. Olivius, _et al._ A model for implanting neuronal tissue into the cochlea. BRAIN RESEARCH PROTOCOLS 2004;12(3):152-156

**ALZET Comments**: Brain-derived neurotrophic factor; ciliary neurotrophic factor Ax1, human; Ear (scala tympani); Guinea pig; 2002; 21-22 days; Pump replaced on days 11-12; post op. care (cyclosporine, doxycycline); tissue perfusion (scala tympani).

**P6392**: T. Okuda, _et al._ Inner ear changes with intracochlear gentamicin administration in guinea pigs. Laryngoscope 2004;114(4):694-697

**ALZET Comments**: Gentamicin; Saline; Ear (cochlea); Guinea pig; 2002; 14 days; Controls received mp w/ vehicle; pumps replaced at day 7; pump contained saline only for the first seven days ; PE-10 used; tissue perfusion (cochlea).


**ALZET Comments**: FK506; cyclosporin A; Perilymph, artificial; Ear (cochlea); Guinea pig; 2002; 14 days; Controls received mp w/ vehicle, or contralateral untreated cochlea; dose-response (fig. 3); stress/adverse reaction: (see pg. 385) 4 of 43 animals developed middle ear infections; 4 of 43 animals had post surgical hearing loss; calcineurin inhibitors; "Systematic application may therefore have unwanted side effects that may be avoided by intracochlear perfusion by osmotic pump. The use of an osmotic pumps also allows relatively precise control over the timing and concentration of drugs applied to the tissues of the inner ear." (pg. 389); tissue perfusion (cochlea).

**Q0251**: D. M. Mills, _et al._ Metabolic Presbycusis: Differential Changes in Auditory Brainstem and Otoacoustic Emission Responses with Chronic Furosemide Application in the Gerbil. JARO 2004;5(1-10)

**ALZET Comments**: Furosemide; Ear (round window niche); Gerbil; 2004; 3-7 days; Controls received a bulla vent tube (no mp); no stress (see pg. 2); animal info (young adult, Mongolian, 45-65g); dose-response; tissue perfusion (round window).

**P6918**: M. Li, _et al._ Vestibular destruction by slow infusion of gentamicin into semicircular canals. Acta Oto-laryngologica 2004;124(35-41

**ALZET Comments**: Gentamicin; Hank’s solution; Ear (semicircular canals); Chinchilla; 1007D; 7 days; Controls received mp w/ vehicle; Meniere's disease; microcatheter used; 27 gauge tubing used for cannulation; tissue perfusion (semicircular canals).

ALZET Comments: AMPA; Perilymph, artificial; Ear (scala tympani); Guinea pig; 2002; 2004; 14-56 days; Controls received mp w/ vehicle; dose-response (fig. 2); long-term study; pumps replaced at 14 or 28 day intervals; stress/adverse reaction: (see pg. 1045) middle ear infections; tissue perfusion (scala tympani).

ALZET Comments: z-DEVD-fmk; z-IETD-fmk; z-LEHD-fmk; z-FA-fmk; JNKI-1, D-; Perilymph, artificial; Ear (cochlea); Guinea pig; 2001; 7 days; Controls received mp w/ vehicle; enzyme inhibitor (caspases (-3,-8,-9), cathepsinB, JNK); peptides; tissue perfusion (cochlea).

ALZET Comments: Brain-derived neurotrophic factor; nerve growth factor; NT-3; NT-4/5; Ear (scala tympani, cochlea); Guinea pig; 2004; 28 days; Tissue perfusion.

ALZET Comments: Brain-derived neurotrophic factor; ciliary neurotrophic factor; Ear (scala tympani); Guinea pig; 2002; 14 days; tissue perfusion (cochlea); comparison of RWM injections vs. mp; peptides.

ALZET Comments: Cisplatin; Saline; Ear (cochlea); Guinea pig; 2002; 1 week; Tissue perfusion (cochlea).

ALZET Comments: Etanercept; PBS; keyhole limpet hemocyanin; Ear (scala tympani); Guinea pig; 2001; 7 days; Controls received mp w/ PBS or KLH; Etanercept is a TNF receptor; keyhole limpet hemocyanin is (KLH); tissue perfusion (scala tympani).

ALZET Comments: D-JNKI-1; Perilymph, artificial; Ear (scala tympani); Guinea pig; 2001; 7 days; Controls received mp w/ vehicle; enzyme inhibitor (JNK); D-JNKI-1 is a C-JUN N-terminal kinase (JNK); glass pipette was glued to PE-50 and pressed against cochlea; tissue perfusion (scala tympani).

ALZET Comments: Thiosulfate, sodium; Perilymph, artificial; water, sterile distilled; Ear (cochlea); Guinea pig; 2001; 7 days; Controls received mp w/ vehicle; stress/adverse reaction: (see pg. 381) "Seven animals died during the course of the CDDP treatment (probably from the toxic effects of CDDP)" (p.381); cancer; "Perfusion of STS into the cochlea via an osmotic minipump completely prevented CDDP-induced hearing loss" (p.391); pump/catheter schematic (p.381); tissue perfusion (cochlea).

ALZET Comments: OPC-31260; Saline; Ear (cochlea); Guinea pig; 2002; Controls received mp w/ vehicle; OPC-31260 is a vasopressin type-2 antagonist; insertion site of the cannula was sealed with biobonde (biomedical adhesive); tissue perfusion (cochlea).

ALZET Comments: Verapamil; Perilymph, artificial; Ear (cochlea); Guinea pig; 2002; 6 weeks; Pumps replaced every two weeks; 2 week stability verified by high pressure liquid chromatography p. 220; good methods p.220; 3 day recovery post implant; tissue perfusion (cochlea).

P6077: H. Lang, et al. Effects of chronic furosemide treatment and age on cell division in the adult gerbil inner ear.
ALZET Comments: Furosemide; Ear (cochlea); Gerbil; 2004; 1 week; No stress (p. 165); tissue perfusion (cochlea).

European Journal of Pharmacology 2003;464(1):75-78
ALZET Comments: Streptomycin; Saline; Ear (cochlea); Guinea pig; 2002; 24 hours; tissue perfusion (round window).

ALZET Comments: Brain-derived neurotrophic factor; Ear (cochlea); Guinea pig; 2004; 4 weeks; Peptides; BDNF was recombinant human; tissue perfusion (cochlea).

ALZET Comments: Thiourea; Perilymph, artificial; water, sterile; Ear (cochlea); Guinea pig; 2002; 14 days; good methods p. 111; microtip catheter was held in place using cyanoacrylate glue at the bulla defect, which was then sealed with dental cement; cites a detailed cannulation method; tissue perfusion (cochlea).

ALZET Comments: Tubulin, beta; PBS; Ear (scala tympani); Guinea pig; 2002; 14 days; Controls received mp w/ vehicle; tissue perfusion (cochlea); peptides.

ALZET Comments: Mannitol; Inulin; Radio-isotopes; 3H tracer; saline; ethanol; Ear (round window); Guinea pig; 1007D; 7 days; Tissue perfusion (round window).