



References on the Administration of Nonsteroidal Anti-Inflammatory Drugs Using ALZET® Osmotic Pumps

1. Acetylsalicylic

Q0421: C. Rivat, *et al.* Chronic stress induces transient spinal neuroinflammation, triggering sensory hypersensitivity and long-lasting anxiety-induced hyperalgesia. *Pain* 2010;150(2):358-368

ALZET Comments: CI-988; chlordiazepoxide; Acetylsalicylic acid; DMSO; saline; SC; CSF/CNS (intrathecal); Rat; 2ML1; 2001; 2002; 14 days; Controls received mp w/ vehicle; animal info (Male, Sprague-Dawley, 300-325 g, 8 wks old; ALZET intrathecal catheter used (0007740); behavioral testing (elevated plus-maze).

P8555: A. Adamek, *et al.* High dose aspirin and left ventricular remodeling after myocardial infarction. *Basic Research In Cardiology* 2007;102(4):334-340

ALZET Comments: Acetylsalicylic acid, lysine; Saline; SC; Mice; 2002; 4 weeks; Controls received mp w/ placebo; functionality of mp verified by serum salicylate concentrations; pumps replaced after 2 weeks; cardiovascular; ischemia (cardiac); animal info (female, C57BL/6, 8-12 weeks old, 20-25 grams); MI induced by coronary artery ligation.

P4829: M. Yuan, *et al.* Reversal of obesity- and diet-induced insulin resistance with salicylates or targeted disruption of *Ikkb*. *Science* 2001;293(1673-1677

ALZET Comments: Acetylsalicylic acid; salicylate, sodium; SC; Rat; mice; 2002; 2ML2; 3-4 weeks; Controls received mp w/ vehicle; 2ML2 used in rats, 2002 used in mice; acetylsalicylic acid also called aspirin: dose was 120 mg/kg/day; diabetes (type II).

P0455: T. Oshima, *et al.* Pharmacological manipulation of canine cyclooxygenase and thromboxane synthetase in vivo: differential renal and platelet recovery rates. *J. Pharmacol. Exp. Ther* 1984;229(2):598-602

ALZET Comments: Acetylsalicylic acid; DMSO; Saline; IV (superficial cervical vein); dog; 2ML1; 3 days; pumps primed for 4 hrs. before implant; used prefilled catheter in vein; greater solubility of ASA in DMSO allowed greater concentration in smaller total volume.

2. Diclofenac

P5994: T. Murase, *et al.* Synergistic effects of nitric oxide and prostaglandins on renal escape from vasopressin-induced antidiuresis. *American Journal of Physiology-Regulatory Integrative and Comparative Physiology* 2003;284(2):R354-R362

ALZET Comments: Vasopressin, 1-desamino-8-D arginine; L-NAME; diclofenac; ranitidine; Saline; DMSO; SC; Rat; 2001; 2002; 5 days; Vasopressin, 1-desamino-8-D arginine was infused in the 2002 pump; L-NAME was dissolved in saline and diclofenac was dissolved in 50% DMSO; both were infused from a 2001 pump.

P3383: O. Risto, *et al.* The effect of low dose diclofenac sodium administered locally on heterotopic bone formation in rats. *Int. Orthopaedics (SICOT)* 1995;19(392-395

ALZET Comments: Diclofenac; NaCl; bone; Rat; 2001; < or = 2 weeks; controls received mp w/saline; tissue perfusion (demineralized bone implant); functionality of mp verified by residual volume; diclofenac is an NSAID.

3. Flurbiprofen

Q0222: C. Campanella, *et al.* Influence of prolonged exposure of a short half life non-steroidal anti-inflammatory drugs on gastrointestinal safety. *INFLAMMOPHARMACOLOGY* 2009;17(4):205-210

ALZET Comments: Flurbiprofen; PEG 400; IP; Rat; 2002; 7 days; Comparison of IP injections vs. mp; stability verified in vitro test for 14 days; animal info (male, Sprague Dawley, adult, 300-350 g.); "There was no significant difference between the two i.p. groups in the post-mortem plasma R or S-flurbiprofen concentration or in the percent of the dose excreted as glucuronidated flurbiprofen in urine on days 1 and 7" pg 207.



P7625: I. Peretto, *et al.* Synthesis and biological activity of flurbiprofen analogues as selective inhibitors beta-amyloid (1-42) secretion. *Journal of Medicinal Chemistry* 2005;48(18):5705-5720

ALZET Comments: Flurbiprofen analogues; flurbiprofen; SC; Rat; 2001; 4-7 days; Dose-response; neurodegenerative (Alzheimer's disease); cassette dosing technology; 2-6 different analog compounds administered simultaneously to one animal.

P1533: S. Offenbacher, *et al.* Changes in cyclooxygenase metabolites in experimental periodontitis in macaca mulatta. *J. Periodontal Res* 1989;24(63-74)

ALZET Comments: Flurbiprofen; SC; monkey; 2ML2; 2ML4; 6, 12 months; controls received no drugs or sham pumps; multiple pumps per animal (2) (simultaneously); pumps replaced every 2 weeks or monthly; long-term study; one animal removed from study due to a 'secondary infection caused by a cage-pressure abrasion at the site of the s.c.

P1208: S. Offenbacher, *et al.* Effects of flurbiprofen on the progression of periodontitis in macaca mulatta. *J. Periodontal Res* 1987;22(6):473-481

ALZET Comments: Flurbiprofen; Tris buffer; SC; monkey; 2ML2; 2ML4; 6 months; controls received mp w/ tris buffer; dose-response (table); 2 doses of agent infused; high dosage group received 2 pumps (2ML2); pumps replaced every 4 weeks for 2ML4, 2 weeks for 2ML2; long-term study.

4. Ibuprofen

R0376: R. G. Kenny, *et al.* Toward Multi-Targeted Platinum and Ruthenium Drugs-A New Paradigm in Cancer Drug Treatment Regimens? *Chem Rev* 2019;

ALZET Comments: Chloridotetrakis(ibuprofenato)diruthenium-(II,III); Rat; cancer (glioma);

Q5442: F. Streijger, *et al.* Combinatorial treatment of acute spinal cord injury with ghrelin, ibuprofen, C16, and ketogenic diet does not result in improved histologic or functional outcome. *J Neurosci Res* 2014;92(7):870-83

ALZET Comments: Ibuprofen; PBS; SC; Rat; Controls received mp w/ vehicle; animal info (male Sprague-Dawley rats, 278-315 g); spinal cord injury; behavioral testing (grooming test, cylinder rearing test, Montoya staircase test, horizontal ladder test); Healing/recovery after spinal cord injury study; Dose (2.5 mL/hour);

Q3526: D. Jurk, *et al.* Chronic inflammation induces telomere dysfunction and accelerates ageing in mice. *Nature Communications* 2014;5(U235-U248)

ALZET Comments: Ibuprofen; PEG; DMSO; SC; Mice; 2004; 8 weeks; Animal info (male, nfkb1 -/-, 24 weeks old); pumps replaced every 28 days; 50% DMSO used; 50% PEG used; behavioral testing (tightrope test); used 7mm wound clips;

Q4703: M. Benadiba, *et al.* Growth inhibitory effects of the Diruthenium-Ibuprofen compound, [Ru(2)Cl(Ibp)(4)], in human glioma cells in vitro and in the rat C6 orthotopic glioma in vivo

1993. *JOURNAL OF BIOLOGICAL INORGANIC CHEMISTRY* 2014;19(1025-1035)

ALZET Comments: Diruthenium-ibuprofen; Ethanol; CSF, artificial; CSF/CNS (intratumoral); Rat; 2002; 14 days; Animal info (female, Wistar, 250-350g); ALZET brain infusion kit used; 15% ethanol used; comparison of injection vs mp; cancer (glioma); tissue perfusion (intratumoral, glioma); "Using the orthotopic C6 model the effects of either chronic 14-day treatment by intra-peritoneal injection of chronic 14-day intra-tumour infusion by an Alzet osmotic pump attached to a brain infusion cannula were tested. Tumour growth was reduced by both routes of administration with the osmotic pump appearing to be the less harmful route in terms of haematological responses." pg 1033; Diruthenium-Ibuprofen aka RuIbp;

Q4741: K. G. Sharp, *et al.* A re-assessment of the effects of treatment with a non-steroidal anti-inflammatory (ibuprofen) on promoting axon regeneration via RhoA inhibition after spinal cord injury. *EXPERIMENTAL NEUROLOGY* 2013;248(:):321-337

ALZET Comments: Ibuprofen; Saline; SC; Rat; 2ML4; 4 weeks; Controls received mp w/ vehicle; animal info (female, Sprague-Dawley, 9-10 weeks old); spinal cord injury; post op. care (bladders expressed BID); behavioral testing (hindlimb



locomotor function; gridwalk task, footprint analysis, girdle test, plantar von frey); immunology; pumps primed for 16h in 37C saline;.

Q1221: T. Madura, *et al.* Ibuprofen improves functional outcome after axotomy and immediate repair in the peripheral nervous system. *Journal of Plastic Reconstructive and Aesthetic Surgery* 2011;64(12):1641-1646

ALZET Comments: Ibuprofen; PBS; SC; Rat; 2ML4; 3 weeks; Controls received mp w/ vehicle; animal info (female, Wistar, 200 g); stress/adverse reaction: "pressure necrosis" (see pg. 1643).

Q0207: D. Van Dam, *et al.* Ibuprofen modifies cognitive disease progression in an Alzheimer's mouse model. *JOURNAL OF PSYCHOPHARMACOLOGY* 2010;24(3):383-388

ALZET Comments: Ibuprofen; PEG 300; water, ultrapure; SC; Mice; 2004; 8 weeks; Controls received mp w/ vehicle; pumps replaced after 4 weeks; animal info (6 wks old, male, APP23); neurodegenerative (Alzheimer's Disease).

P9697: X. X. Wang, *et al.* Ibuprofen Enhances Recovery from Spinal Cord Injury by Limiting Tissue Loss and Stimulating Axonal Growth. *Journal of Neurotrauma* 2009;26(1):81-95

ALZET Comments: Ibuprofen; naproxen; PBS; SC; Rat; mice; 2004; 2ML4; 4 weeks; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, 11-12 wks old, 250-270 g., female, C57BL/6, 8-9 wks old, 20 g.); spinal cord injury; behavioral testing (BBB locomotor scale, Basso mouse scale).

P5919: C. Wagner, *et al.* Differential regulation of renin and Cox-2 expression in the renal cortex of C57Bl/6 mice. *PFLUGERS ARCHIV-EUROPEAN JOURNAL OF PHYSIOLOGY* 2003;447(2):214-222

ALZET Comments: Bumetanide; ibuprofen; SC; Mice; 1007D; 7 days;

P1145: H. Orita, *et al.* Prevention of postsurgical peritoneal adhesion formation by intraperitoneal administration of ibuprofen. *Drug Dev. Res* 1987;10(97-105)

ALZET Comments: Ibuprofen; PBS; Ringer's solution, lactated; IP; rabbit; 2002; 2ML1; 7, 14 days; controls rec'd mp w/ vehicle; mp connected to cath.; 2 exp.; varying doses of agent; ip + extraperitoneal pump placement; comparison of inject. vs. mp infusion; stress/adverse react. (fibrinous tissue).

5. Indomethacin

Q4542: Y. R. Na, *et al.* Consistent Inhibition of Cyclooxygenase Drives Macrophages towards the Inflammatory Phenotype. *PLoS One* 2015;10(U1730-U1742)

ALZET Comments: NA-398; SC-560; indomethacin; DMSO; SC; Mice; 30 days; Controls received mp w/ vehicle; animal info (female, BALB/c); immunology;.

P4819: M. C. Babin, *et al.* Systemic administration of candidate antivesicants to protect against topically applied suitor mustard in the mouse ear vesicant model (MEVM). *Journal of Applied Toxicology* 2000;20(S141-S144)

ALZET Comments: Hydrocortisone; indomethacin; olvanil; PEG 200; SC; mice; 2 days; Controls received mp w/ vehicle; toxicology.

P4475: M. G. Zlatnik, *et al.* The effect of indomethacin and prostacyclin agonists on blood pressure in a rat model of preeclampsia. *Am. J. Obstet. Gynecol* 1999;180(5):1191-1195

ALZET Comments: Iloprost; Cicaprost; L-NAME; Indomethacin; Saline;; SC;; Rat (pregnant);; 2ML2;; 2 weeks;; controls received mp w/vehicle; comparison of SC injections vs. mp; cardiovascular; L-NAME is a synthase inhibitor;.

P3986: P. K. Henke, *et al.* Bacterial products primarily mediate fibroblast inhibition in biomaterial infection. *J. Surg. Res* 1998;74(17-22)

ALZET Comments: Antibody, anti-interferon gamma; Antibody, indomethacin; Antibody, anti-TNF α ; Antibody, interleukin 1 alpha; PBS, sterile; ETHANOL; Indomethacin; SC; mice; 1007D; 7 days; immunology; pump implanted next to Dacron graft; peptides.



P3918: P. K. Henke, *et al.* Prostaglandin E2 modulates monocyte MHC-II (Ia) suppression in biomaterial infection. *J. Surg. Res* 1997;69(372-378)

ALZET Comments: Indomethacin; Antibody, anti-IL-1a; Antibody, anti-TNFa; PBS; ETHANOL; SC; Mice; 7 days; Controls received mp w/ vehicle; immunology.

P4207: K. Shimoda, *et al.* Effect of antioxidants, anti-inflammatory drugs, and histamine antagonists on Sparfloxacin-induced phototoxicity in mice. *Fundam. Appl. Toxicol* 1996;31(133-140)

ALZET Comments: Catalase; Dimethyl sulfoxide; Dexamethasone; Indomethacin; Pyrilamine maleate; AA-861; Cimetidine; Phenidone; Ethanol; Saline; SC; mice; 1007D; 72 hours; all agents infused concomitantly in the same pump; preliminary study conducted to test solubility and toxicity for 5 days; enzyme inhibitors; toxicology.

P3614: M. Fernandez, *et al.* Acute and chronic cyclooxygenase blockade in portal-hypertensive rats: influence on nitric oxide biosynthesis. *Gastroenterol* 1996;110(1529-1535)

ALZET Comments: Indomethacin; Sodium carbonate; SC; Rat; 2ML2; 7 days; sonication used to suspend indomethacin.

P2852: T. Sakamoto, *et al.* Effect of intravitreal administration of indomethacin on experimental subretinal neovascularization in the subhuman primate. *Arch Ophthalmol* 1995;113(222-226)

ALZET Comments: Indomethacin; GBR buffer; Cyclodextrin, B-; Eye (vitreal); monkey; 2ML2; 14 days; control eyes received mp with vehicles; enzyme inhibitor; indomethacin is a cyclooxygenase (COX) inhibitor; detailed description of vitreal cannula implantation; empty pump implanted at time of cannula implantation to allow 1-month recovery period; beta-cyclodextrin used as a carrier molecule; some monkeys served both as control and drug treatment group (different treatment in each eye); a vitreal opacity appeared in some eyes during infusion but disappeared after the pump was disconnected.

P1204: W. Schlegel, *et al.* Effect of continuous intrauterine administration of prostaglandin F2alpha and indomethacin on fertilization of rabbits. *Horm. Metab. Res* 1986;18(457-461)

ALZET Comments: Indomethacin; Prostaglandin F2a; HCl; Sodium hydroxide; Saline; intrauterine; rabbit; 2002; 11 days; controls received mp w/ vehicle; separate and simultaneous infusion of agents; comparison of agents effects; NaOH, HCl and saline were used in combination as the vehicle for indomethacin; many different exp.; tissue perfusion (cornua of uterus).

P0794: T. G. Kennedy. Intrauterine infusion of prostaglandins and decidualization in rats with uteri differentially sensitized for the decidual cell reaction. *Biol. Reprod* 1986;34(2):327-335

ALZET Comments: Indomethacin; Prostaglandin E2; Prostaglandin F2a; Ethanol; Gelatin; PBS; intrauterine; Rat; 2001; 5 days; replacement therapy (ovariectomy); controls received mp w/ vehicle; estradiol and progesterone injected sc w/ mp PG infusion; vehicle contained indomethacin to reduce PG synthesis; tissue perfusion (uterus).

P1031: P. E. Doktorcik, *et al.* 6-Keto-prostaglandin E1 and the decidual cell reaction in rats. *Prostaglandins* 1986;32(5):679-689

ALZET Comments: Indomethacin; Prostaglandin E1; Prostaglandin E2; Ethanol; Gelatin; PBS; intrauterine; Rat; 2001; 5 days; mp w/vehicle; dose-response; indomethacin infused with prostaglandin E1 in one group and with prostaglandin E2 in another group; tissue perfusion (uterus).

P0739: T. G. Kennedy. Evidence for the involvement of prostaglandins throughout the decidual cell reaction in the rat. *Biol. Reprod* 1985;33(140-146)

ALZET Comments: Indomethacin; Prostaglandin E2; Prostaglandin F2a; Ethanol; PBS; intrauterine; Rat; 2001; 5 days; replacement therapy (ovariectomy); pumps primed overnight in saline; sc adminis. of agents in comb. w/mp infusion; separate and simultaneous infusion of agents; tissue perfusion (uterus).

6. Ketorolac



P8822: J. M. Scarlett, *et al.* Regulation of central melanocortin signaling by interleukin-1beta. *Endocrinology* 2007;148(9):4217-4225

ALZET Comments: Ketorolac; Saline, sterile; SC; Mice; 1007D; 2 days; Controls received mp w/ vehicle; animal info (male, C57BL/6J, 4-5 wks old).

P5091: M. D. Southall, *et al.* Twenty-four hour exposure to prostaglandin downregulates prostanoid receptor binding but does not alter PGE(2)-mediated sensitization of rat sensory neurons. *Pain* 2002;96(285-296)

ALZET Comments: Ketorolac tromethamine; Saline; CSF/CNS (intrathecal); Rat; 2001; 48 hours; controls received mp w/ vehicle; ketorolac is an NSAID sold as Toradol; cannula patency verified by saline injection.

P4204: J. V. Shufflebarger, *et al.* The effect of ketorolac on microvascular thrombosis in an experimental rabbit model. *Plast. Reconstr. Surg* 1996;98(140-145)

ALZET Comments: Ketorolac; IV (jugular); rabbit; 2ML1; 7 days; controls received mp w/saline; functionality of mp verified by residual volume; comparison of i.m. injections vs. mp; ketorolac also called Toradol; NSAID.

7. Meclofenamate

P1305: E. L. Sargent, *et al.* Intraluteal infusion of a prostaglandin synthesis inhibitor, sodium meclufenamate, causes premature luteolysis in rhesus monkeys. *Endocrinology* 1988;123(5):2261-2269

ALZET Comments: Meclofenamate, sodium; Saline; Water; intraovarian (corpus luteum); IV (jugular); monkey; 2ML1; 7 days; stress/adverse reaction (cortisol and progesterone levels); tissue perfusion.

8. Naproxen

Q3710: A. C. Rosa, *et al.* Prevention of Bleomycin-Induced Lung Inflammation and Fibrosis in Mice by Naproxen and JNJ7777120 Treatment. *Journal of Pharmacology and Experimental Therapeutics* 2014;351(308-316)

ALZET Comments: JNJ7777120; naproxen; SC; Mice; 1004; Control animals received mp w/ vehicle; animal info (male, C57BL/6, ~2 mo old, 25-30 g); infusion rate listed as 0.11 ul/hr; JNJ7777120 also known as (1-[(5-chloro-1H-indol-2-yl)carbonyl]-4-methylpiperazine), is a selective H4R antagonist; one group received combination of JNJ7777120 and naproxen.

P8571: C. Baj-Rossi, *et al.* Continuous monitoring of Naproxen by a cytochrome P450-based electrochemical sensor. *Biosens Bioelectron* 2014;53(283-7)

ALZET Comments: Naproxen; PBS; In vitro; 1002; Naproxen is a non-steroidal anti-inflammatory agent; This paper reports the characterization of an electrochemical biosensor for the continuous monitoring of Naproxen delivered by alzet pumps.

Q4700: C. Baj-Rossi, *et al.* Continuous monitoring of Naproxen by a cytochrome P450-based electrochemical sensor. *BIOSENSORS & BIOELECTRONICS* 2014;53(:):283-287

ALZET Comments: Naproxen; Methanol; In Vitro; 1002; 16 hours; Functionality of mp verified by naproxen levels measured with sensors;

P9697: X. X. Wang, *et al.* Ibuprofen Enhances Recovery from Spinal Cord Injury by Limiting Tissue Loss and Stimulating Axonal Growth. *Journal of Neurotrauma* 2009;26(1):81-95

ALZET Comments: Ibuprofen; naproxen; PBS; SC; Rat; mice; 2004; 2ML4; 4 weeks; Controls received mp w/ vehicle; animal info (female, Sprague Dawley, 11-12 wks old, 250-270 g., female, C57BL/6, 8-9 wks old, 20 g.); spinal cord injury; behavioral testing (BBB locomotor scale, Basso mouse scale).

P1504: W. Y. Chan, *et al.* Effects of inhibition of prostaglandin synthesis on uterine oxytocin receptor concentration and myometrial gap junction density in parturient rats. *Biol. Reprod* 1988;39(1117-1128)



ALZET Comments: Naproxen, sodium; Saline; SC; Rat (pregnant); 2001; 3 days; no comment posted.

9. Sup Dismut-PEG

P3263: E. H. Karran, *et al.* A simple in vivo model of collagen degradation using collagen-gelled cotton buds: the effects of collagenase inhibitors and other agents. *Inflamm. Res* 1995;44(36-46

ALZET Comments: Collagenase inhibitor A; Collagenase inhibitor B; Collagenase inhibitor C; tempol; Superoxide dismutase-PEG; Cytochalasin B; Pepstatin; APMSF; TLCK; SBTI; Leupeptin; E-64; Methylamine; SC; Rat; 2001; 2ML1; 7 days; controls received mp w/vehicle; no stress (see pg. 39); immunology; pumps connected with catheter tubing to 14C-collagen-gelled cotton buds.

P3114: D. Truelove, *et al.* Neuronal protection with superoxide dismutase in repetitive forebrain ischemia in gerbils. *Free Rad. Biol. Med* 1994;17(5):445-450

ALZET Comments: Superoxide dismutase-PEG; Saline; CSF/CNS; gerbil; 1007D; 6 days; controls received mp with vehicle; ischemia (cerebral).

10. Tempol or Sup Dismutase

Q4181: K. L. H. Wu, *et al.* Role of Nitric Oxide Synthase Uncoupling at Rostral Ventrolateral Medulla in Redox-Sensitive Hypertension Associated With Metabolic Syndrome. *Hypertension* 2014;64(815-+

ALZET Comments: Tempol; coenzyme Q10; CSF, artificial; CSF/CNS (cisterna magna); Rat; 1007D; 2 weeks; Controls received mp w/ vehicle; animal info (male, Sprague Dawley 8 weeks old, 235-296g); post op. care (1000 IU IM); tissue perfusion (cisterna magna); cardiovascular; diabetes; used PE-10 catheter;

Q3661: Q. Su, *et al.* Inhibition of reactive oxygen species in hypothalamic paraventricular nucleus attenuates the renin-angiotensin system and proinflammatory cytokines in hypertension. *TOXICOLOGY AND APPLIED PHARMACOLOGY* 2014;276(115-120

ALZET Comments: Tempol; angiotensin II; CSF, artificial; saline, sterile; CSF/CNS (paraventricular nuclei); Rat; 1004; 4 weeks; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, adult, 250-275g); functionality of mp verified by increase bp; tissue perfusion (paraventricular nucleus); immunology; "The success rate of bilateral microinjection and vein infusion is respectively 65% and 78%." pg 116; bp measured using tail-cuff;

Q4699: A. O. Awonuga, *et al.* THE IN-VIVO EFFECTS OF SUPEROXIDE DISMUTASE ON THE INCIDENCE AND SEVERITY OF POST-OPERATIVE ADHESION DEVELOPMENT 751. *FERTILITY AND STERILITY* 2014;102(E73-E73

ALZET Comments: Superoxide dismutase; Saline; IP; Rat; 3 weeks; Controls received mp w/ vehicle; animal info (female, Sprague Dawley);

Q5520: H. Zheng, *et al.* Centrally mediated erectile dysfunction in rats with type 1 diabetes: role of angiotensin II and superoxide. *J Sex Med* 2013;10(9):2165-76

ALZET Comments: Enalapril maleate, Losartan, Tempol; CSF, artificial; CSF/CNS (ventricle); Rat; 1003D; 14 days; Controls received mp w/ aCSF; ALZET brain infusion kit 2 used; Enalapril is an ACE inhibitor; Losartan is an ANG II AT1 receptor antagonist; tempol is a SOD mimetic; Therapeutic indication (erectile dysfunction); Dose: Enalapril (0.5 mg/m), losartan (2 mg/mL), tempol (50 mg/mL);

Q2125: K. Ozumi, *et al.* Role of Copper Transport Protein Antioxidant 1 in Angiotensin II-Induced Hypertension A Key Regulator of Extracellular Superoxide Dismutase. *Hypertension* 2012;60(2):476-U487

ALZET Comments: Angiotensin II; Tempol; Saline; SC; Mice; 2002; 7 days; Controls received mp w/ vehicle; animal info (Atox1 -/-, 3 mo old); blood pressure measured via tail cuff.



Q1866: C. Loinard, *et al.* C/EBP Homologous Protein-10 (CHOP-10) Limits Postnatal Neovascularization Through Control of Endothelial Nitric Oxide Synthase Gene Expression. *Circulation* 2012;125(8):1014-U126

ALZET Comments: Tempol; Mice; 2002; Controls received mp w/ saline; animal info (CHOP-10 deficient, wt, 28 g, 8 wks old); ischemia.

Q2183: S. F. Knight, *et al.* Folate Receptor-Targeted Antioxidant Therapy Ameliorates Renal Ischemia-Reperfusion Injury. *Journal of the American Society of Nephrology* 2012;23(5):793-800

ALZET Comments: Tempol; Saline; folate; IV (jugular); Mice; 48 hours; Controls received mp w/ vehicle; animal info (male, C57BL/6, 11 wks old); ischemia (renal); 7-day pump used; post op. care (buprenorphine in saline).

Q1904: M. Fujita, *et al.* Sympathoexcitation by Brain Oxidative Stress Mediates Arterial Pressure Elevation in Salt-Induced Chronic Kidney Disease. *Hypertension* 2012;59(1):105-U259

ALZET Comments: Tempol; CSF, artificial; CSF/CNS; IP; Rat; 2002; 4 weeks; Controls received mp w/ vehicle; animal info (Sprague Dawley, male, 3 wks old); pumps replaced after 2 week; cannula placement verified by ICV injection of Evans Blue dye after euthanization.

Q1702: N. J. Willett, *et al.* Redox Signaling in an In Vivo Murine Model of Low Magnitude Oscillatory Wall Shear Stress.

ANTIOXIDANTS & REDOX SIGNALING 2011;15(5):1369-1378

ALZET Comments: Tempol; ebselen; DMSO; saline; SC; IV (jugular); Mice; 2ML1; 1007D; 4 days; Animal info (male, 11-13 wks old, C57BL/6, P47 phox -/-); 50% DMSO used.

Q1156: M. H. W. Kappers, *et al.* The Vascular Endothelial Growth Factor Receptor Inhibitor Sunitinib Causes a Preeclampsia-Like Syndrome With Activation of the Endothelin System. *Hypertension* 2011;58(2):295-U351

ALZET Comments: Tempol; SC; Rat; 2ML2; 8 days; Animal info (male, Wistar, Kyoto, 280-300 g).

P9880: K. L. H. Wu, *et al.* Nitric Oxide and Superoxide Anion Differentially Activate Poly(ADP-ribose) Polymerase-1 and Bax to Induce Nuclear Translocation of Apoptosis-Inducing Factor and Mitochondrial Release of Cytochrome c after Spinal Cord Injury. *Journal of Neurotrauma* 2009;26(7):965-977

ALZET Comments: Methylisothiourea, S-; PTIO, carboxy-; Coenzyme Q₁₀; tempol; FeTMPyP; furosemide; PJ-34; CSF, artificial; sesame oil; CSF/CNS (spinal cord); Rat; 1003D; 3 days; Controls received mp w/ vehicle; multiple pumps per animal (2); post op. care (procraine penicillin); adult, male, specific pathogen free, 200-250 g.); spinal cord injury; PE-10 catheter used; PTIO is a NO trapping agent; enzyme inhibitor PJ-34 is poly(ADP-ribose) polymerase PARP inhibitor.

P9640: Y. M. Kang, *et al.* Brain nuclear factor-kappa B activation contributes to neurohumoral excitation in angiotensin II-induced hypertension. *Cardiovascular Research* 2009;82(3):503-512

ALZET Comments: Angiotensin II; losartan; pyrrolidine dithiocarbamate; tempol; Saline; CSF, artificial; IV (femoral); CSF/CNS; Rat; 4 weeks; Controls received mp w/vehicle; peptides; multiple pumps per animal (2); animal info (adult, male, Sprague-Dawley, 275-300g); bilateral cannula used for multiple drug infusions; bilateral infusion;

P9146: Z. H. Zhang, *et al.* Aldosterone acts centrally to increase brain renin-angiotensin system activity and oxidative stress in normal rats. *American Journal of Physiology-Heart and Circulatory Physiology* 2008;294(2):H1067-H1074

ALZET Comments: Aldosterone; RU-28318; Tempol; losartan; CSF, artificial; CSF/CNS; Rat; 2002; 1 week; Controls received mp w/ vehicle; post op. care (buprenorphine); animal info (male, Sprague Dawley, 250-300 g.); silastic tubing used; dental cement used.

P9074: B. J. Xue, *et al.* Central estrogen inhibition of angiotensin II-induced hypertension in male mice and the role of reactive oxygen species. *American Journal of Physiology-Heart and Circulatory Physiology* 2008;295(3):H1025-H1032

ALZET Comments: Tempol; estradiol, 17B-; ICI-182780; SC; CSF/CNS; Mice; 1002; 7, 14 days; ALZET brain infusion kit used; peptides; animal info (male, C57BL/6, 12-16 wks old); location of cannula was verified histologically post mortem.

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



ALZET Comments: Angiotensin II; dye, coomassie blue R250; G86976; tempol; SC; kidney (outer medulla); Rat; 1007D; 4, 7 days; 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.

P9252: Z. Y. Qin, *et al.* Role of Menkes ATPase in Angiotensin II-Induced Hypertension A Key Modulator for Extracellular Superoxide Dismutase Function. *Hypertension* 2008;52(5):945-U556

ALZET Comments: Angiotensin II; norepinephrine; tempol; Saline; SC; Mice; 2002; 14 days; Controls received sham surgery with no mp or empty mp; functionality of mp verified by blood pressure; cardiovascular; peptides; multiple pumps per animal (2); animal info (female, C57BL/6EJ blotchy MNK mut, 8-12 wks old).

P9076: D. M. Liu, *et al.* Role of oxidant stress on AT1 receptor expression in neurons of rabbits with heart failure and in cultured neurons. *Circulation Research* 2008;103(2):186-193

ALZET Comments: Tempol; CSF, artificial; CSF/CNS; Rabbit; 2001; 7 days; Controls received mp w/ vehicle; animal info (New Zealand, White, 3.5-4.3 kg.); 19 gauge cannula used.

P9053: Y. M. Kang, *et al.* Cross-talk between cytokines and renin-angiotensin in hypothalamic paraventricular nucleus in heart failure: role of nuclear factor-kappa B. *Cardiovascular Research* 2008;79(4):671-678

ALZET Comments: Losartan; SN50; tempol; CSF, artificial; CSF/CNS; Rat; 4 weeks; Controls received mp w/ vehicle; peptides; animal info (male, Sprague Dawley, 250-275 g.); pumps were primed in 0.9% saline for 24 hours; SN50 is a synthetic protein.

P9759: N. N. Ge, *et al.* Long-Term Hearing Loss in Gerbils With Bacterial Meningitis Treated With Superoxide Dismutase. *OTOLOGY & NEUROTOLOGY* 2008;29(8):1061-1067

ALZET Comments: Superoxide dismutase; CSF, artificial; CSF/CNS (intrathecal); Gerbil; 1002; 14 days; Controls received IM injections of SOD; half-life (p.1065) 40 hours; animal info (8 wks old, male, Mongolian); dental cement used to hold tubing in place; silastic tubing used; image of surgical placement of pumps fig.2., fig. 4.

11. Tolmetin

P2007: K. E. Rodgers, *et al.* Effect of tolmetin sodium dihydrate on adhesion formation by intraperitoneal administration of antineoplastic agents. *Cancer Chemother. Pharmacol* 1992;29(248-251

ALZET Comments: Doxorubicin HCl; Mitoxantrone; Tolmetin sodium; Bleomycin; Cisplatin; Methotrexate; PBS; IP; Rat; 2ML1; 7 days; Antibiotic; cancer; no stress (see p249).