



### References on the Administration of Prostaglandins Using ALZET® Osmotic Pumps

**Q7487:** P. Sorensen, *et al.* A Blend of F Prostaglandins Functions as an Attractive Sex Pheromone in Silver Carp. *Fishes* 2019;4(2):

**Agents:** Prostaglandin F<sub>2</sub>-alpha **Vehicle:** Not Stated; **Route:** IP; **Species:** Fish (Carp); **Pump:** 2ML1; **Duration:** 8 days; **ALZET Comments:** Dose (1ug/g body weight for 8 days); animal info (9 juvenile Silver, Bighead, and Common Carp (all approximately 50 g +/- 10 g);

**Q6722:** H. Li, *et al.* Cyclooxygenase-2 inhibits T helper cell type 9 differentiation during allergic lung inflammation via down-regulation of IL-17RB. *Am J Respir Crit Care Med* 2013;187(8):812-22

**ALZET Comments:** Prostaglandin D<sub>2</sub>; ProstaglandinE<sub>2</sub>; Saline, sterile; SC; Mice (knockout); 1004; 7 days; Controls received mp w/ vehicle; animal info (6- to 10-week-old male COX-12/2, COX-22/2, and WT littermate control mice);

**Q1919:** H. Lim, *et al.* Common Carp Implanted with Prostaglandin F<sub>2</sub>-alpha Release a Sex Pheromone Complex that Attracts Conspecific Males in Both the Laboratory and Field. *JOURNAL OF CHEMICAL ECOLOGY* 2012;38(2):127-134

**ALZET Comments:** Prostaglandin F<sub>2</sub>-alpha; Water, deionized, sterile; IP; Fish (carp); 2ML1; 2 weeks; Animal info (juvenile, male, female, carp); "We suggest that the implant technique may be useful in future studies of how PGF pheromones function and could be further developed to attract invasive fish for use in control." pg 127.

**Q1921:** H. Li, *et al.* Cyclooxygenase-2 Regulates Th17 Cell Differentiation during Allergic Lung Inflammation. *AMERICAN JOURNAL OF RESPIRATORY AND CRITICAL CARE MEDICINE* 2011;184(1):37-49

**ALZET Comments:** Prostaglandin E<sub>2</sub>; prostaglandin F<sub>2</sub>, alpha; iloprost; Ethanol; saline, sterile; Mice; Controls received mp w/ vehicle; animal info (6-10 wks old, COX-1 -/-, COX-2 -/-, wt); 15% ethanol used.

**P9405:** M. Failla, *et al.* 16,16-Dimethyl Prostaglandin E<sub>2</sub> Efficacy on Prevention and Protection from Bleomycin-Induced Lung Injury and Fibrosis. *American Journal of Respiratory Cell and Molecular Biology* 2009;41(1):50-58

**ALZET Comments:** Prostaglandin E<sub>2</sub>; prostaglandin E<sub>2</sub>, dimethyl-; PBS; SC; Mice; 2002; 4, 7, 21 days; Controls received mp w/ vehicle or no treatment; no stress (see pg. 51); animal info (male, CD, 25-35 g., bleomycin-induced lung injury); "This route of administration was preferred because of constant drug delivery... and in our pilot study was found to be both innocuous and efficacious." (p. 51).

**P7704:** M. G. Cattaneo, *et al.* Alprostadil suppresses angiogenesis in vitro and in vivo in the murine Matrigel plug assay. *Br. J. Pharmacol* 2003;138(2):377-385

**ALZET Comments:** Prostaglandin E<sub>1</sub>; cyclodextrin; Saline, isotonic; SC; Mice; 4 days; Controls received mp w/ vehicle; animal info (C57/BL6, female, 6-8 weeks old).

**P6225:** S. Brault, *et al.* Selective neuromicrovascular endothelial cell death by 8-iso-prostaglandin F-2 alpha - Possible role in ischemic brain injury. *Stroke* 2003;34(3):776-782

**ALZET Comments:** Hydrogen Peroxide; Prostaglandin F<sub>2</sub> alpha, 8-Iso-; CGS12970; U-46619; Urotensin II; CSF, artificial; CSF/CNS; Rat; 1 week; Controls received mp w/ vehicle; enzyme inhibitor (thromboxane A<sub>2</sub> synthase); cardiovascular; peptides; U46619 is a thromboxane A<sub>2</sub> synthase inhibitor; ischemia (cerebral).

**P5041:** K. Yoshida, *et al.* Stimulation of bone formation and prevention of bone loss by prostaglandin E EP4 receptor activation. *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA* 2002;99(7):4580-4585

**ALZET Comments:** Prostaglandin E<sub>2</sub>; DI-004; AE1-259; AE-248; AE1-329; Ethanol; propylene glycol; bone (femur); mice; 1002; 6 weeks;; Controls received mp w/ vehicle; pumps replaced every 2 weeks; vehicle was 40% ethanol, 60% propylene glycol. DI-004, AE1-259, AE-248, and AE1-329 are agonists for Prostaglandin E receptor subtypes: EP1, EP2, EP3, and EP4, respectively.



**P5346:** C. A. Lyons, *et al.* Regulation of matrix metalloproteinases (type IV collagenases) and their inhibitors in the virgin, timed pregnant, and postpartum rat uterus and cervix by prostaglandin E-2-cyclic adenosine monophosphate. *American Journal of Obstetrics and Gynecology* 2002;187(1):202-208

**ALZET Comments:** Prostaglandin E<sub>2</sub>; IV (femoral); Rat; Rat (pregnant); 24 hours; Controls received mp w/ saline; catheter was filled with enough saline to provide a 3 hour recovery prior to onset of PGE<sub>2</sub> delivery.

**Q6869:** W. Wang, *et al.* Cytokine and Cyclooxygenase-2 Protein in Brain Areas of Tumor-bearing Mice with Prostanoid-related Anorexia. *Cancer Research* 2001;61(4707-4715)

**ALZET Comments:** Prostaglandin E<sub>2</sub>; IP; Mice; 1007D; 7 days; Dose (1872 µg/100 µl or 321 µg/ µl); Controls received mp w/ vehicle; animal info (Adult, female age-matched C57BL/6 mice (22-27 g));

**P3029:** D. K. Vanderwall, *et al.* Corpus luteal function in nonpregnant mares following intrauterine administration of prostaglandin E<sub>2</sub> or estradiol-17B. *Theriogenology* 1994;42(1069-1083)

**ALZET Comments:** Prostaglandin E<sub>2</sub>; Estradiol, 17B-; Ethanol; PBS; intrauterine; horse; 2001; 7 days; controls received no treatment or mp with vehicle; tissue perfusion (uterine horn lumen); no stress (see pg. 1078); benzathine penicillin-G given prophylactically.

**P2527:** S. C. Miller, *et al.* Local stimulation of new bone formation by prostaglandin E<sub>1</sub>: quantitative histomorphometry and comparison of delivery by minipumps and controlled-release pellets. *Bone* 1993;14(143-151)

**ALZET Comments:** Prostaglandin E<sub>1</sub>; Emulphor; Ethanol; bone (mandible); dog; 3 weeks; controls received undiluted vehicle which was 1:1 mixture of Emulphor:80% ETOH; tissue perfusion (bone); comparison of pellets vs. mp; pumps replaced weekly; authors state that subperiosteal bone formation was greater for comparable doses when PGE<sub>1</sub> was delivered by minipumps as compared to pellets.

**P3311:** S. C. Marks Jr, *et al.* Local induction of alveolar bone in adult dogs by infusion of prostaglandin E<sub>1</sub>. *Biological Mechanisms of Tooth Movement and Craniofacial Adaptation* 1992;137-143

**ALZET Comments:** Prostaglandin E<sub>1</sub>; Emulphor; Ethanol; bone (mandible); dog; 3 weeks; controls received mp w/vehicle; tissue perfusion (bone); comparison of pellets vs. mp; pumps replaced weekly; "...we estimated that PGE delivered by minipump produces 25 to 30% more bone than the same amount of starting material delivered by pellet." (p.139).

**P1946:** T. Kamei, *et al.* Intra-graft delivery of 16, 16-dimethyl PGE<sub>2</sub> induces donor-specific tolerance in rat cardiac allograft recipients. *Transplantation* 1991;51(1):242-246

**ALZET Comments:** Prostaglandin E<sub>2</sub> analogue; Ethanol; Saline; IA (innominate); IP; IV (lumbar); Rat; 2ML1; 2ML2; 1, 2 weeks; tissue perfusion (cardiac allograft); immunology; pumps implanted IP.

**P1917:** M. P. Kahky, *et al.* Prostaglandin E<sub>1</sub> enhances tumoricidal activity of 5-fluoro-2'-deoxyuridine in rats. *J. Surg. Res* 1991;51(119-123)

**ALZET Comments:** Prostaglandin E<sub>1</sub>; Uridine, fluorodeoxy-; IV (jugular); Rat; 2ML1; 7 days; stability confirmed for both agents in pumps for 7 days at pH 7.4.

**P3077:** M. B. Zelinski-Wooten, *et al.* Intraluteal infusions of prostaglandins of the E, D, I, and A series prevent PGF<sub>2a</sub>-induced, but not spontaneous, luteal regression in rhesus monkeys. *Biol. Reprod* 1990;43(507-516)

**ALZET Comments:** Prostaglandin A<sub>2</sub>; Prostaglandin E<sub>2</sub>; Prostaglandin D<sub>2</sub>; Prostaglandin I<sub>1</sub>, 6b-; Prostaglandin F<sub>2a</sub> THAM salt; Albumin, bovine serum; Ethanol; Water, distilled; Intraovarian (corpus luteum); monkey; 2ML1; 7 days; controls received mp with saline +/- BSA; tissue perfusion (corpus luteum); functionality of mp verified by residual volume; pumps replaced until onset of menses; stability verified by in vitro testing -- see pp. 509-510; good methods; ALZAID test kit used; agents infused singly and with PGF<sub>2a</sub>; degradation of PGE<sub>2</sub> & PGD<sub>2</sub> occurred.

**P3140:** S. C. Marks, *et al.* Site-directed formation of new lamellar bone in adult dogs by infusion of prostaglandin E<sub>1</sub>. In 'Fundamentals of bone growth : methodology and applications', A. D. Dixon, B. G. Sarnat and D. A. N. Hoyte (eds), CRC Press, Boca Raton 1990;Chp. 37):375-381



**ALZET Comments:** Prostaglandin E1; Emulphor; Ethanol; bone (mandible); dog; 5 weeks; control side of mandible received mp with vehicle; tissue perfusion (bone); long-term study, pumps replaced weekly; each dog served as its own control -- one mp with PGE1 to one side and one with vehicle to the other side of mandible; pump implanted in superficial neck tissues; dogs given penicillin orally (100,000 U/d) for first post-operative week.

**P1369:** O. W. Tawfik, *et al.* Further evidence for role of leukotrienes as mediators of decidualization in the rat. *Prostaglandins* 1988;35(3):379-386

**ALZET Comments:** FPL-55712; Guaiaretic acid, nordihydro-; Leukotriene, C4; Prostaglandin E2; Ethanol; Propylene glycol; Saline; Water; Intrauterine; Rat; 2001; 1,4 days; Tissue perfusion (uterus); FPL-55712 is a leukotriene antagonist.

**P3028:** S. C. Marks Jr, *et al.* Local infusion of prostaglandin E1 stimulates mandibular bone formation in vivo. *J. Oral Pathol* 1988;17(500-505)

**ALZET Comments:** Prostaglandin E1; Emulphor; Ethanol; bone (mandible); dog; 3 weeks; controls received mp with vehicle; tissue perfusion (bone); pumps replaced weekly; stability: 70% of original activity after 1 week at 37 degrees C; penicillin given for 1 week post-surgery.

**P1418:** H. V. Gaskill III. Continuous infusion of tumor necrosis factor: mechanisms of toxicity in the rat. *J. Surg. Res* 1988;44(664-671)

**ALZET Comments:** Tumor necrosis factor, human; Prostaglandin E1; Albumin, rat serum; Saline; Triacetin; IP; Rat; 2ML1; 5 days; Multiple pumps per animal (2); PGE1 and TNF concomitantly infused; cancer/immunology; toxicology/teratology; peptides.

**P1358:** T. Engstrom, *et al.* Oxytocin receptors and contractile response of the myometrium after long term infusion of prostaglandin F2a, indomethacin, oxytocin and an oxytocin antagonist in rats. *Regul. Pept* 1988;20(65-72)

**ALZET Comments:** Oxytocin, desamino-; Oxytocin; Prostaglandin F2a; Saline; IP; Rat; 2001; 5 days; peptides.

**P1125:** H. V. Gaskill. Intraportal prostaglandin E1 ameliorates the toxicity of intraportal 2'-deoxy-5-fluorouridine in rats. *J. Surg. Res* 1987;43(2):128-132

**ALZET Comments:** Uridine, fluorodeoxy-; Prostaglandin E1; Saline; IV (hepatic portal); Rat; 2ML1; 7 days; controls received mp w/ saline; mp connected to catheter in portal vein; concomitant and simultaneous infusion of agents; cancer; toxicology.

**P1092:** E. W. Younger, *et al.* The stability of prostaglandin E1 in dilute physiological solutions at 37 degrees C. *J. Prostaglandins* 1986;31(5):923-927

**ALZET Comments:** Prostaglandin E1; Ethanol; Saline; Water; no duration posted; mp not used, different vehicles were tested w/PGE1 to ascertain which was the best for use in mp; stability of PGE1 in various vehicles at 37 degrees C; peptides.

**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).

**P0972:** T. Nagamatsu, *et al.* Antinephritic effect of prostaglandin E1 on serum sickness nephritis in rats (3) suppression of leukocytes by prostaglandin E1 as a mechanism for preventing immune complex glomerulonephritis. *Jpn. J. Pharmacol* 1986;42(109-116)

**ALZET Comments:** Prostaglandin E1 a-cyclodextrin; Ethanol; Saline; SC; Rat; 2ML1; 3 weeks; pumps replaced every week; controls received mp w/vehicle; immunology.

**P0773:** M. D. Lifschitz. Prostaglandins may mediate chloride concentration gradient across domes formed by MDCK1 cells. *Am. J. Physiol* 1986;250(F525-F531)



**ALZET Comments:** Prostaglandin E2; Glycine; in vitro (cell culture); 2002; 5 hours; mp infusion in culture dish to continually add PGE2 to MDCK cell culture.

**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).

**P0608:** T. L. Voegeli, *et al.* Utilization of prostaglandins in fracture healing. Presented at the 31st Annual Meeting of the Orthopaedic Research Society, Jan. 21-24, Las Vegas, NV 1985;134

**ALZET Comments:** Prostaglandin E1; Prostaglandin E2; Triacetin; bone (tibia); rabbit; 4 weeks; mp model not stated; no stress p. 134 - no morbidity or mortality; tissue perfusion.

**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).

**P2461:** H. V. Gaskill III, *et al.* Gastrointestinal toxicity of regional 2-deoxy-5-fluorouridine (FUDR): a study of prophylaxis and potential mechanisms in the rat. *Surg. Forum* 1985;25(398-400)

**ALZET Comments:** Uridine, fluorodeoxy-; Prostaglandin E1; IV (hepatic portal); Rat; 2ML1; 1 week; controls received mp w/ buffer; cancer; toxicology.

**P0578:** T. Nagamatsu, *et al.* Studies on experimental immune complex nephritis : (3) therapeutic effect of prostaglandin E1 a-cyclodextrin host molecule (PGE1.CD) on serum sickness nephritis in rats. *Jpn. J. Pharmacol* 1984;35(4):407-414

**ALZET Comments:** Prostaglandin E1 a-cyclodextrin; Saline; SC; Rat; 2ML1; 10 days; comparison of 2x daily sc injec vs. mp infusion.

**P1017:** G. Jasmin, *et al.* Calcium and myocardial cell injury. An appraisal in the cardiomyopathic hamster. *J. Physiol. Pharmacol* 1984;62(891-898)

**ALZET Comments:** EP-459; EP-475; Prostaglandin E2, dimethyl-; DMSO; SC; hamster; 2001; no duration posted; pumps replaced weekly; agents infused separately and simultaneously; peptides; EP-459 and EP-475 are thiol protease inhibitors.

**P1215:** F. J. Auletta, *et al.* Luteolysis in the rhesus monkey: ovarian venous estrogen, progesterone, and prostaglandin F2a-metabolite. *Prostaglandins* 1984;27(2):299-310

**ALZET Comments:** Prostaglandin F2a; intraovarian (corpus luteum); monkey; no duration posted; paper cites mp used in preliminary study; tissue perfusion.

**P0481:** F. J. Auletta, *et al.* An intra-corpus luteum site for the luteolytic action of prostaglandin F2a in the rhesus monkey. *Prostaglandins* 1984;27(2):285-298

**ALZET Comments:** Prostaglandin F2a; Saline; Tromethamine (THAM); intraovarian (corpus luteum); intraovarian (stroma); SC; monkey; 1701; 17 days; pumps replaced after 7 days; tissue perfusion (corpus luteum & ovarian stroma).



**P0199:** Y. Y. Wu, *et al.* Infusions of chemicals into the brain and the development of sustained elevations of blood pressure in the rat. *Life Sci* 1982;30(1537-1545

**ALZET Comments:** Carbachol chloride; Echothiophate iodide; Histamine dihydrochloride; Prostaglandin E2; Thyrotropin-rel. factor; Saline; CSF/CNS; Rat; 1701; 2001; no duration posted; 2001 w/carbachol & echothiophate, 1701 w/histamine, PGE2, & TRH, 7 days; comparison of agents effects.

**P0290:** J. W. Wilks. Comparison of three subcutaneous modes of prostaglandin-F2a administration for pregnancy termination in the hamster. *Prostaglandins* 1982;24(6):837-842

**ALZET Comments:** Prostaglandin F2a tromethamine salt; SC; hamster; 1701; 1 day; comparison of injec. vs. mp infusion.

**P0413:** T. G. Kennedy, *et al.* Induction of decidualization in rats by the intrauterine infusion of prostaglandins. *Biol. Reprod* 1982;27(1):253-260

**ALZET Comments:** Prostaglandin E2; Prostaglandin F2a; Ethanol; Gelatin; PBS; intrauterine; Rat; 2001; 4 days; comparison of agents effects; pumps filled eve prior to use, stored at 4 deg. C in saline; PGE2 and PGF2a used alone and in combination; tissue perfusion (uterus).

**P0089:** B. H. Vickery, *et al.* Manipulation of duration of action of a synthetic prostaglandin analogue (TPT) assessed in the pregnant beagle bitch. *Prostaglandins Med* 1980;5(2):93-100

**ALZET Comments:** Prostaglandin analog (TPT); Ethanol; Sodium phosphate; SC; dog; 1-2 days; comparison of injections sc vs. infusion.

**P0076:** S. Christensen. Failure of infusion of prostaglandin A2 to restore the response to antidiuretic hormone in rats with polyuria induced by lithium. *J. Endocrinol* 1980;84(3):459-465

**ALZET Comments:** Prostaglandin A2; Vasopressin, arginine; Methanol; Propylene glycol; Saline; IV (atrium); Rat; 1701; 7 days; comparison of bolus injection vs. infusion; separate & simultaneous infusion of agents; pumps replaced 1-2 times; peptides.

**P0026:** B. R. Pratt, *et al.* Effect of continuous intrauterine administration of prostaglandin E2 on life-span of corpora lutea of nonpregnant ewes. *J. Anim. Sci* 1979;48(6):1441-1446

**ALZET Comments:** Prostaglandin E2; Ethanol; Sodium phosphate; intrauterine; sheep; 1701; 6 and 7 days; replaced every 7 days until estrus or day 40; tissue perfusion (uterus).