References on the Administration of Calcitonin and Calcitriol Using ALZET® Osmotic Pumps

Calcitonin


**Agents:** Calcitonin gene-related peptide; **Route:** SC; **Species:** Rat; **Pump:** 2006; **Duration:** 6 weeks;

**ALZET Comments:** Dose (50 ug/kg/day); animal info (Sprague Dawley Rats, 8 to 10 weeks old); behavioral testing (Advanced Dynamic Weight Bearing Assessment, Open Field Assessment); functionality of mp verified by increased plasma levels; Calcitonin gene-related peptide aka CGRP, Substance P aka SP; peptides; dependence;


**Agents:** Angiotensin II; Calcitonin gene-related peptide **Vehicle:** PMC7294141; **Route:** Saline; **Species:** Mice; Rat; **Pump:** 1004; **Duration:** 14 days;

**ALZET Comments:** Dose (750 ug/kg/d Angiotensin II; 300 ng/kg/h Angiotensin II plus Calcitonin gene-related peptide); Controls received mp w/ vehicle; animal info (Two-month-old male C57BL/6J mice, weighing 18-25 g; male Sprague-Dawley rats, 80-100 g); Blood pressure measured via tail cuff; Angiotensin II aka Ang II; Calcitonin gene-related peptide aka CGRP; cardiovascular;


**Agents:** Substance P; Calcitonin gene-related peptide **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 3, 4 weeks;

**ALZET Comments:** Dose (SP- 100 ug/kg/day, CGRP-100 ug/kg/day or both); Controls received mp w/ vehicle; animal info (Balb/C, 6 weeks old, 16-18 g); Substance P aka SP, Calcitonin gene-related peptide aka CGRP; dependence;


**Agents:** Alpha-calcitonin gene-related peptide **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** 1007D; **Duration:** 28 days;

**ALZET Comments:** Dose (4 mg/kg b.w/day per mouse); animal info (Male C57/BL6 mice); pumps replaced every 7 days; Alpha-calcitonin gene-related peptide aka a-CGRP; cardiovascular;


**Agents:** Calcitonin gene-related peptide, SP600125, chelerythrine, CGRP8-37 receptor antagonist **Vehicle:** Saline; DMSO; **Route:** IP, Kidney (cortical region); **Species:** Mice; **Pump:** Not Stated; **Duration:** Not Stated;

**ALZET Comments:** Dose (30 ng/kg/d); 10% DMSO used; Controls received mp w/ vehicle; animal info (Male C57BL/6 mice aged 8 to 10 weeks); CGRP is a 37-amino acid neuropeptide; enzyme inhibitor (SP600125 is a c-Jun Nterminal protein kinase (JNK), and chelerythrine is a specific protein kinase C (PKC) inhibitor); CGRP infused to the cortical region of the denervated kidney via an ALZET intrathecal catheter. The catheter was anchored to the obstructed ureter, and osmotic pump placed SC; some mice were given CGRP8-37 (120 μg/kg/d), SP600125 (30 mg/kg/d), chelerythrine (5 mg/kg/d) or vehicle (0.9% saline or 10% DMSO in 0.9% saline) via IP pump.
Q7052: I. Rossetti, et al. Calcitonin gene-related peptide decreases IL-1beta, IL-6 as well as Ym1, Arg1, CD163 expression in a brain tissue context-dependent manner while ameliorating experimental autoimmune encephalomyelitis. J Neuroimmunol 2018;323(94-104)
Agents: Calcitonin gene-related peptide Vehicle: CSF, artificial; Route: CSF/CNS (intrathecal); Species: Mice; Pump: 2002; Duration: 2 weeks;
ALZET Comments: Controls received mp w/ vehicle; animal info (7-8 week old C57BL/6 female mice); peptides;

Agents: Calcitonin gene-related peptide antagonist (8-37) Vehicle: Saline; Route: SC; Species: Mice; Pump: Not Stated; Duration: 7 days;
ALZET Comments: animal info (Nine-week-old male C57BL/6 mice as wild type mice);

Agents: Neuroendocrine peptide aminoprocalcitonin, anti- Vehicle: PBS; Route: Not Stated; Species: Mice (transgenic); Pump: 1004; Duration: 28 days;
ALZET Comments: Dose (500 ug/kg/day); animal info (Adult male C57BL/6 and APP/PS1 mice); neurodegenerative (Alzheimer Disease);

Q4655: J. G. Yan, et al. CALCITONIN PUMP IMPROVES NERVE REGENERATION AFTER TRANSECTION INJURY AND REPAIR. MUSCLE & NERVE 2015;51(229-234
Agents: Calcitonin Vehicle: Water, distilled sterile; Route: CSF/CNS (sciatic nerve); Species: Rat; Pump: 2006; Duration: 12 weeks;
ALZET Comments: Animal info (Sprague Dawley, 250-300g, 3 months old); half-life (p.233); long-term study; “To achieve a continuous and gradual mode of delivery, a mini-osmotic pump was implanted to deliver medication at a constant 0.15 ul/h” pg 233; “Calcitonin has short absorption and elimination half-lives of 10–15 minutes and 50–80 minutes, respectively; however, using an osmotic pump allows for gradual and prolonged release.” pg233; pg230 diagram of pump implantation;

Agents: Calcitonin gene-related peptide, alpha; calcitonin gene-related peptide (8-37), alpha Vehicle: PBS; Route: SC; Species: Mice; Pump: Not Stated; Duration: 7 days; 14 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (CGRP -/-); immunology;

Agents: Calcitonin gene-related peptide (8-37) Vehicle: Not Stated; Route: CSF/CNS (intrathecal); Species: Rat; Pump: 2001; Duration: 7 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (female, Lewis, 180-200g); behavioral testing (Von Frey filaments; Plantar test); immunology; peptides;

Agents: Antibody, anti-aminoprocalcitonin 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;

**Agents:** Calcitonin gene-related peptide  
**Vehicle:** CSF, artificial  
**Route:** CSF/CNS (intrathecal)  
**Species:** Mice  
**Pump:** 2002  
**Duration:** 14 days  

**ALZET Comments:** Controls received mp w/ vehicle; good methods (pg. 20); stress/adverse reaction: animal death (2/31 total) (see pg. 20); ALZET mouse intrathecal catheter used; encephalomyelitis model; Dose (50 pmol/hour CGRP);  


**Agents:** Calcitonin gene related peptide (8-37)  
**Vehicle:** Not Stated  
**Route:** Not Stated  
**Species:** Mice  
**Pump:** Not Stated  
**Duration:** 6 weeks  

**ALZET Comments:** Animal info (male, C57BL6J, 22 months old); functionality of mp verified by serum levels; peptides; diabetes;  


**Agents:** Parathormone (1-84), rat; calcitonin, rat  
**Vehicle:** Acetate buffer  
**Route:** SC  
**Species:** Rat  
**Pump:** 2001  
**Duration:** 22 days  

**ALZET Comments:** Animal info (female, Wistar, E0); replacement therapy (thyroidectomy); teratology;  


**Agents:** Nifedipine; calcitonin  
**Vehicle:** Not Stated  
**Route:** Not Stated  
**Species:** Rat  
**Pump:** Not Stated  
**Duration:** 4, 12, 24 hours  

**ALZET Comments:** Animal info (Brattleboro rats); functionality of mp verified by measuring urine output and concentration; ALZET osmotic pumps used to infuse calcitonin to increase trafficking of aquaporin 2 vesicles in collecting duct. Effect is short lived, despite continued calcitonin delivery; might need dose adjustment; diabetes;  


**Agents:** Calcitonin  
**Vehicle:** Not Stated  
**Route:** Not Stated  
**Species:** Rat  
**Pump:** Not Stated  
**Duration:** 4, 12, 24 hours  

**ALZET Comments:** Animal info (Brattleboro rats); functionality of mp verified by measuring urine output and concentration; ALZET osmotic pumps used to infuse calcitonin to increase trafficking of aquaporin 2 vesicles in collecting duct. Effect is short lived, despite continued calcitonin delivery; might need dose adjustment; diabetes;  


**Agents:** Calcitonin gene related peptide; calcitonin gene related peptide (8-37)  
**Vehicle:** Not Stated  
**Route:** SC  
**Species:** Rat  
**Pump:** Not Stated  
**Duration:** 10 days  

**ALZET Comments:** Controls received mp w/ saline; animal info (Sprague Dawley, male, 292-305 g, 67 days); CGRP (8-37) is a CGRP1 receptor antagonist; peptides  


**Agents:** Calcitonin  
**Vehicle:** Saline  
**Route:** SC  
**Species:** Rat  
**Pump:** Not Stated  
**Duration:** 7 days  

**ALZET Comments:** Controls received mp w/ vehicle; pumps removed and new pump implanted after 10 days; animal info (Brattleboro, VP-deficient, adult, male)
Q0079: B. Morte, et al. Thyroid Hormone Regulation of Gene Expression in the Developing Rat Fetal Cerebral Cortex: Prominent Role of the Ca²⁺/Calmodulin-Dependent Protein Kinase IV Pathway. Endocrinology 2010;151(2):810-820

**Agents:** Parathyroid hormone (1-84); Calcitonin, rat **Vehicle:** Acetate buffer; **Route:** SC; **Species:** Rat; **Pump:** 2001; **Duration:** Not Stated;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (female, Wistar, adult, 250-300 g); replacement therapy (parathyroidectomy)


**Agents:** Parathyroid hormone, rat (1-84); Calcitonin, rat; Thyroxine **Vehicle:** Acetate buffer; **Route:** SC; **Species:** Rat (pregnant); **Pump:** 2001; **Duration:** 4-8 days;

**ALZET Comments:** Teratology; peptides; animal info (Female, Wistar, 250-300 g); replacement therapy (parathyroidectomy)


**Agents:** Calcitonin, salmon **Vehicle:** Not Stated; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 14 days;

**ALZET Comments:** Controls received mp w/ vehicle; functionality of mp verified by residual volume; dose-response (Fig. 2); animal info (female, C57BL/6, 6 wks old)


**Agents:** Calcitonin gene-related peptide (8-37) **Vehicle:** Not Stated; **Route:** IP; **Species:** Mice; **Pump:** Not Stated; **Duration:** 3, 7 days;

**ALZET Comments:** Controls received mp w/ saline; animal info (male, C57BL/6, wt, a-CGRP, -/-, 20-25g., Bile duct ligation); peptides


**Agents:** Adrenomedullin, human; Calcitonin gene-related peptide (8-37) **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 7, 14 days;

**ALZET Comments:** Controls received mp w/ vehicle; cardiovascular; peptides; ischemia (cerebral); animal info (male, Sprague-Dawley 220 g); “continuous and longterm infusion of AM starting at day 1 after I/; MCAO


**Agents:** Calcitonin gene-related peptide (8-37) **Vehicle:** Not Stated; **Route:** IP; **Species:** Rat; **Pump:** Not Stated;

**ALZET Comments:** Cardiovascular; peptides; ischemia (cardiac)


**Agents:** Calcitonin gene-related peptide (1-8), alpha-Rat; Calcitonin gene-related peptide (1-13), alpha-Rat; Calcitonin gene-related peptide (1-14), alpha-Rat **Vehicle:** Saline; Bacitracin; **Route:** IV (jugular); **Species:** Rat; **Pump:** 2002; **Duration:** 14 days;

**ALZET Comments:** Controls received mp w/ vehicle; antihypertensive; peptides; ischemia (cardiac)
**Agents:** Calcitonin, salmon  
**Vehicle:** Acetic acid; Sodium acetic; Sodium chloride; water, distilled  
**Route:** SC;  
**Species:** Rat;  
**Pump:** 2ML1;  
**Duration:** 7 days; 24 hours;  
**ALZET Comments:** Functionality of mp verified by calcitonin plasma levels

**Agents:** Calcitonin gene-related peptide (8-37)  
**Vehicle:** Not Stated;  
**Route:** IP;  
**Species:** Mice;  
**Pump:** 1002;  
**Duration:** 28 days;  
**ALZET Comments:** Paper incorrectly states the release rate and duration of Model 1002 which delivers at 0.25 ul/hr for 14 days; CGRP is an adrenomedullin receptor antagonist; peptides

**Agents:** Calcitonin gene-related peptide  
**Vehicle:** Saline;  
**Route:** SC;  
**Species:** Rat;  
**Pump:** 2ML1;  
**Duration:** 4 days;  
**ALZET Comments:** Blood pressure taken; peptides

**Agents:** Calcitonin gene-related peptide (8-37)  
**Vehicle:** saline;  
**Route:** SC;  
**Species:** Rat (pregnant);  
**Pump:** 2ML2;  
**Duration:** Not Stated;  
**ALZET Comments:** controls received mp w/ vehicle; stability verified by mass spectrometry for 14 days (p. 625); peptides; agent is a potent vasodilator

**Agents:** Parathyroid hormone, human 1-34; calcitonin, salmon  
**Vehicle:** Acetate buffer; saline;  
**Route:** SC;  
**Species:** Rat;  
**Pump:** 2004;  
**Duration:** 28 days;  
**ALZET Comments:** Controls received mp w/ vehicle or sham ovx + mp w/ vehicle; functionality of mp verified by serum levels; replacement therapy (ovariectomy); comparison of daily PTH sc injections vs. mp; peptides

P4895: D. Q. Chu, et al. The calcitonin gene-related peptide (CGRP) antagonist CGRP(8-37) blocks vasodilatation in inflamed rat skin: involvement of adrenomedullin in addition to CGRP. Neuroscience Letters 2001;310(169-172  
**Agents:** Calcitonin gene-related peptide (8-37)  
**Vehicle:** Saline; BSA;  
**Route:** SC;  
**Species:** Rat;  
**Pump:** Not Stated;  
**Duration:** Not Stated;  
**ALZET Comments:** controls received mp w/ vehicle; cardiovascular; peptides; CGRP (8-37) is a calcitonin gene related peptide antagonist. BSA was .01% in saline to prevent adsorption.

**Agents:** Calcitonin gene-related peptide  
**Vehicle:** Saline;  
**Route:** Intramuscular (soleus);  
**Species:** Rat;  
**Pump:** 2002;  
**ALZET Comments:** controls received mp w/ vehicle; tissue perfusion (soleus muscle extrajunctional surface); peptides

**Agents:** Tetrodotoxin; potassium chloride; calcitonin gene-related peptide  
**Vehicle:** Saline; Dye, methylene blue;  
**Route:** Intramuscular (soleus);  
**Species:** Rat;  
**Pump:** 2001; 2002;  
**Duration:** 3.8 days;  
**ALZET Comments:** Controls received mp w/ vehicle; tissue perfusion (soleus muscle); detailed methods for catheter construction and surgical procedures (p. 114 - 115); Lynch coil technique used; pump filled w/ saline and agents loaded in modified PE-100 tubing; solutions separated by oil drop; pumps w/ various flow rates were tested but model 2002 was chosed because its small flow rate permits to avoid excessive fluid accumulation on muscle surface; diagram of pump-catheter assembly and location (p. 114); peptides

Agents: L-NAME; Calcitonin gene-related peptide Vehicle: Saline, sterile; Route: SC; Species: Rat (pregnant); Pump: 2ML1; Duration: 1 week;
ALZET Comments: Controls received mp w/ vehicle; peptides; CGRP and L-NAME or vehicle delivered from separate pumps concomitantly.


Agents: Parathyroid hormone; Calcitonin; Vitamin D, 1,25-dihydroxy- Vehicle: NaCl; HCl; Cysteine; Saline, isotonic; Route: SC; Species: Rat; Pump: 2002; Duration: 13 days;
ALZET Comments: controls received sham tubing; functionality of mp verified by hormone assays; replacement therapy (thyroidectomy, thyroparathyroidectomy); dose-response; stress/adverse reaction: high doses led to animal death; peptides; agents given singly and in combination


Agents: Calcitonin gene-related peptide (8-37) Vehicle: Saline; Route: SC; Species: Rat; Pump: 2001; Duration: 7 days;
ALZET Comments: controls received mp w/ vehicle; CGRP (8-37) is a calcitonin receptor antagonist; peptides


Agents: Calcitonin gene-related peptide Vehicle: Not Stated; Route: Scrotal; Species: Pig (neonate); Pump: 2002; Duration: 2 weeks;
ALZET Comments: Controls received mp w/PBS; tissue perfusion (undescended testes); replacement therapy (cryptorchidism); dose-response; peptides; "Injection of excess CGRP into the scrotum may delay descent...the pig model has overcome some of these difficulties as the o


Agents: L-NAME; Calcitonin gene-related peptide Vehicle: Saline, sterile; Route: SC; Species: Rat (pregnant); Pump: 2ML2; Duration: Not Stated;
ALZET Comments: Controls received mp w/ vehicle; agents given singly and concomitantly in the same pump; cardiovascular


Agents: Calcitonin, salmon Vehicle: Saline; Benzyl alcohol; Gelatin; Route: Not Stated; Species: Rat; Pump: Not Stated; Duration: 6 weeks;
ALZET Comments: controls received mp w/ vehicle; functionality of mp verified by calcitonin plasma levels by radioimmunoassay; comparison of s.c. injections vs. mp; pumps replaced after 3 weeks; peptides


Agents: Calcitonin, salmon Vehicle: Aminocaproic acid; HCl; Route: Not Stated; Species: Rat; Pump: 2ML1; Duration: 4 days;
ALZET Comments: controls received mp with vehicle


Agents: Calcitonin, human Vehicle: Not Stated; Route: Intrauterine; SC; Species: Rat; Pump: 2001; Duration: 14 days;
ALZET Comments: Tissue perfusion (uterus); dose-response (graph, p.832); comparison of polyurethane matrices vs mp

Agents: Calcitonin analog; Calcitonin, synthetic salmon
Vehicle: Gelatin; Saline
Route: SC
Species: Mice
Pump: 2001
Duration: 48 hours

ALZET Comments: Pumps were reimplanted in a second animal; analog is RG-12851


Agents: Parathyroid hormone, bovine; calcitonin
Vehicle: Saline, cysteine hydrochloride
Route: SC
Species: mice
Pump: 2001
Duration: 7 days

ALZET Comments: Controls received mp w/ vehicle; animal info (4-5 wk old); Dose: calcitonin (2 IU/ul), PTH (1 IU/ul)


Agents: Calcitonin, Parathyroid hormone
Vehicle: Saline, Physiologic
Route: SC
Species: Mice
Pump: 2001
Duration: 3, 6, 12, 18, 24, 48 and 72 hrs

ALZET Comments: Controls received mp w/ vehicle; dose-response (0.1, 0.375, 0.5, 0.75, 1.0, or 1.25 IU/h); Multiple pumps per animal (2): Animals receiving both hormones were implanted through separate skin incisions with two pumps. “To control the uniformity of the applied stimulus, we used surgically implantable Alzet osmotic minipumps...


Agents: Calcitonin, salmon
Vehicle: Aminocaproic acid
Route: SC
Species: Rat
Pump: 2002
Duration: 1, 4, 7 days

ALZET Comments: controls received mp w/vehicle; dose-response; mp primed w/saline 12 hours before implantation; stability; peptides


Agents: Calcitonin
Vehicle: Not Stated
Route: SC
Species: Rat
Pump: 2002
Duration: 6, 12 days

ALZET Comments: Controls received sham implantation; replacement therapy (thyroparathyroidectomy); peptides


Agents: Calcitonin, salmon
Vehicle: Albumin, bovine serum; PBS
Route: SC
Species: Rat (pregnant)
Duration: 5 days

ALZET Comments: pump model not stated; replacement therapy (thyroparathyroidectomy); peptides


Agents: Calcitonin; Parathyroid hormone, bovine
Vehicle: Cysteine HCl; HCl; Saline
Route: SC
Species: Rat
Pump: Not Stated
Duration: 7 days

ALZET Comments: Organ replacement therapy (thyroparathyroidectomy); peptides


Agents: Calcitonin, salmon
Vehicle: Not Stated
Route: SC
Species: Rat
Pump: Not Stated
Duration: 1, 14 days

ALZET Comments: Comparison of human vs. animal data; intermittent vs. mp infusion; peptides


Agents: Calcitonin, salmon
Vehicle: Not Stated
Route: SC
Species: Rat
Pump: Not Stated
Duration: 1, 14 days

ALZET Comments: Comparison of human vs. animal data; intermittent vs. mp infusion; peptides
Calcitriol

**Q9290**: Y. Ito, et al. Vitamin D improves pulmonary function in a rat model for congenital diaphragmatic hernia. Archives of Biochemistry and Biophysics 2021;700(108769)

**Agents**: Calcitriol  
**Vehicle**: Not Stated  
**Route**: SC  
**Species**: Rat  
**Pump**: 2002  
**Duration**: 12 days  

**ALZET Comments**: Dose (0.03 ug/kg/day); animal info (pregnant Sprague Dawley rats); dependence;

**Q9565**: M. L. Xu, et al. Calcitriol ameliorated autonomic dysfunction and hypertension by down-regulating inflammation and oxidative stress in the paraventricular nucleus of SHR. Toxicology and Applied Pharmacology 2020;394(114950)

**Agents**: Calcitriol  
**Vehicle**: Propylene glycol; Ethanol  
**Route**: CSF/CNS (hypothalamic paraventricular nucleus)  
**Species**: Rat  
**Pump**: 1004  
**Duration**: 4 weeks  

**ALZET Comments**: Dose (40 ng/day); 50% Ethanol, 50% Propylene Glycol used; Controls received mp w/ vehicle; animal info (Twelve-week-old male spontaneously hypertensive rats and Wistar Kyoto rats); Blood pressure measured via radiotelemetry transmitters;140 mmHg - 180 mmHg;Resultant plasma level (700 pg/ml norepinephrine); cardiovascular;


**Agents**: Calcitriol  
**Vehicle**: Saline  
**Route**: SC  
**Species**: Rat  
**Pump**: 2004  
**Duration**: 4 week  

**ALZET Comments**: Dose (6 ng/day); 0.9% NaCl used; Controls received mp w/ vehicle; animal info (Female and male Wistar rats); Blood pressure measured via tail cuff method;120.6 mmHg - 132.9 mmHg;cardiovascular;


**Agents**: Calcitriol  
**Vehicle**: Saline  
**Route**: SC  
**Species**: Rat  
**Pump**: 2004  
**Duration**: 7 days  

**ALZET Comments**: Dose (6 ng/day); 0.9% Saline used; Controls received mp w/ vehicle; animal info (Male, Wistar Hannover, 180-200 g); immunology;


**Agents**: Calcitriol  
**Vehicle**: PEG  
**Route**: SC  
**Species**: Rat  
**Pump**: 2002  
**Duration**: 4 weeks  

**ALZET Comments**: Animal info (male, Wistar-Kyoto, 200-230g); functionality of mp verified by residual volume; pumps replaced every 2 weeks; post op. care (penicillin SC injection 5000 U/kg); bp measured using tail cuff;


**Agents**: Calcitriol  
**Vehicle**: Not Stated  
**Route**: SC  
**Species**: Rat  
**Pump**: Not Stated  
**Duration**: 6 weeks  

**ALZET Comments**: Controls received mp w/ vehicle; animal info (male, Spontaneously hypertensive rats, stroke-prone, 8 weeks old); cardiovascular; long-term study;


**Agents**: Calcitriol  
**Vehicle**: Ethanol; propylene glycol  
**Route**: SC  
**Species**: Rat  
**Pump**: 2004  
**Duration**: Not Stated  

**ALZET Comments**: Control animals received mp w/ vehicle; animal info (Sprague Dawley, P9); 50% ethanol used; 50% propylene glycol used


**Agents**: Calcitriol  
**Vehicle**: DMSO  
**Route**: SC  
**Species**: Mice  
**Pump**: Not Stated  
**Duration**: 6 weeks  

**ALZET Comments**: Controls received mp w/ vehicle; animal info (9 month old); 15% DMSO used; Dose (18pm/d); Therapeutic indication (osteoporosis)
**Agents:** Aldosterone; Calcitriol **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2004; 2ML4; **Duration:** 4 weeks;
**ALZET Comments:** Controls received no treatment; replacement therapy (uninephrectomy); cardiovascular; animal info (male, Sprague-Dawley, 8 wks old)

**Agents:** Parathyroid hormone (1-34); Calcitriol **Vehicle:** Cysteine; Propylene glycol; Saline; **Route:** Not Stated; **Species:** Rat; **Pump:** 2002; **Duration:** 14 days;
**ALZET Comments:** Controls received mp w/vehicle; replacement therapy (parathyroidectomy; nephrectomy); peptides

**Agents:** Calcitriol; Parathyroid hormone (1-34) **Vehicle:** Cysteine; HCl; Saline; **Route:** Not Stated; **Species:** Rabbit; **Pump:** Not Stated; **Duration:** 7 days;
**ALZET Comments:** Functionality of mp verified by serum levels; peptides

**Agents:** Oxacalcitriol, 22-; Vitamin D3, 24,25-dihydroxy-; Vitamin D3, 1,25-dihydroxy- **Vehicle:** Propylene glycol; **Route:** SC; **Species:** Rat; **Pump:** 2002; **Duration:** 14 days;
**ALZET Comments:** no comment posted

**Agents:** Oxacalcitriol, 22-; Vitamin D3, 24,25-dihydroxy- **Vehicle:** Propylene glycol; **Route:** SC; **Species:** Rat; **Pump:** 2002; **Duration:** 3 days;
**ALZET Comments:** controls received mp w/ vehicle; comparison of ip injections vs. mp; agent is 1,25-(OH)2D3

**Agents:** Calcitriol **Vehicle:** Propylene glycol; **Route:** SC; **Species:** Rabbit; **Pump:** Not Stated; **Duration:** 7, 28 days;
**ALZET Comments:** Functionality of mp verified by plasma levels; toxicity

**Agents:** Calcitriol **Vehicle:** Propylene glycol; **Route:** SC; **Species:** Rabbit; **Pump:** Not Stated; **Duration:** 2 weeks;
**ALZET Comments:** Dose-response; functionality of mp verified by serum levels

**Agents:** Calcitriol; Vitamin D3, 1,25-dihydroxy- **Vehicle:** Ethanol; Propylene glycol; **Route:** SC; **Species:** Rat; **Pump:** 2001; **Duration:** 1 week;
**ALZET Comments:** functionality of mp verified by measuring residual volume

**Agents:** Calcitriol **Vehicle:** Propylene glycol; **Route:** SC; **Species:** Rabbit; **Pump:** 2ML1; 2ML4; **Duration:** 7, 28 days;
**ALZET Comments:** Functionality of mp verified by serum calcitriol levels; dose-response (graphs); 3 doses of calcitriol infused

Agents: Calcitriol  Vehicle: Propylene glycol; Route: SC; Species: Rat; Pump: 2002; Duration: 40 days; 
ALZET Comments: comparison of calcitriol or OHD2 po 3x/wk vs. mp infusion; intermittent oral dosing; mp replaced every 2 weeks; no stress implied by the normal growth of the animals