Recent References on the Administration of Drugs of Abuse (including Amphetamines, Barbiturates, Cocaine, GHB, Heroin, Nicotine, and PCP)
Using ALZET® Osmotic Pumps

Amphetamines (2011-Present)


**Agents:** Amphetamine sulfate, d- **Vehicle:** Saline; **Route:** CSF/CNS (lateral ventricle); **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;

**ALZET Comments:** Dose (); 0.9% Saline used; Controls received mp w/ vehicle; animal info (Male Sprague-Dawley rats, 300-350 g); behavioral testing (locomotion test); d-amphetamine sulfate aka AMPH; ALZET brain infusion kit 2 used; Brain coordinates (0.8 mm posterior, 1.4 mm lateral, 4.5 mm ventral from the bregma); cyanoacrylate adhesive;

Q7057: P. Petschner, et al. Gene expression analysis indicates reduced memory and cognitive functions in the hippocampus and increase in synaptic reorganization in the frontal cortex 3 weeks after MDMA administration in Dark Agouti rats. BMC Medicine 2018;19(1):S80

**Agents:** Methamphetamine, 3,4-methylenedioxy- **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2001; **Duration:** Not Stated;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (8-week old Dark Agouti rats weighing 152 +/- 3.58 g);


**Agents:** amphetamine **Vehicle:** saline, bacteriostatic; **Route:** SC; **Species:** Rat; **Pump:** 2ML2; **Duration:** 7, 13 days;

**ALZET Comments:** Dose (0.1 or 0.32 mg/kg/h), (2ML2 pump 0.5 μl/h); Controls received mp w/ vehicle; animal info (male, Sprague-Dawley, 300-350g); behavioral testing (operant chambers); comparison of IP injection vs mp; dependence;


**Agents:** Methamphetamine **Vehicle:** DMSO; acetic acid; water; **Route:** SC; **Species:** Rat; **Pump:** 2ML1; **Duration:** 7 days;

**ALZET Comments:** Dose (1.5 mg/kg/day); 2% acetic acid, 25% DMSO used; Controls received mp w/ vehicle; animal info (Male Sprague-Dawley rats weighing 300–350 g); dependence


**Agents:** Methamphetamine, 3,4-methylenedioxy **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2ML2; **Duration:** 10 days;

**ALZET Comments:** Dose (0.3 or 3 mg/kg/day); animal info (Sprague-Dawley rats);


**Agents:** Methamphetamine **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 2 weeks;

**ALZET Comments:** Dose (3.2 mg/kg/day); animal info (Adult male Sprague-Dawley rats (275-320 g));


**Agents:** Methamphetamine **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 10 days;

**ALZET Comments:** Animal info (male, Sprague Dawley, adult, 280-310g); functionality of mp verified by blood levels;


**Agents:** Methamphetamine hydrochloride **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2ML2; **Duration:** 7 days;

**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 275-300g); functionality of mp verified by elevations in ICSS; behavioral testing (ICSS); dependence; pumps removed after 7 days;

**Agents:** Amphetamine, D-; phenmetrazine  
**Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2001; **Duration:** 14 days;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, Sprague-Dawley, 300-350g); pumps replaced every 7 days; behavioral testing (cocaine self-administration, food self-administration); dependence;

**Agents:** Amphetamine, D-  
**Vehicle:** Saline, sterile; **Route:** SC; **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 12 week old, 350g); behavioral testing (cocaine self-administration); dependence; pumps removed on day 7; used amphetamine concentration of approx 73ug/ml.

**Agents:** Methamphetamine  
**Vehicle:** Not Stated; **Route:** IV (femoral); **Species:** Rat; **Pump:** 2001D; **Duration:** 24 hours;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, Wistar, 350-500g); functionality of mp verified by plasma serum levels; dose-response (pg;33); behavioral testing (foot fault assessment, morris water maze); pumps implanted in inguinal crease; catheter preloaded with 50% dextrose/50% heparin; pumps removed after 61-65hours;

**Agents:** Methamphetamine  
**Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1002; **Duration:** 2 weeks;

**ALZET Comments:** Animal info (Bmal1 -/-, ); behavioral testing (locomotor activity running wheels); dependence; delayed delivery; catheter filled with saline for 4 day recovery; used plastics one catheter;

**Agents:** Methamphetamine  
**Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2ML4; **Duration:** 14 days;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 311-406g); post op. care (Ketoprofen 5 mg/kg); behavioral testing (cocaine self administration); dependence; pumps removed after 14 days;

Q5002: M. Iijima, et al. Effect of an mGlu2/3 receptor antagonist on depressive behavior induced by withdrawal from chronic treatment with methamphetamine. Behavioural Brain Research 2013;246(24-8

**Agents:** methamphetamine (MAP)  
**Vehicle:** saline; **Route:** IV; **Species:** Rat; **Pump:** 2ML1; **Duration:** 5 days;  
**ALZET Comments:** animal info: male, Sprague-Dawley, 5 wks old; tolerance studies; dependence; behavioral testing: forced swimming test, locomotor activity running wheels); dependence; pumps replaced every 7 days; behavioral testing (cocaine self-administration); dependence; pumps removed on day 7; used methamphetamine concentration of approx 73ug/ml.

**Agents:** Methamphetamine  
**Vehicle:** Not Stated; **Route:** IV (femoral); **Species:** Rat; **Pump:** 2001D; **Duration:** 24 hours;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, wistar rats, 200-300 g); functionality of mp verified by MRI measurement of fractional anisotropy;

**Agents:** Methamphetamine  
**Vehicle:** Not Stated; **Route:** IV (femoral); **Species:** Rat; **Pump:** 2001D; **Duration:** 24 hours;  
**ALZET Comments:** Control animals received mp w/ saline; animal info (Wistar, male, adult, 400 g); PE50 tubing used;

**Agents:** Nicotine; Methamphetamine  
**Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (Sprague Dawley, male, 332-396 g)
**Agents:** Methamphetamine **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 7 days; 
**ALZET Comments:** Dose (7 mg/kg/day); Controls received mp w/ vehicle; animal info (adult male Sprague-Dawley rats); Methamphetamine aka METH; dependence; 

**Agents:** Methamphetamine hydrochloride **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2ML1; **Duration:** 7 days; 
**ALZET Comments:** Controls received mp w/ vehicle; animal info (Sprague Dawley, male, 275-300 g); functionality of mp verified via residual volume

**Cocaine (2011-Present)**

**Agents:** Cocaine **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2ML2; **Duration:** Not Stated; 
**ALZET Comments:** Dose (4 mg/kg); Controls received mp w/ vehicle; dependence; 

**Agents:** Cocaine hydrochloride **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 4 weeks; 
**ALZET Comments:** Dose (30 mg/kg/day); 0.9% Saline used; Controls received mp w/ vehicle; animal info (12 weeks old); neurodegenerative (Huntington’s Disease); 

**Agents:** Cocaine hydrochloride **Vehicle:** Saline, sterile; **Route:** SC; **Species:** Rat; **Pump:** 2ML2; **Duration:** 2 weeks; 
**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, Holtzmann/Harlan Sprague Dawley); no stress (see pg.53); post op. care (topical antibiotic ointment); behavioral testing (saccharin intake); 

Q3606: C. M. Pudiak, et al. Tolerance to cocaine in brain stimulation reward following continuous cocaine infusions. Pharmacology Biochemistry and Behavior 2014;122(246-252 
**Agents:** Cocaine **Vehicle:** Saline; sodium metabisulfate; **Route:** SC; **Species:** Rat; **Pump:** 2ML2; **Duration:** 14 days; 
**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, Long-Evans, 275-350g); functionality of mp verified by residual volume; 0.3% sodium metabisulfate used to prevent degradation; stress/adverse reaction: (see pg.294); post op. care (neosporin); dependence; “Cocaine delivered continuously via osmotic minipump may better mimic the high drug-plasma concentrations maintained by an addict during a binge than daily administered cocaine injections.” pg 250; pumps removed after 14 days; pumps primed at 37C for at least 4 hours; 

**Agents:** Cocaine **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2ML4; **Duration:** 28 days; 
**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, SD, 280-300g); behavioral testing (fine motor movement; ambulation; rearing activities; general motor behavior); dependence; MRI; pumps primed for 24 hours in 37C saline;

**Agents:** Cocaine **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;
**ALZET Comments:** Controls received mp w/ saline; animal info (male, Sprague Dawley, 200-250g);


**Agents:** Nicotine; cocaine hydrochloride **Vehicle:** Saline, sterile; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 3, 28 days;
**ALZET Comments:** Controls received mp w/ vehicle; animal info (mGlu5 KO, wt)


**Agents:** Cocaine hydrochloride **Vehicle:** Saline, sterile; **Route:** IP; **Species:** Mice; **Pump:** 1003D; **Duration:** 3 days;
**ALZET Comments:** Controls received mp w/ vehicle; animal info (C57BL/6, male, 7-8 wks old) withdrawal; “continuous cocaine administration via intraperitoneal osmotic minipumps is an excellent tool for the assessment of the effects of cocaine administration and withdrawal on various behavioral measures.” pg 180

**GHP (Gamma-hydroxybutyrate)**


**Agents:** Hydroxybutyrate, gamma- **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** Not Stated; **Duration:** 2,10 days;
**ALZET Comments:** Controls received mp w/ vehicle; dependence; agent is a drug of abuse, known as "liquid ecstasy" or GHB (sodium oxybate); pump model not listed


**Agents:** Hydroxybutyrate, gamma- **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** Not Stated; **Duration:** 5 days;
**ALZET Comments:** Dose (2.5, 12.6, 63 mg/kg/day); Controls received mp w/ vehicle; animal info (female, BALB/cA or ICR); cardiovascular; Therapeutic indication (inhibition of VEGF-induced angiogenesis); GHB is a metabolite of tegafur;

**Heroin**


**Agents:** Heroin **Vehicle:** Not Stated; **Route:** SC; **Species:** Rat; **Pump:** 2ML2; **Duration:** 14 days;
**ALZET Comments:** Controls received mp w/ vehicle; animal info (male, Spargue Dalwley, 175-200g); behavioral testing (place conditioning); used wound clips; Dose (3.5 mg/kg/day);


**Agents:** Heroin **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2ML4; **Duration:** 30 days;
**ALZET Comments:** Control animals received mp w/ vehicle; animal info (Wistar, male, 70 days old); pulsatile delivery; “By filling the pumps with saline and attaching polyethylene (PE60) tubing to the pump, based on the tubing inner diameter and pump flow rate characteristics, the volume needed for different infusion periods (e.g., 14- or 10-h periods) could be determined”; “the tubing was filled with alternating heroin solution and mineral oil”; pulsatile delivery; good methods, pg 78; image of pump with connected Lynch coil; wound clips used; post op. care (Baytril); behavioral testing (elevated plus mazel forced swim test)

Agents: Heroin hydrochloride; morphine sulfate Vehicle: Saline; Route: SC; Species: Mice; Pump: 2001; Duration: Not Stated; ALZET Comments: Controls received mp w/vehicle; dependence; animal info (adult, male, CD-1)

Q0587: B. Kest, et al. Gnao1 (G-alpha, PROTEIN) IS A LIKELY GENETIC CONTRIBUTOR TO VARIATION IN PHYSICAL DEPENDENCE ON OPIOIDS IN MICE. Neuroscience 2009;162(4):1255-1264

Agents: Morphine; heroin Vehicle: Saline; Route: SC; Species: Mice; Pump: 2001; Duration: 7 days; ALZET Comments: Animal info (Naive, adult, 7-12 wks old, male, AcB/BcA)


Agents: Heroin Vehicle: Saline; Route: SC; Species: Rat; Pump: 2ML2; Duration: 192 hours; ALZET Comments: Comparison of sc injections & pellet vs. mp; dependence; 3 day recovery period; pumps connected to a novel gating device to allow on-off delivery; assembly schematic (p. 131); infusions were delivered in 48 hour intervals; animal info (m, wistar, 300-380 grams)


Agents: Heroin Vehicle: Not Stated; Route: SC; Species: Rat; Pump: 2002; Duration: Not Stated; ALZET Comments: Controls received mp with saline or sham operation; dependence


Agents: Ethylketocyclazocine; Heroin; Meperidine; Oxymorphone; Pentazocine; Propoxyphene; Bremazocine; Buprenorphine; Butorphanol; Methadone; Morphine; Nalbuphine; U-50,488H Vehicle: Not Stated; Route: SC; Species: Mice; Pump: Not Stated; Duration: 3 days; ALZET Comments: Comparison of sc morphine pellets vs. mp infusion; comparison of agents effects; controls received unspecified placebo infusion

Nicotine (2020-Present)


Agents: Nicotine Vehicle: Saline, sterile; Route: SC; Species: Mice; Pump: 2001; 2004; Duration: 7 days; 28 days; ALZET Comments: Dose (6 mg/kg/day); Controls received mp w/ vehicle; animal info (pregnant C57BL/6N mice); dependence;


Agents: Nicotine Vehicle: Saline; Route: SC; Species: Rat; Pump: 2ML2; Duration: 14 days; ALZET Comments: Dose (6 mg/kg/d); 0.9% NaCl used; Controls received mp w/ vehicle; animal info (virgin female Wistar rats, 3 months old); Nicotine aka NIC; dependence;

Q9410: T. C. Peixoto, et al. Nicotine exposure during lactation causes disruption of hedonic eating behavior and alters dopaminergic system in adult female rats. Appetite 2021;160(105115

Agents: Nicotine Vehicle: Saline; Route: SC; Species: Rat; Pump: 2ML2; Duration: 14 days; ALZET Comments: Dose (6 mg/kg body mass); Controls received mp w/ vehicle; animal info (Wistar rats, male and female); Nicotine aka Nic; dependence;


Agents: Nicotine Vehicle: Saline; Route: SC; Species: Rat; Pump: 2004; Duration: 28 days; ALZET Comments: Dose (3 mg nicotine/kg bodyweight/day); Controls received mp w/ vehicle; animal info: Wistar female rats (9 weeks old)teratology; dependence;
**Agents:** Nicotine **Vehicle:** Ethanol; Saline; **Route:** SC; **Species:** Mice; **Pump:** 1002; **Duration:** 10 days; 12 days;
**ALZET Comments:** Dose: (2 mg/kg/hr); (60% ethanol, 40% saline) vehicle used; Controls received mp w/ vehicle; animal info: Male C57/Bl6 mice 2.5-3.5 months of age and with weights of 20-32g; dependence;

**Agents:** Nicotine; Mecamylamine **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 2ML2; **Duration:** 14 days;
**ALZET Comments:** Dose (3.2 mg/kg/day Nicotine; 3.0 mg/kg Mecamylamine); Controls received mp w/ vehicle; animal info (Fully outbred adult Wistar rats, 260 g females, 400 g males); dependence;

Q10004: M. A. Kwiatkowski, et al. Chronic nicotine, but not suramin or resveratrol, partially remediates the mania-like profile of dopamine transporter knockdown mice. European Neuropsychopharmacology 2021;42(75-86
**Agents:** Nicotine Hydrogen Tartrate **Vehicle:** Saline, Sterile; **Route:** SC; **Species:** Mice; **Pump:** 2004; **Duration:** 26 days;
**ALZET Comments:** Dose (40 mg/kg/day); 0.9% Sterile Saline used; Controls received mp w/ vehicle; animal info (male wildtype C57BL6/J mice, 50 to 60 weeks old); behavioral testing (Behavioral Pattern Monitor); dependence;

**Agents:** Nicotine ditartrate **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 2 weeks;
**ALZET Comments:** Dose (24 mg/kg/day); Controls received mp w/ vehicle; animal info (2- to 3-month-old C57BL/6J male mice); behavioral testing (Open field test; light-dark transition; rotarod test); dependence;

**Agents:** Nicotine Hydrogen Tartrate Salt **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1004; **Duration:** 28 days;
**ALZET Comments:** Dose (12.6 mg/kg/day); 0.9% Saline used; Controls received mp w/ vehicle; animal info (Male, 8 weeks old); dependence;

**Agents:** Nicotine **Vehicle:** Saline; **Route:** SC; **Species:** Rat; **Pump:** 2ML4; **Duration:** 30 days;
**ALZET Comments:** Dose (4 μg/kg/min); Controls received mp w/ vehicle; animal info (Sprague-Dawley male rats (8-months-old)); ischemia (cardiac injury);

**Agents:** Nicotine **Vehicle:** Saline; **Route:** Abdomen; **Species:** Rat; **Pump:** 1007D; **Duration:** 7 days;
**ALZET Comments:** Dose (1 mg/kg/day); Controls received mp w/ vehicle; animal info (male and virgin female adult Sprague-Dawley rats, 12-14 weeks old); Blood pressure measured via tail-cuff method;105 mmHg - 130 mmHg;cardiovascular;

**Agents:** Nicotine **Vehicle:** Saline; **Route:** IP; **Species:** Mice; **Pump:** 1007D; **Duration:** 7 days;
**ALZET Comments:** Dose (1.67 ng/0.5 uL/hr/20 g); Controls received mp w/ vehicle; animal info (Male C57BL/6J Jcl mice); Resultant plasma level (23 fmol/mL Ghrelin); dependence;
Agents: Nicotine Vehicle: Saline; Route: SC; Species: Rat; Pump: SMP-200; Duration: 21 days;
ALZET Comments: Dose (1.0 mg/d or 0.3 mg/d); Controls received mp w/ vehicle; animal info (Male Long-Evans rats, 300–350 g); dependence;

Agents: Nicotine Vehicle: Saline; Route: SC; Species: Rat; Pump: 2ML2; Duration: 14 days;
ALZET Comments: Dose (6 mg/kg of nicotine per day); Controls received mp w/ vehicle; animal info (Lactating Wistar rats);

Q8667: R. A. Miranda, et al. Thyroid redox imbalance in adult Wistar rats that were exposed to nicotine during breastfeeding. Scientific Reports 2020;10(1):15646
Agents: Nicotine Vehicle: Saline; Route: SC; Species: Rat; Pump: 2ML2; Duration: 14 days;
ALZET Comments: Dose (6 mg/kg/day); 0.9% NaCl used; Controls received mp w/ vehicle; animal info (Pregnant female Wistar rats); Nicotine aka NIC; dependence;

Agents: Nicotine ditartrate Vehicle: Saline; Route: SC; Species: Mice; Pump: 1004; Duration: 2 weeks;
ALZET Comments: Dose (24 mg/kg/day); Controls received mp w/ vehicle; animal info (2- to 3-month-old C57BL/6J male mice); behavioral testing (Open field test; light-dark transition; rotarod test); dependence;

Agents: Nicotine Vehicle: Saline; Route: SC; Species: Rat; Pump: 2ML4; Duration: 14 days;
ALZET Comments: Dose (1.2 or 4.8 mg/kg/day); 0.9% Saline used; Controls received mp w/ vehicle; animal info (Sprague Dawley, 275-300 g); dependence;

Agents: Nicotine hydrogen tartate Vehicle: Saline; Route: SC; Species: Rat; Pump: Not Stated; Duration: 14 days;
ALZET Comments: Dose (6 mg/kg/day); Controls received mp w/ vehicle; animal info (Pregnant female Sprague Dawley rats);

Q8553: G. Jia, et al. Nicotine induces cardiac toxicity through blocking mitophagic clearance in young adult rat. Life Sciences 2020;257(118084
Agents: Nicotine Vehicle: Not stated; Route: SC; Species: Rat; Pump: Not Stated; Duration: 6 weeks;
ALZET Comments: Dose (3 mg/kg/day); Controls received mp w/ vehicle; animal info (Sprague-Dawley rats, 2-4 months old);

Agents: Nicotine Vehicle: Not stated; Route: SC; Species: Mice; Rat; Pump: Not Stated; Duration: 28 days;
ALZET Comments: Dose (0.8 mg/kg/d; 4 mg/kg/d); Controls received mp w/ vehicle; animal info (Male C57BL/6J mice, 8 weeks old; Female and Male Sprague Dawley OFA rats);

Agents: Zonisamide; Nicotine Vehicle: Not stated; Route: SC; Species: Rat; Pump: 2ML1; Duration: 7 days;
ALZET Comments: Dose (40 mg/kg/day Zonisamide, 10, 25 and 50 mg/kg/day Nicotine); animal info (Male S286L-TG and wild-type littermates); Zonisamide aka ZNS; neurodegenerative (Epilepsy);

Agents: Nicotine Vehicle: Not Stated; Route: Not Stated; Species: Rat; Pump: 2ML2; Duration: 14 days;
ALZET Comments: Dose (3.2 mg/kg/day); animal info (Male and female Wistar rats); behavioral testing (physical signs test, Anxiety-like behavior assessments); replacement therapy (Estradiol, progesterone);


Agents: Nicotine Hydrogen Tartrate Vehicle: Salline; Route: CNS/CSF; Species: Rat; Pump: 2ML2; Duration: 21 days;
ALZET Comments: Dose (4.5 mg/kg/day); Controls received mp w/ vehicle; animal info (Sprague Dawley, 6 or 14 weeks old); ischemia (Stroke);


Agents: Nicotine Hydrogen Tartrate Vehicle: Saline; Route: SC; Species: Rat; Pump: ML2; Duration: 16, 21 days;
ALZET Comments: Dose (4.5 mg/kg/day); Controls received mp w/ vehicle; animal info (Female, Sprague Dawley, 6 or 14 weeks old); ischemia (Hypoperfusion);


Agents: Nicotine Vehicle: Alcohol, Saline; Route: SC; Species: Rat; Pump: Not stated; Duration: Not stated;
ALZET Comments: Dose (6 mg/kg/day); Controls received mp w/ vehicle; animal info (pregnant lactating Wistar rat); behavioral testing (Y maze); toxicology;


Agents: Nicotine Vehicle: Saline; Route: SC; Species: Rat; Pump: 2ML2; Duration: 14 days;
ALZET Comments: Dose (6 mg/kg/day); 0.9% NaCl used; Controls received mp w/ vehicle; animal info (pregnant lactating Wistar rat); toxicology;


Agents: Nicotine Bitartrate Vehicle: Saline; Route: SC; Species: Mice; Pump: 1002; Duration: 2 weeks;
ALZET Comments: Dose (6 mg/kg/day or 60 mg/kg/day); 0.9% NaCl used; Controls received mp w/ vehicle; animal info (pregnant ePET-EYFP mice); dependence;

Pentobarbital


Agents: Pentobarbital Vehicle: Saline; Route: CSF/CNS; Species: Rat; Pump: 2001; Duration: 7 days;
ALZET Comments: Controls received mp w/ vehicle; tolerance; dependence; one week recovery period after cannula placement


Agents: Pentobarbital Vehicle: Saline; Route: CSF/CNS; Species: Rat; Pump: 2ML1; Duration: 6 days;
ALZET Comments: Controls received mp with vehicle; tolerance; dependence; animals allowed one week recovery after cannula placement
Agents: Pentobarbital Vehicle: Not Stated; Route: CSF/CNS; Species: Rat; Pump: 2ML1; Duration: 7 days;
ALZET Comments: guide cannula implanted; rats were allowed 1 week recovery before implantation of pump; tolerance; dependence

Agents: Pentobarbital Vehicle: Saline; Route: CSF/CNS; Species: Rat; Pump: 2ML1; Duration: 6 days;
ALZET Comments: controls received mp w/saline; tolerance

Agents: Pentobarbital Vehicle: Saline; Route: CSF/CNS; Species: Rat; Pump: 2ML1; Duration: 7 days;
ALZET Comments: controls received mp w/saline; tolerance; dependence

Agents: Pentobarbital Vehicle: Saline; Route: CSF/CNS; Species: Rat; Pump: 2ML1; Duration: 6 days;
ALZET Comments: controls received vehicle infusion; tolerance; dependence; recipe for equithesin anesthesia provided on p. 170

P3422: T. Ito, et al. Chronic pentobarbital administration alters g-aminobutyric acid(A) receptor a(6)-subunit mRNA levels and diazepam-insensitive [3H]Ro15-4513 binding. Synapse 1996;22(106-113
Agents: Pentobarbital Vehicle: Not Stated; Route: CSF/CNS; Species: Rat; Pump: 2ML1; Duration: 6 days;
ALZET Comments: tolerance; dependence

Agents: Pentobarbital Vehicle: Not Stated; Route: CSF/CNS; Species: Rat; Pump: 2ML1; Duration: 6 days;
ALZET Comments: controls received mp w/saline; tolerance; dependence; animals allowed 1 week recovery after cannula placement

Agents: Pentobarbital Vehicle: Not Stated; Route: CSF/CNS; Species: Rat; Pump: 2ML1; Duration: 6 days;
ALZET Comments: tolerance

Agents: Pentobarbital Vehicle: Not Stated; Route: CSF/CNS; Species: Rat; Pump: Not Stated; Duration: Not Stated;
ALZET Comments: Tolerance

Agents: Pentobarbital Vehicle: Saline; Route: CSF/CNS; Species: Rat; Pump: 2ML1; Duration: 6,7 days;
ALZET Comments: controls received mp with saline; tolerance; dependence; animals allowed 1 week recovery after cannula placement; brain and serum samples taken at 0, 2, 4, 7 days during infusion & 6, 24, 48 hrs. after withdrawal

Agents: Pentobarbital Vehicle: Saline; Route: CSF/CNS; Species: Rat; Pump: 2ML1; Duration: 6,7 days;
ALZET Comments: controls received mp with saline; tolerance; dependence; animals allowed 1 week recovery after cannula placement; brain and serum samples taken at 0, 2, 4, 7 days during infusion & 6, 24, 48 hrs. after withdrawal
**Agents**: Phentobarbital **Vehicle**: Saline; **Route**: CSF/CNS; **Species**: Rat; **Pump**: 2ML1; **Duration**: 6 days;
**ALZET Comments**: tolerance; dependence

**Agents**: Pentobarbital, sodium **Vehicle**: Saline, normal; **Route**: CSF/CNS; **Species**: Rat; **Pump**: 2ML1; **Duration**: 6 days;
**ALZET Comments**: controls received mp w/ filtered, normal saline; tolerance; dependence; good illustration of pump placement (p. 1301)

Phencyclidine

Q9018: S. Takahashi, et al. ASP2905, a specific inhibitor of the potassium channel Kv12.2 encoded by the Kcnh3 gene, is psychoactive in mice. Behavioural Brain Research 2020;378(112315)
**Agents**: Phencyclidine **Vehicle**: Saline; **Route**: SC; **Species**: Mice; **Pump**: 1002; **Duration**: 14 days;
**ALZET Comments**: Dose (1.2 mg/day/mouse); Controls received mp w/ vehicle; animal info (male ddY mice aged 4–5 weeks); behavioral testing (Forced Swim Test; Water-Finding Task); Phencyclidine aka PCP; neurodegenerative (Schizophrenia);

**Agents**: Phencyclidine **Vehicle**: Saline; **Route**: SC; **Species**: Rat; **Pump**: 2ML2; **Duration**: 14 days;
**ALZET Comments**: Dose (5 mg/kg/day); 0.9% Saline used; Controls received mp w/ vehicle; animal info (Male, Sprague Dawley, 250-300 g, 3 months old); Phencyclidine aka PCP; gene therapy;

**Agents**: Phencyclidine hydrochloride **Vehicle**: Saline, sterile, physiological; **Route**: SC; **Species**: Rat; **Pump**: 2ML4; **Duration**: Not Stated;
**ALZET Comments**: Dose (5 mg/kg/day); Controls received mp w/ vehicle; animal info (Sprague-Dawley, male, wks old, 160-200 g, 280-320 g);

**Agents**: Phencyclidine **Vehicle**: Not Stated; **Route**: SC; **Species**: Rat; **Pump**: Not Stated; **Duration**: 14 days;
**ALZET Comments**: Controls received mp w/saline; animal info (Lister hooded, male); post op. care (Baitril, Rimadyl); "Using PCP mini-pump infusion instead of the well described intraperitoneal dosing bears the advantage of reducing the animal’s stress levels, bypasses the risk of potential mis-dosing that could arise from multiple dosing events and consequently may reduce the number of animals needed.” pg 69

P7825: G. Pitas, et al. Anti-phencyclidine monoclonal antibody binding capacity is not the only determinant of effectiveness, disproving the concept that antibody capacity is easily surmounted. Drug Metabolism and Disposition 2006;34(6):906-912
**Agents**: Phencyclidine HCL **Vehicle**: Saline, sterile; **Route**: SC; **Species**: Rat; **Pump**: 2ML1; **Duration**: 4 days;
**ALZET Comments**: Functionality of mp verified by serum PCP concentrations; half-life (pg. 907) 3.9 hours in rats; tolerance; animal info (male, Sprague-Dawley, 270-300g.)

P6979: F. Sams-Dodd. (+) MK-801 and phencyclidine induced neurotoxicity do not cause enduring behaviours resembling the positive and negative symptoms of schizophrenia in the rat. Basic & Clinical Pharmacology & Toxicology 2004;95(5):241-246
**Agents**: MK-801; phencyclidine hydrochloride **Vehicle**: Sodium chloride; **Route**: SC; **Species**: Rat; **Pump**: 2ML2; **Duration**: 6 days;
**ALZET Comments**: Controls received mp w/ vehicle; dose-response; comparison of SC injections vs. mp; post op. care (wound plast); NMDA antagonists

**Agents:** Phencyclidine; phencyclidine HCL  
**Vehicle:** Saline; sterile  
**Route:** SC  
**Species:** Rat  
**Pump:** 2ML2  
**Duration:** 14 days  
**ALZET Comments:** Controls received mp w/ vehicle; serum levels taken; good methods p. 1093; half-life (p. 1093) = 3.9 h in rats; dependence; behavioral study


**Agents:** Phencyclidine, HCL  
**Vehicle:** Saline, sterile physiological  
**Route:** SC  
**Species:** Rat  
**Pump:** 2ML4  
**Duration:** 3.14 days  
**ALZET Comments:** Controls received mp w/ vehicle; functionality of mp verified by serum PCP levels


**Agents:** Phencyclidine  
**Vehicle:** Saline;  
**Route:** SC  
**Species:** Rat (pregnant)  
**Pump:** 2ML1  
**Duration:** 5 days  
**ALZET Comments:** controls received a saline pellet as a “sham minipump”; teratology


**Agents:** Phencyclidine HCl  
**Vehicle:** Saline;  
**Route:** SC  
**Species:** Rat  
**Pump:** 2ML2  
**Duration:** 3,10, 20 days  
**ALZET Comments:** Controls received mp w/ vehicle; dose-response p. 270-271


**Agents:** Phencyclidine HCl  
**Vehicle:** Saline;  
**Route:** SC  
**Species:** Rat  
**Pump:** 2ML4  
**Duration:** 2,3 weeks

**ALZET Comments:** Controls received mp w/ vehicle; functionality of mp verified by serum PCP levels; dose response (graphs p. 160); schizophrenia


**Agents:** Phencyclidine HCl  
**Vehicle:** Saline;  
**Route:** SC  
**Species:** Rat  
**Pump:** 2ML4  
**Duration:** 2 weeks  
**ALZET Comments:** Controls received mp w/ vehicle; functionality of mp verified by PCP serum levels; NMDA antagonist


**Agents:** Phencyclidine HCl  
**Vehicle:** Not Stated  
**Route:** SC  
**Species:** Rat  
**Pump:** Not Stated  
**Duration:** 5 days  
**ALZET Comments:** Controls received silastic polymer pellets ~ the same size and shape as mps; comparison of repeated IP injections vs. mp


**Agents:** Phencyclidine; MK-801  
**Vehicle:** Not Stated  
**Route:** Not Stated  
**Species:** Not Stated  
**Pump:** Not Stated  
**Duration:** 1, 5 days  
**ALZET Comments:** schizophrenia models; brief mention of mp on p. 256


**Agents:** Phencyclidine  
**Vehicle:** Not Stated  
**Route:** SC  
**Species:** Rat  
**Pump:** 2ML2  
**Duration:** 10 days

**ALZET Comments:** Controls received mp with saline; dependence


**Agents:** Phencyclidine HCl; MK-801; LY-235959  
**Vehicle:** Not Stated  
**Route:** Not Stated  
**Species:** Rat  
**Pump:** Not Stated  
**Duration:** 1, 5 days

**ALZET Comments:** controls received empty mp; comparison of single injections vs. mp
**Agents:** Phencyclidine HCl  
**Vehicle:** Not Stated  
**Route:** SC  
**Species:** Mice  
**Pump:** 2001  
**Duration:** 3 days

**ALZET Comments:** Controls received empty mp


**Agents:** Phencyclidine HCl  
**Vehicle:** Saline  
**Route:** SC  
**Species:** Rat  
**Pump:** 2ML2  
**Duration:** 1, 2, 3, 4, 10, 20 days

**ALZET Comments:** Controls received mp with saline, no treatment or sham surgery; pumps replaced at 10 days


**Agents:** Phencyclidine HCl  
**Vehicle:** Not Stated  
**Route:** SC  
**Species:** Mice  
**Pump:** Not Stated  
**Duration:** 5 days

**ALZET Comments:** comparison of pellets vs. mp


**Agents:** Phencyclidine HCl  
**Vehicle:** Not Stated  
**Route:** SC  
**Species:** Mice  
**Pump:** 2001  
**Duration:** 3, 7 days

**ALZET Comments:** Controls received sham operations


**Agents:** Phencyclidine  
**Vehicle:** Water  
**Route:** SC  
**Species:** Rat  
**Pump:** 2ML2  
**Duration:** 10 days

**ALZET Comments:** controls received mp w/ water; dependence; phencyclidine is PCP


**Agents:** Phencyclidine  
**Vehicle:** Saline  
**Route:** SC  
**Species:** Rat  
**Pump:** 2ML2  
**Duration:** 10 days

**ALZET Comments:** comparison of iv infusion by external infusion pump vs. sc infusion by ALZET pump; sc infusion data were much more reproducible (p. 719)


**Agents:** Phencyclidine  
**Vehicle:** Not Stated  
**Route:** Not Stated  
**Species:** Rat  
**Pump:** 2ML2  
**Duration:** 10 days

**ALZET Comments:** no comment posted


**Agents:** Phencyclidine  
**Vehicle:** Saline  
**Route:** SC  
**Species:** Rat  
**Pump:** 2ML4  
**Duration:** 10 days

**ALZET Comments:** dependence


**Agents:** Phencyclidine HCl  
**Vehicle:** Not Stated  
**Route:** SC  
**Species:** Mice  
**Pump:** 1701  
**Duration:** 1, 5 days

**ALZET Comments:** no comment posted


**Agents:** Phencyclidine HCl  
**Vehicle:** Saline  
**Route:** SC  
**Species:** Mice  
**Pump:** 1701  
**Duration:** 2, 6 days

**ALZET Comments:** Comparison of acute ip injections vs. chronic infusion