References on the Administration of Cocaine Using ALZET® Osmotic Pumps


**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);


**ALZET Comments:** Cocaine;


**ALZET Comments:** Cocaine hydrochloride; Saline, sterile; SC; Rat; 2ML2; 2 weeks; 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); dependence; pumps removed after 2 weeks.;

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

**ALZET Comments:** Cocaine; Saline; sodium metabisulfate; SC; Rat; 2ML2; 14 days; 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 degredation; 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.;


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

Q3428: F. F. Caputi, et al. Dynorphin/KOP and nociceptin/NOP gene expression and epigenetic changes by cocaine in rat striatum and nucleus accumbens. PROGRESS IN NEURO-PSYCHOPHARMACOLOGY & BIOLOGICAL PSYCHIATRY 2014;49( );36-46

**ALZET Comments:** Cocaine; SC; Rat; 2001; 7 days; Controls received mp w/ saline; animal info (male, Sprague Dawley, 200-250g); dependence; pumps primed overnight in 37C saline;.


**ALZET Comments:** Nicotine; cocaine hydrochloride; Saline, sterile; SC; IP; Mice; 2004; 1003D; 3, 28 days; Controls received mp w/ vehicle; animal info (mGlu5 KO, wt).


**ALZET Comments:** Cocaine hydrochloride; Saline, sterile; IP; Mice; 1003D; 3 days; Controls received mp w/ saline; 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.
ALZET Comments: Cocaine; SC; Rat; 2ML4; 28 days; Controls received mp w/saline; good methods pg. 243; animal info (male, Sprague Dawley, 250-300 g); microdialysis fiber attached to exit port to prevent development of necrotic skin.

ALZET Comments: Cocaine; fluoxetine; GBR12909; nisoxetine; Water, sterile; SC; CSF/CNS; Rat; 2001; 2ML1; 7 days; Controls received mp w/ vehicle; no stress (see pg. 37); animal info (male, Sprague-Dawley, 200-250 grams).

ALZET Comments: Cocaine; Water, sterile; CSF/CNS; Rat; 7 days; Controls received mp w/ vehicle; animal info (male, Sprague-Dawley, 200-250 grams).

ALZET Comments: Cocaine, hydrochloride; Saline; SC; Rat; 2ML2; 2 weeks; Controls received mp w/ vehicle; functionality of mp verified by residual volume; comparison of IP injections vs. SC mp; tolerance; "The cocaine pumps were slightly modified by adding a microdialysis fiber to the output portal to minimize tissue necrosis from the cocaine." p. 151; behavioral study.

ALZET Comments: Cocaine HCl; Saline, isotonic; SC; Rat; 2ML2; 3,7 days; Controls received mp w/ vehicle; dose-response; tolerance; "mp slightly modified by adding a microdialysis fiber to the output portal to eliminate tissue necrosis from the cocaine." (pg. 294); mp primed in 37 degree Celsius water for 4 hours.

ALZET Comments: Cocaine HCl; Saline, isotonic; SC; Rat; 2ML2; 14 days; Controls received mp w/ vehicle; tolerance; dependence; "The pumps were slightly modified by adding a microdialysis fiber to the output portal to eliminate tissue necrosis from the cocaine." (p. 112).

ALZET Comments: Cocaine; SC; Rat; 2001; 7 days; Tolerance.

ALZET Comments: Cocaine; pramipexole; Saline; SC; Rat; 2ML2; 14 days; Functionality of mp verified by measuring residual volume; pulsed delivery - drugs administered either continuously or for 16 or 20 hrs per day (p. 409); study included behavioral testing; pramipexole is a direct dopamine agonist; microdialysis fiber attached to pump via catheter to minimize tissue necrosis caused by the cocaine (p. 408); intermittent delivery made possible by disconnecting and reconnecting an externalized catheter.

ALZET Comments: Cocaine; RTI-117; GBR 12909; Saline; DMSO; water, sterile; SC; Rat; 2ML1; 2ML2; 7, 14 days; Controls received mp w/ vehicle; brain tissue distribution; 50% DMSO used for GBR12909.
ALZET Comments: Cocaine,; Saline,; SC,; monkey (pregnant),; 2ML4,; ~ 180 days,; Controls received mp w/ vehicle, functionality of mp verified by cocaine serum levels; dose-response (p. 136); long-term study, pumps replaced every 28 days for up to 180 days (until birth); teratology,.

ALZET Comments: Cocaine HCl,; Saline,; SC,; Rat,; 2ML2,; 14 days,; controls received mp w/ vehicle, functionality of mp verified by residual volume; "The pumps were modified by adding a microdialysis fiber to the output portal to eliminate cocaine-induced tissue necrosis".  p. 170.

P4517: T. H. Lee, et al. Altered activity of midbrain dopamine neurons following 7-day withdrawal from chronic cocaine abuse is normalized by D$_2$ receptor stimulation during the early withdrawal phase. Neuropsychopharmacology 1999;21(127-136)
ALZET Comments: Cocaine,; Saline,; SC,; Rat,; 2ML2,; 14 days,; comparison of SC injections vs. mp; tolerance; modified flow moderators used,.

ALZET Comments: Cocaine HCl,; Saline, isotonics,; SC,; Rat,; 2ML2,; 14 days,; controls received mp w/vehicle, functionality of mp verified by measuring residual volume; comparison of SC injections vs. mp; tolerance; microdialysis; pumps were modified by adding a microdialysis fiber to eliminate tissue necrosis from cocaine administration.

ALZET Comments: Cocaine; GBR 12909; Fluoxetine HCl; Nisoxetine HCl, RTI-117; DMSO; Water, sterile,; SC,; Rat,; 2001; 2ML1; 2ML2,; 7, 14 days; antidepressant; controls received mp w/ saline; RTI-117 is a dopamine uptake inhibitor; 2ML1 used to deliver GBR 12909, due to its limited solubility,.

ALZET Comments: Cocaine,; Saline,; SC,; Rat,; 2ML2,; 2 weeks,; controls received mp w/vehicle, functionality of mp verified by residual volume; no stress (P. 448); tolerance; At the end of the experiment, the tissue surrounding the minipumps was inspected and found to be normal (p. 448),.

ALZET Comments: Cocaine; Naltrexone HCl; Morphine sulfate; Saline; SC,; Rat,; 2001; 7 days; controls received mp w/vehicle, functionality of mp verified by plasma levels; dose-response (p. 279-280); tolerance.

ALZET Comments: Cocaine HCl; Saline, sterile; SC,; Rat,; 2ML2,; 14 days; controls received mp w/vehicle, functionality of mp verified by residual volume; good methods (p.265); dependence; microdialysis.

ALZET Comments: Cocaine HCl; SKF-82958; Bromocriptine; Hydrobromide, R(+)-6-bromo-APB; PD 128907; Saline; SC,; Rat,; 2ML1,; 24,48,66,72,90,96,168,336 hours; controls received mp w/vehicle; dopamine agonists.
P3484: M. S. Matell, et al. 5-HT(3) receptor mediated dopamine release in the nucleus accumbens during withdrawal from continuous cocaine. Psychopharmacology 1997;130(2):242-248
ALZET Comments: Cocaine HCl; Saline; SC; Rat; 2ML2; 14 days; controls received mp w/ saline; functionality of mp verified by residual solution; tolerance; microdialysis fiber added to delivery port to eliminate tissue necrosis.

ALZET Comments: Cocaine HCl; GBR 12909; Saline; DMSO; Water, sterile; SC; Rat; 2001; 2ML1; 7 days; controls received mp w/ vehicle; tolerance.

P3863: G. R. King, et al. Blockade of cocaine sensitization and tolerance by the co-administration of odansetron, a 5-HT3 receptor antagonist, and cocaine. Psychopharmacology 1997;130(1):159-165
ALZET Comments: Cocaine HCl; Saline, sterile isotonic; SC; Rat; 2ML2; 14 days; controls received saline injection; functionality of mp verified by measuring residual volume; comparison of injections vs mp; tolerance; microdialysis.

ALZET Comments: Cocaine HCl; SC; sheep; 2ML2; 15, 18 days; no comment posted.

ALZET Comments: Cocaine HCl; CSF/CNS; Rat; 2001; 7 days; controls received mp w/ aCSF.

ALZET Comments: Cocaine HCl; Saline; SC; Rat; 2ML2; 2 weeks; functionality of mp verified by measuring residual volume; no stress (see p. 936) - no observed skin necrosis.

ALZET Comments: Cocaine HCl; Eticlopride; SCH-23390; Saline; SC; Rat; 2001; 3 days; no comment posted.

ALZET Comments: Cocaine HCl; Eticlopride; SCH-23390; Saline; SC; Rat; 2001; 3 days; controls received mp w/saline; eticlopride is a D1 & D2 receptor antagonist.

ALZET Comments: Cocaine HCl; SC; Rat; 2001; 7 days; no comment posted.

ALZET Comments: Hydrobromide, R(+)-6-bromo-APB-SKF-38393; Nafadotride, (5)-bromocriptine; Cocaine HCl; Saline; Rat; 2ML1; 3 days; controls received mp w/ saline.
P2807: G. R. King, et al. 5-HT3 agonist-induced dopamine overflow during withdrawal from continuous or intermittent cocaine administration. Psychopharmacology 1995;117(458-465

ALZET Comments: Cocaine HCl; Saline; SC; Rat; 2ML2; 14 days; controls received mp with saline; comparison of sc injections vs. mp; tolerance.

P3070: J. L. Neisewander, et al. Time-dependent changes in sensitivity to apomorphine and monoamine receptors following withdrawal from continuous cocaine administration in rats. Synapse 1994;16(1-10

ALZET Comments: Cocaine HCl; Saline, sterile; SC; Rat; 2ML2; 2 weeks; controls received mp with saline; functionality of mp verified by residual volume; possible minipump failure noted.


ALZET Comments: Cocaine; sheep (fetus); no duration posted; functionality of mp verified by plasma, amniotic fluid, and meconium samples; stability verified by in vitro testing at 39 degrees; teratology; pump released drug into amniotic fluid; pump placed on fetal back; ampicillin added to amniotic fluid.


ALZET Comments: Cocaine HCl; Saline; SC; Rat; 2ML2; 14 days; functionality of mp verified measuring residual amount; comparison of ip injections vs mp; no stress (pg. 400); good methods: "minipumps were modified by adding a microdialysis fiber . . . to increase surface area over which cocaine is delivered." This allowed higher dose delivery without necrotic skin lesion.


ALZET Comments: Cocaine HCl; Saline; SC; Rat; 2ML2; 14 days; functionality of mp verified by residual volume; comparison of sc injections vs. mp; tolerance; microdialysis fiber added to pump's outflow portal to increase surface area distribution, and to avoid necrotic skin lesions.


ALZET Comments: Cocaine; Saline; SC; Rat; 2ML4; 28 days; controls received mp with saline; dependence; pump incision site covered with an antibiotic and 5% lignocaine to prevent discomfort and infection.

P2339: G. R. King, et al. Dopamine efflux during withdrawal from continuous or intermittent cocaine. Psychopharmacology 1993;111(179-184

ALZET Comments: Cocaine HCl; Saline; SC; Rat; 2ML2; 14 days; functionality of mp verified measuring residual amount; comparison of SC injections vs. mp; no stress (see pg. 180); tolerance; microdialysis fiber.


ALZET Comments: Cocaine HCl; Saline; SC; Rat; 2ML2; 14 days; Controls received mp w/ saline; comparison of sc injections vs. mp; tolerance; animal info (male, Sprague-Dawley, 100-125 grams).


ALZET Comments: Cocaine; Saline; SC; Rat; 14 days; good methods; microdialysis; pump modified; modification eliminated necrosis.
ALZET Comments: Cocaine; Water, sterile; rabbit (pregnant); 22 days; controls received mp with water; teratology; 2 mps implanted.

ALZET Comments: Cocaine; SC; Rat (pregnant); 2ML2; 14 days; controls received sham op; functionality of mp verified by plasma levels; no stress (see p. 50).

ALZET Comments: Cocaine HCl; Saline; SC; Rat; 2ML2; 14 days; controls received mp w/ saline; functionality of mp verified by residual volume; tolerance; gentamicin applied after surgery; no tissue necrosis seen.

P2218: S. T. Cain, et al. Chronic continuous or intermittent infusion of cocaine differentially alter the concentration of neuropeptin-like immunoreactivity in specific rat brain regions. Neuropsychopharmacology 1993;8(259 -265
ALZET Comments: Cocaine HCl; Saline; SC; Rat; 2ML2; 14 days; controls received mp w/ saline; functionality of mp verified upon removal; stability verified upon removal; tolerance.

P2185: L. Y. Burger, et al. Day/night differences in D1 but not D2 DA receptor protection from EEDQ denaturation in rats treated with continuous cocaine. Synapse 1993;13(20-29
ALZET Comments: SCH-23390; Cocaine HCl; Raclopride; Water; SC; Rat; 2ML2; 14 days; no comment posted.

ALZET Comments: Cocaine HCl; Sodium chloride; IP; Rat; 2001; 6 days; controls received mp w/ vehicle; functionality of mp verified by residual pump volume and plasma levels; comparison of iv injections vs. mp.

ALZET Comments: Cocaine HCl; Saline; IV (jugular); Rat; 2001; 2, 4, 6 days; comparison of intermittent injections vs mp.

ALZET Comments: Cocaine HCl; Saline; SC; Rat; 2ML2; 14 days; functionality of mp verified by residual volume upon explant; comparison of sc injections vs. mp; tolerance; advantages of mp (pg. 247).

ALZET Comments: Cocaine HCl; Nicotine tartrate; Saline; SC; Rat; 2001; 7 days; tolerance.

ALZET Comments: Cocaine; Saline; IV (vena cava); Rat; 2ML2; 11 or 12 days; controls received mp w/ saline; tolerance; loop of catheter tubing exposed to terminate infusion.

ALZET Comments: Cocaine HCl; Water; SC; rabbit; 2ML4; 22 days; teratology.
ALZET Comments: Cocaine HCl; Saline; SC; mice; 2002; 3 weeks; no comment posted.

ALZET Comments: Cocaine HCl; Rat; 8 days; controls received mp w/ saline; cardiovascular.

ALZET Comments: Cocaine HCl; Saline; SC; mice; 2001; 14 days; no comment posted.

ALZET Comments: Cocaine; IP; Rat; 7-14 days; controls received mp w/saline; dose-response; comparison of injections vs. mp; tolerance.

ALZET Comments: Cocaine HCl; Hank's solution; SC; mice; 2001; 7 days; no comment posted.

ALZET Comments: Cocaine; Water; SC; Rat; 2001; 1, 2 weeks; controls received plastic sham pumps; stress/adverse reaction (localized vasoconstriction); pump replaced.

ALZET Comments: Cocaine HCl; Saline; SC; monkey; 2002; 14 days; dose-response; functionality of mp verified by plasma levels; pump replaced > than or = to 2 months elapsed between implants; toxicology/teratology.

ALZET Comments: Cocaine; Saline; SC; Rat (pregnant); 2ML4; 28 days; toxicology/teratology.

ALZET Comments: Amphetamine sulfate, d-; Cocaine HCl; Saline; IV (jugular); SC; Rat; 2ML1; 3, 30 days; controls received silastic plug implant.

ALZET Comments: Cocaine; IV (jugular); Rat; 2ML4; 21 days; tolerance.

ALZET Comments: Cocaine HCl; Saline; SC; mice; no duration posted; no comment posted.

ALZET Comments: Cocaine HCl; Saline; SC; Rat; 2 weeks; pump model not stated; controls received mp w/ saline.