References on the Administration of Dopamine Using ALZET® Osmotic Pumps


**Agents:** Dopamine, hydroxy-6  
**Vehicle:** Not stated;  
**Route:** CSF/CNS (visual cortex);  
**Species:** Cat;  
**Pump:** Not stated;  
**Duration:** Not stated;  
**ALZET Comments:** Controls received mp w/ vehicle; animal info (young kittens); 6-hydroxydopamine aka 6-OHDA; dependence;


**ALZET Comments:** Dopamine, anaerobia; Saline; CSF/CNS; Mice; 2001; 7 days; Controls received mp w/ vehicle; animal info (5 month old C57Bl/6 J mice); neurodegenerative (Parkinson’s disease);.


**ALZET Comments:** Guanethidine, 6-hydroxydopamine hydrochloride; Saline, Ascorbic acid; SC; Rat; 2002; 2 weeks; Controls received mp w/ vehicle; animal info (240-250g); Good alzet diagram ;.

Q3720: J. Wedel, et al. Simultaneous subcutaneous implantation of two osmotic minipumps connected to a jugular vein catheter in the rat. Laboratory Animals 2014;48(338-341)

**ALZET Comments:** Dopamine, N-octanoyl; Tween 80; saline; IV (jugular); Rat; 2ML4; 14 days; animal info (male, Brown Norway, 230-270 g, female, Wistar, 280-310 g); good methods; "Our data show that double pump implantation is a feasible alternative to changing pumps or the use of extracorporeal pump systems connected via a long wire to partly restrained animals." pg 338; N-octanoyl-dopamine also known as NOD; multiple pumps (2) used; two pumps connected to Y connector, in-house made Y-tube; "we showed that the simultaneous implantation of two slow-flow rate osmotic pumps connected to a jugular vein catheter is feasible and is not linked to additional signs of discomfort compared with single pump-implanted rats." pg 341.


**ALZET Comments:** Dopamine; SCH23390; Saline; CSF/CNS (area X); Bird (zebra finch); 1002; Controls received mp w/ vehicle; good methods (pg 5731); ALZET brain infusion kit used; animal info (adult, male); Y-connector used; pump externalized with a backpack; pump placed inside microcentrifuge tube; cannula placement verified by histological examination.


**ALZET Comments:** Amphetamine sulfate; Dopamine; Propylene Glycol; SC; CSF/CNS (nucleus accumbens); Rat; 2ML2; 14 days; comparison of injections and sylastic pellet vs mp; pulsed delivery; PE tubing contained drug and a dye in short sections interspersed with a substance immiscible with drug, to allow 12 hour infusions of drug and 12-hour infusions of the inert substance (perfluorodecalin) throughout a 14 day infusion period.; pumps primed in a physiological saline solution at 37°C for 4 hours.


**ALZET Comments:** Dopamine; Saline; SC; Rat; 7 days; Controls received mp w/ vehicle; comparison of SC injections vs. mp; animal info (male, Sprague-Dawley, 230-260g, gastric ulceration).

ALZET Comments: Dopamine; IV (femoral); Rat; 2ML1; 24 hours; Functionality of mp verified by blood pressure; animal info (male, Fisher, 200-250g).


ALZET Comments: Dopamine; IP; Mice; 48 hours; Controls received mp w/ saline; functionality of mp verified by dopamine plasma concentration; animal info (male, NMRI, 8-9 wk old, 30-34-g.); laparotomy or polymicrobial sepsis induced by cecal ligation and puncture.


ALZET Comments: Dopamine; IV (femoral); Rat; 2ML1; 24 hours; Controls received mp w/ isotonic saline; ischemia; reperfusion injury; animal info (male, Lewis, 220-250 g).


ALZET Comments: Dopamine; Saline; IV (femoral); Rat; 2ML1; 24 hours; Controls received mp w/ vehicle; animal info (male, Lewis Fisher).


ALZET Comments: Dopexamine; dopamine; IP; Mice; 48 hours; Controls received saline & sham operation; immunology; polymicrobial sepsis induced cecal ligation & puncture (CLP).

P6447: R. Ozono, et al. Dopamine D2 receptor modulates sodium handling via local production of dopamine in the kidney. Journal of Cardiovascular Pharmacology 2003;42(S75-S79

ALZET Comments: Dopamine; Saline; SC; Mice (knockout); 2002; 3 days; cardiovascular.


ALZET Comments: Dopamine; HCL; saline; Ascorbic acid; SC; Mice; 1007D; 5 days; Controls received mp w/ vehicle (without HCL); Incorrectly states the pump's release rate was 0.25 ul/hr, (correct rate is 0.5 ul/hr).


ALZET Comments: Dopamine, agonists; SC; Monkey; Pump model and duration not listed; neurodegenerative (Parkinson's disease).


ALZET Comments: Dopamine;; Water, distilled; Sodium metabisulfite;; SC;; Rat;; 2ML4;; 2 weeks;; Antihypertensive; vehicle was water w/ 0.1% sodium metabisulfate;;


ALZET Comments: Dopamine HCl; Sodium metabisulfite; CSF/CNS (hypothalamus); Rat; 2002; 13 days; controls received mp w/vehicle; stability verified by HPLC after 13 days; two pumps implanted per animal; bilateral cannula used; bilateral infusion;

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Bibliography

ALZET Comments: Forskolin; Dopamine, 6-hydroxy-; Ascorbate; Saline; DMSO; CSF/CNS (visual cortex); cat; 2001; 7 days; no stress (see pg. 64); stability verified by HPLC assays; good methods (extremely detailed for all CSF/CNS aspects and protocols).

ALZET Comments: Dopamine, hydroxy-6; CSF/CNS (striatum); 4 days; ALZET pumps mentioned on pg. 76; neurodegenerative (Parkinson’s disease).

ALZET Comments: Dopamine, 6-hydroxy-; Ascorbate; Saline; CSF/CNS (striatum); Rat; 2001; 7 days; controls received vehicle infusion; dose-response (figure z); comparison of acute infusion vs. mp; stability verified by bioassay of pump effluent.

ALZET Comments: Dopamine; Saline, acidified; SC; bird (chicken); 2001; 24,48,72 hours; controls received mp w/saline; immunology.

ALZET Comments: Brain-derived neurotrophic factor; NT-3; Dopamine, 6-hydroxy-; PBS; CSF/CNS (substantia nigra); CSF/CNS (central caudate putamen); Rat; 2002; 2 weeks; controls received mp w/ vehicle; stability verified by DRG bioassay; 77-85% biological activity of BDNF & NT-3 remained after 14 days; 6-hydroxydopamine stable for 8 days; peptides; after 6 days, concomitant infusion of BDNF, NT-3 or vehicle with 6-OHDA; recomb. human BDNF used.

ALZET Comments: Dopamine HCl; SC; Rat; 2 weeks; controls received mp with saline.

P2584: N. Mataga, et al. 6R-tetrahydrobiopterin perfusion enhances dopamine, serotonin, and glutamate outputs in dialysate from rat striatum and frontal cortex. Brain Research 1991;551(64-71)
ALZET Comments: Dopamine, 6-hydroxy-; Saline; Ascorbate; CSF/CNS (striatum); Rat; 2001; 1 week; microdialysis probes implanted after pumps taken out.

ALZET Comments: Dopamine HCl; Sodium metabisulfite; CSF/CNS; CSF/CNS (striatum); Rat; 2002; no duration posted; stability verified in vehicle for 10 days at 37 degrees celsius by HPLC.

ALZET Comments: Dopamine; SC; Rat; 1, 2 weeks; controls received pumps with saline only.

ALZET Comments: Dopamine, 6-hydroxy-; Haloperidol; Sulpiride; CSF/CNS; Rat; 8 days; Japanese, English abstract.

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Bibliography

ALZET Comments: Dopamine; Lisuride; Pergolide; Hydroxynaphthoxacine, 4-propyl-9-; HCl; Water; CSF/CNS; Rat; 1, 2 weeks; PHNO is dopamine D-2 receptor agonist;

ALZET Comments: Deprenyl; Dopamine; Lisuride; Pargyline; Pergolide; HCl; Sodium metabisulfite; Water; CSF/CNS; Rat; 2001; 6, 7 days; mp connected to cannula; stability of DA verified in several vehicles, p 146; concomitant DA infusion with pargyline; DA infusion with deprenyl; replacement therapy (dopamine deficiency); stability verified in vitro; antihypertensive; neurodegenerative (Parkinson's disease).

ALZET Comments: CGS-15855A; Apomorphine; Dopamine, antagonists; Ascorbic acid; Saline; SC; Rat; 2ML2; 2, 14 days; comparison of ip injections vs. mp infusion; functionality of mp verified by serum, brain levels; stability verified at 14 days by HPLC.

ALZET Comments: Antipyrine; bleomycin; dopamine HCl; melatonin; methotrexate, sodium; nicotine; prednisolone; radio-isotopes; valproic acid; 3C tracer; 3H tracer; IA; IP; SC; Mice, rabbit, Rat; no duration posted; ALZA-authored; synoptic review of mp; post op. care (antibiotic); comparison of sc injections vs. mp infusion; pulsed delivery.

ALZET Comments: Dopamine; 3H tracer; Ascorbate; Saline; Sodium metabisulfite; Water; CSF/CNS (corpus striatum); Rat; 2002; 13 days; controls rec'd mp w/veh. ; mp connected to cann. in corpus striatum; some groups rec'd unilat. lesions of substantia nigra; mp inf. diff. amounts of agents to diff. groups; pumps primed o'night with saline.

ALZET Comments: Dopamine; Pargyline; Deprenyl; Lisuride; Pergolide; HCl; Sodium metabisulfate; CSF/CNS; Rat; 2001; 6,7 days; controls received mp with vehicles; replacement therapy (lesion in dopamine pathway); stability verified for 1 week by measuring dopamine concentrations and its metabolites at varying time intervals with HPLC; concomitant dopamine infusion w/ pargyline and w/ deprenyl; antihypertensive; neurodegenerative (Parkinson's disease).

ALZET Comments: Dopamine; CSF/CNS (amygdala); CSF/CNS (nucleus accumbens); monkey; Rat; 13 days; Pump model not stated; controls rec'd mp w/ unspecif. vehicle; mp conn. to cannulae in amygdala/rat; mp conn. to cath. in nucleus accumbens/monkey; mp primed overnight; concomit. haloperidol admin.; tissue perf. (amygdala, nucleus accumbens).

ALZET Comments: Dopamine; Sodium metabisulfate; CSF/CNS (nucleus accumbens); monkey; 13 days; Pump model not stated; controls received mp w/ vehicle; mp connected to cannulae in nucleus accumbens; mp primed overnight; multiple pumps per animal (2).

ALZET Comments: Dopamine, 6-hydroxy-; Ascorbic acid; Saline; SC; Rat; 2001; 3 days; comparison of iv injection vs. mp infusion.

**ALZET Comments:** Dopamine, 6-hydroxy-; CSF/CNS (substantia nigra); Rat; 2002; 4 or 10 days; controls rec’d mp w/vehicle; mp connected to steel guide cannula in SN; multiple pumps per animal (2); mps primed overnight.


**ALZET Comments:** Dopamine; Glycine; Strychnine; Water; CSF/CNS (nucleus accumbens); Rat; 2001; 13 days; controls received mp w/vehicle; mp connected to cannula in nucleus accum.; mps & injection units primed overnight; lithium admin. ip; agents admin. simult. in 1 group; comparison of ip inject. vs mp infusion.

P0857: J. C. Barnes, et al. Lithium and bupropion antagonise the phasic changes in locomotor activity caused by dopamine infused into the rat nucleus accumbens. Psychopharmacology 1986;89(311-316)

**ALZET Comments:** Dopamine HCl; Lithium; Sodium metabisulfite; CSF/CNS (nucleus accumbens); IP; Rat; 2002; 13 days; controls rec’d mps & injection units primed overnight; lithium admin. ip; agents admin. simult. in 1 group; comparison of ip inject. vs mp infusion.


**ALZET Comments:** Dopamine HBr, 6-hydroxy-; Substance P; CSF/CNS (occipital cortex); cat (kitten); 1 week; comparison of agents effects; ALZET not mentioned but author cites previous mp papers as methods reference; cannot be positive substance P deliv. by mp; peptides.


**ALZET Comments:** Dopamine HCl, 6-hydroxy-; Ascorbic acid; Saline; CSF/CNS (cortex); Rat; 2001; 3 or 7 days; cited previous mp paper for 6-OHDA stability.
ALZET Comments: Dopamine HBr, 6-hydroxy-; Ascorbic acid; Saline; pump not used; Stability of 6-OHDA in 0.4% ascorbic acid at room temp, 20-38°C for at least 1 week verified by HPLC-ECD & biologic activity; minipump itself not used in exp.

ALZET Comments: Dopamine HCl; Nitrogen; Sodium metabisulfite; CSF/CNS (nucleus accumbens); Rat; 2002; 13 days; no stress p. 288; pumps primed overnight, bilateral pump implantation; bilateral infusion.

ALZET Comments: Acetylcholine HCl; Aminobutyric acid, Y-; Serotonin bimaleinate; Dopamine HCl; Norepinephrine bitartrate; Nitrogen; Sodium metabisulfite; CSF/CNS (nucleus accumbens); Rat; 2002; 13 days; Cholinergic agent; comparison of agents effects; no stress p. 175; stability of substances remaining in pump after 13 days was verified.

ALZET Comments: Angiotensin II; Dopamine; Metoclopramide; IP; IV; Rat; 2 days; simultaneous administration of MCP (iv) w/ All (ip), and MCP (iv) w/ DOP (iv); MCP and All also infused alone, all by mp; peptides.

ALZET Comments: Dopamine HBr, 6-hydroxy-; Ascorbate; Saline; CSF/CNS (visual cortex); cat (kitten); 2001; 1 week; Multiple pumps per animal (2); 1st pump contained agent and infused into one hemisphere, 2nd pump contained the vehicle only and infused the other hemisphere.

ALZET Comments: Dopamine, 6-hydroxy-; Ascorbate; Saline; CSF/CNS (occipital cortex); cat (kitten); 2001; 1 week; no comment posted.

ALZET Comments: Dopamine HCl; Nitrogen; Sodium metabisulfite; CSF/CNS (nucleus accumbens); Rat; 13 days; mp model not stated; comparison of injection vs. mp infusion; no stress - p. 28; multiple pumps per animal (2); pumps primed overnight before implantation.

ALZET Comments: Dopamine, 6-hydroxy-; Ascorbate; Saline; CSF/CNS (visual cortex); cat (kitten); 1 week; comparison of injection vs. infusion; multiple pumps per animal (2).

ALZET Comments: Dopamine HCl; Nitrogen; Sodium metabisulfite; CSF/CNS (nucleus accumbens); Rat; 2002; 13 days; no stress p. 328, 333; 2 pumps implanted simultaneously, bilaterally; pumps primed overnight; post-infusion N-propylnorapomorphine challenge; bilateral infusion.

ALZET Comments: Dopamine HBr, 6-hydroxy-; Norepinephrine HCl, l-; Saline; CSF/CNS (visual cortex); cat (kitten); no duration posted; no comment posted.

ALZET Comments: Dopamine HBr, 6-hydroxy-; Norepinephrine HCl; Radio-isotopes; 3H tracer; Ascorbate; Saline; CSF/CNS (visual cortex); cat; cat (kitten); 1701; 1, 3, & 7 days; no comment posted.

ALZET Comments: Dopamine, 6-hydroxy-; Norepinephrine; Radio-isotopes; 3H tracer; Ascorbate; Saline; CSF/CNS (visual cortex); cat (kitten); no duration posted; pumps replaced after 1 week.

ALZET Comments: Norepinephrine; dopamine, 6-hydroxy-; saline; ascorbate; CSF/CNS (visual cortex); cat (kitten); 1701; 7 days; controls received mp with vehicle in other visual cortex; multiple pumps per animal (2); pump/cannula schematic P. 762, Fig. 1.