



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

**Q5966:** P. Weydt. Mechanisms and Modifiers of Energy Metabolism in ALS and Huntington Disease. Open Access Repositorium der Universität Ulm 2016;

**ALZET Comments:** Cannabinol; PEG 400; SC; Mice; 2004; 4 weeks; animal info (SOD 1 transgenic); pumps replaced every 28 days; Therapeutic indication (amyotrophic lateral sclerosis); Dose (5 mg/kg);.

**Q3610:** E. J. Rahn, *et al.* Prophylactic cannabinoid administration blocks the development of paclitaxel-induced neuropathic nociception during analgesic treatment and following cessation of drug delivery. *Molecular Pain* 2014;10(U1-U19)

**ALZET Comments:** AM1710; Taxol-WIN-55212-2; AM251; AM630; DMSO; PEG 400; SC; Rat; 2ML4; 28 days; Controls received mp w/ saline; animal info (male, Sprague Dawley, 300-400g); functionality of mp verified by residual volume; 50% PEG 400 used; 50% DMSO used; Multiple pumps per animal (2); stress/adverse reaction: (see pg.15); behavioral testing (mechanical threshold, cold withdrawal, locomotor activity); AM1710 is a cannabillactone CB2-selective agonist; pumps removed on day 22; WIN55,212-2 is a CB1/CB2 agonist;.

**Q4814:** Heloísa Helena Vilela Costa, *et al.* Continuous central infusion of cannabinoid receptor agonist WIN 55,212-2 decreases maternal care in lactating rats: Consequences for fear conditioning in adulthood males. *Behav. Brain Res* 2013;257(31-38)

**ALZET Comments:** WIN-55212-2; NaCl; tween, DMSO; CSF/CNS; Rat; 1007D; 7 days; Controls received mp w/ vehicle; animal info (female, Wistar, 9 weeks old); 10% DMSO used; dose-response (pg 34); behavioral testing (fear conditioning, maternal behavior); teratology; "The continuous infusion of WIN in the CNS using an osmotic minipump in lactating dams eliminates the possibility that WIN affects the behavior of the offspring when offered in the milk. Thus, any behavioral change in offspring could be attributed only to changes in maternal behavior from the administration of WIN in the dams." pg 37; Cannula placement verified via Evans Blue dye postmortem; Dose (10 or 100 nmol/h);.

**Q0907:** N. Saghafi, *et al.* Cannabinoids attenuate cancer pain and proliferation in a mouse model. *Neuroscience Letters* 2011;488(3):247-251

**ALZET Comments:** WIN-55212-2; ACEA; AM1241; DMSO; water; SC; Mice (nude); 2002; 2 weeks; Animal info (Foxn1 nu, athymic, 4-5 wks old, 20-25 g); cancer (oral); behavioral testing (mechanical allodynia); 50% DMSO used; wound clips used; pain.

**Q1709:** R. E. Hampson, *et al.* Memory encoding in hippocampal ensembles is negatively influenced by cannabinoid CB1 receptors. *Behavioural Pharmacology* 2011;22(4):335-346

**ALZET Comments:** Rimonabant; WIN-55212-2; Ethanol; saline, pluronic; CSF/CNS (hippocampus); Rat; 2004; 4 weeks; Controls received mp w/ vehicle; animal info (male, Long Evans, 4-12 mo old); pumps replaced after 16-22 days; post op. care (antibiotic, buprenorphine); behavioral testing (delayed nonmatch to sample (DNMS) task).

**P9694:** Y. Marchalant, *et al.* Cannabinoids attenuate the effects of aging upon neuroinflammation and neurogenesis. *NEUROBIOLOGY OF DISEASE* 2009;34(2):300-307

**ALZET Comments:** WIN-55212-2; SR141716A; SR144528; iodoresiniferatoxin, 5-; DMSO; PEG; SC; CSF/CNS (fourth ventricle); Rat; 2004; 2ML4; 4 weeks, 21 days; Controls received mp w/ vehicle; no stress pg. 303 "well tolerated"; animal info (23 months old, male, F-344); 50% DMSO used; SR144528 is a selective CB2 antagonist; 50% PEG used.

**P9281:** Y. Marchalant, *et al.* Cannabinoid receptor stimulation is anti-inflammatory and improves memory in old rats. *NEUROBIOLOGY OF AGING* 2008;29(12):1894-Rat1901

**ALZET Comments:** WIN-55212-2; DMSO; SC; Rat; 2ML4; 21 days; Controls received mp w/ vehicle; dose-response (fig. 1); no stress (see pg. 1897); animal info (male, F-344; 3 and 23 months old); neurodegenerative (Alzheimer's Disease); behavioral testing (water maze); "Chronic infusion of DMSO and WIN-55212-2 were well tolerated by all rats." (p. 1897); 100% DMSO used.



**P8518:** I. J. Lever, *et al.* Continuous infusion of the cannabinoid WIN 55,212-2 to the site of a peripheral nerve injury reduces mechanical and cold hypersensitivity. *British Journal of Pharmacology* 2007;151(2):292-302

**ALZET Comments:** WIN-55212-2 mesylate salt; SR141716A; SR144528; Saline; tween 20; albumin, rat serum; DMSO; CSF/CNS (sciatic nerve); Rat; 2001; 6, 7 days; Controls received mp w/ vehicle; functionality of mp verified after removal, as well as mp/catheter connection, catheter patency and position; dose-response (fig. 3); animal info (male, Wistar, 250-300 g, partial ligation injury); 4% DMSO; 14.5 % DMSO.

**Q5957:** A. Witting, *et al.* Endocannabinoids accumulate in spinal cord of SOD1 G93A transgenic mice. *J Neurochem* 2004;89(6):1555-7

**ALZET Comments:** Cannabinol; PEG 400; SC; Mice; 2004; 12 weeks; Controls received mp w/ vehicle; animal info (SOD1 transgenic; 6 week old; 25 grams); Dose (5 mg/kg/day); long-term study; pumps replaced every 4 weeks up to 2 times; neurodegenerative (ALS); no stress (see pg. 183); dose and the repeated pump replacements were well tolerated; cannabinol (CBN) is a nonpsychotropic cannabinoid; Therapeutic indication (amyotrophic lateral sclerosis);

**P5515:** M. L. Casanova, *et al.* Inhibition of skin tumor growth and angiogenesis in vivo by activation of cannabinoid receptors. *J. Clin. Invest* 2003;111(1):43-50

**ALZET Comments:** JWH-133; WIN-55212-2; PBS; BSA; SC; Mice (nude); 2002; 11 days; Controls received mp w/ vehicle; cancer; cannabinoid agonists.

**P5754:** I. Galve-Roperh, *et al.* Anti-tumoral action of cannabinoids: involvement of sustained ceramide accumulation and extracellular signal-regulated kinase activation. *Nat Med* 2000;6(3):313-319

**ALZET Comments:** WIN-55212-2; Cannabinol, delta-9-tetrahydro-; PBS; BSA; CSF/CNS (intratumoral); Rat; 2001; 7 days; Tissue perfusion (tumor); cancer; WIN-55,212-2 is a potent synthetic cannabinol agonist.

**P7108:** B. C. Paria, *et al.* Effects of cannabinoids on preimplantation mouse embryo development and implantation are mediated by brain-type cannabinoid receptors<sup>1</sup>. *Biology of Reproduction* 1998;58(1490-1495)

**ALZET Comments:** Cannabinol, delta-9-tetrahydro-; SR141716A; Propylene glycol; ethanol; SC; Mice; 1007D; 3-4 days; Controls received mp w/ the less active (+)THC stereoisomer; functionality of mp verified by plasma THC levels.

**P2491:** B. K. Colasanti. A comparison of the ocular and central effects of delta-9 tetrahydrocannabinol and cannabigerol. *J. Ocular Pharmacol* 1990;6(4):259-269

**ALZET Comments:** Cannabinol, delta-9-tetrahydro-; Cannabigerol; PEG 400; Eye (cornea); cat; 9 days; controls received mp w/ vehicle; dose-response (p.262); unilateral delivery.

**P1511:** B. K. Colasanti. Intraocular pressure, ocular toxicity and neurotoxicity in response to 11-hydroxy-delta9-tetrahydrocannabinol and 1-nantradol. *J. Ocular Pharmacol* 1985;1(2):123-135

**ALZET Comments:** Cannabinol, tetrahydro-; Nantradol, 1-; PEG 400; Eye; cat; 2001; 9 days; topical application; tissue perfusion.

**P0466:** B. K. Colasanti, *et al.* Intraocular pressure, ocular toxicity and neurotoxicity after administration of delta9-tetrahydrocannabinol or cannabichromene. *Exp. Eye Res* 1984;38(63-71)

**ALZET Comments:** Cannabichromene; Cannabinol, delta-9-tetrahydro-; PEG 400; Eye (cornea); cat; 2001; 9 days; comparison of agents effects; pump implanted sc and connected via sc tubing to cornea; tissue perfusion.

**P0577:** B. K. Colasanti, *et al.* Intraocular pressure, ocular toxicity and neurotoxicity after administration of cannabigerol or cannabigerol. *Exp. Eye Res* 1984;39(3):251-259

**ALZET Comments:** Cannabigerol; Cannabinol; PEG 400; Eye; cat; 9 days; mp model not stated; comparison of agents effects; intermittent eye drop admin. vs. mp infusion; tissue perfusion.

**P0652:** B. K. Colasanti, *et al.* Ocular hypotension, ocular toxicity, and neurotoxicity in response to marijuana extract and cannabidiol. *Gen. Pharmacol* 1984;15(6):479-484



**ALZET Comments:** Cannabidiol; Marihuana extract; Cannabinol, delta-9-tetrahydro-; PEG; Eye (cornea); cat; 9 days; mp model not stated; comparison of acute topical admin/ injec vs. mp infusion; comparison of agents effects; agents admin. topically to cat corneas; tissue perfusion.