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;

**Agents**: Cannabinol **Vehicle**: PEG 400; **Route**: SC; **Species**: Mice; **Pump**: 2004; **Duration**: 4 weeks;

**ALZET Comments**: 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

**Agents**: AM1710; Taxol-WIN-55212-2; AM251; AM630 **Vehicle**: DMSO; PEG 400; **Route**: SC; **Species**: Rat; **Pump**: 2ML4; **Duration**: 28 days;

**ALZET Comments**: 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 cannabialactone CB2-selective agonist; pumps removed on day 22; WIN55,212-2 is a CB1/CB2 agonist;


**Agents**: WIN-55212-2 **Vehicle**: NaCl; Tween, DMSO; **Route**: CSF/CNS; **Species**: Rat; **Pump**: 1007D; **Duration**: 7 days;

**ALZET Comments**: 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);


**Agents**: WIN-55212-2; ACEA; AM1241 **Vehicle**: DMSO; Water; **Route**: SC; **Species**: Mice (nude); **Pump**: 2002; **Duration**: 2 weeks;

**ALZET Comments**: 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

**Agents**: Rimonabant; WIN-55212-2 **Vehicle**: Ethanol; saline, pluronic; **Route**: CSF/CNS (hippocampus); **Species**: Rat; **Pump**: 2004; **Duration**: 4 weeks;

**ALZET Comments**: 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)


**Agents**: WIN-55212-2; SR141716A; SR144528; iodoresiniferatoxin, 5- **Vehicle**: DMSO; PEG; **Route**: SC; **Species**: Mice (nude); **Pump**: 2004; 2ML4; **Duration**: 4 weeks, 21 days;

**ALZET Comments**: 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

**Agents**: WIN-55212-2 **Vehicle**: DMSO; **Route**: SC; **Species**: Rat; **Pump**: 2ML4; **Duration**: 21 days;

**ALZET Comments**: 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


**Agents**: WIN-55212-2 mesylate salt; SR141716A; SR144528 **Vehicle**: Saline; Tween 20; albumin, rat serum; DMSO; **Route**: CSF/CNS (sciatic nerve); **Species**: Rat; **Pump**: 2001; **Duration**: 6, 7 days;

**ALZET Comments**: 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


**Agents**: Cannabinol **Vehicle**: PEG 400; **Route**: SC; **Species**: Mice; **Pump**: 2004; **Duration**: 12 weeks;

**ALZET Comments**: 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; cannabinoids (CBN) is a nonpsychotropic cannabinoid; Therapeutic indication (amyotrophic lateral sclerosis);


**Agents**: JWH-133; WIN-55212-2 **Vehicle**: PBS; BSA; **Route**: SC; **Species**: Mice (nude); **Pump**: 2002; **Duration**: 11 days;

**ALZET Comments**: Controls received mp w/ vehicle; cancer; cannabinoid agonists


**Agents**: Tetrahydrocannabinol (- or +) **Vehicle**: Not Stated; **Route**: SC; **Species**: Mice; **Pump**: Not Stated; **Duration**: 3 days;

**ALZET Comments**: Dose (20 ug/hr/day); animal info (Female, pregnant); dependence;


**Agents**: WIN-55212-2; Cannabinol, delta-9-tetrahydro- **Vehicle**: PBS; BSA; **Route**: CSF/CNS (intratumoral); **Species**: Rat; **Pump**: 2001; **Duration**: 7 days;

**ALZET Comments**: 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.1. Biology of Reproduction 1998;58(1490-1495

**Agents**: Cannabinol, delta-9-tetrahydro-; SR141716A **Vehicle**: Propylene glycol; Ethanol; **Route**: SC; **Species**: Mice; **Pump**: 1007D; **Duration**: 3,4 days;

**ALZET Comments**: Controls received mp w/ the less active (+)THC stereoisomer; functionality of mp verified by plasma THC levels


**Agents**: Cannabinol, delta-9-tetrahydro-; Cannabigerol **Vehicle**: PEG 400; **Route**: Eye (cornea); **Species**: Cat; **Pump**: Not Stated; **Duration**: 9 days;

**ALZET Comments**: Controls received mp w/ vehicle; dose-response (p.262); unilateral delivery
**Agents:** Cannabinol, tetrahydro-; Nantradol, 1- **Vehicle:** PEG 400; **Route:** Eye; **Species:** Cat; **Pump:** 2001; **Duration:** 9 days;
**ALZET Comments:** Topical application; tissue perfusion

P0466: B. K. Colasanti, *et al.* Intraocular pressure, ocular toxicity and neurotoxicity after administration of delta9-tetrahydrocannabinol or cannabichromene. Experimental Eye Research 1984;38(63-71
**Agents:** Cannabichromene; Cannabinol, delta-9-tetrahydro- **Vehicle:** PEG 400; **Route:** Eye (cornea); **Species:** Cat; **Pump:** 2001; **Duration:** 9 days;
**ALZET Comments:** Comparison of agents effects; pump implanted sc and connected via sc tubing to cornea; tissue perfusion

**Agents:** Cannabigerol; Cannabinol **Vehicle:** PEG 400; **Route:** Eye; **Species:** Cat; **Pump:** Not Stated; **Duration:** 9 days;
**ALZET Comments:** mp model not stated; comparison of agents effects; intermittent eye drop admin. vs. mp infusion; tissue perfusion

**Agents:** Cannabidiol; Marihuana extract; Cannabinol, delta-9-tetrahydro- **Vehicle:** PEG; **Route:** Eye (cornea); **Species:** Cat; **Pump:** Not Stated; **Duration:** 9 days;
**ALZET Comments:** 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