



References on the Administration of Liposomes Using ALZET® Osmotic Pumps

- Q2301:** K. Nishijima, *et al.* Interactions among pulmonary surfactant, vernix caseosa, and intestinal enterocytes: intra-amniotic administration of fluorescently liposomes to pregnant rabbits. *AMERICAN JOURNAL OF PHYSIOLOGY-LUNG CELLULAR AND MOLECULAR PHYSIOLOGY* 2012;303(3):L208-L214
Agents: Liposomes, fluorescently labeled; coatasome EL-01-C, hydrated **Vehicle:** DMSO; water, distilled; **Route:** Intrauterine; **Species:** Rabbit (fetus); **Pump:** 2ML1; **Duration:** 1 week;
ALZET Comments: Control animals received mp w/ liposome alone; animal info (Japanese, White, 4.2-5.4 kg, teen); tissue perfusion (fetus); "5-cm sterile PE 60 silicone catheter with silicone flange was attached to each pump" pg L209; Fig 2, image of pump and catheter placement; multiple pumps used (2); teratology.
- P7197:** J. A. MacKay, *et al.* Distribution in brain of liposomes after convection enhanced delivery; modulation by particle charge, particle diameter, and presence of steric coating. *Brain Research* 2005;1035(2):139-153
Agents: Liposomes; FITC-dextran-lysine **Vehicle:** Saline; tris buffer; **Route:** CSF/CNS (caudate putamen); CSF/CNS (intratumoral); **Species:** Rat; **Pump:** 2001D; **Duration:** 24 hours;
ALZET Comments: Tissue perfusion (intratumoral); comparison of acute CSF/CNS injection vs. mp; half-life (p. 151) 9.9 hours; cancer (glioblastoma); ALZET brian infusion kit 2 used; brain tissue distribution; post op. care (buprenorphine).
- R0213:** M. L. Duan, *et al.* Protection and treatment of sensorineural hearing disorders caused by exogenous factors: experimental findings and potential clinical application. *Hearing Research* 2002;169(169-178
Agents: Liposomes, cationic **Vehicle:** **Route:** Ear (cochlea); **Species:** Guinea pig; **Pump:** **Duration:** **ALZET Comments:** Gene therapy; tissue perfusion (cochlea).
- P4436:** M. Wareing, *et al.* Cationic liposome mediated transgene expression in the guinea cochlea. *Hearing Research* 1999;128(61-69
Agents: Liposomes, cationic; Gene, beta-galactosidase **Vehicle:** Dextrose solution;; **Route:** ear;; **Species:** Guinea pig;; **Pump:** 1007D;; **Duration:** **ALZET Comments:** tissue perfusion (cochlea); comparison of micro injections vs. mp; stress/adverse reaction: significant fibrosis and acute immune response localized at the site of cochleostomy; gene therapy; prophylactic antibiotics provided; PE50 tubing was connected to PE10;.
- P3745:** D. Sanchis, *et al.* Short-term treatment with oleoyl-oestrone in liposomes (Merlin-2) strongly reduces the expression of the ob gene in young rats. *Biochem. J* 1997;326(357-360
Agents: Oestrone, oleoyl; Liposomes **Vehicle:** **Route:** IV (jugular); **Species:** Rat; **Pump:** 2ML2; **Duration:** 3, 6, 10, 14 days;
ALZET Comments: controls received mp w/ liposomes; functionality of mp verified by radioimmunoanalysis of 3H-oestrone; Merlin-2 is code name for oestrone, oleoyl in liposomes.
- P4146:** F. Balada, *et al.* Effect of the slimming agent oleoyl-estrone in liposomes on the body weight of rats fed a cafeteria diet. *Arch. Physiol. Biochem* 1997;105(5):487-495
Agents: Estrone, oleoyl-; Liposomes **Vehicle:** **Route:** IV (jugular); **Species:** Rat; **Pump:** 2ML2; **Duration:** 28 days;
ALZET Comments: controls received mp w/liposome suspension; pumps replaced after 14 days; oleoyl-estrone in liposomes was named Merlin-2.
- P3831:** F. Balada, *et al.* Effect of the slimming agent oleoyl-estrone in liposomes on the body weight of zucker obese rats. *Int. J. Obes* 1997;21(789-795
Agents: Estrone, oleoyl-; Liposomes **Vehicle:** **Route:** IV (left jugular); **Species:** Rat; **Pump:** 2ML2; **Duration:** 28 days;
ALZET Comments: controls received mp w/liposomes; pumps replaced after 2 weeks; stress/adverse reaction: transient weight loss after surgical implantation of mp (pg. 790); oleoyl-estrone in liposomes referred to as "merlin-2".
- P3860:** J. Zhu, *et al.* A continuous intracerebral gene delivery system for in vivo liposome-mediated gene therapy. *Gene Therapy* 1996;3(472-476



Agents: Liposomes; Gene, herpes simplex virus thymidine kinase; Gene, lacZ **Vehicle:** **Route:** CSF/CNS (caudate nucleus); **Species:** Rat; **Pump:** 1003D; **Duration:** 3 days;
ALZET Comments: controls received mp w/LacZ gene; tissue perfusion (tumor); functionality of mp verified by gene expression; comparison of intracerebral injections vs. mp; no stress (see pg.473); stability verified by gene expression; ALZET brain infusion kit used; cancer; gene therapy; "DNA-liposome complexes were stable within minipumps at body temperature (37C) for 1-3 days." (pg.474); "continuous administration of DNA-liposome complexes did not result in significant in vivo toxicity." (pg.474).

P3526: D. Sanchis, *et al.* Oleoyl-estrone induces the loss of body fat in rats. *Int. J. Obes* 1996;20(588-594)
Agents: Estrone, oleoyl-; Liposomes **Vehicle:** **Route:** IV (jugular); **Species:** Rat; **Pump:** 2ML2; **Duration:** 14 days;
ALZET Comments: no comment posted.

P1978: S. Lerman, *et al.* Miniosmotic pumps for liposomal drug delivery. *Liposome Technol* 1993;1(429-438)
Agents: Liposomes **Vehicle:** **Route:** Eye (lens); **Species:** rabbit; **Pump:** 2ML1; **Duration:** no duration posted;
ALZET Comments: pulsed delivery described; detailed surgical methods.

P2086: J. Joles, *et al.* Subcutaneous administration of HMG-CoA reductase inhibitors in hyperlipidaemic and normal rats. *Lab. Anim* 1992;26(269-280)
Agents: Lovastatin; Pravastatin; Liposomes; Simvastatin **Vehicle:** Propylene glycol; **Route:** **Species:** Rat; **Pump:** 2ML4;
Duration: no duration posted;
ALZET Comments: comparison of injections and oral administration vs. mp; stress/adverse reaction: local cystic reaction to simvastatin and lovastatin (p. 271, 275); enzyme inhibitor (HMG-CoA reductase), sc injections of simvastatin also caused subcutaneous toxicity.

P2013: D. G. Stein, *et al.* Intracerebral administration of alpha-tocopherol-containing liposomes facilitates behavioral recovery in rats with bilateral lesions of the frontal cortex. *J. Neurotrauma* 1991;8(4):281-292
Agents: Phosphatidylcholine; vitamin E; Liposomes **Vehicle:** **Route:** CSF/CNS (cortex); **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;
ALZET Comments: Multiple pumps per animal (2); agent also called D-alpha-tocopherol.

P1722: S. Lerman. Test models to determine potential ocular drug induced side effects. *Lens Eye Toxic. Res* 1989;6(1/2):1-36
Agents: 8-MOP; Chromophore; Sorbinil; Liposomes **Vehicle:** Radio-isotopes; **Route:** Eye (lens); **Species:** rabbit; **Pump:** 2ML1; **Duration:** 7 days;
ALZET Comments: tissue perfusion (ocular lens); liposome-encapsulated agents.

P0957: D. B. Drath. Modulation of pulmonary macrophage superoxide release and tumoricidal activity following activation by biological response modifiers. *Immunopharmacology* 1986;12(2):117-126
Agents: Interferon-gamma; Liposomes **Vehicle:** **Route:** SC; **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;
ALZET Comments: controls received mp w/empty liposomes; liposome encapsulated agent and free agent; comparison of iv injections vs. mp infusion; cancer/immunology; peptides.