



References on the Administration of Endorphins Using ALZET® Osmotic Pumps

- Q8920:** T. Okano, *et al.* Beta-Endorphin Mediates the Development and Instability of Atherosclerotic Plaques. *International Journal of Endocrinology* 2020;2020(4139093)
Agents: B-Endorphin **Vehicle:** Saline; **Route:** SC; **Species:** Mice; **Pump:** 1002; **Duration:** 4 weeks;
ALZET Comments: Controls received mp w/ vehicle; animal info (male spontaneously hyperlipidemic Apoe^{-/-} mice, 13 weeks of age); pumps replaced every 2 weeks; Blood pressure measured tail-cuff method; 91.4 mmHg - 92.1 mmHg; Resultant plasma level (294.3 mg/dL Glucose);
- Q2343:** R. Dutia, *et al.* beta-Endorphin Antagonizes the Effects of alpha-MSH on Food Intake and Body Weight. *Endocrinology* 2012;153(9):4246-4255
Agents: Endorphin, beta, (1-31) **Vehicle:** Saline, sterile; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2001; 1003D; **Duration:** 3, 7days;
ALZET Comments: Animal info (Sprague Dawley, male, 200-250 g); pumps replaced
- P7890:** N. Boyadjieva, *et al.* Role of beta-endorphin, corticotropin-releasing hormone, and autonomic nervous system in mediation of the effect of chronic ethanol on natural killer cell cytolytic activity. *Alcoholism Clinical and Experimental Research* 2006;30(10):1761-1767
Agents: Endorphin, B; corticotropin releasing hormone **Vehicle:** CSF, artificial; **Route:** CSF/CNS (paraventricular nucleus of hypothalamus); **Species:** Rat; **Pump:** 2002; **Duration:** 16 hours;
ALZET Comments: Controls received mp w/ vehicle; peptides; animal info (male, Fischer, 160-175g.)
- P7316:** M. Dokur, *et al.* Beta-endorphin modulation of interferon-gamma, perforin and granzyme B levels in splenic NK cells: Effects of ethanol. *Journal of Neuroimmunology* 2005;166(1-2):29-38
Agents: Endorphin, B- **Route:** CSF/CNS (paraventricular nucleus); **Species:** Rat; **Pump:** 2002; **Duration:** 18 hours;
ALZET Comments: Controls received mp w/ aCSF; immunology; peptides
- P6917:** M. Dokur, *et al.* Modulation of hypothalamic beta-endorphin-regulated expression of natural killer cell cytolytic activity regulatory factors by ethanol in male Fischer-344 rats. *Alcoholism Clinical and Experimental Research* 2004;28(8):1180-1186
Agents: Endorphin, beta **Vehicle:** CSF, artificial; **Route:** CSF/CNS (paraventricular nucleus); **Species:** Rat; **Pump:** 2002; **Duration:** 6 days;
ALZET Comments: Plastics One bilateral guide cannula used with a Y-connector; bilateral infusion;
- P5512:** C. Hill, *et al.* The effects of beta-endorphin (beta-END) on cardiovascular and behavioral dynamics in conscious rats. *Brain Research Bulletin* 2002;59(1):29-34
Agents: Endorphin, B- **Vehicle:** CSF, artificial; **Route:** CSF/CNS; **Species:** Rat; **Pump:** Not Stated; **Duration:** 12 days;
ALZET Comments: Cardiovascular
- P6696:** N. I. Boyadjieva, *et al.* beta-endorphin modulation of lymphocyte proliferation: Effects of ethanol. *Alcoholism Clinical and Experimental Research* 2002;26(11):1719-1727
Agents: Endorphin, B- **Vehicle:** CSF, artificial; **Route:** CSF/CNS (paraventricular nucleus of hypothalamus); **Species:** Rat; **Pump:** 2002; **Duration:** 16 hours;
ALZET Comments: Controls received mp w/ vehicle; peptides; mp connected w/ two infusion cannulae using a Y-connector
- Q6818:** N. Boyadjieva, *et al.* Chronic Ethanol Inhibits NK Cell Cytolytic Activity: Role of Opioid Peptide β -Endorphin. *The Journal of Immunology* 2001;167(10):5645-5652
Agents: β -endorphin; naltrexone **Vehicle:** CSF, artificial; **Route:** CSF/CNS (bilateral paraventricular nuclei); **Species:** Rat; **Pump:** 2002; **Duration:** 4 hours; 16 hours;
ALZET Comments: Dose (100 ng of β -EP/0.5 μ l/h); Controls received mp w/ vehicle; animal info (Male Fischer-344 rats of 150-175 g body weight); naltrexone is an opiate antagonist; Brain coordinates (1.8 mm behind bregma, 1.5 mm lateral to the midline, and 7.7 mm below the skull surface); bilateral cannula used;



P5752: N. Boyadjieva, *et al.* Chronic ethanol inhibits NK cell cytolytic activity: role of opioid peptide beta-endorphin. *J Immunol* 2001;167(10):5645-5652

Agents: Endorphin, B-; Naltrexone **Vehicle:** CSF, artificial; **Route:** CSF/CNS (paraventricular nucleus); **Species:** Rat; **Pump:** 2002; **Duration:** 4,16 hours;

ALZET Comments: Controls received mp w/ vehicle; used a Y-connector to connect pump with a bilateral cannula;

P3465: I. H. Jonsdottir, *et al.* Chronic intracerebroventricular administration of b-endorphin augments natural killer cell cytotoxicity in rats. *Regul. Pept* 1996;62(113-118

Agents: Endorphin, B-; Enkephalin, leucine-; Enkephalin, methionine-; Dynorphin A **Vehicle:** Not Stated; **Route:** SC; CSF/CNS; **Species:** Rat; **Pump:** 2001; 2ML1; **Duration:** 6 days;

ALZET Comments: controls received saline infusion; peptides; ALZET brain infusion kit used

P3710: S. M. Tolpygo, *et al.* Comparative analysis of effects from prolonged peripheral and intracerebral exposure to B-endorphin. *Bulletin of Experimental Biology and Medicine* 1995;120(1):1079-1082

Agents: Endorphin, B- **Vehicle:** Saline, physiological; **Route:** SC; CSF/CNS; **Species:** Rat; **Pump:** 2001; **Duration:** 7 days;

ALZET Comments: controls received mp w/ saline; peptides

P0812: T. Shimazu, *et al.* Chronic infusion of norepinephrine into the ventromedial hypothalamus induces obesity in rats. *Brain Research* 1986;369(1/2):215-223

Agents: Acetylcholine chloride; Cefalotin; Cholecystokinin tetrapeptide; Epinephrine HCl; Bombesin; Endorphin, B-; Enkephalin, methionine-; Norepinephrine HCl **Vehicle:** Saline; Sodium bisulfite; **Route:** CSF/CNS (hypothalamus); **Species:** Rat; **Pump:** 2002; **Duration:** 5-20 weeks;

ALZET Comments: Cholinergic agent; pumps replaced periodically; mp connected to perm. steel cannula in hypothalamus; cannula fitted w/removable protector; (see p.217); agents infused sep. (cefalotin infused w/each agent); long-term study;

P0509: L. C. Saland, *et al.* Chronic infusion of opiate peptides to rat cerebrospinal fluid with osmotic minipumps. *Anat. Rec* 1984;210(115-123

Agents: Endorphin, a-; Endorphin, ovine B-; Enkephalin, methionine-; Naloxone HCl **Vehicle:** Saline; **Route:** CSF/CNS; **Species:** Rat; **Pump:** 2001; **Duration:** 1-2 days;

ALZET Comments: comparison of agents effects; peptides

P0173: R. Schulz, *et al.* Are there subtypes (isoreceptors) of multiple opiate receptors in the mouse vas deferens. *European Journal of Pharmacology* 1981;76(61-66

Agents: Endorphin, a-neo-; DsThr; Dynorphin; Enkephalin analog DADLE; FK-33824; MR-2034; MRZ; Normorphine; Sufentanil **Vehicle:** Water; **Route:** SC; **Species:** mice; **Pump:** 2001; **Duration:** 6 days;

ALZET Comments: peptides; MRZ is 5,9-dimethyl,2'S-5,9-dimethyl-2'-hydroxy-2-(2-methoxy-propyl)-6,7-benzomorphan

P0001: E. Wei, *et al.* Physical dependence on opiate-like peptides. *Science* 1976;193(1262-1263

Agents: Morphine sulfate; methionine-enkephalin; endorphin, B- **Vehicle:** Water; **Route:** CSF/CNS (frontal cortex); CSF/CNS (periaqueductal gray); **Species:** Rat; **Pump:** Not Stated; **Duration:** 70 hours;

ALZET Comments: peptides; dependence; 1 ul/hr pumps used

R0003: E. Wei, *et al.* Chronic, intracerebral infusion of morphine and peptides with osmotic minipumps, and the development of physical dependence. Presented at the International Narcotics Research Conference, July 22, Aberdeen, Scotland 1976;

Agents: Endorphin, a-; Endorphin, B-; Enkephalin, leucine-; Enkephalin, methionine-; Morphine sulfate **Vehicle:** Not Stated;

Route: Not Stated; **Species:** Not Stated; **Pump:** Not Stated; **Duration:** no duration posted;

ALZET Comments: no comment posted