References on the Administration of Enkephalins
Using ALZET® Osmotic Pumps


ALZET Comments: [D-Ala2, N-Me-Phe4, Gly5-ol]-enkephalin; CSF/CNS (intrathecal); Rat; mice; animal info (rat - male, adult, Sprague Dawley, 250-300g; good methods (intrathecal catheter placement pg.11704); mice - male, adult, C57BL/6, 20-25g); No pump used, catheter only for lumbar catherization.


ALZET Comments: Morphine sulfate; enkephalin analog DPDPE; U50,488H; deltorphin II, D-ala2; Saline, pyrogen free; SC; Mice; 1003D; 48 hours; Controls received mp w/ vehicle; dose-response (fig 1); comparison of pellets vs. mp; immunology; animal info (female, 6 wk old); mp primed 4 hours in 37 C saline; "morphine pellet potently exacerbated oral salmonella infection, but morphine given by pump, at doses which were immunosuppressive had a substantially lesser effect (of infection)." (p. 251). "Further, we and others have found that morphine pellets induce sepsis in mice." (p. 251).


ALZET Comments: Enkephalin; Saline; SC; Mice (nude); 2004; 28 days; Controls received mp w/ vehicle; OGF plasma levels taken; comparison of IP and intratumoral injections vs. SC mp; adverse reaction: (see pg. 229) "within 2 days...3 minipumps containing saline were spontaneously dislodged." [possible pocket too small]; cancer (carcinoma); peptides; enkephalin was met-5 and termed OGF or opioid growth factor.


ALZET Comments: Morphine sulfate; Enkephalin analog DAMGO; Dermorphin-derived tetrapeptide (TAPS); CSF, artifical; CSF/CNS; Rat; 2001; 6 days; Controls received mp w/ vehicle; comparison of bolus injections vs. chronic mp; pumps replaced on day 4 to achieve 6 days due to dead space in catheter; ALZET brain infusion kit used; tolerance; dependence; peptides; second hole with guide cannula & stylet used for bolus injections; (ALZET) cannula placement confirmed by fast green dye & the guide cannula confirmed by methylene blue; TAPS is a potent mu-opioid receptor agonist.


ALZET Comments: Enkephalin; Saline; SC; Rabbit; 2ML1; 24 hours; Controls received mp w/ vehicle; cardiovascular; peptides; enkephalin was met-5.


ALZET Comments: Enkephalin analog; Naloxone; Saline; IP; Rat; 1003D; 1-3 days; controls received mp w/ vehicle; functionality of mp verified by aspirating remaining contents; peptides; Enkephalin analog ENK was (D-Met2-Pro5)enkephalinamide, inhibits epidermal growth factor.


ALZET Comments: Endorphin, B-; Enkephalin, leucine-; Enkephalin, methionine-; Dynorphin A; SC; CSF/CNS; Rat; 2001; 2ML1; 6 days; controls received saline infusion; peptides; ALZET brain infusion kit used.


ALZET Comments: Morphine sulfate; Naltrexone; Enkephalin; U-50,488H; Saline; CSF/CNS (intrathecal); Rat; 2001; 7 days; tolerance.

**ALZET Comments:** Naltrexone; DAGO; Enkephalin analog DADLE; DPDPE; U-50,488H; SC; CSF/CNS; Rat; 2001; 7 days; DAGO is a mu-opioid agonist; DPDPE is a delta-opioid agonist.


**ALZET Comments:** Enkephalin; PBS; mice; 1003D; no duration posted; no stress (see pg. 207); immunology; agents are met-enkepalin, DTLET, FK 33-824; pump implantation has no significant effect on humoral immune response as compared with sham-op and untreated animals (p. 208).


**ALZET Comments:** Dexmedetomidine; Clonidine; Enkephalin analog ST-91; Saline; CSF/CNS (intrathecal); Rat; 2001; 7 days; controls received mp with vehicle; tolerance; externalized loop of tubing allowed cessation of flow; dose-response (pg. 330); antihypertensive.


**ALZET Comments:** Morphine sulfate; Enkephalin analog DADLE; Saline; CSF/CNS (intrathecal); Rat; 2001; 7 days; controls received mp w/ vehicle; dose-response (pg.600); stability of morphine in spinal cord assessed; tolerance; "cont. spinal infusion, in contrast to . . . avoids the peak and trough or exponentially decreasing concentration of tolerogen and the receptor during exposure period"; Y-catheter used for intrathecal infusion.


**ALZET Comments:** Morphine; Sufentanil; Enkephalin; Saline; IV; CSF/CNS (intrathecal); CSF/CNS; Rat; 7 days; controls received mp w/vehicle; dose-response (p. 163); tolerance; pain; reference of mp pump study on pp. 162-164.


**ALZET Comments:** Enkephalin analog ST-91; Enkephalin analog DADLE; Enkephalin analog DAMGO; Morphine; Sufentanil; Saline; CSF/CNS (intrathecal); Rat; 2001; 7 days; no comment posted.


**ALZET Comments:** Sufentanil citrate; Enkephalin analog DADLE; Enkephalin analog DAMGO; Morphine; Saline; CSF/CNS (intrathecal); Rat; 2001; 7 days; tissue infusion; dose-response; peptides; tolerance, dependence.


**ALZET Comments:** Enkephalin analog DADLE; Enkephalin analog DAMGO; Enkephalin analog ST-91; Morphine sulfate; Sufentanil citrate; Saline; CSF/CNS (intrathecal); Rat; 2001; 7 days; mp connected to Y-catheter; dose-response; peptides.


**ALZET Comments:** Enkephalin analog DADLE; Saline; CSF/CNS (intrathecal); Rat; 2001; 6, 12 days; pump replaced weekly; neuroscience.

ALZET®
Bibliography

ALZET Comments: Enkephalin analog ST-91; Morphine sulfate; Saline; CSF/CNS (intrathecal); Rat; 2001; 1 week; controls received mp w/ saline; mp connected to 'Y' catheter; 3 doses of agent infused; concomitant infusion of agents.

ALZET Comments: Enkephalin agonist DADLE; PL 017; Saline; CSF/CNS (intrathecal); Rat; 5 days; controls received mp w/saline; mp connected to intrathecal catheter; peptides.

ALZET Comments: Acetylcholine chloride; Cefalotin; Cholecystokinin tetrapeptide; Epinephrine HCl; Bombesin; Endorphin, B-; Enkephalin, methionine-; Norepinephrine HCl; Saline; Sodium bisulfite; CSF/CNS (hypothalamus); Rat; 2002; 5-20 weeks; 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; peptides.

ALZET Comments: Enkephalin agonist DADL; Fentanyl citrate; Saline; SC; Guinea pig; 2001; 5 days; comparison of agents effects; controls were sham-operated only; peptides.

ALZET Comments: Dynorphin A(1-8); Bestatin; Captopril; Dynorphin A; Enkephalin agonist DADL; Fentanyl; Thiorphan; Saline; SC; vas deferens; Mice; 2001; 2ML1; no duration posted; Comparison of agents effects; 2ML1 pump used w/ captopril, thiorphan, and bestatin; DADL & FEN admin. sc; peptides; antihypertensive.

ALZET Comments: Endorphin, a-; Endorphin, ovine B-; Enkephalin, methionine-; Naloxone HCl; Saline; CSF/CNS; Rat; 2001; 1-2 days; comparison of agents effects; peptides.

ALZET Comments: Enkephalin, Leu-; dynorphin; dynorphin (3-13); Saline; SC; Cat; 2ML1; 7 days; Controls received mp w/ vehicle; peptides; post op. care (penicillin E, lactated ringer's solution); ischemia (cerebral); animal info (adult, male, MCAO).

P0252: M. Wuster, et al. The development of opiate tolerance may dissociate from dependence. Life Sci 1982;31(1695-1698
ALZET Comments: Enkephalin agonist DADL; Morphine; SC; Guinea pig; no duration posted; Confusing paper; refers to previous mp papers in methods & mtls. so mp used but not actually mentioned; not sure of agents used; peptides.

ALZET Comments: Enkephalin agonist DADL; Naloxone; Saline; CSF/CNS (intrathecal); Rat; 2001; 5 days; agents infused alone and/or concomitantly; peptides.

ALZET Comments: Enkephalin agonist DADL; SC; Guinea pig; mice; 2001; 2ML1; 1 week; 2001 (mice), 2ML1 (GP); peptides.

ALZET Comments: Enkephalin analog; Morphine sulfate; Water; CSF/CNS (caudal aqueduct); Rat; 1701; 3 days; 1701 (also pump that delivers 1.4 ul/hr.??), 3 days; if pump malfunctioned (catheter dislodged, etc), same pump reimplanted into another animal; peptides.

ALZET Comments: DsThr; Enkephalin agonist DADL; Fentanyl; FK-33824; MR-2034; MRZ; Normorphine; Water; SC; Guinea pig; 2001; 6 days; peptides.

ALZET Comments: Enkephalin analog DADLE; Sufentanil; CSF/CNS; SC; Rat; 2001; 7-8 days; comparison of chronic vs. acute infusion of DADL; DADL infused ivt, SUF infused sc; peptides.

ALZET Comments: Endorphin, a-neo-; DsThr; Dynorphin; Enkephalin analog DADLE; FK-33824; MR-2034; MRZ; Normorphine; Sufentanil; Water; SC; mice; 2001; 6 days; peptides; MRZ is 5,9-dimethyl,2'S-5,9-dimethyl-2'-hydroxy-2-(2-methoxy-propyl)-6,7-benzomorphan, a kappa opioid agonist.

ALZET Comments: Enkephalin analog DADLE; Sufentanil; SC; mice; 2001; 6 days; peptides.

ALZET Comments: Enkephalin analog DADLE; Sufentanil; SC; mice; 2001; 6 days; simultaneous infusion of agents; peptides.

ALZET Comments: Enkephalin analog DADLE; Follicle stimulating hormone; Growth hormone, bovine; Growth hormone, rat; Pituitary extract; Prolactin, bovine; Prolactin, rat; Thyroid-stimulating hormone; Water; SC; Rat; 1701; 1 week; peptides.

ALZET Comments: Enkephalin analog DADLE; Etorphine; Sufentanil; SC; mice; 2001; 1, 3, or 6 days; separate & simultaneous infusion of agents; peptides.

ALZET Comments: Enkephalin analog DADLE; Sufentanil; SC; mice; 1701; 6 days; peptides.

ALZET Comments: Enkephalin analog; no duration posted; no comment posted.

ALZET Comments: Enkephalin analog; CSF/CNS (fourth ventricle); Rat; no duration posted; no comment posted.

**ALZET Comments:** Morphine sulfate; methionine-enkephalin; endorphin, B-; Water; CSF/CNS (frontal cortex); CSF/CNS (periaqueductal gray); Rat; 70 hours; peptides; dependence; 1 ul/hr pumps used.


**ALZET Comments:** Endorphin, a-; Endorphin, B-; Enkephalin, leucine-; Enkephalin, methionine-; Morphine sulfate; no duration posted; no comment posted.