References on the Administration of Interferons Using ALZET® Osmotic Pumps

1. Alpha


Agents: Interleukin-1 beta; Interleukin-6; Interleukin-10; Interleukin-12; Interleukin-17; Interleukin-23; Interferon, gamma; Tumor Necrosis Factor, alpha; Interleukin-1 beta, anti; Transforming Growth Factor-B1, anti Vehicle: PBS; Route: SC;
Species: Mice; Pump: 1007D; Duration: 10 Days;
ALZET Comments: Dose (IL-1b (83μg/ml); IL-6 (83μg/ml); IL-10 (166μg/ml);
IL-12 (83μg/ml); IL-17 (125μg/ml); IL-23 (166μg/ml); IFNg (83μg/ml); TNFa (166μg/ml); anti-TGF-b1 (166μg/ml); anti-IL-1b (150μg/ml)); Controls received mp w/ vehicle; animal info (Eight- to twelve-week-old female C57BL/6 mice); Immunology (“evaluate the suitability of osmotic pumps as a model for biofilms in implant associated infections, we implanted osmotic pumps pre-colonized with bioluminescent Staphylococcus aureus”);


Agents: Interferon, alpha; interferon, gamma Vehicle: PBS; BSA; Route: SC; Species: Mice; Pump: 2006; Duration: 16 weeks;
ALZET Comments: Animal info (13 wks old, female, B/W); pumps replaced after 8 weeks; long-term study; stability verified after 8 weeks; "residue IFNs from the pumps at the end of treatment were tested on IFN and IFN responsive cell lines and demonstrated that the in vivo conditions in the pump did not affect bioactivity of both IFNs (data not shown)" pg 63


Agents: Interferon-alpha, recomb. human Vehicle: Saline; Route: SC; Species: Mice; Pump: 2001; Duration: 6 days;
ALZET Comments: Controls received mp w/ vehicle; comparison of SC injections vs. mp; half-life (p. 579) "relatively short"; peptides; animal info (male, ICR, 5 wks old); behavioral testing (locomotor activity)


Agents: Interferon-alpha Vehicle: Saline, sterile; Route: SC; Species: Mice; Pump: 2001; Duration: 7 days;
ALZET Comments: Controls received mp w/ vehicle; immunology; peptides


Agents: Antibody, anti-interferon gamma; Antibody, indomethacin; Antibody, anti-TNFa; Antibody, interleukin 1 alpha Vehicle: PBS, sterile; ETHANOL; Indomethacin; Route: SC; Species: mice; Pump: 1007D; Duration: 7 days;
ALZET Comments: immunology; pump implanted next to Dacron graft; peptides

2. Beta


Agents: Interleukin-1 beta; Interleukin-6; Interleukin-10; Interleukin-12; Interleukin-17; Interleukin-23; Interferon, gamma; Tumor Necrosis Factor, alpha; Interleukin-1 beta, anti; Transforming Growth Factor-B1, anti Vehicle: PBS; Route: SC;
Species: Mice; Pump: 1007D; Duration: 10 Days;
ALZET Comments: Dose (IL-1b (83μg/ml); IL-6 (83μg/ml); IL-10 (166μg/ml);
IL-12 (83μg/ml); IL-17 (125μg/ml); IL-23 (166μg/ml); IFNg (83μg/ml); TNFa (166μg/ml); anti-TGF-b1 (166μg/ml); anti-IL-1b (150μg/ml)); Controls received mp w/ vehicle; animal info (Eight-to-twelve-week-old female C57BL/6 mice); Immunology (“evaluate the suitability of osmotic pumps as a model for biofilms in implanted associated infections, we implanted osmotic pumps pre-colonized with bioluminescent Staphylococcus aureus”);

Agents: Interferon-beta, recomb. human Vehicle: Not Stated; Route: Not Stated; Species: Mice; Pump: 2002; Duration: 14 days;
ALZET Comments: Animal info (Hmox1 KO)

Agents: Interleukin-1, beta recomb. rat; Interferon-gamma, recomb. rat Vehicle: Saline, physiological; albumin, human serum; Route: CSF/CNS (intratumoral); Species: Rat; Pump: 1003D; Duration: 48 hours;
ALZET Comments: Controls received mp w/ vehicle; tissue perfusion (tumor); cancer (glioma)

Agents: Interferon, gamma Vehicle: Not Stated; Route: SC; Species: Mice; Pump: 1007D; Duration: no duration posted;
ALZET Comments: controls received pumps with heat-inactivated cytokines; peptides

3. Gamma

Agents: Interleukin-1 beta; Interleukin-6; Interleukin-10; Interleukin-17; Interleukin-23; Interferon, gamma; Tumor Necrosis Factor, alpha; Interleukin-1 beta, anti; Transforming Growth Factor-B1, anti Vehicle: PBS; Route: SC; Species: Mice; Pump: 1007D; Duration: 10 Days;
ALZET Comments: Dose (IL-1b (83μg/ml); IL-6 (83μg/ml); IL-10 (166μg/ml); IL-12 (83μg/ml); IL-17 (125μg/ml); IL-23 (166μg/ml); IFNg (83μg/ml); TNFa (166μg/ml); anti-TGF-b1 (166μg/ml); anti-IL-1b (150μg/ml)); Controls received mp w/ vehicle; animal info (Eight-to-twelve-week-old female C57BL/6 mice); Immunology ("evaluate the suitability of osmotic pumps as a model for biofilms in implant associated infections, we implanted osmotic pumps pre-colonized with bioluminescent Staphylococcus aureus");

Agents: Interferon, gamma Vehicle: Not Stated; Route: SC; Species: Mice; Pump: 1007D; Duration: 7 days;
ALZET Comments: Dose (15 uM/d); animal info (8-10 week old, male, BALB/c); cardiovascular;

Q4560: L. Pereira, et al. IFN gamma regulates proliferation and neuronal differentiation by STAT1 in adult SVZ niche. Frontiers in Cellular Neuroscience 2015;9(U1-U10
Agents: Interferon, gamma Vehicle: Saline; Route: CSF/CNS (third ventricle); Species: Mice; Pump: 1007D; Duration: 7 days;
ALZET Comments: Controls received mp w/ vehicle; animal info (male, STAT2 KO or 129S6/SvEv); immunology;

Agents: Interferon, gamma  
**Vehicle**: Saline;  
**Route**: SC;  
**Species**: Mice;  
**Pump**: Not Stated;  
**Duration**: 7 days;  
**ALZET Comments**: Controls received mp w/ vehicle; animal info (prf-/ or WT, lymphocytic choriomeningitis virus infected); functionality of mp verified by serum levels; immunology; murine model of hemophagocytic lymphohistiocytosis;


**Agents**: Interferon, alpha; interferon, gamma  
**Vehicle**: PBS; BSA;  
**Route**: SC;  
**Species**: Mice;  
**Pump**: 2006;  
**Duration**: 16 weeks;  
**ALZET Comments**: Animal info (13 wks old, female, B/W); pumps replaced after 8 weeks; long-term study; stability verified after 8 weeks; "residue IFNs from the pumps at the end of treatment were tested on IFN and IFN responsive cell lines and demonstrated that the in vivo conditions in the pump did not affect bioactivity of both IFNs (data not shown)" pg 63

**4. Tau**


**ALZET Comments**: U0126; serum protein, ovine; interferon tau, recombinant ovine; DMSO; Intrauterine (uterine horn); Sheep (ewe); 2ML1; 6 days; Controls received mp w/ vehicle; animal info (female, Suffolk Ovis aries); 3% DMSO used; tissue perfusion (uterine horn); cyanoacrylate adhesive; used cyanoacrylate glue to anchor pump; interferon tau aka IFNT;


**ALZET Comments**: Cortisol; PF915275; meloxicam; interferon, tau, recombinant ovine; Ethanol; Intrauterine (uterine horn); Sheep (ewe); 2ML1; Control animals received mp w/ vehicle; animal info (mature, rambouillet, female, ewe); 2% ethanol used; vinyl catheter used (0007760); "Our previous studies found that infusion of that amount of IFNT in the uterine lumen each day mimics effects of the conceptus on endometrial expression of hormone receptors and IFNT-stimulated genes during early pregnancy in ewes" pg 932.


**ALZET Comments**: interferon-tau, recombinant ovine; BSA; IV (jugular, intrauterine); ewe; 2001D, 1003D; 1 day, 3 day; controls received mp w/ vehicle; functionality of mp verified by serum antiviral activity; pumps were anchored in the s.c. space with cyanoacrylate glue; 200 ug/day (uterine vein); 200 ug/day (jugular vein).


**ALZET Comments**: Interferon, tau, recomb. ovine; meloxicam; PGE2, ovine serum; PGF2a, ovine serum; PGI2, ovine serum; Ethanol; saline; Intrauterine (uterine horn); Sheep (ewe); 2ML1; 7 days; Controls received mp w/ vehicle; animal info (Mature Rambouillet); good methods (pg 2); vinyl tubing used (0007760); 2% ethanol used; enzyme inhibitor (prostaglandin synthase two); tissue perfusion (intrauterine).


**ALZET Comments**: Interferon, tau, recomb. ovine; meloxicam; PGE2, ovine serum; PGF2a, ovine serum; PGI2, ovine serum; Ethanol; saline; Intrauterine (uterine horn); Sheep (ewe); 2ML1; 5 days; Controls received mp w/ vehicle; animal info (Mature Rambouillet); tissue perfusion (intrauterine); multiple pumps used (2); enzyme inhibitor (prostaglandin synthase two).

**ALZET Comments:** Meloxicam; interferon, recomb. ovina, tau; Ethanol; saline; Intrauterine (uterine horn); Sheep (ewe); 2ML1; 7 days; Controls received mp w/ vehicle; animal info (ewe, mature, Rambouillet); cyanoacrylate adhesive; enzyme inhibitor (prostaglandin synthase (PTGS)); vinyl catheter used (0007760); "The Alzet pump was then affixed to the mesometrial ligament between the uterine horn and oviduct by using cyanoacrylate glue... and then secured by sewing the oviduct to the perimetrium of the uterine horn, using 0 coated polyglactin suture." pg 1120; 2% ethanol used; photo of pump and catheter placement, fig. 1; "Intrauterine infusion of that amount of IFNT mimics effects of the conceptus on endometrial expression of hormone receptors and IFNT-stimulated genes during early pregnancy in ewes." pg 1120.


**ALZET Comments:** Interferon-tau, recomb, ovine; IV (uterine vein); Sheep (ewe); 2001D; 2ML1; 7 days; 24 hours; Controls received mp w/BSA or sham surgeries; animal info (white-faced, western range ewe); cyanoacrylate adhesive.