



References on the Administration of Vascular Endothelial Growth Factor Using ALZET® Osmotic Pumps

Q6971: Y. S. Hu, *et al.* Self-assembling vascular endothelial growth factor nanoparticles improve function in spinocerebellar ataxia type 1. *Brain* 2019;142(2):312-321

ALZET Comments: Vascular endothelial growth factor, mouse recomb.; Vascular endothelial growth factor, synthetic peptide (Nano-VEGF); CSF, artificial; CSF/CNS (right lateral ventricle); Mice; 1002; 2 weeks; animal info (8-10, and 24 week-old mice); behavioral testing (rotating rod assay); Brain coordinates (A/P -0.5mm, M/L -1.1mm, D/V -2.5mm);.

Q6340: M. Piazza, *et al.* Simulating vasogenic brain edema using chronic VEGF infusion. *J Neurosurg* 2017;127(4):905-916

ALZET Comments: Vascular endothelial growth factor; PBS; Rat serum albumin; CSF/CNS; Rat; 2001; 1007D; Dose (2, 10, and 20 ng/hr); 0.1% rat serum albumin used; Controls received mp w/ vehicle; animal info (275-350g Male Fischer-344 rats); Brain coordinates (2.5 mm to the right of and 1 mm anterior to bregma); cyanoacrylate adhesive;.

Q6022: Y. Dai, *et al.* The paracrine effect of cobalt chloride on BMSCs during cognitive function rescue in the HIBD rat. *Behav Brain Res* 2017;332(99-109)

ALZET Comments: Vascular Endothelial Growth Factor; Saline; CSF/CNS (Left Lateral Ventricle); Rat; 2001; 7 days; Controls received mp w/ vehicle; animal info (17 weeks); behavioral testing (Morris water maze); Therapeutic indication (Hypoxia-inducible factor-1 α Cobalt chloride Hypoxic-ischemic encephalopathy);.

Q5190: Y. H. Rhee, *et al.* Neural stem cells secrete factors facilitating brain regeneration upon constitutive Raf-Erk activation. *Sci Rep* 2016;6(32025)

ALZET Comments: Raf-Transducer cells, conditioned media; leukemia inhibitory factor; fibroblast growth factor 2; vascular endothelial growth factor; CSF, artificial; CSF/CNS; Mice; 1007D; 6 days; Controls received mp w/ vehicle or control media; animal info (male, C57Bl6, 50-100g); ALZET brain infusion kit 2 used; immunology; cyanoacrylate adhesive; Brain coordinates;.

Q5561: A. E. Kline, *et al.* Combination therapies for neurobehavioral and cognitive recovery after experimental traumatic brain injury: Is more better? *Prog Neurobiol* 2016;142(45-67)

ALZET Comments: Vascular endothelial growth factor, Fibroblast Growth Factor 2; Saline; CSF/CNS (lateral ventricle); Mice; 7 days; Controls received mp w/ vehicle; VEGF and FGF-2 were administered singly or in combination in same pump; Therapeutic indication (Traumatic brain injury); Dose (VEGF (10 mg/mL), FGF-2 (2.5 mg/mL));.

Q4609: S. L. Taylor, *et al.* VEGF can protect against blood brain barrier dysfunction, dendritic spine loss and spatial memory impairment in an experimental model of diabetes. *NEUROBIOLOGY OF DISEASE* 2015;78(1-11)

ALZET Comments: Vascular endothelial growth factor (165); CSF, artificial; CSF/CNS; Mice; 2006; 8 weeks; Controls received mp w/ vehicle; animal info (male, C57BL6J, 2 months old); ALZET brain infusion kit 3 used; behavioral testing (Morris water maze); diabetes;.

Q5243: J. Oller, *et al.* C/EBPbeta and Nuclear Factor of Activated T Cells Differentially Regulate Admts-1 Induction by Stimuli Associated with Vascular Remodeling. *Mol Cell Biol* 2015;35(19):3409-22

ALZET Comments: Vascular Endothelial Growth Factor, Angiotensin II, Losartan, Cyclosporine; Saline; SC; Mice; 21 days; Controls received mp w/ vehicle; animal info (Calcineurin (CN) B1 (Cnb1 $_{-}/fl$) conditional knockout mice, C57BL/6 mice); dose-response; vegf aka vascular endothelial growth factor; Dose (VEGF 25 ug/kg/day, AngII 1 ug/kg/min, CsA 5 mg/kg/day, Losartan 10 mg/kg/day);.

Q3348: A. D. Lassaletta, *et al.* Microvascular Notch Signaling Is Upregulated in Response to Vascular Endothelial Growth Factor and Chronic Myocardial Ischemia. *CIRCULATION JOURNAL* 2014;78(3):743-751

ALZET Comments: Vascular endothelial growth factor, recombinant human; Heparin; Saline; Intrapericardial; Pig; 2ML4; 4 weeks; Animal info (male, Yorkshire miniswine, 13-22kg); ischemia (cardiac, chronic); stress/adverse reaction: (see pg. 746);



post op. care (Enrofloxacin 68mg PO daily for 5 days; aspirin 325 mg/day for 5 days; buprenorphine HCL 0.3 mg/kg, transdermal fentanyl patch 4mcg/kg for 72h); cardiovascular;

Q3833: F. Chehrehasa, *et al.* An Acute Growth Factor Treatment that Preserves Function after Spinal Cord Contusion Injury. *Journal of Neurotrauma* 2014;31(1807-1813

ALZET Comments: Vascular endothelial growth factor; platelet-derived growth factor-BB; PBS; CSF/CNS (intrathecal); Rat; 2001; 7 days; Controls received mp w/ saline; animal info (female, Wistar, 20-25 weeks, 300g); spinal cord injury; post op. care (cephalothin; buprenorphine; manual bowel and bladder expression BID); behavioral testing (locomotor behavior; gait and footprint analysis); used Rat intrathecal catheter; pumps primed in 37C saline overnight.

Q2881: A. Zechariah, *et al.* Vascular Endothelial Growth Factor Promotes Pericyte Coverage of Brain Capillaries, Improves Cerebral Blood Flow During Subsequent Focal Cerebral Ischemia, and Preserves the Metabolic Penumbra. *Stroke* 2013;44(6):1690-U393

ALZET Comments: Vascular endothelial growth factor; Saline; CSF/CNS; Mice; 2004; 3, 10 days; Controls received mp w/ saline; animal info (male C57BL6/j, 20-25g); ischemia.

Q2468: X. W. Xiao, *et al.* Hypoglycemia Reduces Vascular Endothelial Growth Factor A Production by Pancreatic Beta Cells as a Regulator of Beta Cell Mass. *Journal of Biological Chemistry* 2013;288(12):8636-8646

ALZET Comments: Vascular endothelial growth factor, A; Mice; 2004; Animal info (C57BL/6, MIP-GFP, male, 8 wks old);

Q2611: A. H. Siddiqui, *et al.* Angiotensin Receptor Agonistic Autoantibody-Mediated Soluble Fms-Like Tyrosine Kinase-1 Induction Contributes to Impaired Adrenal Vasculature and Decreased Aldosterone Production in Preeclampsia. *Hypertension* 2013;61(2):472-U526

ALZET Comments: Vascular endothelial growth factor, 121; Mice (pregnant); 5 days; Animal info (C57BL/6).

Q2990: J. W. Shim, *et al.* VEGF, which is elevated in the CSF of patients with hydrocephalus, causes ventriculomegaly and ependymal changes in rats. *Experimental Neurology* 2013;247(;):703-709

ALZET Comments: Vascular endothelial growth factor-A165; Bevacizumab; Saline; BSA; CSF/CNS; Rat; 2001D; 1 day; Controls received mp w/ vehicle, or (saline, BSA); Peptides; animal info (male Sprague-Dawley rats, 250g); Brain infusion kit (2) used;

Q2593: L. Shan, *et al.* Vascular endothelial growth factor B prevents the shift in the ocular dominance distribution of visual cortical neurons in monocularly deprived rats. *Experimental Eye Research* 2013;109(;):17-21

ALZET Comments: Vascular endothelial growth factor B; CSF, artificial; CSF/CNS; Rat; 1007D; Control animals received mp w/ vehicle; animal info (Long Evans hooded); PE60 tubing used.

Q2833: L. Wang, *et al.* Hepatic Vascular Endothelial Growth Factor Regulates Recruitment of Rat Liver Sinusoidal Endothelial Cell Progenitor Cells. *Gastroenterology* 2012;143(6):1555-U239

ALZET Comments: Vascular endothelial growth factor; IP; Rat; Animal info (Lewis, VEGF KO, hepatectomy); infusion rate of 1 ul/hr.

Q1819: O. Thau-Zuchman, *et al.* SUBACUTE TREATMENT WITH VASCULAR ENDOTHELIAL GROWTH FACTOR AFTER TRAUMATIC BRAIN INJURY INCREASES ANGIOGENESIS AND GLIOGENESIS. *Neuroscience* 2012;202(;):334-341

ALZET Comments: Vascular endothelial growth factor; Saline; CSF/CNS; Mice; 7 days; Controls received mp w/ vehicle; animal info (adult, Sabra, 40 g).

Q1655: O. Thau-Zuchman, *et al.* Combination of Vascular Endothelial and Fibroblast Growth Factor 2 for Induction of Neurogenesis and Angiogenesis after Traumatic Brain Injury. *Journal of Molecular Neuroscience* 2012;47(1):166-172

ALZET Comments: Vascular endothelial growth factor; Saline; CSF/CNS; Mice; 1007D; 7 days; Controls received mp w/ vehicle; animal info (male, Sabra, adult, 40 g).



Q1620: R. Reitmeir, *et al.* Vascular endothelial growth factor induces contralesional corticobulbar plasticity and functional neurological recovery in the ischemic brain. *Acta Neuropathologica* 2012;123(2):273-284

ALZET Comments: Vascular endothelial growth factor; NaCl; CSF/CNS; Mice; 2002; 2004; 4 weeks; Controls received mp w/ vehicle; animal info (male, C57Bl6/j, 8-10 wks old, 23-25 g); ischemia (MCAO); stress/adverse effects, "complications related to pump insertion" pg 274; behavioral testing (Rotarod, grip strength test).

Q1775: C. Lutton, *et al.* Combined VEGF and PDGF Treatment Reduces Secondary Degeneration after Spinal Cord Injury. *Journal of Neurotrauma* 2012;29(5):957-U479

ALZET Comments: Vascular endothelial growth factor; platelet-derived growth factor; Saline; CSF/CNS (intrathecal); Rat; 2001; 7 days; Controls received mp w/ vehicle; animal info (Wistar, male, adult, 300 g, 20-25 wks old); functionality of mp verified in vitro; "catheter was... sutured to the muscle to keep it in place" pg 959.

Q1810: J. Herz, *et al.* Intracerebroventricularly delivered VEGF promotes contralesional corticorubral plasticity after focal cerebral ischemia via mechanisms involving anti-inflammatory actions. *NEUROBIOLOGY OF DISEASE* 2012;45(3):1077-1085

ALZET Comments: Vascular endothelial growth factor, recomb. human; CSF/CNS; Mice; 2002; 2004; 4 weeks; Controls received mp w/ saline; animal info (male, C57BL/6J, 8-10 wks old, 23-25 g); ischemia.

Q2316: E. G. Argandona, *et al.* Effect of intracortical vascular endothelial growth factor infusion and blockade during the critical period in the rat visual cortex. *Brain Research* 2012;1473(1):141-154

ALZET Comments: Vascular endothelial growth factor; anti-VEGF; PBS; CSF/CNS (cortex); Rat; 1007D; Control animals received mp w/ vehicle; animal info (Long Evans, P18); ALZET brain infusion kit used; cyanoacrylate adhesive used.

Q1347: A. H. Siddiqui, *et al.* Recombinant Vascular Endothelial Growth Factor 121 Attenuates Autoantibody-Induced Features of Pre-eclampsia in Pregnant Mice. *American Journal of Hypertension* 2011;24(5):606-612

ALZET Comments: Vascular endothelial growth factor 121; SC; Mice (pregnant); 1007D; 5 days; Animal info (C57BL/6, 8 wks old).

Q0878: N. Ortuzar, *et al.* Combination of intracortically administered VEGF and environmental enrichment enhances brain protection in developing rats. *Journal of Neural Transmission* 2011;118(1):135-144

ALZET Comments: Vascular endothelial growth factor; CSF/CNS (cortex); Rat; 1007D; 7 days; Controls received mp w/ PBS or no implantation; animal info (Long-Evans, P18); cyanoacrylate adhesive; ALZET brain infusion kit 3 used; "Total operating time was approximately 25 min." pg 137.

Q1236: E. A. Miyasaka, *et al.* In vivo growth of a bioengineered internal anal sphincter: comparison of growth factors for optimization of growth and survival. *PEDIATRIC SURGERY INTERNATIONAL* 2011;27(2):137-143

ALZET Comments: Fibroblast growth factor-2; vascular endothelial growth factor-2; platelet-derived growth factor; SC; Mice; 1004; 28 days; Controls received mp with no growth factors; animal info (C57BL/6); good methods, pg 138; tissue perfusion (internal anal sphincter); silicone catheter used; "the osmotic pumps we used completed delivery of the growth factors by 28 days, which would clearly limit the duration of exposure to the growth factor, lessening the risk of malignancy" pg 143.

Q2201: J. Mateus, *et al.* Endothelial growth factor therapy improves preeclampsia-like manifestations in a murine model induced by overexpression of sVEGFR-1. *American Journal of Physiology-Heart and Circulatory Physiology* 2011;301(5):H1781-H1787

ALZET Comments: Vascular endothelial growth factor 121; PBS; SC; Mice (pregnant); 2002; 10 days; Controls received mp w/ vehicle; animal info (CD-1); functionality of mp verified by residual volume and plasma drug levels.

Q1664: L. M. Chu, *et al.* Resveratrol supplementation abrogates pro-arteriogenic effects of intramyocardial vascular endothelial growth factor in a hypercholesterolemic swine model of chronic ischemia. *Surgery* 2011;150(3):390-399

ALZET Comments: Vascular endothelial growth factor, recomb. human; Intrapericardial; Pig; Animal info (intact, male, Yorkshire); stress/adverse effects "sudden cardiac death", pg 393.



Q1355: O. Thau-Zuchman, *et al.* Vascular endothelial growth factor increases neurogenesis after traumatic brain injury. *Journal of Cerebral Blood Flow and Metabolism* 2010;30(5):1008-1016

ALZET Comments: Vascular endothelial growth factor; CSF/CNS; Mice; 6, 7 days; Controls received mp w/ vehicle or were sham operated; animal info (adult, Sabra, male, 40 g); infusion rate of 0.5 ul/hr.

Q1592: L. B. Romo, *et al.* VEGF protects spinal motor neurons against chronic excitotoxic degeneration in vivo by activation of PI3-K pathway and inhibition of p38MAPK. *Journal of Neurochemistry* 2010;115(5):1090-1101

ALZET Comments: Isoxazolepropionate, alpha amino-3-hydroxy-5-; vascular endothelial growth factor, recomb., 164; SU14980, tyrphostin; LY294002; wortmannin; PD-98059; SB203580; neurodegenerative (amyotrophic lateral sclerosis); PBS; DMSO; CSF/CNS (intrathecal, spinal cord); Rat; 2004; 2, 10, 20 days; Controls received mp w/ vehicle; animal info (Wistar, male, 270-290 g, adult); alpha amino-3-hydroxy-5-isoxazolepropionate also known as AMPA; wound clips used; post op. care, pg 1091 (penicillin); good methods, pg 1091; multiple pumps used (2); multiple intrathecal catheters used; wound clips used; 2% DMSO used; enzyme inhibitor (p38 mitogen-activated protein kinase, p38MAPK).

Q0712: J. N. Nicoletti, *et al.* Vascular endothelial growth factor attenuates status epilepticus-induced behavioral impairments in rats. *EPILEPSY & BEHAVIOR* 2010;19(3):272-277

ALZET Comments: Vascular endothelial growth factor, 165, recomb. human; vascular endothelial growth factor, inactivated; PBS, sterile; CSF/CNS (hippocampus); Rat; 2002; 2 weeks; Controls received no surgical manipulations or protein infusions; animal info (male Sprague-Dawley, 250-350 g); behavioral testing (Morris water maze, Grid locomotor activity, Light-dark exploration).

Q1197: C. Lee, *et al.* Vascular Endothelial Growth Factor Is Involved in Mediating Increased De Novo Hippocampal Neurogenesis in Response to Traumatic Brain Injury. *Journal of Neurotrauma* 2010;27(3):541-553

ALZET Comments: Vascular endothelial growth factor 164; SU5416; uridine, bromodeoxy; CSF, artificial; DMSO; CSF/CNS; Rat; 2002; 13 days; Controls received mp w/ vehicle; animal info (young, Sprague Dawley, male, 270-300 g); 1% DMSO used.

R0287: S. S. Glaser, *et al.* Vascular factors, angiogenesis and biliary tract disease. *CURRENT OPINION IN GASTROENTEROLOGY* 2010;26(3):246-250

ALZET Comments: Vascular endothelial growth factor, alpha; BSA; IP; Rat; 1 week; animal info (BDL+HAL).

Q0400: E. Bogaert, *et al.* VEGF protects motor neurons against excitotoxicity by upregulation of GluR2. *NEUROBIOLOGY OF AGING* 2010;31(12):2185-2191

ALZET Comments: Vascular endothelial growth factor; CSF/CNS; Rat; 2004; 1 week; Controls received mp w/ vehicle; animal info (80 days old).

Q0354: A. Ahmed, *et al.* A New Mouse Model to Explore Therapies for Preeclampsia. *PLoS One* 2010;5(10):U325-U333

ALZET Comments: Vascular endothelial growth factor (121); PBS, sterile; SC; Mice; 7 days; Animal info (CBA/J x DBA/2 and CBA/J x BALB/c).

P9708: N. O. Schmidt, *et al.* Vascular endothelial growth factor-stimulated cerebral microvascular endothelial cells mediate the recruitment of neural stem cells to the neurovascular niche. *Brain Research* 2009;1268(1):24-37

ALZET Comments: Vascular endothelial growth factor, recomb. human; CSF/CNS (parenchyma); Mice (nude); 2004; Controls received mp w/PBS; animal info (6 wks old).

Q0282: C. Schmidt, *et al.* Rapid three-dimensional quantification of VEGF-induced scaffold neovascularisation by microcomputed tomography. *Biomaterials* 2009;30(30):5959-5968

ALZET Comments: Vascular endothelial growth factor (165); SC; Rat; 1002; 10 days; Controls received mp w/ PBS; animal info (male, Wistar, 234-254 g); functionality of mp verified by residual volume; post op. care (buprenorphine); pump connected to a porous polyurethane construct, schematic on Figure 1A;.

P9814: G. Santulli, *et al.* In vivo properties of the proangiogenic peptide QK. *Journal of Translational Medicine* 2009;7(1):U1-U10



ALZET Comments: Vascular endothelial growth factor-15; vascular endothelial growth factor-165; QK; IA (femoral); Rat; 2002; 14 days; Peptides; animal info (12 wks old, WKY, normosensitive); QK is a de novo engineered VEGF mimicking peptide.

Q0514: C. Lee, *et al.* Inhibition of VEGF receptor 2 increased cell death of dentate hilar neurons after traumatic brain injury. *Experimental Neurology* 2009;220(2):400-403

ALZET Comments: Vascular endothelial growth factor (164); SU5416; CSF, artificial; DMSO; CSF/CNS; Rat; 1002; 13 days; Controls received mp w/ vehicle; animal info (young, male, Sprague Dawley, 270-330 g.); cannula placement verified by histology; 1% DMSO used; artificial CSF recipe.

P8799: A. Tsuchiya, *et al.* Sca-1+ endothelial cells (SPECs) reside in the portal area of the liver and contribute to rapid recovery from acute liver disease. *Biochemical and Biophysical Research Communications* 2008;365(3):595-601

ALZET Comments: Vascular endothelial growth factor-inhibitor; DMSO; IP; Mice; 9, 11 days; Controls received mp w/ vehicle; animal info (C57BL/6; 4, 8, 12 wks old; anti-Fas Ab-induced liver damage); agent also known as CBO-P11.

P9443: E. Segi-Nishida, *et al.* Electroconvulsive seizure and VEGF increase the proliferation of neural stem-like cells in rat hippocampus. *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*

2008;105(32):11352-11357

ALZET Comments: Vascular endothelial growth factor 164, recomb. rat; PBS; CSF/CNS; Rat; 1003D; 3 days; 24 hours; Controls received mp w/ vehicle; brain tissue distribution; peptides; animal info (male, Sprague Dawley, 175-200 g.); delayed delivery (in the 48 hour infusion, PBS infused for 24 hours to "avoid the influence of cannulation and anesthesia." (p. 11354) then VEGF infused for 24 hours).

P9198: E. S. Rennel, *et al.* Recombinant human VEGF_{165b} protein is an effective anti-cancer agent in mice. *European Journal of Cancer* 2008;44(13):1883-1894

ALZET Comments: Vascular endothelial growth factor-165-b, recomb.; NaCl, sterile; SC; Mice; 28 days; No stress (see pg. 1888); half-life (p. 1893) 25 min in mice, 13.8-72 min in rats; cancer (colon); post op. care (Temgesic); animal info (C57/Bl6, 720 g.); silk sutures used; "no adverse effects were observed with this infusion of VEGF165b" pg. 1888; compound is an anti angiogenic isoform of VEGF.

P9248: K. Poesen, *et al.* Novel Role for Vascular Endothelial Growth Factor (VEGF) Receptor-1 and Its Ligand VEGF-B in Motor Neuron Degeneration. *Journal of Neuroscience* 2008;28(42):10451-10459

ALZET Comments: Vascular endothelial growth factor-B186, recomb. mouse; CSF, artificial; CSF/CNS; Rat; 2004; 100 days; Controls received mp w/ vehicle; long-term study; pumps replaced every 25 days; no stress (see pg. 10456); stability verified by 4 weeks in mp at 37 degrees Celsius; animal info (HAN-Wistar x Sprague Dawley-hSOD1G93A, 60 days old); behavioral testing (Rotarod test); "this delivery route was chosen because previous studies demonstrated that intracerebroventricularly delivered VEGF diffuses from the CSF into the neural parenchyma, where it reaches it's target motor neurons." (p. 10456).

P9139: J. N. Nicoletti, *et al.* Vascular endothelial growth factor is up-regulated after status epilepticus and protects against seizure-induced neuronal loss in hippocampus. *Neuroscience* 2008;151(1):232-241

ALZET Comments: Vascular endothelial growth factor, recomb. human; BowAng1; Flt-Fc; CSF/CNS (dorsal hippocampus); Rat; 5 days; Controls received mp w/ PBS; animal info (male, Sprague Dawley, adult, 250-350 g.); cannula, polyvinyl catheter from Plastics One used; BowAng1 is a fusion of four molecules of angiopoietin-1 with two molecules of hFC; Flt-Fc is an immunoadhesin.

P8833: M. Boodhwani, *et al.* Comparison of vascular endothelial growth factor and fibroblast growth factor-2 in a swine model of endothelial dysfunction. *European Journal of Cardio-thoracic Surgery* 2008;33(4):645-650

ALZET Comments: Vascular endothelial growth factor 165, recomb. human; Heparin; Intramyocardial; Pig (miniswine); 2ML4; 4 weeks; Tissue perfusion (myocardial); half-life (p. 649) "short"; cardiovascular; peptides; ischemia (cardiac); animal info (Yucatan mini-swine, 20-30 kg.).



R0359: A Review of the Foreign-body Response to Subcutaneously-implanted Devices: The Role of Macrophages and Cytokines in Biofouling and Fibrosis. *Journal of Diabetes Science and Technology* 2008;2(5):768-777

ALZET Comments: Antibody, TGF beta neutralizing; Vascular endothelial growth factor; SC; Pig (mini); 28 days; animal info (Yucatan mini pigs); enzyme inhibitor (pSmad2);

P8267: J. L. Warner-Schmidt, *et al.* VEGF is an essential mediator of the neurogenic and behavioral actions of antidepressants. *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA* 2007;104(11):4647-4652

ALZET Comments: Vascular endothelial growth factor 164, recomb. rat; CSF/CNS; Rat; 1003D; 3 days; Controls received mp w/ vehicle; peptides; animal info (male, Sprague-Dawley, 175-200g.).

P8306: K. Tiranathanagul, *et al.* Tissue engineering of an implantable bioartificial hemofilter. *ASAIO Journal* 2007;53(2):176-186

ALZET Comments: Platelet-derived growth factor-BB; vascular endothelial growth factor 164; Saline, normal; albumin, rat serum; acetic acid; IA (femoral); IV (femoral); Rat; 2004; 28 days; Artificial kidney; controls received mp w/ vehicle; peptides; animal info (male, Fisher 344); mp attached by cannula to bioartificial hemofilter device, which surrounded and delivered agent to the femoral vessels; nephrology.

P8512: Y. Huang, *et al.* Distinct roles of VEGFR-1 and VEGFR-2 in the aberrant hematopoiesis associated with elevated levels of VEGF. *Blood* 2007;110(2):624

ALZET Comments: Vascular endothelial growth factor 165, recomb. human; vascular endothelial growth factor, receptor-2 selective; vascular endothelial growth factor, receptor-1 selective; Mice; 2004; 28 days; Controls received mp w/ PBS; cancer; peptides; animal info (female, Balb/c, 6-8 weeks old); angiogenesis; hematology.

R0246: E. Hedlund, *et al.* Cell therapy and stem cells in animal models of motor neuron disorders. *European Journal of Neuroscience* 2007;26(7):1721-1737

ALZET Comments: Vascular endothelial growth factor; CSF/CNS; Rat; Animal info (SOD1G93A, P60, P85); neurogenerative (ALS); Review; see p. 1722-1724, 1726-1727; ref. Storkebaum et al, 2005.

P8366: M. I. Dorrell, *et al.* Combination angiostatic therapy completely inhibits ocular and tumor angiogenesis. *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA* 2007;104(3):967-972

ALZET Comments: Vascular endothelial growth factor, aptamer; EMD472523; T2-TrpRS; PBS; CSF/CNS (intratumoral); Rat; 2001D; 2ML2; 2ML4; 3,6 days; 24 hours; Controls received mp w/ vehicle; cancer (gliosarcoma); animal info (male, Fischer, 344); EMD472523 is an integrin antagonist, VEGF aptamer is chemically identical to Macugen; T2 is a proteolytic fragment of tryptophan tRNA synthetase; all agents have angiostatic activity; tissue perfusion (tumor).

P8299: C. A. Cruze, *et al.* The Y_2 receptor mediates increases in collateral-dependent blood flow in a model of peripheral arterial insufficiency. *Peptides* 2007;28(2):269-280

ALZET Comments: Peptide YY, recomb. human; peptide YY (3-36), recomb. human; vascular endothelial growth factor 165; PBS; glycerol; sodium citrate; Tween 20; IA (iliac); Rat; 14 days; Controls received mp w/ vehicle; replacement therapy (femoral artery occlusion); dose-response (fig. 4); half-life (p. 276) <30 minutes; cardiovascular; peptides; ischemia (hindlimb); animal info (male, Sprague-Dawley, 325-350 grams).

P7987: Y. M. Wang, *et al.* Vascular endothelial growth factor improves recovery of sensorimotor and cognitive deficits after focal cerebral ischemia in the rat. *Brain Research* 2006;1115(186-193

ALZET Comments: Vascular endothelial growth factor; CSF, artificial; CSF/CNS; Rat; 1003D; 3 days; Controls received mp w/ vehicle; ischemia (cerebral); behavioral study.

P7561: Y. J. Sun, *et al.* Vascular endothelial growth factor-B (VEGFB) stimulates neurogenesis: Evidence from knockout mice and growth factor administration. *Developmental Biology* 2006;289(2):329-335

ALZET Comments: Vascular endothelial growth factor-B; CSF, artificial; CSF/CNS; Rat; mice; 1003D; 3 days; Controls received mp w/ vehicle; ischemia (cerebral); animal info (mice, 10-12 wk old; male, Sprague-Dawley).



P8017: T. Kawai, *et al.* Inhibitor of vascular endothelial growth factor receptor tyrosine kinase attenuates cellular proliferation and differentiation to mature neurons in the hippocampal dentate gyrus after transient forebrain ischemia in the adult rat. *Neuroscience* 2006;141(3):1209-1216

ALZET Comments: Vascular endothelial growth factor receptor tyrosine kinase inhibitor; DMSO; CSF/CNS (dentate gyrus); Rat; 2001; 7 days; Controls received mp w/ vehicle; dose-response (fig. 4); enzyme inhibitor (VEGF receptor tyrosine kinase); ischemia (transient forebrain); animal info (male, Wistar, 8 weeks old, carotid artery occlusion); 0.5% DMSO; agent also known as 4-[(4'-chloro-2'-fluoro) phenylamino]-6,7-dimethoxyquinazoline; tissue perfusion (dentate gyrus).

P8096: A. Gosain, *et al.* Exogenous pro-angiogenic stimuli cannot prevent physiologic vessel regression. *Journal of Surgical Research* 2006;135(2):218-225

ALZET Comments: Vascular endothelial growth factor 164, recomb.; platelet-derived growth factor; fibroblast growth factor-2; Wound site; Mice; 2002; 11 days; Controls received mp w/ PBS; functionality of mp verified by VEGF levels in wound sponges, residual volume; stability verified by activity of residual VEGF in endothelial cell cord formation assay (fig.4); cardiovascular; peptides; animal info (female, BALB/c, 8-9 wks old, implanted sponge wounds); "The activity of VEGF isolated from the pump was comparable to fresh recombinant VEGF 164, confirming that the recombinant growth factors present in the mini-osmotic pump retain robust biological activity." (p.221).

P7784: E. Gaudio, *et al.* Vascular endothelial growth factor stimulates rat cholangiocyte proliferation via an autocrine mechanism. *Gastroenterology* 2006;130(4):1270-1282

ALZET Comments: Vascular endothelial growth factor-A, recomb. mouse; vascular endothelial growth factor-C, recomb. mouse; Saline; BSA; IP; Rat; 1 week; Controls received mp w/ vehicle; peptides; animal info (male, Fischer 344, 150-175g.).

P7731: A. N. Carr, *et al.* Efficacy of systemic administration of SDF-1 in a model of vascular insufficiency: Support for an endothelium-dependent mechanism. *Cardiovascular Research* 2006;69(4):925-935

ALZET Comments: Vascular endothelial growth factor; stromal cell-derived factor-1a; PBS; glycerol; sodium acetate; sodium azide; IA (iliac); Rat; 2 weeks; Controls received mp w/ vehicle; dose-response (table 1); cardiovascular; peptides; animal info (adult); bilateral femoral artery ligation; occlusive cardiovascular disease.

P8163: M. Boodhwani, *et al.* High-dose atorvastatin is associated with impaired myocardial angiogenesis in response to vascular endothelial growth factor in hypercholesterolemic swine. *Journal of Thoracic and Cardiovascular Surgery* 2006;132(6):1299-1306

ALZET Comments: Vascular endothelial growth factor 165, recomb. human; Heparin; Perivascular (circumflex coronary artery); Pig (mini); ZML4; 4 weeks; Cardiovascular; peptides; ischemia (cardiac); animal info (male, female, yucatan, 20-30 kg, 23 weeks old).

P6730: E. Storkebaum, *et al.* Treatment of motoneuron degeneration by intracerebroventricular delivery of VEGF in a rat model of ALS. *Nature Neuroscience* 2005;8(1):85-92

ALZET Comments: Vascular endothelial growth factor, recomb. rat; CSF/CNS; Rat; 2004; 100 days; Long-term study; pumps replaced every 28 days; ALZET brain infusion kit used; VEGF was cleared from CSF within 3h; "70-80% of VEGF in pumps remained active after 4 weeks."; neurodegenerative (Amyotrophic Lateral Sclerosis).

P7417: N. O. Schmidt, *et al.* Brain tumor tropism of transplanted human neural stem cells is induced by vascular endothelial growth factor. *NEOPLASIA* 2005;7(6):623-629

ALZET Comments: Vascular endothelial growth factor, recomb. human; CSF/CNS (parenchyma); Mice; 2004; Controls received mp w/ PBS; functionality of mp verified by residual volume; cancer.

P7495: M. Burchardt, *et al.* Application of angiogenic factors for therapy of erectile dysfunction: protein and DNA transfer of VEGF 165 into the rat penis. *UROLOGY* 2005;66(3):665-670

ALZET Comments: Vascular endothelial growth factor, human 165; Saline, sterile; heparin; IA (renal); Rat; 2004; 28 days; Controls received mp w/ vehicle; functionality of mp verified by VEGF serum immunoassay; comparison of CDNA plasmid micro-injections vs. mp; gene therapy; peptides; animal info (male, Sprague-Dawley); urology; 2000 Units of heparin used.



P6908: G. Alonso, *et al.* Hyperosmotic stimulus induces reversible angiogenesis within the hypothalamic magnocellular nuclei of the adult rat: a potential role for neuronal vascular endothelial growth factor. *BMC NEUROSCIENCE* 2005;6(U1-U19)

ALZET Comments: Antibody, anti-vascular endothelial growth factor; PBS; CSF/CNS (supraoptic nucleus); Rat; 1007D; 6 days; Schematic fig 9; 10 mm, 26 gauge cannula used.

P6564: O. Suzuki, *et al.* VEGF-promoted surgical angiogenesis in necrotic bone. *MICROSURGERY* 2004;24(1):85-91

ALZET Comments: Vascular endothelial growth factor 165; Phosphate buffer; albumin rabbit serum; Bone; Rabbit; 1003D; 3 days;

P6370: P. S. Manonkitiwongsa, *et al.* Neuroprotection of ischemic brain by vascular endothelial growth factor is critically dependent on proper dosage and may be compromised by angiogenesis. *Journal of Cerebral Blood Flow and Metabolism* 2004;24(6):693-702

ALZET Comments: Vascular endothelial growth factor; Saline; IA (carotid); Rat; 2001; 7 days; Controls received mp w/ vehicle; dose response (p. 697); stroke; ischemia (cerebral); biocompatible glue was used to secure catheter in artery.

P6614: I. Kodama, *et al.* Estrogen regulates the production of VEGF for osteoclast formation and activity in *op/op* mice. *Journal of Bone and Mineral Research* 2004;19(2):200-206

ALZET Comments: Antibody, anti-vascular endothelial growth factor; vascular endothelial growth factor; Flt-1/F_e chimera; SC; Mice; 1002; 2 weeks; Plasma levels taken.

P6834: N. Hashiya, *et al.* In vivo evidence of angiogenesis induced by transcription factor ets-1 - Ets-1 is located upstream of angiogenesis cascade. *Circulation* 2004;109(24):3035-3041

ALZET Comments: Antibody, anti-vascular endothelial growth factor; antibody, immunoglobulin G, rabbit; IP; Mice; Cardiovascular; ischemia.

P6634: S. D. Croll, *et al.* VEGF-mediated inflammation precedes angiogenesis in adult brain. *Experimental Neurology* 2004;187(2):388-402

ALZET Comments: Vascular endothelial growth factor 164, mouse; Flt-Fc; angiopoietin I, human; angiopoietin II, human; PBS; CSF/CNS (frontoparietal cortex); Rat; 2002; 1,2,3,4,5,7 days; Controls received mp w/ vehicle or hFc; dose-response (fig. 1); brain tissue distribution; peptides; cyanoacrylate adhesive (Loctite 495).

P6774: L. Bello, *et al.* Combinatorial administration of molecules that simultaneously inhibit angiogenesis and invasion leads to increased therapeutic efficacy in mouse models of malignant glioma. *Clinical Cancer Research* 2004;10(13):4527-4537

ALZET Comments: PEX, recomb. human; PF-4/CTF; P4-4/DLR; vascular endothelial growth inhibitor, cyclo-; Water, sterile; SC; Mice; mice (nude); 2004; 28, 112, 140 days; Dose-response; long-term study; pumps replaced every 28 days; no stress (see pg. 4532); cancer (glioma); peptides; "The treatment was always very well tolerated without the occurrence of any side effects." (p. 4532); angiogenesis inhibitor.