



References on the Administration of Gastrin Using ALZET® Osmotic Pumps

Q5844: X. Jiang, *et al.* Gastrin stimulates renal dopamine production by increasing the renal tubular uptake of L-DOPA. *Am J Physiol Endocrinol Metab* 2017;312(1):E1-E10

ALZET Comments: RNA, small interfering (Gastrin-specific); TransIT in vivo transfection reagent; Kidney (subscapular space); Mice; 1007D; 7 days; Controls received mp with mock (nonsilencing) siRNA; ALZET polyethylene tubing used ; Therapeutic indication (Nephrology, Hypertension, L-Dopa); Dose (3 ug/day).

Q4918: M. Zhang, *et al.* Growth factors and medium hyperglycemia induce Sox9+ ductal cell differentiation into β cells in mice with reversal of diabetes. *pnas* 2016;113(3):650-655

ALZET Comments: Gastrin; epidermal growth factor, human recombinant; Acetic acid; PBS; IP; Mice; 1007D; 7 days; Controls received mp w/ vehicle; animal info (male, WT or Ins1 CreERT); diabetes; Dose (gastrin 3 ug/kg/hr; EGF 10 ug/kg/hr);.

Q3878: R. Feng, *et al.* Indian Hedgehog Mediates Gastrin-Induced Proliferation in Stomach of Adult Mice. *Gastroenterology* 2014;147(655-+)

ALZET Comments: Gastrin-17; PBS; IP; Mice; 7 days; Controls received mp w/ vehicle; animal info (PC-ShH KO/GKO, 3 months old); immunology;.

Q6729: K. M. Marshall, *et al.* The C-terminal flanking peptide of progastrin induces gastric cell apoptosis and stimulates colonic cell division in vivo. *Peptides* 2013;46(83-93)

ALZET Comments: Gastrin, amidated; Gastrin, non-amidated, glycine-extended; C-terminal flanking peptide; PBS; BSA; Mice (knockout); 1002; 11 days; Dose (2.5 nmol/kg/h (Gamide and Ggly); 10 nmol/kg/h (CTFP)); 0.1% BSA used; animal info (Gastrin knockout (GASKO) mice, male and female, 10-12 weeks old); peptides;.

Q1065: A. Ferrand, *et al.* Stimulation of proliferation in the colorectal mucosa by gastrin precursors is blocked by desferrioxamine. *American Journal of Physiology-Gastrointestinal and Liver Physiology* 2010;299(1):G220-G227

ALZET Comments: Gastrin, glycine-extended; PBS; BSA; IP; Rat; 2ML4; 28 days; Controls received mp w/ vehicle; animal info (male, Sprague Dawley, 250-300 g); functionality of mp verified by serum ggly levels; peptides.

P9593: E. Mensah-Osman, *et al.* Regulated expression of the human gastrin gene in mice. *REGULATORY PEPTIDES* 2008;151(1-3):115-122

ALZET Comments: Gastrin-17; IP; Mice (transgenic); 1007D; 7 days; Controls received mp w/PBS; peptides; animal info (hGasBAC, wt).

P8736: Y. Zavros, *et al.* Reduced pepsin a processing of sonic hedgehog in parietal cells precedes gastric atrophy and transformation. *Journal of Biological Chemistry* 2007;282(46):33265-33274

ALZET Comments: Gastrin-17, rat; gastrin-17 gly; IP; Mice; 1002; 14 days; Functionality of mp verified by plasma gastrin levels; peptides; animal info (C57BL/6 x 129/SV, G -/-, wt, 8 weeks old).

P8307: R. N. Jain, *et al.* Transcriptional profiling of gastrin-regulated genes in mouse stomach. *PHYSIOLOGICAL GENOMICS* 2007;29(1):1-12

ALZET Comments: Gastrin-17, rat; Saline; BSA; Mice; 2001; 7 days; Controls received mp w/ vehicle; peptides; animal info (male, C57BL/6, GAS-KO, 8-10 wks old).

P9001: B. Stenstroem, *et al.* Is gastrin partially responsible for body weight reduction after gastric bypass? *European Surgical Research* 2006;38(2):94-101



ALZET Comments: Gastrin-17, synthetic rat; Saline; BSA; SC; Rat; 2 months; Controls received no treatment; functionality of mp verified by serum gastrin concentrations; long-term study; pumps replaced every 2 weeks; peptides; animal info (male, Sprague Dawley, 2 months old, 230 g., gastric bypass).

P7538: R. N. Jain, *et al.* Gene expression profiling of gastrin target genes in parietal cells. *PHYSIOLOGICAL GENOMICS* 2006;24(2):124-132

ALZET Comments: Gastrin, rat; Saline; BSA; SC; Mice; 2001; 7 days; Controls received mp w/ vehicle; replacement therapy (gastrin knockout); animal info (GAS-KO, male, 8-10 wk old); mp primed overnight in saline.

P7906: N. Houli, *et al.* Mitogenic effects of both amidated and glycine-extended gastrin-releasing peptide in defunctioned and azoxymethane-treated rat colon in vivo. *REGULATORY PEPTIDES* 2006;134(1):9-16

ALZET Comments: Gastrin-releasing peptide, amidated; gastrin-releasing peptide, glycine extended; PBS; IP; Rat; 2ML4; 4 weeks; Controls received mp w/ vehicle; no stress (see pg. 11-12); cancer (colorectal); peptides; animal info (male, Sprague-Dawley, 250-350g); "All animals remained healthy during the 4 week experimental period and rats in the different experimental groups gained weight at the same rate." (p. 11-12).

P8926: G. L. Cui, *et al.* Gastrin-induced apoptosis contributes to carcinogenesis in the stomach. *LABORATORY INVESTIGATION* 2006;86(10):1037-1051

ALZET Comments: Gastrin-17; SC; Mice; 8 weeks; Controls received mp w/ PBS; functionality of mp verified by serum gastrin levels; pumps replaced; cancer (gastric); peptides; animal info (male, GAS-KO, 2 months old).

P7532: H. F. Helander, *et al.* Cell proliferation in the gastric epithelium of the ulcer rat. *SCANDINAVIAN JOURNAL OF GASTROENTEROLOGY* 2005;40(12):1386-1393

ALZET Comments: Thymidine; gastrin-17, synthetic rat; Saline; BSA; SC; Rat; 2ML1; 2ML2; 1, 2, 6, 13 days; Controls received mp w/ agent and no induced ulcer; functionality of mp verified by plasma gastrin levels; multiple pumps per animal (2); animal info (female, Sprague-Dawley, 200-250 g); mp primed overnight in 37C s.

P6493: I. Rooman, *et al.* Combined gastrin and epidermal growth factor treatment induces islet regeneration and restores normoglycaemia in C57Bl6/J mice treated with alloxan. *Diabetologia* 2004;47(2):259-265

ALZET Comments: Gastrin I, rat; epidermal growth factor, recomb. human; DMSO; saline, physiological; acetic acid; BSA; IP; Mice; 1007D; 1 week; Controls received no treatment; peptides; 8% DMSO.

P7077: F. Lefranc, *et al.* Characterization of gastrin-induced proangiogenic effects in vivo in orthotopic U373 experimental human glioblastomas and in vitro in human umbilical vein endothelial cells. *Clinical Cancer Research* 2004;10(24):8250-8265

ALZET Comments: Gastrin-17; Saline; CSF/CNS (intratumoral); Rat (nude); 1002; 7 days; Controls received mp w/ vehicle; stability verified; cancer (glioma).

P6496: H. F. Helander, *et al.* Parietal cell density during gastric ulcer healing in the rat. *SCANDINAVIAN JOURNAL OF GASTROENTEROLOGY* 2004;39(1):20-26

ALZET Comments: Thymidine, (methyl-3H)-; gastrin-17, synthetic rat; Saline; BSA; SC; Rat; 2ML1; 2ML2; 1,2,6,13 days; Functionality of mp verified by gastrin plasma concentrations; multiple pumps per animal (2); mp primed overnight in saline @ 37 degrees Celsius.

P6560: D. Chen, *et al.* Altered control of gastric acid secretion in gastrin-cholecystokinin double mutant mice. *Gastroenterology* 2004;126(2):476-487

ALZET Comments: Cholecystokinin-8S; cholecystokinin-8; gastrin-17; SC; Mice; 2,6 days; Comparison of single SC gastrin-17 injection vs. mp; peptides; mp incubated overnight in 0.9% NaCl at room temperature prior to implantation.

R0200: L. C. Samuelson, *et al.* Insights into the regulation of gastric acid secretion through analysis of genetically engineered mice. *Annual Review of Physiology* 2003;65(383-400)

ALZET Comments: Gastrin; Mice; 6 days; Replacement therapy (gastrin deficient mice).



P5644: N. Poorkhalkali, *et al.* Cell kinetics of the oesophageal epithelium in the rat: Effects of hypergastrinaemia. SCANDINAVIAN JOURNAL OF GASTROENTEROLOGY 2003;38(1):14-19

ALZET Comments: Gastrin-17; thymidine; Saline; BSA; radio-isotopes; 3H tracer; SC; Rat; 2ML1; 2ML2; 24 hrs; 6,9,15,17 days; Comparison of acute injections vs. mp; pumps replaced after 13 days in some groups; multiple pumps per animal (2) in one group (one with each agent); gastrin dissolved in saline w/ BSA.

P6078: Y. Huang, *et al.* Partitioning of aquaporin-4 water channel mRNA and protein in gastric glands. Digestive Diseases and Sciences 2003;48(10):2027-2036

ALZET Comments: Gastrin; Saline; albumin; SC; Rat; 8 days; Controls received mp w/ vehicle; peptides.

P5406: M. Yao, *et al.* COX-2 selective inhibition reverses the trophic properties of gastrin in colorectal cancer. British Journal of Cancer 2002;87(5):574-579

ALZET Comments: Gastrin-17; Saline; SC; Mice; Controls received mp w/ vehicle; cancer; peptides; colorectal cancer.

P5587: F. Lefranc, *et al.* Gastrin significantly modifies the migratory abilities of experimental glioma cells. Lab. Invest 2002;82(9):1241-1252

ALZET Comments: Gastrin; SC; Rat; 1002; 14 days; controls received mp with saline; tissue perfusion (tumor resection cavity); cancer.

P5572: A. J. FitzGerald, *et al.* Effects of amidated gastrin and glycine-extended gastrin on cell proliferation and crypt fission in parenterally and orally fed rats. Digestion 2002;66(1):58-66

ALZET Comments: Gastrin, glycine-extended; saline; SC; Rat; 2001; 7 days; gastrointestinal mitogen.

P5015: A. Kramer, *et al.* Regulation of daily locomotor activity and sleep by hypothalamic EGF receptor signaling. Science 2001;294(5551):2511-2515

ALZET Comments: Transforming growth factor- α ; Brain-derived neurotrophic factor; Vasoactive intestinal polypeptide; Peptide, histidine-isoleucine; Gastrin releasing peptide; Substance P; Neuromedin-C; Neurokinin A; Neuropeptide K; Neuropeptide Y; Somatostatin; Antrin; Cholecystokinin; Thyrotropin-releasing hormone; Neurotensin; Neuromedin N;; CSF, artificial; CSF/CNS (third ventricle); hamster; 2002; 18-22 days; peptides.

Q6808: A. Aly, *et al.* Short term infusion of glycine-extended gastrin(17) stimulates both proliferation and formation of aberrant crypt foci in rat colonic mucosa. Int J Cancer 2001;94(3):307-13

ALZET Comments: Gastrin-17, glycine-extended; PBS; albumin, bovine serum; IP; Rat; 2ML4; 2ML1; 1 week; 4 weeks; Dose (10 nmol/kg/hr; 2/5 nmol/kg/hr); 0.1% BSA used; Controls received mp w/ vehicle; animal info (Young adult male Sprague-Dawley rats, 250–350 g in weight);

P4120: J. Morisset, *et al.* Hormonal control of rat fetal pancreas development. Biol. Neonate 1999;75(327-336

ALZET Comments: Cerulein; Gastrin-releasing peptide; Pentagastrin; Gastrin-releasing peptide antagonist; Hydrocortisone; L-365,260; Saline; DMSO; Water; SC; Rat (pregnant); 2ML4; no duration posted; peptides; L-365,260 is a CCKB receptor antagonist.

P4583: L. Friis-Hansen, *et al.* Impaired gastric acid secretion in gastrin-deficient mice. Am. J. Physiol 1998;274(G561-G568

ALZET Comments: Gastrin-17; Saline; BSA; SC; Mice; 2001; 6 days; Controls received mp w/vehicle; functionality of mp verified by plasma levels; peptides.

P3923: Y. Kato, *et al.* Growth factor enhancement of intestinal function: dramatic response but lack of synergism. J. Pediatr. Surg 1997;32(1598-1600

ALZET Comments: Epidermal growth factor; Gastrin I, human synthetic; IV (jugular); Rat; 2002; 14 days; controls received mp w/ saline; peptides; multiple pumps per animal (2) to infuse both agents simultaneously; recomb. human EGF used.

P3387: S. Tsutsui, *et al.* Inhibition of gastrin-stimulated enterochromaffin-like cell proliferation and mucosal histamine production in the rat stomach by the somatostatin analogue octreotide. Regul. Pept 1995;57(175-182



ALZET Comments: Octreotide; Gastrin; SC; Rat; 2ML2; 9 days; controls received mp w/saline; peptides.

P2838: G. E. Feurle, *et al.* The role of CCK and its analogues in the organogenesis of the fetal rat pancreas. *Pancreas* 1995;10(3):281-286

ALZET Comments: MK-329; Immunoglobulin, antigastrin/CCK; DMSO; Tween 80; NaCl; Serum, rat; SC; Rat; 2ML4; no duration posted; controls received mp with vehicles; immunoglobulin is monoclonal IgG.

P2164: K. Szepeshazi, *et al.* Growth inhibition of estrogen-dependent and estrogen-independent MXT mammary cancers in mice by the bombesin and gastrin-releasing peptide antagonist RC-3095. *J. Natl. Cancer Inst* 1992;84(24):1915-1920

ALZET Comments: Bombesin; Gastrin-releasing peptide; RC-3095; Propylene glycol; Water; SC; mice; 2002; 10, 14, 17, 18, 33 days; controls received mp with vehicle; pumps replaced at day 16; cancer; peptides; RC-3095 is a bombesin antagonist.

P2413: A. C. Petropoulos, *et al.* Effect of short-term treatment with gastrin and related peptides on gastrointestinal histamine H₂-receptors. *J. Pharmacol. Exp. Ther* 1992;262(2):624-631

ALZET Comments: Gastrin; Pentagastrin; Cholecystokinin-8S; Tiotidine; Saline; SC; Guinea pig; 2001; 7 days; peptides.

P2206: A. Hajri, *et al.* Gastrin-releasing peptide: in vivo and in vitro growth effects on an acinar pancreatic carcinoma. *Cancer Res* 1992;52(3726-3732)

ALZET Comments: Gastrin-releasing peptide; Saline; Rat; 2002; 15 days; controls received mp w/saline; cancer; peptides.

P2393: D. Y. Dy, *et al.* SMS 201.995 inhibits in vitro and in vivo growth of human colon cancer. *Cancer Res* 1992;52(917-923)

ALZET Comments: Octreotide; Gastrin; Saline; SC; mice; 2002; 14-35 days; controls received mp w/ saline; pumps replaced; stress/adverse reaction (ulceration, p. 918); 2 pumps implanted; cancer.

P2056: E. Brenna, *et al.* Trophic effect of gastrin on the enterochromaffin like cells of the rat stomach: establishment of a dose response relationship. *Gut* 1992;33(1303-1306)

ALZET Comments: Gastrin-17; Albumin; SC; Rat; 2ML1; 28 days; functionality of mp verified by plasma levels; dose-response (table); pumps replaced every 7 days; peptides.

P1908: A. P. N. Majumdar, *et al.* Gastrin affects enzyme activity and gene expression in the aging rat pancreas. *Exp. Gerontol* 1991;26(57-64)

ALZET Comments: Gastrin-17; Rat; 14 days; no comment posted.

P2053: B. Ryberg, *et al.* Gastrin stimulates the self-replication rate of enterochromaffinlike cells in the rat stomach. *Gastroenterol* 1990;99(935-942)

ALZET Comments: Gastrin-17; Ranitidine; Albumin, bovine serum; SC; Rat; 2ML1; 12 days; functionality of mp verified by plasma levels; dose-response (table); pumps replaced on day 6; peptides.

P1915: B. Ryberg, *et al.* Gastrin stimulates the self-replication rate of enterochromaffinlike cells in the rat stomach. *Gastroenterology* 1990;99(935-942)

ALZET Comments: Gastrin-17; Ranitidine; Albumin, bovine serum; Rat; 2ML1; 12 days; pumps replaced after 6 days; peptides.

P1640: B. Ryberg, *et al.* Trophic effects of continuous infusion of [Leu15]-gastrin-17 in the rat. *Gastroenterology* 1990;98(33-38)

ALZET Comments: Gastrin-17; Albumin; Saline; SC; Rat; 2ML1; 28 days; functionality of mp verified by blood levels; dose-response;pump replaced every 7 days; peptides.

P1808: R. Hakanson, *et al.* Evidence that gastrin enhances 45Ca uptake into bone through release of a gastric hormone. *Regul. Pept* 1990;28(107-118)

ALZET Comments: Gastrin-17; Ranitidine; Albumin; SC; Rat; 2ML1; 2ML2; 4 weeks; pumps replaced weekly (2ML1) or every two weeks (2ML2); peptides.



P1360: N. A. P. Majumdar, *et al.* Gastrin: levels and trophic action during advancing age. *Am. J. Physiol* 1988;254(G538-G542)

ALZET Comments: Gastrin; Saline; SC; Rat; 14 days; dose-response (graph); functionality of mp verified by tissue levels; peptides.

P0988: M. Z. Schwartz, *et al.* The influence of gastrin on gastrointestinal function. *J. Pediatr. Surg* 1986;21(12):1123-1127

ALZET Comments: Gastrin-17; Saline; intestine; SC; Rat; 2002; 14 days; controls received mp w/saline; mp connected to catheter in lumen; peptides; multiple pumps (2) per animal; intest. absorption study; tissue perfusion.

P0892: M. Z. Schwartz, *et al.* Enhancement of small intestine absorption by intraluminal gastrin. *J. Surg. Res* 1986;40(421-425)

ALZET Comments: Gastrin-17; Saline; intestine (small intestine); Rat; 2002; 14 days; controls received mp w/saline; mp connected to 2 catheters in the proximal stroma; peptides; tissue perfusion.

P1247: M. Z. Schwartz, *et al.* Enhancement of small intestine function by gastrin. *J. Surg. Res* 1985;38(613-617)

ALZET Comments: Gastrin-17; Saline; SC; Rat; 2002; 14 days; controls received mp w/ saline; rat fetal small intestine segment implanted sc in Fisher strain recipient; peptides.

P0297: J. Lamote, *et al.* Effect of cholecystokinin-octapeptide, caerulein, and pentagastrin on epithelial cell proliferation in the murine gallbladder. *Gastroenterology* 1982;83(371-377)

ALZET Comments: Caerulein; Pentagastrin; Saline; SC; mice; 2001; 6 days; compared acute injec. w/mp infusion; peptides.

P0092: S. Hosoda, *et al.* *Praomys (Mastomys) natalensis*: animal model for study of histamine-induced duodenal ulcers. *Gastroenterology* 1981;80(1):16-21

ALZET Comments: Gastrin I, human synthetic; Tetragastrin; Histamine dihydrochloride; Pentagastrin; Sodium bicarbonate; Water; SC; Rat; 1701; no duration posted; 7 days histamine (no vehicle listed), 2 days peptides; comparison of agents inducement of ulcers; 1-2 pumps/animal.