

# CURRICULUM VITAE

## Tomohisa ISHIKAWA

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## ADDRESS

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## EDUCATION

- 1989 Ph.D. in Pharmacology, University of Tsukuba, Ibaraki, Japan  
Thesis: " Positive inotropic effect of calcitonin gene-related peptide mediated by cyclic AMP in guinea pig heart."
- 1986 M.S. in Pharmacology, University of Tsukuba, Ibaraki, Japan
- 1984 B.S. in Pharmaceutical Sciences, Tokyo University of Science, Tokyo, Japan

## APPOINTMENTS

- 2019-present Dean, Graduate School of Integrated Pharmaceutical and Nutritional Sciences,  
Dean, Graduate Division of Pharmaceutical Sciences,  
University of Shizuoka, Shizuoka, Japan
- 2015-2019 Vice dean, School of Pharmaceutical Sciences, University of Shizuoka, Shizuoka, Japan
- 2006-present Professor, Department of Pharmacology, University of Shizuoka, Shizuoka, Japan
- 1998-2006 Associate Professor, Department of Pharmacology, University of Shizuoka, Shizuoka, Japan
- 1994-1998 Assistant Professor, Department of Pharmacology, University of Tsukuba, Ibaraki, Japan

- 1993-1994      Research Assistant Professor, Department of Physiology, University of Nevada, NV, U.S.A.
- 1990-1993      Research Associate, Department of Physiology, University of Nevada, NV, U.S.A.
- 1990-1991      Assistant Professor, Department of Pharmacology, University of Tsukuba, Ibaraki, Japan

## **RESEARCH INTEREST**

Signaling molecules involved in the functional regulation of pancreatic endocrine cells  
 Intracellular signaling mechanisms involved in the activation of hepatic stellate cells

## **SOCIETY MEMBERSHIPS**

Pharmaceutical Society of Japan  
 The Japanese Pharmacological Society  
 Japanese Association of Cardiovascular Pharmacology  
 Japan Diabetes Society  
 American Diabetes Association.

## **PUBLICATIONS**

- 1) Ishida H, Saito S, Horie A, Ishikawa T. Alleviation of mechanical stress-induced allodynia by improving blood flow in chronic constriction injury mice. *Eur J Pharmacol.* 2019; 849: 67-74. doi: 10.1016/j.ejphar.2019.02.002
- 2) Sawatani T, Kaneko YK, Doutsu I, Ogawa A, Ishikawa T. TRPV2 channels mediate insulin secretion induced by cell swelling in mouse pancreatic  $\beta$ -cells. *Am J Physiol Cell Physiol.* 2019; 316: C434-C443. doi: 10.1152/ajpcell.00210.2017.
- 3) Sawatani T, Kaneko YK, Ishikawa T. Dual effect of reduced type I diacylglycerol kinase activity on insulin secretion from MIN6  $\beta$ -cells. *J Pharmacol Sci.* 2019; 140: 178-186. doi: 10.1016/j.jphs.2019.06.001.
- 4) Yamaoka M, Terabayashi T, Nishioka T, Kaibuchi K, Ishikawa T, Ishizaki T, Kimura T. IRR is involved in glucose-induced endocytosis after insulin secretion. *J Pharmacol Sci.* 2019; 140: 300-304. doi: 10.1016/j.jphs.2019.07.002.
- 5) Ishida H, Saito SY, Dohi N, Ishikawa T. Mechanism of Membrane Depolarization Involved in  $\alpha$ 1A-adrenoceptor-mediated contraction in rat tail and iliac arteries. *Biol Pharm Bull.* 2019; 42: 1741-1745. doi: 10.1248/bpb.b19-00473.
- 6) Furukawa S, Yamaguchi M, Ooka A, Kikuchi H, Ishikawa T, Saito SY. Differentiation-inducing factor-1 prevents hepatic stellate cell activation through inhibiting GSK3 $\beta$  inactivation. *Biochem Biophys Res Commun.* 2019; 520: 140-144. doi: 10.1016/j.bbrc.2019.09.117.
- 7) Kimura T, Yamaoka M, Terabayashi T, Kaibuchi K, Ishikawa T, Ishizaki T. GDP-bound Rab27a dissociates from the endocytic machinery in a phosphorylation-dependent manner after insulin secretion. *Biol Pharm Bull.* 2019; 42: 1532-1537. doi: 10.1248/bpb.b19-00242.
- 8) Ishida H, Saito S, Hishinuma E, Kitayama T, Ishikawa T. Differential contribution of calcium

channels to  $\alpha$ 1-adrenoceptor-mediated contraction is responsible for diverse responses to cooling between rat tail and iliac arteries. *Eur J Pharmacol.* 2018; 826: 9–16. doi: 10.1016/j.ejphar.2018.02.023.

- 9) Sagara H, Kanakogi M, Tara Y, Ouchi H, Kimura J, Kaneko Y, Inai M, Asakawa T, Ishikawa T, Kan T. Concise synthesis of polymethoxyflavone sudachitin and its derivatives, and biological evaluations. *Tetrahedron Lett.* 2018; 59: 1816–1818. doi: 10.1016/j.tetlet.2018.03.064.
- 10) Ishida H, Saito S, Ishikawa T.  $\alpha$ 1A-Adrenoceptors, but not  $\alpha$ 1B- or  $\alpha$ 1D-adrenoceptors, contribute to enhanced contractile response to phenylephrine in cooling conditions in the rat tail artery. *Eur J Pharmacol.* 2018; 838: 120–128. doi: 10.1016/j.ejphar.2018.09.004
- 11) Serizawa I, Iwasaki N, Ishida H, Saito S, Ishikawa T. G-protein coupled estrogen receptor-mediated non-genomic facilitatory effect of estrogen on cooling-induced reduction of skin blood flow in mice. *Eur J Pharmacol.* 2017; 797: 26–31.
- 12) Ishida H, Saito S, Hishinuma E, Ishikawa T. Differential contribution of nerve-derived noradrenaline to high  $K^+$ -induced contraction depending on type of artery. *Biol Pharm Bull* 2017; 40: 56–60.
- 13) Sato T, Kaneko YK, Sawatani T, Noguchi A, Ishikawa T. Obligatory role of early  $Ca^{2+}$  responses in  $H_2O_2$ -induced  $\beta$ -cell apoptosis. *Biol Pharm Bull* 2015; 38, 1599–1605.
- 14) Kaneko YK, Takii M, Kojima Y, Yokosawa H, Ishikawa T. Structure-dependent inhibitory effects of green tea catechins on insulin secretion from pancreatic  $\beta$ -cells. *Biol Pharm Bull* 2015; 38: 476–481.
- 15) Ishikawa T. Recent progress in the research of insulin secretion. *Biol Pharm Bull* 2015; 38: 655.
- 16) Kaneko YK, Ishikawa T. Diacylglycerol signaling pathway in pancreatic  $\beta$ -cells: An essential role of diacylglycerol kinase in the regulation of insulin secretion. *Biol Pharm Bull* 2015; 38: 669–673.
- 17) Sato T, Kaneko YK, Sawatani T, Noguchi A, Ishikawa T. Obligatory role of early  $Ca^{2+}$  responses in  $H_2O_2$ -induced  $\beta$ -cell apoptosis. *Biol Pharm Bull* 2015; 38: 1599–1605.
- 18) Goto K, Saito S, Ishikawa T. Enhanced vasoconstriction to  $\alpha_1$ -adrenoceptor stimulation during cooling in mouse cutaneous plantar arteries. *Eur J Pharmacol* 2014; 742: 1–7.
- 19) Honda M, Komatsu R, Isobe T, Tabo M, Ishikawa T. Involvement of the autonomic nervous system in diurnal variation of corrected QT intervals in common marmosets. *J Pharmacol Sci* 2013; 121: 131–137.
- 20) Kaneko YK, Kobayashi Y, Motoki K, Nakata K, Miyagawa S, Yamamoto M, Hayashi D, Shirai Y, Sakane F, Ishikawa T. Depression of type I diacylglycerol kinases in pancreatic  $\beta$ -cells from male mice results in impaired insulin secretion. *Endocrinology* 2013; 154: 4089–4098.
- 21) Sahara Y, Saito S, Ishikawa T. Involvement of nitric oxide production in the impairment of skin blood flow response to local cooling in diabetic  $db/db$  mice. *Eur J Pharmacol* 2013; 720: 147–179.
- 22) Kaneko YK, Ishikawa T. Dual role of nitric oxide in pancreatic  $\beta$ -cells. *J Pharmacol Sci* 2013; 123: 295–300.
- 23) Yoshimura T, Ito A, Saito S, Takeda M, Kuriyama H, Ishikawa T. Calcitonin ameliorates enhanced arterial contractility after chronic constriction injury of the sciatic nerve in rats. *Fundam Clin Pharmacol* 2012; 26: 315–321.
- 24) Suzuki K, Saito S, Ishikawa T. Involvement of phosphatidylcholine-specific phospholipase C in thromboxane A<sub>2</sub> receptor-mediated extracellular  $Ca^{2+}$  influx in rat aorta. *Eur J Pharmacol* 2012; 677: 123–130.
- 25) Nakayama K, Tanabe Y, Obara K, Ishikawa T. Mechanosensitivity of Pancreatic  $\beta$ -cells, Adipocytes, and Skeletal Muscle Cells: The Therapeutic Targets of Metabolic Syndrome. In: *Mechanically Gated Channels and their Regulation*. Kamkin A, Lozinsky I (eds), 2012; p379–

- 404, Springer.
- 26) Takada M, Noguchi A, Sayama Y, Kaneko Y, Ishikawa T. IP<sub>3</sub> receptor-mediated initial Ca<sup>2+</sup> mobilization constitutes a triggering signal for H<sub>2</sub>O<sub>2</sub>-induced apoptosis in INS-1  $\beta$ -cells. *Biol Pharm Bull* 2011; 34: 954–958.
  - 27) Obara K, Ukai K, Ishikawa T. Mechanism of potentiation by tea epigallocatechin of contraction in porcine coronary artery: the role of protein kinase C $\delta$ -mediated CPI-17 phosphorylation. *Eur J Pharmacol* 2011; 668: 414–418.
  - 28) Kashihara T, Goto K, Sahara Y, Nakayama K, Ishikawa T. Differential involvement of  $\alpha_1$ -adrenoceptors in vasoconstrictor responses to cooling in mouse plantar arteries in vitro and in vivo. *J Smooth Muscle Res* 2009; 45: 87–95.
  - 29) Kashihara T, Nakayama K, Matsuda T, Baba A, Ishikawa T. Role of Na<sup>+</sup>/Ca<sup>2+</sup> exchanger-mediated Ca<sup>2+</sup> entry in pressure-induced myogenic constriction in rat posterior cerebral arteries. *J Pharmacol Sci* 2009; 110: 218–222.
  - 30) Nakayama K, Obara K, Ishikawa T, Nishizawa S. Specific mechanotransduction signaling involved in myogenic responses of the cerebral arteries. In: *Mechanosensitivity of the heart*. Kamkin A, Kiseleva I (eds), 2009; p453–9481, Springer.
  - 31) Sunouchi T, Suzuki K, Nakayama K, Ishikawa T. Dual effect of nitric oxide on ATP-sensitive K<sup>+</sup> channels in rat pancreatic  $\beta$ -cells. *Pflügers Arch* 2008; 456: 573–579.
  - 32) Kashihara T, Nakayama K, Ishikawa T. Distinct roles of protein kinase C isoforms in myogenic constriction of rat posterior cerebral arteries. *J Pharmacol Sci* 2008; 108: 446–454.
  - 33) Noguchi A, Takada M, Nakayama K, Ishikawa T. cGMP-independent anti-apoptotic effect of nitric oxide on thapsigargin-induced apoptosis in the pancreatic  $\beta$ -cell line INS-1. *Life Sci* 2008; 83: 865–870.
  - 34) Honda M, Suzuki M, Nakayama K, Ishikawa T. Role of  $\alpha_{2C}$ -adrenoceptors in local cooling-induced reduction of skin blood flow in mice. *Br J Pharmacol* 2007; 152: 91–100.
  - 35) Ito Y, Obara K, Ikeda R, Ishii M, Tanabe Y, Ishikawa T, Nakayama K. Passive stretching produces Akt- and MAPK-dependent augmentations of GLUT4 translocation and glucose uptake in skeletal muscles of mice. *Pflügers Arch* 2006; 451: 803–813.
  - 36) Koganezawa T, Ishikawa T, Fujita Y, Yamashita T, Tajima T, Honda M, Nakayama K. Local regulation of skin blood flow during cooling involving presynaptic P2 purinoceptors in rats. *Br J Pharmacol* 2006; 148: 579–586.
  - 37) Takii M, Ishikawa T, Tsuda H, Kanatani K, Sunouchi T, Kaneko Y, Nakayama K. Involvement of stretch-activated cation channels in hypotonically induced insulin secretion in rat pancreatic  $\beta$ -cells. *Am J Physiol Cell Physiol* 2006; 291: C1405–C1411.
  - 38) Obara K, Nishizawa S, Koide M, Nozawa K, Mitate A, Ishikawa T, Nakayama K. Interactive role of protein kinase C $\delta$  with Rho-kinase in the development of cerebral vasospasm in a canine two-hemorrhage model. *J Vasc Res* 2005; 42: 67–76.
  - 39) Yano S, Ishikawa T, Tsuda H, Obara K, Nakayama K. Ionic mechanism for contractile response to hyposmotic challenge in canine basilar arteries. *Am J Physiol Cell Physiol* 2005; 288: C702–C709.
  - 40) Ishikawa T, Iwasaki E, Kanatani K, Sugino F, Kaneko Y, Obara K, Nakayama K. Involvement of novel protein kinase C isoforms in carbachol-stimulated insulin secretion from rat pancreatic islets. *Life Sci* 2005; 77: 462–469.
  - 41) Amano S, Ishikawa T, Nakayama K. Facilitation of L-type Ca<sup>2+</sup> currents by fluid flow in rabbit cerebral artery myocytes. *J Pharmacol Sci* 2005; 98: 425–429.
  - 42) Ishikawa T, Kohno F, Kawase R, Yamamoto Y, Nakayama K. Contribution of nitric oxide produced by inducible nitric oxide synthase to vascular responses of mesenteric arterioles in

- streptozotocin-diabetic rats. *Br J Pharmacol* 2004; 141: 269–276.
- 43) Nakayama K, Obara K, Tanabe Y, Saito M, Ishikawa T, Nishizawa S. Interactive role of tyrosine kinase, protein kinase C, and Rho/Rho kinase systems in the mechanotransduction of vascular smooth muscles. *Biorheology* 2003; 40: 307–314.
  - 44) Ishikawa T, Kaneko Y, Sugino F, Nakayama K. Two distinct effects of cGMP on cytosolic  $\text{Ca}^{2+}$  concentration of rat pancreatic  $\beta$ -cells. *J Pharmacol Sci* 2003; 91: 41–46.
  - 45) Kaneko Y, Ishikawa T, Amano S, Nakayama K. Dual effect of nitric oxide on cytosolic  $\text{Ca}^{2+}$  concentration and insulin secretion in rat pancreatic  $\beta$ -cells. *Am J Physiol Cell Physiol* 2003; 284: C1215–C1222.
  - 46) Kiyoshi A, Ishikawa T, Hayashi K, Iwatsuki Y, Ishii K, Nakayama K. Rhythmic contractions in pulmonary arteries of monocrotaline-induced pulmonary hypertensive rats. *Pflügers Arch* 2003; 447: 142–149.
  - 47) Nakada S, Ishikawa T, Yamamoto Y, Kaneko Y, Nakayama K. Constitutive nitric oxide synthases in rat pancreatic islets: direct imaging of glucose-induced nitric oxide production in  $\beta$ -cells. *Pflügers Arch* 2003; 447: 305–311.
  - 48) Hayashi K, Ishikawa T, Yamashita T, Tajima T, Nakayama K. Biphasic response of cutaneous blood flow induced by passive cutaneous anaphylaxis in rats. *Eur J Pharmacol* 2003; 482: 305–311.
  - 49) Nakayama K, Obara K, Tanabe Y, Ishikawa T. 20-Hydroxyeicosatetraenoic acid potentiates contractile activation of canine basilar artery in response to stretch via protein kinase C-mediated inhibition of calcium-activated potassium channel. *Adv Exp Med Biol* 2003; 538: 411–416.
  - 50) Ishikawa T, Nejishima H, Imamura T, Nakayama K. Non-contribution of renin-angiotensin system to pressor response to  $N^{\text{G}}$ -nitro-L-arginine in dogs. *Fundam Clin Pharmacol* 2002; 16: 15–21.
  - 51) Sugino F, Ishikawa T, Nakada S, Kaneko Y, Yamamoto Y, Nakayama K. Inhibition by nitric oxide of  $\text{Ca}^{2+}$  responses in rat pancreatic  $\alpha$ -cells. *Life Sci* 2002; 71: 85–93.
  - 52) Obara K, Koide M, Ishikawa T, Tanabe Y, Nakayama K. Protein kinase C $\delta$  but not protein kinase C $\epsilon$  activity is involved in contractile potentiation by endothelin-1 in the porcine coronary artery. *J Cardiovasc Pharmacol* 2000; 36: S120–S121.
  - 53) Kimura M, Obara K, Sasase T, Ishikawa T, Tanabe Y, Nakayama K. Specific inhibition of stretch-induced increase in L-type calcium channel currents by herbimycin A in canine basilar arterial myocytes. *Br J Pharmacol* 2000; 130: 923–931.
  - 54) Saitou T, Ishikawa T, Obara K, Nakayama K. Characterization of whole-cell currents elicited by mechanical stimulation of *Xenopus* oocytes. *Pflügers Arch* 2000; 440: 858–8651.
  - 55) Matsuura N, Ishikawa T, Abe S, Yuyama H, Sugino F, Ishii K, Nakayama K. Nitric oxide-cyclic GMP system potentiates glucose-induced rise in cytosolic  $\text{Ca}^{2+}$  concentration in rat pancreatic  $\beta$ -cells. *Life Sci* 1999; 65: 1515–1522.
  - 56) Nakayama K, Fukuta Y, Kiyoshi A, Y. Iwatuki, Ishii K, Ishikawa T, Iida M, Iwata H, Enomoto M. (+)-[ $^3\text{H}$ ]Isradipine and [ $^3\text{H}$ ]glyburide bindings to heart and lung membranes from rats with monocrotaline-induced pulmonary hypertension. *Jpn J Pharmacol* 1999; 81: 176–184.
  - 57) Tanaka M, Ishikawa T, Nishikawa T, Goto K, Sato S. Influence of acidosis on cardiotonic effects of milrinone. *Anesthesiology* 1998; 88: 725–734.
  - 58) Yamanaka A, Ishikawa T, Goto K. Endothelium-dependent relaxation independent of NO, prostaglandins and epoxyeicosatrienoic acids in guinea pig coronary artery. *J Pharmacol Exp Ther* 1998; 285: 480–489.
  - 59) Tomobe YI, Ishikawa T, Goto K. Enhanced endothelium-independent vasodilator response to

- calcitonin gene-related peptide in the mesenteric artery of spontaneously hypertensive rats. *Eur J Pharmacol* 1998; 351: 351–355.
- 60) Yamada M, Ishikawa T, Fujimori A, Miyauchi T, Goto K. Enhanced depressor and hyperemic responses to calcitonin gene-related peptide in spontaneously hypertensive rats. *Peptides* 1998; 19: 697–701.
  - 61) Ishikawa T, Eckman DM, Keef KD. Characterization of delayed rectifier  $K^+$  currents in coronary artery cells near resting membrane potential. *Can J Physiol Pharmacol* 1997; 75: 1116–1122.
  - 62) Yamada M, Ishikawa T, Fujimori A, Goto K. Local neurogenic regulation of rat hindlimb circulation: Release of vasodilator peptide, calcitonin gene-related peptide, after skeletal muscle contraction. *Br J Pharmacol* 1997; 122: 703–709.
  - 63) Yamada M, Ishikawa T, Yamanaka A, Fujimori A, Goto K. Local neurogenic regulation of rat hindlimb circulation:  $CO_2$ -induced release of vasodilator peptide, calcitonin gene-related peptide, from sensory nerves. *Br J Pharmacol* 1997; 122: 710–714.
  - 64) Khoyi MA, Ishikawa T, Keef KD, Westfall DP.  $Ca^{2+}$ -induced inhibition of  $^{45}Ca^{2+}$  influx and  $Ca^{2+}$  current in smooth muscle of the rat vas deferens. *Am J Physiol* 1996; 270: C1468–C1477.
  - 65) Miyauchi T, Tomobe Y, Ishikawa T, Goto K, Sugishita Y. Vasoconstriction by endothelin-1 in resistance and conduit portions of isolated human mesenteric arteries. *Eur J Pharmacol* 1996; 303: 193–196.
  - 66) Miyauchi T, Tomobe Y, Ishikawa T, Goto K, Sugishita Y. Calcitonin gene-related peptide (CGRP) induces more potent vasorelaxation in the resistance portion than in the conduit portion of mesenteric arteries in humans. *Peptides* 1996; 17: 877–879.
  - 67) Ishikawa T, Hume JR, Keef KD. Modulation of  $K^+$  and  $Ca^{2+}$  channels by histamine  $H_1$  receptor stimulation in rabbit coronary artery cells. *J Physiol (Lond)* 1993; 468: 379–400.
  - 68) Gelband CH, Ishikawa T, Post JM, Keef KD, Hume JR. Intracellular divalent cations block smooth muscle  $K^+$  channels. *Circ Res* 1993; 73: 24–34.
  - 69) Ishikawa T, Hume JR, Keef KD. Differential modulation of  $Ca^{2+}$  channels by cAMP and cGMP in non-dialyzed vascular smooth muscle cells. *Circ Res* 1993; 73: 1128–1137.
  - 70) Ishikawa S, Tsukada H, Yuasa H, Fukue M, Wei S, Onizuka M, Miyauchi T, Ishikawa T, Mitsui K, Goto K, Hori M. Effects of endothelin-1 and conversion of big endothelin-1 in the isolated perfused rabbit lung. *J Appl Physiol* 1992; 72: 2387–2392.
  - 71) Tomobe Y, Ishikawa T, Yanagisawa M, Kimura S, Masaki T, Goto K. Mechanisms of increased sensitivity to endothelin-1 in aortic smooth muscle of spontaneously hypertensive rats. *J Pharmacol Exp Ther* 1991; 257: 555–561.
  - 72) Ishikawa T, Li L, Shinmi O, Kimura S, Yanagisawa M, Goto K, Masaki T. Characteristics of binding of endothelin-1 and endothelin-3 to rat hearts: developmental changes in mechanical responses and receptor subtypes. *Circ Res* 1991; 69: 918–926.
  - 73) Gelband CH, Carl A, Post JM, Bowen SM, Ishikawa T, Keef KD, Sanders KM, Hume JR. Effect of cromakalim and lemakalim on whole-cell and single channel  $K^+$  currents in canine colonic, renal and coronary smooth muscle cells. In: *Ion Channels of Vascular Smooth Muscle Cells and Endothelial Cells*. Sperelakis N, Kuriyama H (eds), 1991; p125–138, Elsevier Science Publishing.
  - 74) Miyauchi T, Tomobe Y, Shiba R, Ishikawa T, Yanagisawa M, Kimura S, Sugishita Y, Ito I, Goto K, Masaki T. Involvement of endothelin in the regulation of human vascular tonus: potent vasoconstrictor effect and existence in endothelial cells. *Circulation* 1990; 81: 1874–1880.
  - 75) Ishikawa T, Yanagisawa M, Goto K, Masaki T. Effects of endothelin on neonatal and adult rat hearts. In: *Developmental Cardiology: Morphogenesis and Function*. Clark EB, Takao A (eds), 1990; p 375–379, Futura Publishing.
  - 76) Miyauchi T, Ishikawa T, Sugishita Y, Saito A, Goto K. Involvement of calcitonin gene-related

- peptide in the positive chronotropic and inotropic effects of piperine and development of cross tachyphylaxis between piperine and capsaicin in the isolated rat atria. *J Pharmacol Exp Ther* 1989; 248: 816–824.
- 77) Li L, Ishikawa T, Miyauchi T, Yanagisawa M, Kimura S, Goto K, Masaki T. Pressor response to endothelin in guinea pigs. *Jap J Pharmacol* 1989; 49: 549–552.
  - 78) Goto K, Kasuya Y, Matsuki N, Takuwa Y, Kurihara H, Ishikawa T, Kimura S, Yanagisawa M, Masaki T. Endothelin activates the dihydropyridine-sensitive, voltage-dependent  $\text{Ca}^{2+}$  channel in vascular smooth muscle. *Proc Natl Acad Sci USA* 1989; 86: 3915–3918.
  - 79) Miyauchi T, Ishikawa T, Tomobe Y, Yanagisawa M, Kimura S, Sugishita Y, Ito I, Goto K, Masaki T. Characteristics of pressor response to endothelin in spontaneously hypertensive and Wistar-Kyoto rats. *Hypertension* 1989; 14: 427–434.
  - 80) Kasuya Y, Ishikawa T, Yanagisawa M, Kimura S, Goto K, Masaki T. Mechanism of contraction to endothelin in isolated porcine coronary artery. *Am J Physiol* 1989; 257: H1828–H1835.
  - 81) Goto K, Ishikawa T, Fujimori A, Saito A, Kimura S. Control of the cardiovascular function by novel peptide (CGRP)-containing nerves. In: *Regulatory Roles of Neuropeptides* 1989; p55–69, Excepta Medica.
  - 82) Ishikawa T, Okamura N, Saito A, Masaki T, Goto K. Positive inotropic effect of calcitonin gene-related peptide mediated by cyclic AMP in guinea pig heart. *Circ Res* 1988; 63: 726–734.
  - 83) Miyauchi T, Sano Y, Hiroshima O, Yuzuriha T, Sugishita Y, Ishikawa T, Saito A, Goto K. Positive inotropic effects and receptors of calcitonin gene-related peptide (CGRP) in porcine ventricular muscles. *Biochem Biophys Res Commun* 1988; 155: 289–294.
  - 84) Miyauchi T, Ishikawa T, Sugishita Y, Saito A, Goto K. Effects of piperine on calcitonin gene-related peptide (CGRP)-containing nerves in the isolated rat atria. *Neurosci Lett* 1988; 91: 222–227.
  - 85) Ishikawa T, Yanagisawa M, Kimura S, Goto K, Masaki T. Positive inotropic action of novel vasoconstrictor peptide endothelin on guinea pig atria. *Am J Physiol* 1988; 255: H970–H973.
  - 86) Yanagisawa M, Inoue A, Ishikawa T, Kasuya Y, Kimura S, Kumagaye S, Nakajima K, Watanabe TX, Sakakibara S, Goto K, Masaki T. Primary structure, synthesis, and biological activity of rat endothelin, an endothelium-derived vasoconstrictor peptide. *Proc Natl Acad Sci USA* 1988; 85: 6964–6967.
  - 87) Ishikawa T, Yanagisawa M, Kimura S, Goto K, Masaki T. Positive chronotropic effects of endothelin, a novel endothelium-derived vasoconstrictor peptide. *Pflügers Arch* 1988; 413: 108–110.
  - 88) Goto K, Ishikawa T, Kimura S, Saito A. Intramural nerve-mediated inotropic responses of left atria of rats and guinea pigs: demonstration of alpha adrenergic and nonadrenergic noncholinergic responses in guinea pigs. *J Pharmacol Exp Ther* 1987; 243: 723–730.
  - 89) Saito A, Ishikawa T, Kimura S, Goto K. Role of calcitonin gene-related peptide as cardiotonic neurotransmitter in guinea pig left atria. *J Pharmacol Exp Ther* 1987; 243: 731–736.
  - 90) Ishikawa T, Okamura N, Saito A, Goto K. Effects of calcitonin gene-related peptide (CGRP) and isoproterenol on the contractility and adenylate cyclase activity in the rat heart. *J Mol Cell Cardiol* 1987; 19: 723–727.
  - 91) Shoji T, Ishihara H, Ishikawa T, Saito A, Goto K. Vasodilating effects of human and rat calcitonin gene-related peptides in isolated porcine coronary arteries. *Naunyn-Shmiedeberg's Arch Pharmacol* 1987; 336: 438–444.
  - 92) Miyauchi T, Ishikawa T, Sugishita Y, Saito A, Goto K. Effects of capsaicin on nonadrenergic noncholinergic nerves in the guinea pig atria: role of calcitonin gene-related peptide as cardiac neurotransmitter. *J Cardiovasc Pharmacol* 1987; 10: 675–682.

- 93) Saito A, Ishikawa T, Masaki T, Kimura S, Goto K. Pharmacological analysis of autonomic innervation of the right atria of rats and guinea pigs: demonstration of nonadrenergic noncholinergic nerves. *J Pharmacol Exp Ther* 1986; 238: 713–719.

and other 24 reviews and book chapters in Japanese.