

## 受賞歴

- 2007年 財団法人日本心臓血圧研究振興会 榊原記念研究助成  
2006年 日本心臓病財団・ノバルティス循環器分子細胞研究助成  
2006年 日本心臓病財団「動脈硬化 Update」研究奨励賞  
2005年 血管カンファレンス研究助成  
2000年 内藤記念財団 海外留学助成

## 著書・総説

1. 田中亨、倉林正彦 血管平滑筋細胞から骨芽細胞への分化調節機構 **実験医学増刊号** 羊土社 2008, 26, 164-169
2. 田中亨、倉林正彦 低酸素における遺伝子調節 **細胞工学** 秀潤社 2000, 19, 1154-59
3. 田中亨、永井良三 うっ血性心不全 **新・内科治療薬ガイド** 文光堂 1999, 614-620

## 論文リスト

1. **Tanaka T**, Sato H, Doi H, Yoshida CA, Shimizu T, Matsui H, Yamazaki M, Akiyama H, Kawai-Kowase K, Iso T, Komori T, Arai M, Kurabayashi M. Runx2 represses myocardin-mediated differentiation and facilitates osteogenic conversion of vascular smooth muscle cells. *Mol Cell Biol.* 2008, 28: 1147-60
2. **Tanaka T**, Nishimura D, Wu RC, Amano M, Iso T, Kedes L, Nishida H, Kaibuchi K, Hamamori Y. Nuclear Rho Kinase, ROCK2, Targets p300 Acetyltransferase. *J Biol Chem.* 2006, 281: 15320-15329
3. **Tanaka T**, Kanda T, Takahashi T, Saegusa S, Moriya J, Kurabayashi M. Interleukin-6-induced reciprocal expression of SERCA and natriuretic peptides mRNA in cultured rat ventricular myocytes. *J Int Med Res.* 2004, 32: 57-61
4. **Tanaka T**, Akiyama H, Kanai H, Sato M, Takeda S, Sekiguchi K, Yokoyama T, Kurabayashi M. Endothelial PAS domain protein 1 (EPAS1) induces adrenomedullin gene expression in cardiac myocytes: role of EPAS1 in an inflammatory response in cardiac myocytes. *J Mol Cell Cardiol.* 2002, 34: 739-748
5. **Tanaka T**, Kanda T, McManus BM, Kanai H, Akiyama H, Sekiguchi K, Yokoyama T, Kurabayashi M. Overexpression of interleukin-6 aggravates viral myocarditis: impaired increase in tumor necrosis factor- $\alpha$ . *J Mol Cell Cardiol.* 2001, 33: 1627-1635
6. **Tanaka T**, Kanda T, Itoh T, Tsugawa H, Takekoshi N, Yamakawa J, Kurimoto M, Kurabayashi M. Increased cardiac weight in interleukin-6 transgenic mice with viral infection accompanies impaired expression of natriuretic peptide genes. *Res Commun Mol Pathol Pharmacol.* 2001, 110: 275-283
7. **Tanaka T**, Kurabayashi M, Kanai H, Sekiguchi K, Aihara Y, Yokoyama T, Arai M, Kanda T, Nagai R. Induction of VEGF gene transcription by IL-1 $\beta$  is mediated through stress-activated MAP

- kinase and Sp1 sites in cardiac myocytes. *J Mol Cell Cardiol.* 2000, 32: 1955–67
8. **Tanaka T**, Kurabayashi M, Aihara Y, Ohyama Y, Nagai R. Inducible Expression of Manganese Superoxide Dismutase by Phorbol 12-Myristate 13-Acetate is mediated by Sp1 in Endothelial Cells. *Arteriosclerosis, Thrombosis, and Vascular Biology.* 2000, 20: 392–401

#### 共著者論文リスト

1. Shimizu T, **Tanaka T**, Iso T, Kawai-Kowase K, Kurabayashi M. Azelnidipine inhibits Msx2-dependent osteogenic differentiation and matrix mineralization of vascular smooth muscle cells. *Int Heart J.* 2012; 53: 331–5
2. Ohyama Y, **Tanaka T**, Shimizu T, Matsui H, Sato H, Koitabashi N, Doi H, Iso T, Arai M, Kurabayashi M. Runx2/Smad3 complex negatively regulates TGF- $\beta$ -induced connective tissue growth factor gene expression in vascular smooth muscle cells. *J Atheroscler Thromb.* 2012; 19 : 23–35
3. Suga T, Iso T, Shimizu T, **Tanaka T**, Yamagishi S, Takeuchi M, Imaizumi T, Kurabayashi M. Activation of receptor for advanced glycation end products induces osteogenic differentiation of vascular smooth muscle cells. *J Atheroscler Thromb.* 2011; 18: 670–83
4. Shimizu T, **Tanaka T**, Iso T, Matsui H, Ooyama Y, Kawai-Kowase K, Arai M, Kurabayashi M. Notch signaling pathway enhances bone morphogenetic protein 2 (BMP2) responsiveness of Msx2 gene to induce osteogenic differentiation and mineralization of vascular smooth muscle cells. *J Biol Chem.* 2011; 286: 19138–48
5. Ueno M, Maeno T, Nomura M, Aoyagi-Ikeda K, Matsui H, Hara K, **Tanaka T**, Iso T, Suga T, Kurabayashi M. Hypoxia-inducible factor-1  $\alpha$  mediates TGF- $\beta$ -induced PAI-1 production in alveolar macrophages in pulmonary fibrosis. *Am J Physiol Lung Cell Mol Physiol.* 2011; 300: L740–52.
6. Nakahara T, Sato H, Shimizu T, **Tanaka T**, Matsui H, Kawai-Kowase K, Sato M, Iso T, Arai M, Kurabayashi M. Fibroblast growth factor-2 induces osteogenic differentiation through a Runx2 activation in vascular smooth muscle cells. *Biochem Biophys Res Commun.* 2010; 394: 243–8
7. Shimizu T, **Tanaka T**, Iso T, Doi H, Sato H, Kawai-Kowase K, Arai M, Kurabayashi M. Notch signaling induces osteogenic differentiation and mineralization of vascular smooth muscle cells: role of Msx2 gene induction via Notch-RBP-Jk signaling. *Arterioscler Thromb Vasc Biol.* 2009; 29: 1104–11
8. Doi H, Iso T, Shiba Y, Sato H, Yamazaki M, Oyama Y, Akiyama H, **Tanaka T**, Tomita T, Arai M, Takahashi M, Ikeda U, Kurabayashi M. Notch signaling regulates the differentiation of bone marrow-derived cells into smooth muscle-like cells during arterial lesion formation. *Biochem Biophys Res Commun.* 2009; 381: 654–9

9. Kawai-Kowase K, Ohshima T, Matsui H, **Tanaka T**, Shimizu T, Iso T, Arai M, Owens GK, Kurabayashi M. PIAS1 mediates TGFbeta-induced SM alpha-actin gene expression through inhibition of KLF4 function-expression by protein sumoylation. *Arterioscler Thromb Vasc Biol.* 2009; 29: 99-106
10. Atsuta H, Uchiyama T, Kanai H, Iso T, **Tanaka T**, Suga T, Maeno T, Arai M, Nagai R, Kurabayashi M. Effects of a stable prostacyclin analogue beraprost sodium on VEGF and PAI-1 gene expression in vascular smooth muscle cells. *Int J Cardiol.* 2009; 132: 411-8
11. Hara S, Arai M, Tomaru K, Doi H, Koitabashi N, Iso T, Watanabe A, **Tanaka T**, Maeno T, Suga T, Yokoyama T, Kurabayashi M. Prostaglandin F2alpha inhibits SERCA2 gene transcription through an induction of Egr-1 in cultured neonatal rat cardiac myocytes. *Int Heart J.* 2008; 49: 329-42
12. Luo H, Li Y, Mu JJ, Zhang J, **Tanaka T**, Hamamori Y, Jung SY, Wang Y, Qin J. Regulation of intra-S phase checkpoint by ionizing radiation (IR)-dependent and IR-independent phosphorylation of SMC3. *J Biol Chem.* 2008; 283: 19176-83
13. Doi H, Iso T, Sato H, Yamazaki M, Matsui H, **Tanaka T**, Manabe I, Arai M, Nagai R, Kurabayashi M. Jagged1-selective notch signaling induces smooth muscle differentiation via a RBP-Jkappa-dependent pathway. *J Biol Chem.* 2006; 281: 28555-28564
14. Niwano K, Arai M, Koitabashi N, Hara S, Watanabe A, Sekiguchi K, **Tanaka T**, Iso T, Kurabayashi M. Competitive binding of CREB and ATF2 to cAMP/ATF responsive element regulates eNOS gene expression in endothelial cells. *Arterioscler Thromb Vasc Biol.* 2006; 26: 1036-1042
15. Hasegawa K, Wakino S, **Tanaka T**, Kimoto M, Tatematsu S, Kanda T, Yoshioka K, Homma K, Sugano N, Kurabayashi M, Saruta T, Hayashi K. Dimethylarginine dimethylaminohydrolase 2 increases vascular endothelial growth factor expression through Sp1 transcription factor in endothelial cells. *Arterioscler Thromb Vasc Biol.* 2006; 26: 1488-1494
16. Itakura H, Akiyama H, Hagimura N, Doi H, **Tanaka T**, Kishi S, Kurabayashi M. Triamcinolone acetonide suppresses interleukin-1 beta-mediated increase in vascular endothelial growth factor expression in cultured rat Muller cells. *Graefes Arch Clin Exp Ophthalmol.* 2006; 244: 226-231
17. Doi H, Iso T, Yamazaki M, Akiyama H, Kanai H, Sato H, Kawai-Kowase K, **Tanaka T**, Maeno T, Okamoto E, Arai M, Kedes L, Kurabayashi M. HERP1 inhibits myocardin-induced vascular smooth muscle cell differentiation by interfering with SRF binding to CArG box. *Arterioscler Thromb Vasc Biol.* 2005; 25: 2328-2334
18. Akiyama H, **Tanaka T**, Doi H, Kanai H, Maeno T, Itakura H, Iida T, Kimura Y, Kishi S, Kurabayashi M. Visible light exposure induces VEGF gene expression through activation of retinoic acid receptor-alpha in retinoblastoma Y79 cells. *Am J Physiol Cell Physiol.* 2005; 288: C913-920

19. Akiyama H, **Tanaka T**, Itakura H, Kanai H, Maeno T, Doi H, Yamazaki M, Takahashi K, Kimura Y, Kishi S, Kurabayashi M. Inhibition of ocular angiogenesis by an adenovirus carrying the human von Hippel-Lindau tumor-suppressor gene in vivo. *Invest Ophthalmol Vis Sci.* 2004; 45: 1289-1296
20. Sato M, **Tanaka T**, Maemura K, Uchiyama T, Sato H, Maeno T, Suga T, Iso T, Ohyama Y, Arai M, Tamura J, Sakamoto H, Nagai R, Kurabayashi M. The PAI-1 gene as a direct target of endothelial PAS domain protein-1 in adenocarcinoma A549 cells. *Am J Respir Cell Mol Biol.* 2004; 31: 209-215
21. Sano M, Wang SC, Shirai M, Scaglia F, Xie M, Sakai S, **Tanaka T**, Kulkarni PA, Barger PM, Youker KA, Taffet GE, Hamamori Y, Michael LH, Craigen WJ, Schneider MD. Activation of cardiac Cdk9 represses PGC-1 and confers a predisposition to heart failure. *Embo J.* 2004; 23: 3559-3569
22. Sato H, Watanabe A, **Tanaka T**, Koitabashi N, Arai M, Kurabayashi M, Yokoyama T. Regulation of the human tumor necrosis factor-alpha promoter by angiotensin II and lipopolysaccharide in cardiac fibroblasts: different cis-acting promoter sequences and transcriptional factors. *J Mol Cell Cardiol.* 2003; 35: 1197-1205
23. Tomaru K, Arai M, Yokoyama T, Aihara Y, Sekiguchi K, **Tanaka T**, Nagai R, Kurabayashi M. Transcriptional activation of the BNP gene by lipopolysaccharide is mediated through GATA elements in neonatal rat cardiac myocytes. *J Mol Cell Cardiol.* 2002; 34: 649-659
24. Akiyama H, **Tanaka T**, Maeno T, Kanai H, Kimura Y, Kishi S, Kurabayashi M. Induction of VEGF gene expression by retinoic acid through Sp1-binding sites in retinoblastoma Y79 cells. *Invest Ophthalmol Vis Sci.* 2002; 43: 1367-1374
25. Yoshida A, Kand T, **Tanaka T**, Yokoyama T, Kurimoto M, Tamura J, Kobayashi I. Interleukin-18 reduces expression of cardiac tumor necrosis factor-alpha and atrial natriuretic peptide in a murine model of viral myocarditis. *Life Sci.* 2002; 70: 1225-1234
26. Maeno T, **Tanaka T**, Sando Y, Suga T, Maeno Y, Nakagawa J, Hosono T, Sato M, Akiyama H, Kishi S, Nagai R, Kurabayashi M. Stimulation of vascular endothelial growth factor gene transcription by all trans retinoic acid through Sp1 and Sp3 sites in human bronchioloalveolar carcinoma cells. *Am J Respir Cell Mol Biol.* 2002; 26: 246-253
27. Sato M, **Tanaka T**, Maeno T, Sando Y, Suga T, Maeno Y, Sato H, Nagai R, Kurabayashi M. Inducible expression of endothelial PAS domain protein-1 by hypoxia in human lung adenocarcinoma A549 cells. Role of Src family kinases-dependent pathway. *Am J Respir Cell Mol Biol.* 2002; 26: 127-134
28. Sekiguchi K, Kurabayashi M, Oyama Y, Aihara Y, **Tanaka T**, Sakamoto H, Hoshino Y, Kanda T, Yokoyama T, Shimomura Y, Iijima H, Ohyama Y, Nagai R. Homeobox protein Hex induces

- SMemb/nonmuscle myosin heavy chain-B gene expression through the cAMP-responsive element. *Circ Res.* 2001; 88: 52-58
29. Kanai H, **Tanaka T**, Aihara Y, Takeda S, Kawabata M, Miyazono K, Nagai R, Kurabayashi M. Transforming growth factor-beta/Smads signaling induces transcription of the cell type-restricted ankyrin repeat protein CARP gene through CAGA motif in vascular smooth muscle cells. *Circ Res.* 2001; 88: 30-36
  30. Seta Y, Kanda T, **Tanaka T**, Arai M, Sekiguchi K, Yokoyama T, Kurimoto M, Tamura J, Kurabayashi M. Interleukin-18 in patients with congestive heart failure: induction of atrial natriuretic peptide gene expression. *Res Commun Mol Pathol Pharmacol.* 2000; 108: 87-95
  31. Kanda T, **Tanaka T**, Sekiguchi K, Seta Y, Kurimoto M, Wilson McManus JE, Nagai R, Yang D, McManus BM, Kobayashi I. Effect of interleukin-18 on viral myocarditis: enhancement of interferon-gamma and natural killer cell activity. *J Mol Cell Cardiol.* 2000; 32: 2163-2171
  32. Seta Y, Kanda T, **Tanaka T**, Arai M, Sekiguchi K, Yokoyama T, Kurimoto M, Tamura J, Kurabayashi M. Interleukin 18 in acute myocardial infarction. *Heart.* 2000; 84: 668
  33. Sekiguchi K, Kanda T, Ono Z, **Tanaka T**, Yokoyama T, Aihara Y, Toyama T, Sakamaki T, Kobayashi I, Kurabayashi M, Nagai R. Augmented responses of angiotensin I and II in patients with ischemic heart disease: relation to left ventricular function. *Jpn Heart J.* 2000; 41: 269-278
  34. Aihara Y, Kurabayashi M, Saito Y, Ohyama Y, **Tanaka T**, Takeda S, Tomaru K, Sekiguchi K, Arai M, Nakamura T, Nagai R. Cardiac ankyrin repeat protein is a novel marker of cardiac hypertrophy: role of M-CAT element within the promoter. *Hypertension.* 2000; 36: 48-53
  35. Aihara Y, Kurabayashi M, **Tanaka T**, Takeda SI, Tomaru K, Sekiguchi KI, Ohyama Y, Nagai R. Doxorubicin represses CARP gene transcription through the generation of oxidative stress in neonatal rat cardiac myocytes: possible role of serine/threonine kinase-dependent pathways. *J Mol Cell Cardiol.* 2000; 32: 1401-1414
  36. Seta Y, Kanda T, Yokoyama T, Arai M, Sekiguchi K, **Tanaka T**, Kobayashi I, Kurabayashi M, Nagai R. Therapy with the nonpeptide endothelin receptor antagonist 97-139 in a murine model of congestive heart failure: reduction of cardiac mass and myofiber hypertrophy. *Jpn Heart J.* 2000; 41: 79-85
  37. Yokoyama T, Sekiguchi K, **Tanaka T**, Tomaru K, Arai M, Suzuki T, Nagai R. Angiotensin II and mechanical stretch induce production of tumor necrosis factor in cardiac fibroblasts. *Am J Physiol.* 1999; 276: H1968-1976
  38. Yokoyama T, Arai M, Sekiguchi K, **Tanaka T**, Kanda T, Suzuki T, Nagai R. Tumor necrosis factor-alpha decreases the phosphorylation levels of phospholamban and troponin I in spontaneously beating rat neonatal cardiac myocytes. *J Mol Cell Cardiol.* 1999; 31: 261-273
  39. Kanda T, Nakano M, Yokoyama T, Hoshino Y, Okajima F, **Tanaka T**, Saito Y, Nagai R, Kobayashi I. Heat stress aggravates viral myocarditis in mice. *Life Sci.* 1999; 64: 93-101