

Cardiovascular Medicine

1. Staffs and Students (April, 2009)

Professor	Mitsuaki Isobe	
Associate Professor	Kenzo Hirao	
Junior Associate Professor	Hitoshi Hachiya	
Assistant Professor	Mihoko Kawabata,	Hiroshi Inagaki,
	Go Haraguchi,	Shigeki Kimura,
	Takeshi Sasaki,	Shunji Yoshikawa,
	Ryoko Azuma	
Graduate Student	Kino Futamatsu,	Takanobu Yamamoto,
	Takashi Ishihara,	Masanori Konishi,
	Hirokazu Ohigashi,	Seiji Matsubara,
	Yasutoshi Nagata,	Kengo Tanabe,
	Masatoshi Komura,	Manabu Kurabayashi,
	Ayumi Goda,	Daisuke Tezuka,
	Yoshihide Takahashi,	Takeshi Sasaki,
	Masakazu Ohno,	Koji Higuchi,
	Kamimura Munehiro,	Sasaoka Taro,
	Tatsuya Hayashi,	Masaaki Shoji,
	Shingo Maeda,	Kiyoshi Ohtomo,
	Tetsuo Kamiishi,	Masahiko Setoguchi,
	Susumu Tao,	Tomoko Manno,
	Hiroshi Kawata	

2. Education

We are dealing with pathophysiology of circulatory system especially cardiovascular diseases. Cardiovascular diseases are principal cause of death in our country. These diseases are categorized into several fields. They include ischemic heart disease, myocardial disease, valvular disease, atherosclerosis, arrhythmia, and infectious disease. The common final figure of these diseases is heart failure leading to patients' death. Based on recent progresses in molecular biology and bioengineering our knowledge on the pathophysiology of these diseases has been expanded rapidly. There are variety of new diagnostic technologies including imaging tests, hematological tests and electrophysiological tests. In addition, development in the treatment of cardiovascular disease is overwhelming. They include intravascular catheter intervention, catheter ablation and operation. Medical treatment has also been progressed rapidly. Further, gene therapy for cardiovascular diseases has started. All of these fields are our focus for education. In this course, students learn about modern knowledge and technologies in cardiovascular diseases, especially in the field of pathophysiology, diagnosis, treatment and prevention.

3. Research Subjects

The purposes of our investigation are to reveal the etiology and pathophysiology of cardiovascular diseases, and to develop new technologies for diagnosis and treatment. For that purpose we investigate clinical cases and model animals. Currently our investigations are focused on arteriosclerosis, atherosclerosis, cardiomyopathy, myocarditis, arrhythmias, cardiac rejection and heart failure. The relationship between gene mutation and cardiovascular disease, electrophysiology, myocardial cell transplantation and myocardial regeneration are also our major subjects of research.

- 1) Clinical study of gene therapy for coronary artery disease (Isobe)
- 2) Clinical study for treatment of acute coronary syndrome (Isobe, Inagaki, Kimura)
- 3) Molecular mechanism and treatment of myocardial ischemia and reperfusion injury (Isobe, Haraguchi)
- 4) Molecular mechanism and treatment of coronary restenosis and vascular disease (Isobe)
- 5) Gene therapy of myocarditis and cardiac chronic rejection (Isobe, Suzuki)
- 6) Cardiac rejection and immunological tolerance (development of safe immunosuppressive therapy) (Isobe, Suzuki)
- 7) Treatment of heart failure and cardiomyopathy by myocardial regeneration (Isobe, Suzuki)
- 8) Regulation of arteriosclerosis by targeting transcription factors (Isobe)

- 9) Gene therapy of vascular disease (Isobe)
- 10) Diagnostic imaging of aortitis (Isobe)
- 11) Molecular mechanism and treatment of aortitis (Isobe)
- 12) Assessment of vascular endothelial dysfunction in vasculitis, heart failure and arrhythmia (Isobe)
- 13) Application in gene therapy for heart failure and cardiomyopathy (Isobe)
- 14) Molecular system of myocardial remodeling in heart failure and ventricular hypertrophy (Isobe)
- 15) Therapy of sleep apnea syndrome with heart failure (Isobe)
- 16) Assessment by imaging of coronary artery and cardiac function (Isobe Tezuka)
- 17) System of origin with tachyarrhythmias (particularly supraventricular tachycardia) (Hirao)
- 18) Medical therapy and ablation for tachyarrhythmias (Hirao)
- 19) Research for the conduction of atrio-ventricular node (Hirao)
- 20) Research and Therapy for arrhythmia by using Cardioendoscope (Hirao)
- 21) Research of atrial fibrillation from origin of pulmonary vein (Hirao)
- 22) Research of genetic factor with atrial fibrillation (Hirao)
- 23) Research of ablation for atrial fibrillation (Hirao Hachiya)

We conduct collaborative researches with not only Medical Research Institute and other facilities in our university but also domestic and foreign institutes according to research projects. Since clinical cases in our hospital are diverse and abundant, clinical investigations are also our major target. Therefore, we can provide many research projects depending on students' need. We encourage and help students to pursue their own original way of investigation.

4. Clinical Services

Students are also encouraged to learn about clinical cardiology. They can participate in any clinical activities underwent in our hospital including cardiac catheterization, electrophysiological study, catheter ablation, various imaging tests, cardiac pathology, and patients care.

5. Publications

Original Article

1. Goda A, Koike A, Hoshimoto-Iwamoto M, Nagayama O, Yamaguchi K, Tajima A, Sawada H, Itoh H, Isobe M, Aizawa T: Prognostic value of heart rate profiles during cardiopulmonary exercise testing in patients with cardiac disease. *Int Heart J* 50, 59-71, 2009
2. Ogawa M, Suzuki J, Takayama K, Isobe M. Matrix metalloproteinase suppression induced by clarithromycin in murine cardiac allografts. *Transplant Proc.* 41:395-397, 2009.
3. Furukawa T, Hirao K, Isobe M: Influence of autonomic stimulation on the genesis of atrial fibrillation in remodeled canine atria is not the same as that in normal atria. *Circ J* 73:468-475, 2009 (Mar)
4. Takahashi Y, Takahashi A, Miyazaki S, Kuwahara T, Takei A, Fujino T, Fujii A, Kusa S, Yagishita A, Nozato T, Hikita H, Sato A, Hirao K, Isobe M: Electrophysiological Characteristics of Localized Reentrant Atrial Tachycardia Occurring After Catheter Ablation of Long-Lasting Persistent Atrial Fibrillation. *J Cardiovasc Electrophysiol*, 20:623-629, 2009
5. Konishi M, Maejima Y, Inagaki H, Haraguchi G, Hachiya H, Suzuki J, Hirao K, Isobe M: Clinical characteristics of acute decompensated heart failure with rapid onset of symptoms. *J Card Failure* 15 : 300-304, 2009 (May)
6. Miyazaki S, Kuwahara T, Kobori A, Takahashi Y, Takahashi A: Adenosine triphosphate exposes dormant pulmonary vein conduction responsible for recurrent atrial tachyarrhythmias: The importance of evaluating the dormant conduction during the re-do ablation procedure. *Circ J* 73: 1160-1162, 2009
7. Suzuki J, Tezuka D, Morishita R, Isobe M: An initial case of suppressed restenosis with nuclear factor-kappa B decoy transfection after percutaneous coronary intervention. *J Gene Med* 11: 89-91, 2009(Jan)
8. Haga T, Suzuki J, Kosuge H, Ogawa M, Saiki H, Haraguchi G, Maejima Y, Isobe M, Uede T: Attenuation of experimental autoimmune myocarditis by blocking T cell activation through 4-1BB pathway. *J Mol Cell Cardiol* 46:717-727, 2009 (May)
9. Ogawa M, Suzuki J, Isobe M: The Mechanism of Anti-Inflammatory Effects of Prostaglandin E2 Receptor 4 Activation in Murine Cardiac Transplantation. *Transplantation* 87: 1645-1653, 2009 (Jun)
10. Ogawa M, Suzuki J, Hirata Y, Nagai R, Isobe M. A critical role of COX-2 in the progression of neointimal formation after wire injury in mice. *Expert Opin Ther Targets.* 13: 505-511, 2009 (May)

11. Suzuki K, Hirao K, Toshida N, Yamamoto N, Tanaka M, Isobe M: Modification of atrioventricular conduction in dogs by laser irradiation of Koch's triangle guided by balloon-tipped carioscope. *J Interv Card Electrophysiol* 25: 97-105, 2009(Jan)
12. Goda A, Yamashita T, Suzuki S, Ohtsuka T, Uejima T, Oikawa Y, Yajima J, Koike A, Nagashima K, Kirigaya H, Sagara K, Ogasawara K, Isobe M, Sawada H, Aizawa T: Prevalence and prognosis of patients with heart failure in Tokyo: A prospective cohort of Shinken Database 2004-5. *Int Heart J* 50:609-625 2009.
13. Maeda S, Nishizaki M, Yamawake M, Ashikaga T, Shimada H, Asano M, Ihara K, Murai T, Suzuki H, Fujii H, Sakurada H, Hiraoka M, Isobe M: Ambulatory electrocardiogram-based T-wave alterans and heart rate turbulence predict high risk of arrhythmic events in patients with old myocardial infarction. *Circ J*, 73: 2223-2228, 2009
14. Kimura S, Kakuta T, Yonetsu T, Suzuki A, Iesaka Y, Fujiwara H, Isobe M: Clinical Significance of Echo Signal Attenuation on Intravascular Ultrasound in Patients With Coronary Artery Disease. *Circulation Cardiovasc Intervent* 2: 444-454, 2009
15. Nakayama A, Sakatsume M, Kasama T, Kawara T, Gejyo F, Isobe M, Sato K, Shiba K: Molecular heterogeneity of urinary albumin in glomerulonephritis: Comparison of cardiovascular disease with albuminuria. *Clin Chim Acta* 402: 94-101, 2009(apr)
16. Setoguchi M, Okishige K, Sugiyama K, Shimura T, Maeda M, Aoyagi H, Kurabayashi M, Azegami K, Hagiwara H, Isobe M: Sudden cardiac death associated with Curg-Strauss syndrome. *Circ J* 73: 2355-2359, 2009
17. Maeda S, Nishizaki M, Hashiyama N, Mo M, Isobe M: Giant aneurysm in coronary artery fistula. *J Am Coll Cardiol* 54: 24, 2009
18. Isobe K, Kuba K, Maejima Y, Suzuki J, Kubota S, Isobe M: Inhibition of endostatin deteriorates left ventricular remodeling and heart failure through matrix proteinases and angiotensin converting enzyme in rat myocardial infarction. *Circ J* 74: 109-119, 2009

Review Article

1. Suzuki J, Isobe M, Morishita R, Nagai R. Effects of tea catechins on inflammation-related cardiovascular disease. *Curr Immunol Review*. 5:167-174, 2009
2. Suzuki J, Isobe M, Morishita R, Nagai R: Nucleic acid drugs for prevention of cardiac rejection. *J Biomed Biotech*. vol. 2009, Article ID 916514, 5 pages, 2009.

Book

1. Suzuki J, Isobe M, Morishita R, Nagai R. Anti-Oxidation on Cardiovascular Diseases. In press; In *Aging and Oxidative Stress*. Bondy S (eds.) in the series of *Oxidative Stress in Applied Basic Research and Clinical Practice*. Armstrong D (eds.) Springer/Humana Press. California, 2009
2. Suzuki J, Ogawa M, Hishikari K, Takayama K, Isobe M. Roles of Prostaglandin E2 and its Receptors in Inflammation-Related Cardiovascular Diseases. In press; In *Prostaglandins: Biochemistry, Functions, Types and Roles*. Columbus F. (eds.) NovaScience, New York, 2009.
3. Hishikari K, Suzuki J, Ogawa M, Isobe M. Roles of Prostaglandins and the Receptors in the Development of Myocardial Ischemia. In press; In *Myocardial Ischemia: Causes, Symptoms and Treatment*. Columbus F. (eds.) Nova Science, New York, 2009.