

Department of Internal Medicine

Division of Cardiology

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General Summary

We have 6 research groups for covering the broad field of cardiology. We perform studies from both clinical and basic standpoints in each research group. We aspire to achieve a greater understanding of the pathogenesis of cardiovascular diseases and to establish or improve clinical diagnostic methods and therapies.

Research Activities

Ischemic Heart Disease Research Group

We have converted patients' data, including risk factors and coronary lesion morphology, from catheterization examinations and treatments in patients with ischemic heart diseases, into a database. Using this precise database, we have been performing a study comparing risk factors, clinical outcomes, and others. In addition, we have participated in nationwide clinical studies, such as J-DESSERT (The Japan-Drug Eluting Stents Evaluation; a Randomized Trial), J-LESSON (Japan Unprotected Left Main Coronary Artery Disease Percutaneous Coronary Intervention Strategy On New Generation Stents), RESET (Randomized Evaluation of Sirolimus-eluting versus Everolimus-eluting stent Trial), NEXT (NOBORI Biolimus-Eluting versus XIENCE/PROMUS Everolimus-eluting Stent Trial), PROPEL (A Prospective Multicenter Post-Approval Study to Evaluate the Long-Term Efficacy and Safety of the Resolute Integrity in the Japanese All-Comers Patients with Coronary Artery Disease), NIPPON (Nobori Dual Antiplatelet Therapy as Appropriate Duration), and OPERA (Optimal Duration of DAPT Following Treatment With Endeavor [Zotarolimus-eluting Stent] in Real-world Japanese Patients). Most of these studies have investigated treatment with drug-eluting stents and the diagnosis of coronary spasm, which is closely related to the etiology of ischemic heart disease.

Arrhythmia Research Group

We have a special team for the management of patients with arrhythmic diseases. We focus on the curative treatment of atrial fibrillation through catheter ablation. All types of arrhythmias, including tachycardia and bradycardia, are treated. We have drawn fully upon the strength of new devices and pioneering approaches and have actively reported new findings.

Heart Failure Research Group

In regard to heart failure research, we have been especially assessing data related to plasma levels of B-type natriuretic peptide (BNP), which is a sensitive marker of heart failure, and been participating in multicenter research on standard values that will be of use in clinical practice. In addition, we have reported in detail on plasma BNP levels in patients with acute heart failure before and after admission to the hospital and are now assessing clinical data regarding the relationship between plasma BNP levels and obesity.

Imaging Research Group

Multidetector (row) computed tomography has become a reliable method for detecting coronary arterial organic stenosis. We have been investigating the possibility that a change in coronary arterial tone can also be detected with repeated multidetector (row) computed tomography. We are also studying new approaches of echocardiography.

Molecular Biology Research Group

In myocardial metabolism, we have investigated an association between cellular damage and intracellular ion kinetics. We have also studied the decrease in the serum potassium concentration during acute coronary syndrome. We hypothesized that aldosterone is involved in a cardioprotective mechanism in the acute phase of ischemia and in abrupt cellular damage. We found a previously unknown nongenomic action of aldosterone by using cultured neonatal rat cardiomyocytes and the Langendorff system. We are now focusing on the mechanisms of changes in energy metabolism in the failing heart.

Cardiac Physiology Research Group

We have investigated cardiac physiology and pathophysiology, especially cardiac Ca^{2+} handling and adrenergic signaling related to excitation-contraction coupling. We have studied the relationship between Ca^{2+} leak and altered Ca^{2+} uptake in sarcoplasmic reticulum using a genetically engineered mouse heart. We have also reported the role of thrombin on cardiac disease, leading to experiments using a mouse model of dilated cardiomyopathy.

Publications

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