Shinji Makino
Keio University

About Publications 80 Network

About

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Publications
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Publications (80)

Dilated Cardiomyopathy (DCM)-linked Heat shock protein Family D Member 1 (HSPD1) mutations cause upregulation of ROS and autophagy through mitochondrial dysfunction

Article Full-text available

Jun 2020

Enomoto Hirokazu · Nishant Mittal · Takayuki Inomata · [...] · Shinji Makino

Aims During heart failure, the levels of circulatory heat shock protein family D member 1 (HSP60) increase. However, its underlying mechanism is still unknown. The apical domain of heat shock protein family D member 1 (HSPD1) is conserved throughout evolution. We found a point mutation in HSPD1 in a familial dilated cardiomyopathy (DCM) patient. A...

View

Perturbation of the titin/MURF1 signaling complex is associated with hypertrophic cardiomyopathy in a fish model and in human patients

Article Full-text available

Oct 2019

Yuta Higashikuse · Nishant Mittal · Takuro Arimura · [...] · Shinji Makino

Hypertrophic cardiomyopathy (HCM) is a hereditary disease characterized by cardiac hypertrophy with diastolic dysfunction. Gene mutations causing HCM have been found in about half of the patients, while the genetic etiology and pathogenesis remain unknown for many cases of HCM. To identify novel mechanisms underlying HCM pathogenesis, we generated...

View

Versican is crucial for the initiation of cardiovascular lumen development in medaka (Oryzias latipes)

Article Full-text available

Jul 2019

Nishant Mittal · Sung-Han Yoon · Enomoto Hirokazu · [...] · Shinji Makino

Versican is an evolutionary conserved extracellular matrix proteoglycan, and versican expression loss in mice results in embryonic lethality owing to cardiovascular defects. However, the in utero development of mammals limits our understanding of the precise role of versican during cardiovascular development. Therefore, the use of evolutionarily di...

View

Perturbation of the titin/MURF1 signaling complex is associated with hypertrophic cardiomyopathy in a fish model and in human patients

Preprint

Jun 2019

Yuta Higashikuse · Nishant Mittal · Takuro Arimura · [...] · Shinji Makino

Hypertrophic cardiomyopathy (HCM) is a hereditary disease characterized by cardiac hypertrophy with diastolic dysfunction. Gene mutations causing HCM have been found in about half of the patients, while the genetic etiology and pathogenesis remain unknown for many cases of HCM. To identify novel mechanisms underlying HCM pathogenesis, we generated...

View

Mice lacking fat storage-inducing transmembrane protein 2 show improved profiles upon pressure overload-induced heart failure

Article Full-text available

Mar 2019

Natsumi Nishihama · Takahiro Nagayama · Shinji Makino · Ryuta Koishi

Fat storage-inducing transmembrane proteins 1 and 2 (FITM1 and FITM2, respectively) are transmembrane endoplasmic/sarcoplasmic reticulum proteins involved in lipid droplet formation. The physiological functions of FITM1 have only been reported in skeletal muscle, while those of FITM2 were analyzed using genetically engineered mice. However, their r...

View

A tale of two sisters with hypertrophic cardiomyopathy and recurrent embolism: When is the optimal timing of the intervention for left atrial appendage?

Article

Sep 2018

Mai Kimura · Takashi Kohno · Shinji Makino · [...] · Keiichi Fukuda

Hypertrophic cardiomyopathy (HCM) is an extremely heterogeneous genetic disease that affects the left ventricle (LV) and has a varied clinical course and phenotypic expression. Here, we report a case of two sisters with HCM who developed a massive refractory left atrial appendage (LAA) thrombus and recurrent embolism. The older sister, who was at a...

View

Selective modulation of local linkages between active transcription and oxidative demethylation activity shapes cardiomyocyte-specific gene-body epigenetic status in mice

Article Full-text available

May 2018

Mayumi Oda · Shunichi Wakabayashi · N. Ari Wijetunga · [...] · Shinji Makino

Background: Cell-type-specific genes exhibit heterogeneity in genomic contexts and may be subject to different epigenetic regulations through different gene transcriptional processes depending on the cell type involved. The gene-body regions (GBRs) of some cardiomyocyte (CM)-specific genes are long and highly hypomethylated in CMs. To explore the...

View

Supplementary Material 1

Data

May 2018

Mayumi Oda · Shunichi Wakabayashi · N. Ari Wijetunga · [...] · Shinji Makino

View

Supplementary Material 2

Data

May 2018

Mayumi Oda · Shunichi Wakabayashi · N. Ari Wijetunga · [...] · Shinji Makino

View

Host stromal versican is essential for cancer-associated fibroblast function to inhibit cancer growth

Article

Aug 2015

Kanda Fanhchaksai · Futoshi Okada · Naoko Nagai · [...] · Hideto Watanabe

The stroma provides a microenvironment that regulates tumor cell behavior. The extracellular matrix has long been recognized to be important in tumor cell behavior, and previous studies have revealed the impact of individual matrix molecules on tumor progression. Although several reports have highlighted some central roles of tumor cell-expressed v...

View

Abstract 13585: Up Regulation of Autophagy in Hsp60 Mutant Heart is an Adaptive Response to Increased Oxidative Stress and Causes Cardiomyopathy

Article

Nov 2014

Enomoto Hirokazu · Shinji Makino · Nishant Mittal · [...] · Keiichi Fukuda

Introduction: Despite the recent advance of genetic studies, genetic causes of hereditary dilated cardiomyopathy (DCM) are still unknown in most cases. Heat shock protein 60 (Hsp60) is a well-known chaperonin, responsible for correct folding and transportation of cytoplasmic protein to mitochondria. This study is aimed to investigate whether dysfun...

View

Endothelin-1 Induces Myofibrillar Disarray and Contractile Vector Variability in Hypertrophic Cardiomyopathy-Induced Pluripotent Stem Cell-Derived Cardiomyocytes

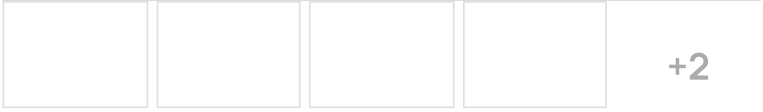
Article Full-text available

Oct 2014

Atsushi Tanaka · Shinsuke Yuasa · Giulia Mearini · [...] · Keiichi Fukuda

Background Despite the accumulating genetic and molecular investigations into hypertrophic cardiomyopathy (HCM), it remains unclear how this condition develops and worsens pathologically and clinically in terms of the genetic–environmental interactions. Establishing a human disease model for HCM would help to elucidate these disease mechanisms; how...

View



Jun 2014

Shinji Makino · K Fukuda · S Miyoshi · [...] · S Ogawa

View

Cardiomyocytes can be generated from marrow stromal cells in vitro

Data Full-text available

Jun 2014

Shinji Makino · K Fukuda · S Miyoshi · [...] · S Ogawa

We have isolated a cardiomyogenic cell line (CMG) from murine bone marrow stromal cells. Stromal cells were immortalized, treated with 5- azacytidine, and spontaneously beating cells were repeatedly screened. The cells showed a fibroblast-like morphology, but the morphology changed after 5-azacytidine treatment in -30% of the cells; they connected...

View

Necessity for rule out coronary artery disease with the positive findings of 18F-FDG-PET in case of systemic sarcoidosis

Article

Jan 2014

Toru Egashira · Shinji Makino · Akira Kunitomi · [...] · Keiichi Fukuda

View

Ventricular septal defects in mice targeted deletion of versican in vascular smooth muscle cells

Article

Aug 2013

Sonoko Hatano · Shinji Makino · Hideto Watanabe

Purpose: To determine the function of versican (Vcan) in the cardiovascular system in vivo, we generated the versican conditional knockout mice, in which the Vcan gene was selectively ablated in vascular smooth muscle cells (SMCs). Versican is a large secreted chondroitin sulfate proteoglycan, which is important for cardiac development, and is also...

View

Characterization of the RNA-binding protein Musashi1 in zebrafish BrainRes12

Data Full-text available

Jan 2013

Shinsuke Shibata · Masato Yano · Masahiko Umei · [...] · Hironori Kawahara

View

MiR-142-3p is essential for hematopoiesis and affects cardiac cell fate in zebrafish

Article

Aug 2012

Takahiko Nishiyama · Ruri Kaneda · Tomohiko Ono · [...] · Keiichi Fukuda

MicroRNAs (miRNAs) play a pivotal role during embryonic development and are required for proper organogenesis, including hematopoiesis. Recent studies suggest that, in the early mesoderm, there is an interaction between the hematopoietic and cardiac lineages. However, whether miRNAs can affect other lineages remains unknown. Therefore, we investiga...

View

Genetic Analysis of Essential Cardiac Transcription Factors in 256 Patients With Non-Syndromic Congenital Heart Defects

Article

Apr 2012

Kazuki Kodo · Tsutomu Nishizawa · Michiko Furutani · [...] · Hiroyuki Yamagishi

The genetic basis of most congenital heart defects (CHDs), especially non-syndromic and non-familial conditions, remains largely unknown. DNA samples were collected from immortalized cell lines and original genomes of 256 non-syndromic, non-familial patients with cardiac outflow tract (OFT) defects. Genes encoding NKX2.5, GATA4, GATA6, MEF2C, and I...

View

Characterization of the RNA-binding protein Musashi1 in zebrafish

Article Full-text available

Feb 2012

Shinsuke Shibata · Masahiko Umei · Hironori Kawahara · [...] · Hideyuki Okano

Musashi (Msi) is an evolutionarily conserved gene family of RNA-binding proteins (RBPs) that is preferentially expressed in the nervous system. The first member of the Msi family was identified in Drosophila. Drosophila Msi plays an important role in regulating asymmetric cell division of the sensory organ precursor cells. The mammalian orthologs,...

View

Wnt2 accelerates cardiac myocyte differentiation from ES-cell derived mesodermal cells via non-canonical pathway

Article

Nov 2011

Takeshi Onizuka · Shinsuke Yuasa · Dai Kusumoto · [...] · Keiichi Fukuda

The efficient induction of cardiomyocyte differentiation from embryonic stem (ES) cells is crucial for cardiac regenerative medicine. Although Wnts play important roles in cardiac development, complex questions remain as to when, how and what types of Wnts are involved in cardiogenesis. We found that Wnt2 was strongly up-regulated during cardiomyoc...

View

Research Highlights

Article

May 2011

Masaki Ieda · Shinsuke Yuasa · Motoaki Sano · [...] · Keiichi Fukuda

View

Neural Crest-Derived Stem Cells Migrate and Differentiate Into Cardiomyocytes After Myocardial Infarction

Article

Mar 2011

Yuichi Tamura · Keisuke Matsumura · Motoaki Sano · [...] · Keiichi Fukuda

We recently demonstrated that primitive neural crest-derived (NC) cells migrate from the cardiac neural crest during embryonic development and remain in the heart as dormant stem cells, with the capacity to differentiate into various cell types, including cardiomyocytes. Here, we examined the migration and differentiation potential of these cells o...

View

G-CSF influences mouse skeletal muscle development and regeneration by stimulating myoblast proliferation

Article Full-text available

Mar 2011

Mie Hara · Shinsuke Yuasa · Kenichiro Shimoji · [...] · Keiichi Fukuda

After skeletal muscle injury, neutrophils, monocytes, and macrophages infiltrate the damaged area; this is followed by rapid proliferation of myoblasts derived from muscle stem cells (also called satellite cells). Although it is known that inflammation triggers skeletal muscle regeneration, the underlying molecular mechanisms remain incompletely un...

View

Methods for Differentiation of Bone-Marrow-Derived Stem Cells into Myocytes

Chapter

Feb 2011

Shinji Makino · Keiichi Fukuda

Although heart transplantation is the ultimate therapy for severe heart failure, it is not widely used owing to the inadequate supply of donor hearts. Therefore, cell-based therapies for the prevention or treatment of cardiac dysfunction have attracted significant interest. Since we first reported (in 1999) that bone marrow (BM) mesenchymal stem ce...

View

The Overexpression of S105N Mutant Rad Leads Intracellular Ca2+ Overload Via Up-Regulation of Cardiac Ryanodine Receptor Activity

Article

Jan 2011

Hiroyuki Yamakawa · Mitsushige Murata · Tomoyuki Suzuki · [...] · Keiichi Fukuda

Background: The ras-related small G-protein Rad was originally identified from skeletal muscle of patients with type 2 diabetes mellitus. We have recently reported that Rad plays a critical role in generating arrhythmias. The study was aimed to elucidate the role of Rad in intracellular calcium homeostasis. Methods and Results: We developed the tra...

View

Simple autogeneic feeder cell preparation for pluripotent stem cells

Article

Oct 2010

Weizhen Li · Hiromi Yamashita · Fumiyuki Hattori · [...] · Keiichi Fukuda

Mouse embryonic fibroblasts (MEFs) are the most commonly used feeder cells for pluripotent stem cells. However, autogeneic feeder (AF) cells have several advantages such as no xenogeneic risks and reduced costs. In this report, we demonstrate that common marmoset embryonic stem (cmES) cells can be maintained on common marmoset AF (cmAF) cells. Thes...

View

Table S1

Data

Sep 2010

Keiko Uchida · Megumi Aramaki · Maki Nakazawa · [...] · Hiroyuki Yamagishi

Genotype Distributions of Embryos from IP3R1+/−-IP3R2−/− Intercrosses. (0.03 MB DOC)

View

Materials and Methods S1

Data

Sep 2010

Keiko Uchida · Megumi Aramaki · Maki Nakazawa · [...] · Hiroyuki Yamagishi

(0.03 MB DOC)

View

Figure S1

Data

Sep 2010

Keiko Uchida · Megumi Aramaki · Maki Nakazawa · [...] · Hiroyuki Yamagishi

The ultrastructures of the subcellular organelles of the IP3R1−/−-IP3R2−/− mice are comparable with those of the IP3R1+/−-IP3R2−/− mice. Scale bars, 1 μm. g, golgi; m, mitochondrion; mf, myofilament; n, nucleus; rer, rough endoplasmic reticulum; sr, sarcoplasmic reticulum. (1.74 MB TIF)

View

Figure S2

Data

Sep 2010

Keiko Uchida · Megumi Aramaki · Maki Nakazawa · [...] · Hiroyuki Yamagishi

Expression of site-specific markers in embryonic hearts. Whole-mount in situ hybridization images of the left- or right-side of the hearts of E9.5 IP3R1+/−-IP3R2−/- (upper panels) and IP3R1−/−-IP3R2−/− (lower panels) embryos. The expression patterns of Nkx2.5, MLC2a, and MLC2v (earliest markers of the embryonic heart), and of Hand2, Hand1 and Hrt2...

View

Figure S3

Data

Sep 2010

Keiko Uchida · Megumi Aramaki · Maki Nakazawa · [...] · Hiroyuki Yamagishi

Cross-sections of E9.5 placentas from IP3R1−/−-IP3R2+/− (upper panels), IP3R1+/−-IP3R2−/− (middle panels) and IP3R1−/−-IP3R2−/− (lower panels) mutant mice. The widths of the labyrinth area indicated in parentheses. Higher-magnification images of the boxed areas are shown in the right panels. Scale bars, 0.5 mm. The graph shows quantification of the...

View

Figure S4

Data

Sep 2010

Keiko Uchida · Megumi Aramaki · Maki Nakazawa · [...] · Hiroyuki Yamagishi

The percentages of cells with nuclear translocation of NFATc1 in the IP3R1−/−-IP3R2−/− hearts (white bars) are significantly lower than those in the IP3R1+/−-IP3R2−/− hearts (black bars) at E9.5 to E10.0 (*P<0.01, n = 3). Error bars indicate standard deviations. (2.97 MB TIF)

View

Video S1

Data

Sep 2010

Keiko Uchida · Megumi Aramaki · Maki Nakazawa · [...] · Hiroyuki Yamagishi

Atrioventricular regurgitation in the zebrafish hearts treated with DMSO (top), calcineurin inhibitor, cyclosporine A, (middle) and IP3R inhibitor, 2APB, (bottom). (0.32 MB MOV)

View

Gene Knock-Outs of Inositol 1,4,5-Trisphosphate Receptors Types 1 and 2 Result in Perturbation of Cardiogenesis

Article Full-text available

Sep 2010

Keiko Uchida · Megumi Aramaki · Maki Nakazawa · [...] · Hiroyuki Yamagishi

Inositol 1,4,5-trisphosphate receptors (IP3R1, 2, and 3) are intracellular Ca2+ release channels that regulate various vital processes. Although the ryanodine receptor type 2, another type of intracellular Ca2+ release channel, has been shown to play a role in embryonic cardiomyocytes, the functions of the IP3Rs in cardiogenesis remain unclear. We...

View

Epigenetic control of cardiomyocyte production in response to a stress during the medaka heart development

Article

Apr 2010

Yusuke Taneda · Sayaka Konno · Shinji Makino · [...] · Atsushi Kawakami

The size and morphology of organs are largely determined by a genetic program. However in some cases, an epigenetic mechanism influences the process of organ development. Particularly, epigenetic factors such as hemodynamic stress and blood pressure affect the morphogenesis of cardiac chambers and valves. Here, we report that the epigenetic influen...

View

Zac1 Is an Essential Transcription Factor for Cardiac Morphogenesis

Article Full-text available

Feb 2010

Shinsuke Yuasa · Takeshi Onizuka · Kenichiro Shimoji · [...] · Keiichi Fukuda

The transcriptional networks guiding heart development remain poorly understood, despite the identification of several essential cardiac transcription factors. To isolate novel cardiac transcription factors, we performed gene chip analysis and found that Zac1, a zinc finger-type transcription factor, was strongly expressed in the developing heart....

View

Nongenetic method for purifying stem cell-derived cardiomyocytes

Article Full-text available

Nov 2009

Fumiyuki Hattori · Hao Chen · Hiromi Yamashita · [...] · Keiichi Fukuda

Several applications of pluripotent stem cell (PSC)-derived cardiomyocytes require elimination of undifferentiated cells. A major limitation for cardiomyocyte purification is the lack of easy and specific cell marking techniques. We found that a fluorescent dye that labels mitochondria, tetramethylrhodamine methyl ester perchlorate, could be used t...

View

Omentopexy enhances graft function in myocardial cell sheet transplantation

Article

Aug 2009

Ryo Suzuki · Fumiyuki Hattori · Yuji Itabashi · [...] · Keiichi Fukuda

Myocardial cell sheets (MCS) are a potentially valuable tool for tissue engineering aimed at heart regeneration. Several methods have recently been established for the fabrication of MCS. However, the lack of a sufficient blood supply has inhibited functional recovery of the MCS. To address this challenge, we combined MCS transplantation with oment...

View

A novel in vitro system for studying cardiomyocyte differentiation with medaka embryonic cells

Article

Feb 2009

Masao Hyodo · Shinji Makino · Yasunori Awaji · [...] · Michio Tsuda

Our studies revealed that dissociated cells from medaka (the fresh-water fish, Oryzias latipes) blastula-stage embryos differentiate into many rhythmically contracting cells when incubated with a conditioned medium from a cell line. Analyses of these cells by immunostaining, electron microscopy, expression of marker genes, action potential recordi...

View

Abstract 5304: Dominant Negative Suppression of Rad Leads to Intracellular Ca 2+ Overload via Up-Regulation of Cardiac Ryanodine Receptor Activity

Article

Oct 2008

Mitsushige Murata · Hirotaka Yada · Hiroyuki Yamakawa · [...] · Keiichi Fukuda

Background: We have recently reported that the ras-related small G-protein Rad plays a critical role in generating arrhythmias via regulation of L-type Ca $^{2+}$ channel. However, it has remained unclear whether or not the mechanism for its arrhythmogenesis is attributed only to L-type Ca $^{2+}$ channel activity. This study was designed to demonstrate the...

View

DEXAMETHASONE INDUCES LATE PHASE OF CARDIOPROTECTION VIA A CYCLOOXYGENASE2DEPENDENT MECHANISM

Article

Oct 2008

Kayoko Tamaki · Ken Shinmura · Motoaki Sano · [...] · Keiichi Fukuda

View

Bi-maternal Embryonic Stem Cells can differentiate into Cardiomyocytes

Article

Sep 2008

Toshimi Kageyama · Shinji Makino · Shinsuke Yuasa · [...] · Keiichi Fukuda

View

Activation of L-serine biosynthesis is indispensable for hormetic effects of aldehydes in the heart

Article

Sep 2008

Jin Endo · Motoaki Sano · Takaharu Katayama · [...] · Satoshi Ogawai

View

Inhalation of hydrogen gas reduces infarct size in the rat model of myocardial ischemia-reperfusion injury

Article

Sep 2008

Kentaro Hayashida · Motoaki Sano · Ikuroh Ohsawa · [...] · Keiichi Fukuda

Inhalation of hydrogen (H(2)) gas has been demonstrated to limit the infarct volume of brain and liver by reducing ischemia-reperfusion injury in rodents. When translated into clinical practice, this therapy must be most frequently applied in the treatment of patients with acute myocardial infarction, since angioplastic recanalization of infarct-re...

View

Cardiomyocytes Can Be Generated from Parthenogenetic Embryonic Stem Cells

Conference Paper

Aug 2008

Toshimi Kageyama · Shinji Makino · Takeshi Onizuka · [...] · Keiichi Fukuda

View

Common marmoset embryonic stem cell can differentiate into cardiomyocytes

Article

Jun 2008

Hao Chen · Fumiyuki Hattori · Mitsushige Murata · [...] · Keiichi Fukuda

Common marmoset monkeys have recently attracted much attention as a primate research model, and are preferred to rhesus and cynomolgus monkeys due to their small bodies, easy handling and efficient breeding. We recently reported the establishment of common marmoset embryonic stem cell (CMESC) lines that could differentiate into three germ layers. H...

View

Mesenchymal Stem-Cell-Derived Cardiomyogenic Cells

Chapter

Nov 2007

Keiichi Fukuda · Jun Fujita · Daihiko Hakuno · Shinji Makino

IntroductionBone marrow mesenchymal marrow stem cells as a source of cardiomyocytesMethod of establishing bone-marrow-derived cardiomyocytesRegenerated cardiomyocytes display a fetal ventricular phenotypeDevelopmental stage of undifferentiated and differentiated cardiomyogenic cellsSerial changes in action potential shape in cardiomyogenic cells si...

View

Abstract 1372: Characterization Of The Rejuvenation Of Cardiac Sympathetic Nerves In Cardiac Hypertrophy

Article

Oct 2007

Kensuke Kimura · Masaki Ieda · Hideaki Kanazawa · [...] · Keiichi Fukuda

Background : Cardiac hypertrophy induces the fetal isoform of genes (rejuvenation), including contractile proteins, ion channels, and natriuretic peptides. Cardiac sympathetic nerve function is known to be altered in cardiac hypertrophy and congestive heart failure. We recently reported that alteration of cardiac sympathetic nerves (CSN) was caused...

View

Abstract 991: The Novel BTB/POZ Protein, RhoBTB3, Regulates Mitochondrial Function Via The Ubiquitin Proteasome System

Article

Oct 2007

Shinsuke Yuasa · Takeshi Onizuka · Shimoji Kenichiro · [...] · Keiichi Fukuda

Although BTB/POZ family proteins play a critical role in the development of various organs, and are recently known as a substrate adaptor of CUL3 ubiquitin ligases, the involvement of these proteins in heart development remains unknown. We recently

isolated the novel protein, RhoBTB3, an 83-kD protein which comprises an N-terminal Rho GTPase resemb...

View

Bone Marrow-Derived Cells Are Involved in the Pathogenesis of Cardiac Hypertrophy in Response to Pressure Overload

Article

Sep 2007

Jin Endo · Motoaki Sano · Jun Fujita · [...] · Keiichi Fukuda

Bone marrow (BM) cells possess broad differentiation potential and can form various cell lineages in response to pathophysiological cues. The present study investigated whether BM-derived cells contribute to the pathogenesis of cardiac hypertrophy, as well as the possible cellular mechanisms involved in such a role. Lethally irradiated wild-type mi...

View

Intramolecular Control of Protein Stability, Subnuclear Compartmentalization, and Coactivator Function of Peroxisome Proliferator-activated Receptor Coactivator 1

Article Full-text available

Sep 2007

Motoaki Sano · Satori Tokudome · Noriaki Shimizu · [...] · Keiichi Fukuda

Peroxisome proliferator-activated receptor γ coactivator (PGC)-1 is a critical transcriptional regulator of energy metabolism. Here we found that PGC-1α is a short lived and aggregation-prone protein. PGC-1α localized throughout the nucleoplasm and was rapidly destroyed via the ubiquitin-proteasome pathway. Upon proteasome inhibition, PGC-1α formed...

View

Sema3a maintains normal heart rhythm through sympathetic innervation patterning

Article

Jun 2007

Masaki Ieda · Hideaki Kanazawa · Kensuke Kimura · [...] · Keiichi Fukuda

Sympathetic innervation is critical for effective cardiac function. However, the developmental and regulatory mechanisms determining the density and patterning of cardiac sympathetic innervation remain unclear, as does the role of this innervation in arrhythmogenesis. Here we show that a neural chemorepellent, Sema3a, establishes cardiac sympatheti...

View

Application of Mesenchymal Stem Cell-Derived Cardiomyocytes as Bio-pacemakers: Current Status and Problems to Be Solved

Article

Mar 2007

Yuichi Tomita · Shinji Makino · Daihiko Hakuno · [...] · Keiichi Fukuda

Bone marrow mesenchymal stem cells (CMG cells) are multipotent and can be induced by 5-azacytidine to differentiate into cardiomyocytes. We characterized the electrophysiological properties of these cardiomyocytes and investigated their potential for use as transplantable bio-pacemakers. After differentiation, action potentials in spontaneously bea...

View

Nerve Growth Factor Is Critical for Cardiac Sensory Innervation and Rescues Neuropathy in Diabetic Hearts

Article

Dec 2006

Masaki Ieda · Hideaki Kanazawa · Yasuyo Ieda · [...] · Keiichi Fukuda

Molecular mechanisms regulating the cardiac sensory nervous system remain poorly understood. Cardiac sensory nerve impairment causes silent myocardial ischemia, a main cause of sudden death in diabetes mellitus (DM). The present study focused on the roles of nerve growth factor (NGF) in the regulation of the cardiac sensory nervous system and analy...

View

Genetic and genomic approaches to study zebrafish heart regeneration

Conference Paper

Sep 2006

Ellen Lien · Michael Schebesta · Shinji Makino · [...] · Mark T. Keating

View

Gene Expression Analysis of Zebrafish Heart Regeneration

Article Full-text available

Sep 2006

Ching-Ling Lien · Michael Schebesta · Shinji Makino · [...] · Mark T Keating

Mammalian hearts cannot regenerate. In contrast, zebrafish hearts regenerate even when up to 20% of the ventricle is amputated. The mechanism of zebrafish heart regeneration is not understood. To systematically characterize this process at the molecular level, we generated transcriptional profiles of zebrafish cardiac regeneration by microarray ana...

View

Dataset S1

Data

Aug 2006

Ching-Ling Lien · Michael Schebesta · Shinji Makino · [...] · Mark T Keating

List of Genes Differentially Expressed During Zebrafish Heart Regeneration Affymetrix probe ID, gene symbol, gene title, functional class, and description are provided for the 662 transcripts that were differentially expressed during zebrafish heart regeneration. The results of our analysis using R include mean signal, mean fc (fold change), and q-...

View

Figure S1

Data

Aug 2006

Ching-Ling Lien · Michael Schebesta · Shinji Makino · [...] · Mark T Keating

Expression Patterns of Representative Genes in Each Cluster The differentially expressed genes were grouped into six clusters (I to VI). Each gene cluster is shown separately for illustrative purposes and the representative genes are indicated graphically by plotting dpa versus log 2 (fold change). Cluster I (genes downregulated during heart regene...

View

Figure S2

Data

Aug 2006

Ching-Ling Lien · Michael Schebesta · Shinji Makino · [...] · Mark T Keating

Sequence Alignment of Human, Mouse, Xenopus, and Zebrafish PDGF-B The alignments were performed using clustW. The gray boxes indicate homologous regions. The red boxes indicate conserved cysteine residues. Zebrafish PDGF-B shows high homology to other species. (404 KB EPS)

View

Table S2

Data

Aug 2006

Ching-Ling Lien · Michael Schebesta · Shinji Makino · [...] · Mark T Keating

Secreted Factors Tested on Zebrafish Cardiomyocytes for Induction of DNA Synthesis (27 KB DOC)

View

Table S1

Data

Aug 2006

Ching-Ling Lien · Michael Schebesta · Shinji Makino · [...] · Mark T Keating

List of Genes Differentially Expressed during Both Heart and Fin Regeneration (44 KB DOC)

View

Danio rerio platelet-derived growth factor B chain-like protein mRNA, partial cds

Data

May 2006

C. Lien · Michael Schebesta · Shinji Makino · [...] · M.T. Keating

View

fgf20 Is Essential for Initiating Zebrafish Fin Regeneration

Article

Jan 2006

Geoffrey G Whitehead · Shinji Makino · Ching-Ling Lien · Mark T Keating

Epimorphic regeneration requires the presence or creation of pluripotent cells capable of reproducing lost organs. Zebrafish fin regeneration is mediated by the creation of blastema cells. Here, we characterize the devoid of blastema (dob) mutant that fails fin regeneration during initial steps, forms abnormal regeneration epithelium, and does not...

View

Heat-shock protein 60 is required for blastema formation and maintenance during regeneration

Article Full-text available

Nov 2005

Shinji Makino · Geoffrey G Whitehead · Ching-Ling Lien · [...] · Mark T Keating

Zebrafish fin regeneration requires the formation and maintenance of blastema cells. Blastema cells are not derived from stem cells but behave as such, because they are slow-cycling and are thought to provide rapidly proliferating daughter cells that drive regenerative outgrowth. The molecular basis of blastema formation is not understood. Here, we...

View

Danio rerio fibroblast growth factor 20b mRNA, complete cds

Data

Oct 2005

G.G. Whitehead · Shinji Makino · M.T. Keating

View

Fgf-20 is required for blastema formation in zebrafish caudal fin regeneration.

Conference Paper

Jul 2005

GG Whitehead · Shinji Makino · CL Lien · [...] · MT Keating

View

express functional adrenergic and muscarinic receptors

Article Full-text available

Feb 2002

Daihiko Hakuno · Keiichi Fukuda · Shinji Makino · [...] · Satoshi Ogawa

We recently reported that cardiomyocytes could be differentiated from bone marrow mesenchymal stem cells in vitro by 5-azacytidine treatment. In native cardiomyocytes, adrenergic and muscarinic receptors play crucial roles in mediating heart rate, conduction velocity, contractility, and cardiac hypertrophy. We investigated whether these receptors a...

View

Development of regenerated cardiomyocyte for the cardiovascular tissue engineering

Article

Nov 2001

Keiichi Fukuda · Daihiko Hakuno · Fusako Konishi · [...] · Satoshi Ogawa

We have isolated a cardiomyogenic cell line (CMG cell) from murine bone marrow stromal cells. Stromal cells were immortalized, treated with 5-azacytidine, and spontaneous beating cells were repeatedly screened for. The cells showed a f ibroblast-like morphology, but the morphology changed after 5-azacytidine treatment in approximately 30% of the ce...

View

Significance of ERK cascade compared with JAK/STAT and PI3-K pathway in gp130-mediated cardiac hypertrophy

Article

Nov 2000

Hiroaki Kodama · Keiichi Fukuda · Jianzhi Pan · [...] · Satoshi Ogawa

We compared the role of the Raf-1/mitogen-activated protein kinase/extracellular signal-regulated protein kinase (MEK)/extracellular signal-regulated protein kinase (ERK)/p90(RSK) cascade in gp130-mediated cardiac hypertrophy with the contribution of the Janus kinase (JAK)/signal transduction and activation of transcription (STAT) and phosphatidyli...

View

Interleukin-6 Family of Cytokines Mediate Angiotensin II-induced Cardiac Hypertrophy in Rodent Cardiomyocytes

Article Full-text available

Oct 2000

Motoaki Sano · Keiichi Fukuda · Hiroaki Kodama · [...] · Satoshi Ogawa

This study was designed to investigate whether angiotensin II induces the interleukin (IL)-6 family of cytokines in cardiac fibroblasts and, if so, whether these cytokines can augment cardiac hypertrophy. Angiotensin II increased IL-6, leukemia inhibitory factor (LIF) and cardiotrophin-1 mRNA by 6.5-, 10.2-, and 2.0-fold, respectively, but did not...

View

Characterization of Insulin-Like Growth Factor-1-Induced Activation of the JAK/STAT Pathway in Rat Cardiomyocytes

Article

Dec 1999

Toshiyuki Takahashi · Keiichi Fukuda · Jianzhi Pan · [...] · Satoshi Ogawa

This study was designed to investigate whether insulin-like growth factor-1 (IGF-1) transduces signaling through the Janus kinase (JAK)/signal transducers and activators of transcription (STAT) pathway in cardiomyocytes and to assess the upstream signals of serine and tyrosine phosphorylation of STAT family proteins. Primary cultured neonatal rat c...

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Gross ionization cross sections for rare-gas atoms and simple molecules in 6-MeV/amu fully stripped–ion impact

Article

Oct 1999

T. Matsuo · T. Kohno · Shinji Makino · [...] · H. Tawara

Using the parallel-plate-condenser method, we have measured gross ionization cross sections in fully stripped–ion (charge state q=2–18) impact on rare gases and simple molecules (H2,N2,O2, and CO2) at a fixed collision energy E of 6 MeV/amu. The observed cross sections have been found to depend weakly on the charge state q compared with the q2 depe...

View

Cardiomyocytes can be generated from marrow stromal cells in vitro

Article Full-text available

Apr 1999

Shinji Makino · Keiichi Fukuda · Shunichirou Miyoshi · [...] · Satoshi Ogawa

We have isolated a cardiomyogenic cell line (CMG) from murine bone marrow stromal cells. Stromal cells were immortalized, treated with 5-azacytidine, and spontaneously beating cells were repeatedly screened. The cells showed a fibroblast-like morphology, but the morphology changed after 5-azacytidine treatment in approximately 30% of the cells; the...

View

Involvement of gp130-mediated signaling in pressure overload-induced activation of the JAK/STAT pathway in rodent heart

Article

Jul 1998

Jing Pan · Keiichi Fukuda · Hiroaki Kodama · [...] · Satoshi Ogawa

Previously, we showed that the JAK/STAT pathway was activated in pressure-overloaded rat heart, and that angiotensin II was partially involved in this activation. The present study was designed to investigate whether gp130-mediated signaling is involved in this activation, and if so, which interleukin (IL)-6 family cytokine is involved. Pressure ov...

View

Biphasic Activation of the JAK/STAT Pathway by Angiotensin II in Rat Cardiomyocytes

Article

Mar 1998

Hiroaki Kodama · Keiichi Fukuda · Jianzhi Pan · [...] · Satoshi Ogawa

This study was designed to demonstrate the characteristic pattern of angiotensin II-induced JAK/STAT (indicating just another kinase/signal transducer and activator of transcription) activation in cultured rat cardiomyocytes by comparing it with leukemia inhibitory factor (LIF)-induced activation. Angiotensin II (10(-7) mol/L) induced rapid phospho...

View

Leukemia Inhibitory Factor, a Potent Cardiac Hypertrophic Cytokine, Activates the JAK/STAT Pathway in Rat Cardiomyocytes

Article

Dec 1997

Hiroaki Kodama · Keiichi Fukuda · Jianzhi Pan · [...] · Satoshi Ogawa

Leukemia inhibitory factor (LIF) is a member of the interleukin-6 family of cytokines, which induces a wide range of responses in a variety of cells. The aim of this study was to investigate whether LIF induces cardiomyocyte hypertrophy and transmits signals through the JAK/STAT (indicating just another kinase/signal transducer and activator of tra...

View

Role of Angiotensin II in Activation of the JAK/STAT Pathway Induced by Acute Pressure Overload in the Rat Heart

Article

Nov 1997

Jianzhi Pan · Keiichi Fukuda · Hiroaki Kodama · [...] · Satoshi Ogawa

This study was designed to determine whether the JAK/STAT (indicating just another kinase/signal transducer and activator of transcription) pathway is activated in cardiac hypertrophy induced in vivo by pressure overload in rats and to demonstrate whether

angiotensin II is involved in the activation of the JAK/STAT pathway. Acute pressure overload...

View

Net-ionization cross sections of rare gases by fully-stripped heavy ion impact

Article

Jan 1997

Shinji Makino · T. Matsuo · M. Mizutani · [...] · Takehiro Murakami

The net-ionization cross sections for Ne and Xe by C6+, Ne10+ and Ar18+ ion impact are presented. These cross section data are discussed in connection with the classical-trajectory Monte Carlo (CTMC) calculations and the Born approximation.

View

J Clin Invest

Article

Shinji Makino · K. Fukuda · S. Miyoshi · [...] · S. Ogawa

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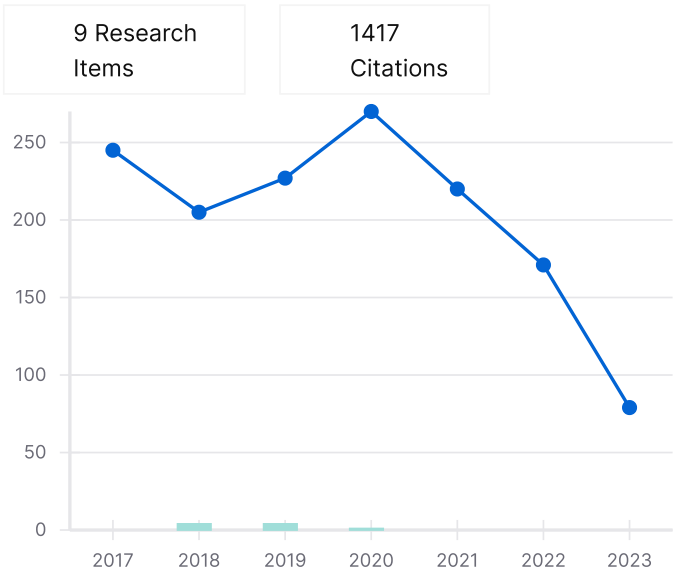

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