Kumamoto University

JSPS Core-to-Core Program A. Advanced Research Networks
Integrative approach for normal and leukemic stem cells

Core-to-Core Program

22nd IRCMS Symposium on

Hematopoietic and Tissue Homeostatic Regulation from the Perspective of Vascular Biology

Date and Time:

13:30-17:00(JST), 5th June 2024

Venue : Onsite and Online
(IRCMS Lounge, Kumamoto University and Zoom)

Speakers:

Gou Young Koh (IBS/KAIST)
Yoshiaki Kubota (Keio University)

Yuichiro Arima (Kumamoto University)
Mayumi Hirayama (Kumamoto University)
Tomson Kosasih (Kumamoto University)
Norika Liu (Kumamoto University)

Organized by Goro Sashida and Rieko Asai

IRCMS

Contact:
IRCMS Administrative Office, Kumamoto University
Email. ircms@jimu.kumamoto-u.ac.jp

Kumamoto University

22nd IRCMS Symposium on
Hematopoietic and Tissue Homeostatic Regulation from the Perspective of Vascular Biology

Opening Remarks	**Goro Sashida (IRCMS, Kumamoto University)**	13:30-13:35
Session Ⅰ (13:35-14:20)	**Chairperson: Toshio Suda (IRCMS, Kumamoto University)**	
Gou Young Koh IBS/KAIST	Exploring novel lymphatics for brain clearance	13:35-14:20
	Break (14:20-14:45)	
Session Ⅱ (14:45-15:45)	**Chairperson: Rieko Asai (IRCMS, Kumamoto University)**	
Mayumi Hirayama Kumamoto University	Haploinsufficiency of Tie2 in mutated blood cells suppresses angiogenesis in the bone marrow and inhibits the progression of MDS	14:45-15:00
Yuichiro Arima Kumamoto University	The Glucose-Fatty Acid-Ketone Bodies Triangle Enhances Cardiac Metabolic Stress Resilience	15:00-15:15
Norika Liu Kumamoto University	Exploring the role of macrophages in the heart development and aging	15:15-15:30
Tomson Kosasih Kumamoto University	HSC heterogeneity in neonatal bone marrow	15:30-15:45
	Break (15:45-16:10)	
Session Ⅲ (16:10-16:55)	**Chairperson: Hiroki Kurihara (IRCMS, Kumamoto University)**	
Yoshiaki Kubota Keio University	Angiocrine signaling in the bone development and repair	16:10-16:55
Closiing Remarks	**Hitoshi Takizawa (IRCMS, Kumamoto University)**	16:55-17:00

Exploring novel lymphatics for brain clearance

Gou Young Koh

(Institute for Basic Science, Korea Advanced Institute of Science and Technology)

Recent evidence indicates that enhancing cerebrospinal fluid (CSF) outflow could ameliorate the onset and progression of neurodegenerative diseases including Alzheimer's disease by improving brain clearance. Although the re-visiting of meningeal lymphatic vessels (mLVs) as a new route of CSF drainage has led to an explosive advance in our understanding of the regulation and roles of CSF outflow, the main lymphatics responsible for CSF outflow has been elusive. In this meeting, I will introduce novel and main lymphatics for CSF outflow in addition to the previously discovered functional meningeal lymphatic vessels that are distributed in the skull base. Moreover, I will provide the evidence for facilitating CSF outflow through the cervical lympahtics as an extracranial approach.

1. Yoon J-H, Jin H, Kim HJ, Hong SP, Yang MJ, Ahn JH, Kim Y-C, Seo J, Lee Y, McDonald DM, Davis MJ*, Koh GY* (2024) Nasopharyngeal lymphatic plexus is a hub for cerebrospinal fluid drainage. **Nature** 625:768-777.

1. Kim Y-C, Ahn JH*, Jin H, Yang MJ, Hong SP, Yoon J-H, Kim S-H, Gebre TN, Lee HJ, Kim Y-M, Koh GY* (2023) Immaturity of immune cells around the dural venous sinuses contributes to viral meningoencephalitis in neonates. **Science Immunology** 8:eadg6155.

1. Ahn JH, Cho H, Kim JH, Kim SH, Ham JS, Park I, Suh SH, Hong SP, Song JH, Hong YK, Jeong Y, Park SH*, Koh GY* (2019) Meningeal lymphatic vessels at the skull base drain cerebrospinal fluid. **Nature**. 572(7767)

Haploinsufficiency of Tie2 in mutated blood cells suppresses angiogenesis in the bone marrow and inhibits the progression of MDS

Mayumi Hirayama

(IRCMS, Kumamoto University)

Tie2 is a receptor tyrosine kinase and regulates angiogenesis and vascular quiescence. Given that Tie2 modulates microvascular density in cancer, we hypothesized that deletion of Tie2 in blood cells can inhibit progression of myelodysplastic syndrome (MDS). We attempted to understand the role of Tie2 in development of MDS by using an Ezh2/Tet2 double knock out (DKO) mouse model. We transplanted bone marrow (BM) cells isolated from Cre-ERT2 mice, $Tie2^{flox/wt}$; Cre-ERT2 mice, $Ezh2^{flox/flox}$; $Tet2^{flox/flox}$; Cre-ERT2 mice, $Ezh2^{flox/flox}$; $Tet2^{flox/flox}$; $Tie2^{flox/wt}$; Cre-ERT2 mice and $Ezh2^{flox/flox}$; $Tet2^{flox/flox}$; $Tie2^{flox/flox}$; Cre-ERT2 mice into lethally-irradiated $Ly5.1^{+}$ recipient mice. Ezh2, Tet2 and Tie2 genes were deleted by administration of tamoxifen one month post the transplantation. We found that $Ezh2^{-/-}Tet2^{-/-}$ DKO, $Ezh2^{-/-}Tet2^{-/-}$ $Tie2^{+/-}$ (DKOTie2$^{+/-}$) and $Ezh2^{-/-}Tet2^{-/-}$ $Tie2^{-/-}$ TKO mice all developed MDS and MDS/MPN, showing anemia and dysplastic cells in the peripheral blood (PB) and the BM; however, DKOTie2$^{+/-}$ mice showed significantly longer survival than did DKO mice and TKO mice. While DKO mice showed deformed $CD31^{+}$ endothelial cells and increased vascular density in the BM, DKOTie2$^{+/-}$ mice mitigated the altered vascular formation in the BM. RNA-sequencing revealed that DKOTie2$^{+/-}$ stem cells repressed expression of genes involved in interferon, cell cycles and angiogenesis, compared to DKO stem cells, suggesting that the haploinsufficiency of Tie2 impaired the property of MDS cells to drive angiogenesis in the BM, resulting in the delayed development of MDS. We are now working on the molecular mechanism of how the Tie2 gene in blood cells modulates the angiogenesis to drive the progression of MDS.

The Glucose-Fatty Acid-Ketone Bodies Triangle Enhances Cardiac Metabolic Stress Resilience

Yuichiro Arima

(IRCMS, Kumamoto University)

Cells possess the characteristic of utilizing specific energy substrates, and the energy sources they use are linked to their functions. Typically, mature cardiomyocytes primarily rely on fatty acid utilization for their energy metabolism. However, during stress responses such as cardiac hypertrophy and heart failure, it is known that glucose metabolism increases, a phenomenon referred to as metabolic remodeling. Nonetheless, the mechanisms by which the characteristics of energy metabolism change have remained unclear. In the course of analyzing ketone body synthesis-deficient mice, we confirmed that in a model of cardiac hypertrophy induced by obesity and hypertension, the reduction in blood ketone body levels exacerbates cardiac hypertrophy. Transcriptome and metabolomics analyses revealed that metabolic remodeling, which occurs during the process of cardiac hypertrophy formation, does not occur in ketone body synthesis-deficient mice, and they remain reliant on fatty acid utilization under stress. Furthermore, investigations using cardiomyocyte lineage cells showed that the administration of ketone bodies promoted glucose utilization and reduced fatty acid utilization, confirming that the enhancement of ketone body synthesis serves as the starting point for metabolic remodeling. These results suggest that ketone body metabolism acts in concert with glucose and fatty acid metabolism, forming a flexible compensatory mechanism (resilience) against metabolic stress.

1. Wenjuan Ma, Yuichiro Arima, Terumasa Umemoto, Tomomasa Yokomizo, Yuqing Xu, Kenichi Miharada, Yosuke Tanaka, Toshio Suda. Metabolic regulation in erythroid differentiation by systemic ketogenesis in fasted mice. Experimental hematology 2023 *in press*
2. Yuichiro Arima. The Impact of Ketone Body Metabolism on Mitochondrial Function and Cardiovascular Diseases. Journal of atherosclerosis and thrombosis 30(12) 1751-1758 2023 (review)
3. Yuichiro Arima, Yoshiko Nakagawa, Toru Takeo, Toshifumi Ishida, Toshihiro Yamada, Shinjiro Hino, Mitsuyoshi Nakao, Sanshiro Hanada, Terumasa Umemoto, Toshio Suda, Tetsushi Sakuma, Takashi Yamamoto, Takehisa Watanabe, Katsuya Nagaoka, Yasuhito Tanaka, Yumiko K Kawamura, Kazuo Tonami, Hiroki Kurihara, Yoshifumi Sato, Kazuya Yamagata, Taishi Nakamura, Satoshi Araki, Eiichiro Yamamoto, Yasuhiro Izumiya, Kenji Sakamoto, Koichi Kaikita, Kenichi Matsushita, Koichi Nishiyama, Naomi Nakagata, Kenichi Tsujita. Murine neonatal ketogenesis preserves mitochondrial energetics by preventing protein hyperacetylation. Nature metabolism 3(2) 196-210 2021

Yuichiro Arima is an associate professor in the developmental cardiology laboratory of the International Research Center for Medical Siences (IRCMS) at Kumamoto University. He is a physician-scientist and has a keen interest in the relationship between cardiovascular development and pathology, and ketone body metabolism. He is trying to clarify the relationship between cardiovascular development and adult-onset disease through basic research. In addition, in the process of analyzing the neonatal period, he elucidated the significance of ketone body metabolism, by analyzing the knockout (KO) mice for HMG-CoA synthase2 (Hmgcs2), the rate-limiting enzyme in ketone body synthesis. Hmgcs2 KO mice can survive but represent severe hepatostetosis with mitochondrial dysfunction. He has deciphered the underlying mechanism and revealed that ketogenesis itself has a protective function for mitochondria. Multifaced functions of ketone body metabolism is an important theme for his research.

Exploring the role of macrophages in the heart development and aging

Norika Liu

(IRCMS, Kumamoto University)

Macrophages exist in all tissues and exhibit different traits in response to signals in the microenvironment of each tissue. The roles of the macrophages include the initiation/regulation of adaptive immune response, the maintenance of homeostasis of tissues, regulation of tissue remodeling during development, and promotion/regulation of regeneration after tissue damage. While the classical classification of their properties is based on a simple distinction between inflammatory and anti-inflammatory types, the advance of the field of bioinformatics has uncovered new subtypes of tissue macrophages. Macrophages are also diverse in origin. Tissue-resident macrophages are derived from erythromyeloid progenitors (EMPs) produced in the yolk sac and seeded to local tissues during embryonic development to adopt mainly phagocytic phenotypes. They self-renew in local tissues without the need for input from circulation. On the other hand, monocyte-derived macrophages originate from the multipotent stem/progenitor cells in circulation and typically have short-lived and pro-inflammatory characteristics. We also identified a new source of macrophages in the heart: the endocardium. The talk will focus on the role of endocardium-derived macrophages and the development of tools to explore the role of lineage-specific tissue macrophages.

1. Liu et al, Nat Commun. 2023 (PMID: 37669937)

2. Nakano and Liu. Dev Cell. 2023 (PMID: 37348504)

3. Liu et al, Aging. 2023 (PMID: 37244285)

I obtained Ph.D. at UCLA in 2018, where I studied vascular endothelial repair mechanisms using femoral artery injury mouse model. From 2018-2021, I studied the molecular mechanisms of cardiovascular development, particularly arterial differentiation. After my post-doc training, I began to focus on the role and origin of tissue macrophages in cardiovascular development. Our recent studies have discovered a novel origin of cardiac macrophages that contribute to local morphogenesis. From 2024, I was appointed as a Jr. PI at Kumamoto University and started a research team focusing on the close relationship between tissue macrophages and blood vessels.

Hematopoietic stem cell heterogeneity in neonatal bone marrow

Tomson Kosasih

(IRCMS, Kumamoto University)

Hematopoietic stem cells (HSCs) emerge in the dorsal aorta of embryos, migrate to the fetal liver for their expansion, and eventually populate bone marrow (BM) around birth to sustain hematopoiesis for the rest of life. It remains largely unknown how neonatal HSCs engraft BM and develop into adult HSCs.

HSC quantification and imaging showed the appearance of HSCs around the BM at E18.5 and their rapid expansion around P2 perinatal BM with close proximity to sinusoidal endothelial cells. Single cell RNA-seq revealed three HSC clusters, one cluster outside BM with inflammatory signature and two clusters inside of BM, one with lymphoid signature (VCAM1^{-}CD150^{high} HSC) and the other with vascular signature (VCAM1^{+}CD150^{low} HSC). In vivo label retention demonstrated that the VCAM1^{+} HSC divided twice as fast as VCAM1^{-} HSC (the former and the latter called fast-cycling (fc-HSCs) and slow-cycling (sc-HSCs), respectively). Functional assays found that sc-HSCs generated more megakaryocyte than fc-HSCs *in vitro* while producing less chimerism *in vivo*. Lineage tracing with Cdh5^{CreERT}/EYFP mice revealed that all fc-HSCs seeded from extramedullary organ while some sc-HSCs were BM *de novo* generated within P1-P3.

Collectively, neonatal HSCs are transcriptionally and functionally heterogeneous. Understanding the developmental maturation process of HSCs will shed a light to the origin of adult HSCs in health and disease.

1. Yvernogeau L., *Gautier R*., Petit L., Khoury H., Relaix F., Ribes V., Sang H., Charbord P., Souyri M., Robin C., Jaffredo T.. 2023. In vivo generation of haematopoietic stem / progenitor cells from bone marrow-derived haemogenic endothelium. *Nature Cell Biology*. 21 (11): 1334-1345.
2. Takizawa H., Regoes RR., Boddupalli CS., Bonhoeffer S., Manz MG.. 2011. Dynamic variation in cycling of hematopoietic stem cells in steady state and inflammation. *Journal of Experimental Medicine*. 208 (2): 273-284.
3. Hayashi Y., Sezaki M., Takizawa H.. 2019. Development of the hematopoietic system: Role of inflammatory factors. Wiley Interdisciplinary Review Developmental Biology. 8 (4): e341.

After being involved as a protein modification scientist in a biopharmaceutical company for 2 years, Tomson started his doctorate training in Kumamoto University. Pursuing his passion in hemato-immune system, he joined Takizawa-lab in IRCMS striving to understand the intrinsic/extrinsic HSCs regulation in physiological/stress state.

Angiocrine signaling in the bone development and repair

Yoshiaki Kubota

(School of Medicine, Keio University)

In vertebrates, the vascular network develops throughout the body to meet tissue demands for oxygen and nutrients, and to secrete organotypic paracrine molecules, known as angiocrine factors, which drive cell differentiation and tissue morphogenesis. The skeletal system consists of bones and teeth, both of which are hardened via mineralization to support daily physical activity and mastication. Recent advances in histological technology have significantly enhanced our understanding of the spatio-temporal association between angiogenesis and osteogenesis during embryonic and postnatal bone development. In this presentation, I will discuss our recent findings on angiocrine signaling regulating development and repairing process of the skeletal system.

1. Iga T, Kobayashi H, Kusumoto D, Sanosaka T, Fujita N, Tai-Nagara I, Ando T, Takahashi T, Matsuo K, Hozumi K, Ito K, Ema M, Miyamoto T, Matsumoto M, Nakamura M, Okano H, Shibata S, Kohyama J, Kim KK, *Takubo K, *Kubota Y. Spatial heterogeneity of bone marrow endothelial cells unveils a distinct subtype in the epiphysis Nat Cell Biol 25(10):1415-1425, 2023
2. Matsubara T, Iga T, Sugiura Y, Kusumoto D, Sanosaka T, Tai-Nagara I, Takeda N, Fong GH, Ito K, Ema M, Okano H, Kohyama J, Suematsu M, *Kubota Y. Coupling of angiogenesis and odontogenesis orchestrates tooth mineralization in mice J Exp Med 4; 219(4): e20211789, 2022.
3. Okabe K, Kobayashi S, Yamada T, Kurihara T, Tai-Nagara I, Miyamoto T, Mukouyama YS, Sato TN, Suda T, Ema M and *Kubota Y. Neurons limit angiogenesis by titrating VEGF in retina. Cell 159: 584-596, 2014.

Welcome to Kumamoto!

구마모토에 오신 것을 환영합니다!

Kumamoto University is located in Kumamoto city, which is at the center of the Kyushu island (Southwest Japan).Kumamoto is is not only a place blessed with natural resources like mountains, rivers, and oceans, but it is also quite rich in history and culture.

Kumamoto Castle is the most symbolic attraction in Kumamoto, which has a history of more than 400 years. Its main feature is its stone walls, known as Musha-gaeshi（武者返し）. These walls are warped to prevent enemy invasion. Unfortunately, in the earthquake of 2016, Kumamoto Castle was severely damaged and is going through a 20-years' restoration.

The damage caused by the Kumamoto earthquake extends through several areas of Kumamoto prefecture. The Aso area, which we will visit on this excursion, was one of the most damaged areas. However, we would like you to see not only the great hurt that Kumamoto people has experienced, but also their resilience and the way these people are overcoming such adversities.

Aso is a place where you can feel the magnificence of nature with your whole being. Despite being a place where you can feel the danger of earthquakes and volcanic eruptions, the area is blessed with rich groundwater and hot springs.

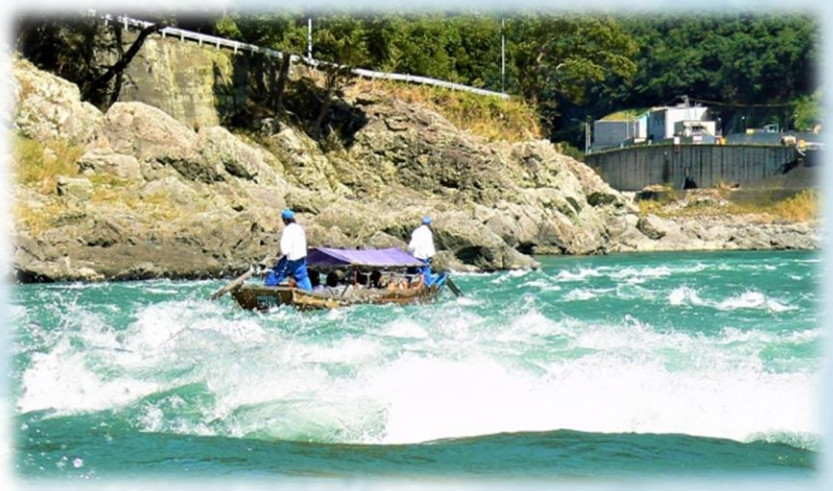
In fact, the groundwater which is nurtured by the Aso mountains, is one of the most valuable resources of Kumamoto City. This groundwater provides for well-being of all the 740,000 habitants of Kumamoto City.

Welcome to Kumamoto!

くまもとへようこそ！

The bountiful waters of Kumamoto also nurture delicious food. All the famous foods in Kumamoto can be summarised by the word ‘red’. Here is where we produce the most amount of tomatoes and watermelons in Japan. Basashi（馬刺し） is a must-try food for visitors of Kumamoto, it is sashimi prepared with horse meat instead of fish. Kumamoto is also famous for its ‘Aka-Ushi’ (red cow) wagyu beef. In Kumamoto, horses and cows live in the grasslands of Aso and grow up drinking clean water and breathing pure air, which make their meat delicious.

Kumamoto is proud of its “Sake（清酒/日本酒）” and “Shochu（焼酎）”, made from a combination of its nutritious water and locally-produced rice. In fact, Kumamoto is the southernmost area where sake is produced in its natural environment. In the past, it was difficult to produce good sake due to the weather, but people spent years doing research to achieve the current amazing taste. This achievement was only possible because of Kumamoto yeast (No. 9 yeast). Interestingly, Kumamoto yeast is still considered one of the conditions for making good sake, as yeast is an important ingredient in the production of alcohol. A yeast called Kumadai-Yeast was recently discovered at Kumamoto University.



In Hitoyoshi-Kuma area, the most southerly region of Kumamoto Prefecture, spirits alcohol have been produced for more than 500 years. The name Kuma-shochu is an alcoholic beverage for which a specific regional name is used as a brand name, similar to Bordeaux for wine or Cognac for brandy. Kuma-Shochu has a variety of flavours depending on how it is made and how it has aged. Two days is a short time, but please enjoy Kumamoto!

Our Culture -- Kumadai-Hub!

Operated by Nanako Watanabe, Nazuki Doi and Hanami Sakai (IRCMS Admin)

Kumadai-Hub is an organization of “self-proclaimed” young volunteers researchers at Kumamoto University. It was founded in December 2019 and is keep growing over the last few years. We use the term “self-proclaimed” because the definition of “young” is ambiguous, so our members gather as “people with a fresh mind”. It started as a free small gathering of researchers/research-enthusiasts from different areas, and has grown in size to about 110 members in a two years span.

Currently, Japanese universities’ policies are full of trendy words such as “young people’s development,” “internationalization,” “joint research,” and “fusion research”. As much as these topics are important, nothing compares to “our own mindset and actions”. In this sense, we developed our community with the help of research administrator, emphasizing the fact that researchers need a fixed space that they come and go when they need and discuss their ideas. Similar to what greeks would do in agoras, their public discussion spaces. We have regular quarterly meetings (once every three months) and also hold diverse social events. Recently some collaborations have emerged through our activities. Despite being always on the look for possibilities of “different fields’ collaboration” and “joint research development” that may emerge in the meetings, this is not our primary goal. We just want to make a fun place that let researchers discuss without barriers. This is the Kumadai-Hub’s main mission.

Kumadai-Hub is a group open not only to professional researchers, but also to students, technical staff, administrative staff, and all others involved in university research. Despite Kumamoto University having a large group of researchers spread through its five departments and three campuses. These researchers don't actually know each other very well. We had a poster exhibition in 2022 that provided an opportunity for us to communicate with each other. The most interesting point was that technical and administrative staff, who are usually on the management side, also made and exhibited posters to introduce their own work. Researchers and students tried to avoid using "cryptic jargons" and focused on having more friendly presentations. The most interesting part was that these rules were not something discussed on a gray room, but people came to this conclusion themselves. Studies and sciences are not exclusive and should not be restricted to a small group, so we need to be able to share them with everyone and explain them to anyone. We need more science communicators! This another of Kumadai-Hub's missions.

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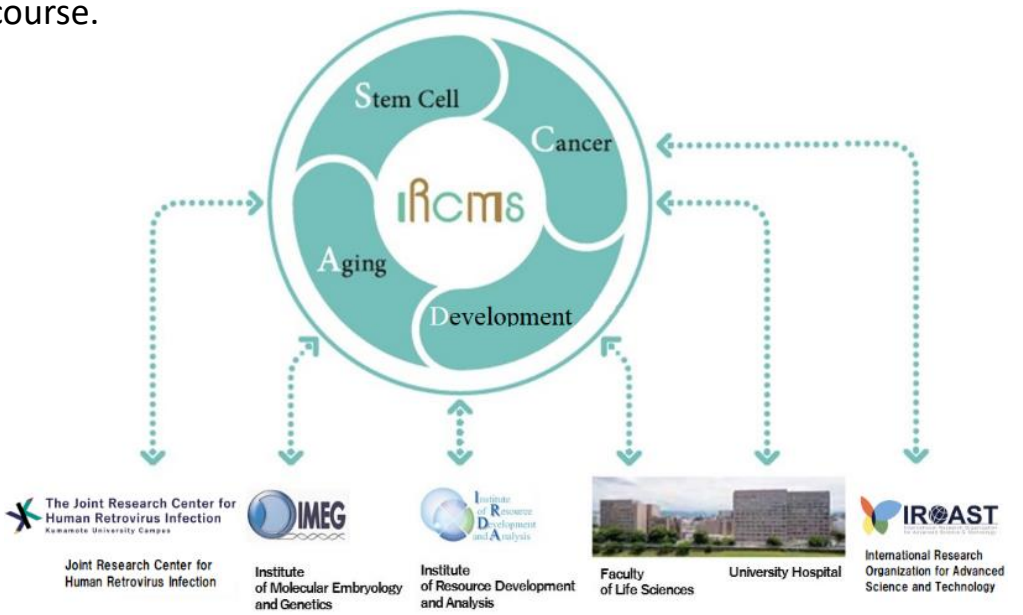
Lastly, our community values face-to-face, but we also value online connections. Since we are in Japan, most members are more comfortable with Japanese, however we also communicate in English and any other language is welcome. Our greatest value is that we don't have barriers based on whether you are Japanese or non-Japanese, male or female, senior or young, your field of interest, or your job title or position. Kumamoto University has a place where we can discuss freely, flatly, and happily.

About IRCMS

The International Research Center for Medical Sciences (IRCMS) was established in 2015 as the center of excellence in Kumamoto University for world-class research in life sciences through the internationalization of its research environment and the establishment of global collaborations.

The Center features an open lab layout with few walls and partitions between labs to facilitate communication among scientists. A meeting lounge and an open café on the 1st floor support active, informal scientific exchange between researchers. English is the official language for all seminars and lab meetings to promote international scientific discourse.

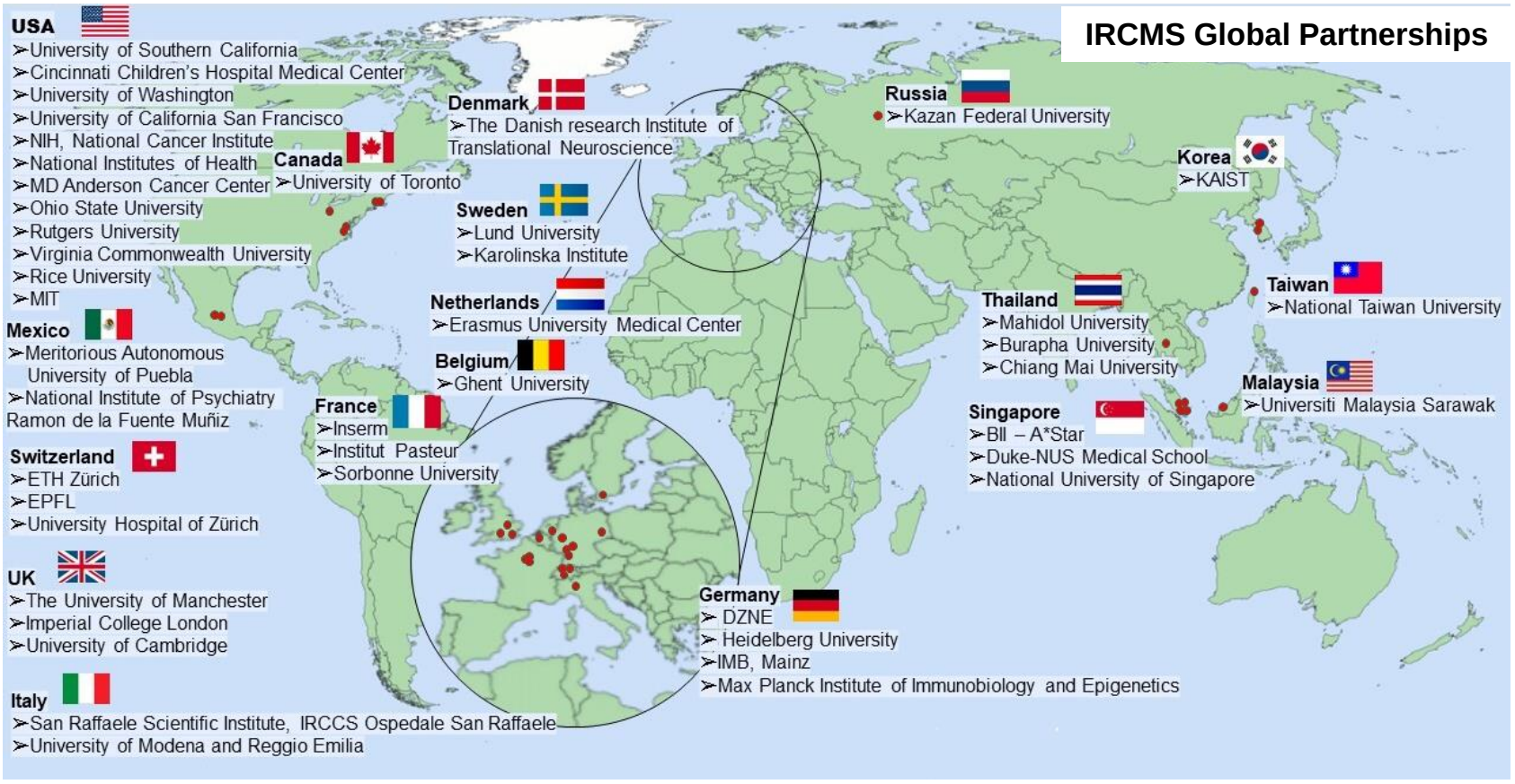
IRCMS is located in the Honjo-Kuhonji area along with Kumamoto University's School of Medicine, the University Hospital, the Joint Research Center for Human Retrovirus Infection, the Institute of Resource Development and Analysis (IRDA) and the Institute of Molecular Embryology and Genetics (IMEG). Through cooperation with these institutes, IRCMS will create a strong collaborative network in the areas of Stem Cell Research, Aging Research, Development Research and Cancer Research.



At present, 12 principal investigators (PIs) and their lab members are conducting research at the Center. IRCMS also aims to establish an international research collaboration network with visiting researchers who hold positions in research institutes abroad. Non-Japanese nationals currently account for 40% of the people working at the Center, excluding visiting researchers, and this number is expected to increase to 50% in the future.

The ultimate goal of IRCMS is to become a successful and innovative role model for the internationalization of academic research. IRCMS is now laying new framework that extends beyond the existing research environment to reach this ultimate goal.

About IRCMS



Open Lab / Core Facility

IRCMS has adopted an "Open Lab" System to stimulate scientific interaction among the scientists and cultivate inter-laboratory collaboration across multiple disciplines. Scientists share lab space and equipment. All of the laboratories and office are visible through the window from the hallway.

To make research equipment sharing and time management efficient, we have established an online booking system and started technical support for cutting-edge technology such as single cell analysis. There is an open café space on the 1st floor to facilitate discussion and networking.


Open Lab


Core facility


Open space


Experiment in the lab

Internship

IRCMS has provided research internship opportunities since 2015 for overseas students who have a strong interest toward the advanced medical research, aiming to raise the interest of IRCMS research and recruit the next generation of young researchers internationally.

We have invited more than 35 interns from 19 countries so far, and some of them came back to IRCMS as Ph.D. course students or Postdoc-Researchers.


Conducting experiment

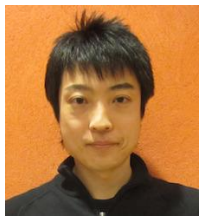

Research instruction

IRCMS Principal investigator

TAKIZAWA Hitoshi
Ph.D.
Professor (Director)
Research Field
Stem Cell Stress

SUDA Toshio
M.D., Ph.D.
Distinguished Professor
Research Field
Stem Cell Regulation

SASHIDA Goro
M.D., Ph.D.
Professor
Research Field
Transcriptional Regulation in Leukemogenesis



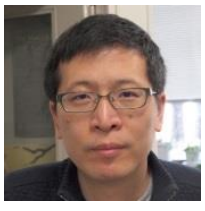
MIHARADA Kenichi
Ph.D.
Professor
Research Field
Proteostasis in Stem Cell

MIZUNO Hidenobu
Ph.D.
Associate Professor
Research Field
Multi-dimensional Imaging

TAKAHASHI Yuta
Ph.D.
Associate Professor
Research Field
Epigenetic Inheritance

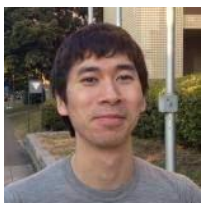
ARIMA Yuichiro
M.D., Ph.D.
Associate Professor (Vice Director)
Research Field
Developmental Cardiology

KURIHARA Hiroki
M.D., Ph.D.
Distinguished Professor
Research Field
Multicellular dynamics



SHENG Guojun
Ph.D.
Professor
Research Field
Developmental Morphogenesis

UMEMOTO Terumasa
Ph.D.
Associate Professor
Research Field
Hematopoietic Stem Cell Engineering



KUROTAKI Daisuke
Ph.D.
Associate Professor
Research Field
Chromatin Organization in Immune Cell Development

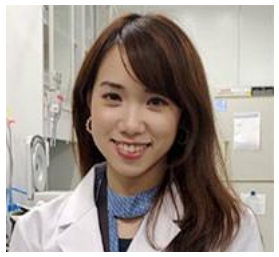
WAKAKUSU Researchers

We started a WAKAKUSU project in April 2024. Our institute will work together to support young researchers to become principal investigators.

<Main Content>
Double mentoring by professors
Instruction on laboratory management
Assistance in preparing applications to obtain research funding
Support for exchanges with overseas researchers

MORISHIMA Tatsuya, M.D., Ph.D
Research Theme:
Epitranscriptome in hematopoiesis

ASAI Rieko, Ph.D
Research Theme:
Cardiac Morphogenesis



LIU Norika, Ph.D
Research Theme:
Macrophages Biology

IRCMS Science Communication Activities

IRCMS is emphasizing the outreach activities of our institute. We value communication-based science. The pandemic experience has made us rethink our trust in science. In general, research in universities and research institutes is not always easy for most people to understand. The same can be said for our institutes, such as basic biology and basic medicine.

Last year, we launched the “Gateway to Life Science” seminar series to develop the science communication skills of all IRCMS staff, and these are available online in Japanese. We aim to make the institute more open to the public through better cooperation between research and non-research staff than ever before.

YouTube

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@IRCMS_KU

Kumamoto University

International Research Center for Medical Sciences,
Kumamoto University
2-2-1, Honjo, Chuo-ku, Kumamoto 860-0811 Japan
E-mail ircms@jimu.kumamoto-u.ac.jp

IRCMS