The 79th Annual Meeting of the Japanese Cancer Association

Day 1

October 1 (Thursday)
In around 1990 Drs. Fearon and Vogelstein proposed the model of genetic alterations by multi hits in colorectal cancer. Since then tumor biologists have strive to prove abnormal functions on oncogenes and tumor-suppressor genes at multi steps during tumor development. In 1999 the 58th Annual Meeting of the Japanese Cancer Association was held at Hiroshima and today's four Japanese speakers, who used to be young, presented their data concerning Ras, p27, SMAD, and β-catenin. During two decades, the technology in medical science and life science has dramatically developed. We now know that many cancer patients indeed have the mutations of driver genes using cancer genome diagnostics. Irrespective the progress of the technology and our understanding for tumor biology, we have not yet provided sufficient and effective anti-cancer drugs to patients. In this symposium five speakers, including Dr. Fearon on the Web, talk about their current research by looking back the past 20 years. All of us hope that the next generation of cancer researchers can overcome the difficult tasks during next two decades.

### Core Symposia

**CS1**

**Molecular carcinogenesis: Footprints and future**

Chairpersons: Eric Fearon (Univ. of Michigan)

Akira Kikuchi (Dept. Mol. Biol. & Biochem., Grad. Sch. of Med., Osaka Univ.)

座長：Eric Fearon (Univ. of Michigan)

菊池 原 (大阪大・医学・分子病態生化学)

In around 1990 Drs. Fearon and Vogelstein proposed the model of genetic alterations by multi hits in colorectal cancer. Since then tumor biologists have strive to prove abnormal functions on oncogenes and tumor-suppressor genes at multi steps during tumor development. In 1999 the 58th Annual Meeting of the Japanese Cancer Association was held at Hiroshima and today’s four Japanese speakers, who used to be young, presented their data concerning Ras, p27, SMAD, and β-catenin. During two decades, the technology in medical science and life science has dramatically developed. We now know that many cancer patients indeed have the mutations of driver genes using cancer genome diagnostics. Irrespective the progress of the technology and our understanding for tumor biology, we have not yet provided sufficient and effective anti-cancer drugs to patients. In this symposium five speakers, including Dr. Fearon on the Web, talk about their current research by looking back the past 20 years. All of us hope that the next generation of cancer researchers can overcome the difficult tasks during next two decades.

**CS1-1** Modeling the Pathogenesis of Human Colorectal Tumorigenesis with Mouse Genetic Models

Eric R. Fearon (1Dept. of Internal Medicine, University of Michigan, 2Dept. of Human Genetics, University of Michigan, 3Dept. of Pathology, University of Michigan, 4Rogel Cancer Center, University of Michigan)

**CS1-2** Visualization of the Receptor Tyrosine kinase (RTK)/Ras/mitogen activated protein (MAP) kinase signaling pathway


受容体型チロシンキナーゼ/嘉四基軸の可視化


**CS1-3** Cell cycle regulation in cancer stem cell as a promising therapeutic target to eradicate cancer


がん幹細胞における細胞周期制御：がん撲滅のための治療標的としての期待

中山 敬一 (九州大・生医研・分子医学)

**CS1-4** TGF-β signaling in progression of cancer


TGF-β シグナルのがん進展における役割

宮原 浩平 (東京大・医・分子病理)

**CS1-5** Wnt signaling and molecular target therapy


Wnt シグナルと分子標的治療

菊池 原 (大阪大・医・分子病態生化学)

### JCA-AACR Joint Symposia

**Sponsored by Princess Takamatsu Cancer Research Fund**

**Room 2**

**Oct. 1 (Thu.) 9:00-11:30**

**AACR1**

**Liquid Biopsy**

Chairpersons: Koshi Mimori (Surg., Kyushu Univ. Beppu Hosp.)

座長：三森 功士（九州大・病院・別府病院・外科）

The cancer genomic medicine project has been globally endorsed and aims to improve the clinical outcomes of intractable cancer patients who acquire resistance to conventional chemotherapies or novel targeted and immunotherapies. However, the personalized and chronicologic monitoring of the dynamics of malignant cells in the body fluid - "liquid biopsy" examination will provide guidance for optimal and timely treatment for cancer patients.

In the United States, in 2015 State of the Union Address, Barack Obama and Joe Biden launched triumphantly the Precision Medicine Initiative to revolutionize the strategies for health improvement and disease treatment. Liquid biopsy is one of the perceptive approaches in their declaration that is intended to implement the analysis of cancer-specific materials, such as cells, extracellular vesicles, nucleic acids, and proteins in a minimally invasive manner through the sampling of blood or other bodily fluids.

In the present JCA-AACR Joint Symposia, we expect diverse discussions on the cutting-edge technology of liquid biopsy, such as the clinical magnitude of cfDNA using large cohort of samples, basic aspects of the detection of mutated cfDNA in cancer patients and the recent technological innovations. We aim to further discuss innovative approaches for future standard diagnostic tools for liquid biopsy development. These deep scientific discussions between AACR and JCA members will strengthen our superb friendship.

**AACR1-1** An overview of the liquid biopsy; the basic traits of cfDNA

Koshi Mimori (Surg., Kyushu Univ. Beppu Hosp.)

**AACR1-2** Helicopter View of Latest Precision Oncology using Liquid Biopsy Technology


**AACR1-3** Applications of circulating tumour cells as a liquid biopsy in lung cancer

Caroline Dive (Cancer Res. UK Manchester Inst., Manchester, United Kingdom)

**AACR1-4** TBD

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The Precision Medicine Initiative in the U.S. defines precision medicine as "an emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person." Research is underway to identify useful biomarkers for precision medicine using genomic data and other omics technologies, and these are expected to be promising fields for future cancer prevention and treatment. Implementation science is required for the effective and efficient incorporation of evidence-based interventions in the omics era into everyday healthcare activities. In this program, after the introduction of implementation science, the current status and future perspective of precision medicine implementation in the U.S. will be presented. We will discuss what is needed to promote research into precision medicine and the strategies required for its implementation in Japan.

**SP1**

**Implementation Science: Improving the Success of Precision Medicine, Cancer Care and Health**


**SP1-1**

**The current status of precision oncology in Japan**


日本におけるがん精密治療の現況

小川 隆文（国立がんセンター・中央病院・先端医療科）

**SP1-2**

**Promotion of implementation research in Japan**

Taichi Shimazu (Ctr. for Public Health Sci., Natl. Cancer Ctr.)

日本における実装研究推進の取り組み

島津 太一（国立がんセンター・社会と健康研究）
Symposia

Oct. 1 (Thu.) 9:00-11:30

Room 5

Exploring the basis of cancer stem cells

Chairpersons:

座長：佐谷 秀行（慶應大・医・先端研・遺伝子制御研究部門）
赤司 浩一（九州大・院医・病態修復内科学）

Cancer stem cells (CSCs) are cells that exist at the top of the hierarchy of cancer cells and are the source of the cancer heterogeneity. Given that CSCs can differentiate into all levels of cancer cells and are the main components of residual tumor after the conventional treatments, their origin, mechanism maintaining their undifferentiated state and the treatment resistance mechanism are the major issues to be uncovered. In this symposium, we would like to hear about the targets and means for controlling CSCs from the speakers who are challenging these fundamental questions.

$S1-1$ Identification of BCAAs metabolism as a critical metabolic machinery for maintaining acute leukemia-initiating cells

ヒト白血病幹細胞維持に必須のアミノ酸代謝経路の解明
菊穂 吉譲, 赤司 浩一 (九州大・病院・遺伝子細胞療法部, 九州大・医・病態修復内科学)

$S1-2$ Polarity protein LLGL2 is a crucial regulator of leucine-dependent proliferation in ER-positive breast cancer cells
Yasuhiro Saito (Inst. Advanced Biosci., Keio Univ.)

ER陽性乳がん細胞において細胞極性タンパク質LLGL2はロイシン依存的細胞増殖の重要な分子である
齋藤 康弘（慶應大・先端生命科学研究）

$S1-3$ Novel approach for cancer therapy by targeting ferroptosis resistance in cancer cells
Osamu Nagano (Div. Gene Reg. IAMR, Keio Univ. Sch. of Med.)

鉄依存性細胞死（フェロトシス）制御機構を標的とした癌治療の新しいアプローチ
永野 修（慶應大・医・先端研・遺伝子制御）

$S1-4$ Defective mitotic regulation facilitates karyotypic evolution of cancer stem cells

分裂期染色体の破壊による幹がん細胞のプロイディ変化
菅野民知, サンペトレア トオビア, 佐谷 秀行, 加藤 昇之 (公財) がん研・研・実験病理部, 慶應大・医・先端研・遺伝子制御)

$S1-5$ Proliferative polyplloid hepatocytes give rise to tumors via ploidy reduction
Tomonori Matsumoto (Oregon Stem Cell Ctr., Oregon Health & Sci. Univ.)

増殖する多倍体肝細胞は倍数性減少を介して腫瘍を発生する
松本 知則（オレゴン健康科学研究オレゴン幹細胞）

$S1-6$ Identification of RHAMM positive proliferative subpopulation within colorectal cancer stem cells

RHAMM陽性大腸癌がん幹細胞系の同定
中野 順太, 菊穂 吉譲, 宮脇 恒太, 水野 晋一, 須田 伸大, 花村 文康, 山口 享子, 山内 拓司, 磯部 大地, 有山 航, 草薙 仁志, 中村 慎史, 前田 高宏, 市場 英司, 赤司 浩一（スタンフォード 大・医・血液内科学, 九州大・医・病態修復内科学, 九州大・医・臨床・腫瘍外科）

$S1-7$ Development of rapid diagnosis of cancer stem cells using double-network hydrogels

ダブルネットワークハイドロゲルを用いたがん幹細胞の迅速診断技術の開発
津田 昇寿, 鈴鹿 淳, 王 賢, 高阪 眞路, 野野 博行, 田中 伸之（北海道大・院医・腫瘍病理, 北海道大・化学反応制御研究 蝕, 北海道大・国際連携研究教育局・ソフトマター, 国立がん研 査・研・細胞情報学）
Molecular basis of targeting oncogenic driver mutation positive cancer

**Chairpersons:** Ryohei Katayama (Div. Of Exp. Chemother., Cancer Chemother. Ctr., Japan) and Charles Joseph David (Tsinghua Univ.)

**Room 6**

**Oct. 1 (Thu.) 9:00-11:30**

**IS1**

**IS1-1**

Mutant Kras co-operates a progenitor-derived enhancer network to initiate pancreatic tumorigenesis


**IS1-2**

Emerging opportunity targeting KRAS mutant cancer

Hiromichi Nakanishi (Div. Mol. Ther., Aichi Cancer Ctr. Res. Inst.)

**IS1-3**

Evasion of KRAS Q61H regulation by tyrosine phosphorylation renders cancer cells resistant to SHP2 inhibitor


**KRA$Q61H変異による$SHP2抑制剤耐性機構解明**


**IS1-4**

e-Met activation leads to the establishment of a TGF Beta-receptor regulatory network in bladder cancer progression


**IS1-5**

Targeting of drug resistant persistor and resistant cells in driver mutation positive cancer


**がん分子標的薬の耐性とその薫るなる抵抗性細胞の解析**

片山 廟平, 藤田 喜也 (公財)がん研・化療研・基礎研究部, 東京大・新領域・メディカル情報情報, (公財)がん研・化療研)

**IS1-6**

Deciphering cancer metabolism and identifying new therapeutic strategies

Zeping Hu (Sch. of Pharm. Sci.)

**IS1-7**

Understanding and Targeting Aberrant mRNA splicing in tumorigenesis

Akihiko Yoshimi (Memorial Sloan Kettering Cancer Ctr., Human Oncology & Pathogenesis Program)

**mRNAスプライシング異常による腫瘍化メカニズムの理解と標的治療**

吉見 昭秀 (M Yourself, HOPP)

Cancer immuno-genomic analysis to understand immune-microenvironment and immune therapy response

Chairpersons: Hidehiko Nagakawa (RIKEN Ctr. for Integrative Med. Sci., Lab. for Cancer Genomics) and Chen Dong (Tsinghua Univ.)

**Room 7**

**Oct. 1 (Thu.) 9:00-11:30**

**IS2**

**IS2-2**

Understanding the immune-stromal landscape of gastric cancer microenvironment by single-cell RNA-seq


**IS2-3**

Defining cellular and molecular dynamics of tumor for the therapeutic reference

Hae-Ok Lee (Dept. BioMed. & HealthSci., The Catholic Univ. of Korea)

**IS2-4**

Immunogenomic analysis of liver cancer


**IS2-5**

Intratumor heterogeneity characterizes immune resistance to adoptive T cell therapy


**IS2-6**

Class I HLA mutational analysis and immunological classification of microsatellite instability-high colorectal cancers


**マイクロsatelitte変異を伴う免疫療法の可能なクラスタークラスI HLA変異解析と免疫療法のステージングの分類**

河津 正人, *上野 史一*, 上野 昭秀, 波江 洋, 石原 聡一郎, 西川 博, 岡部 博, 国立がん研・統計情報研, 東京大・院, 胃腸外科研, 東京大・院, 新領域・メディカル情報情報, 国立がん研・統, 胃腸外科研究一部
**S2 Prospects for cancer research and cancer therapy using genome editing technology**

*Chairperson:* Takashi Yamamoto (Div. Integrated Sci. for Life, Grad. Sch. of Integrated Sci. for Life, Hiroshima Univ.)
Tetsushi Sakuma (Grad. Sch. of Integrated Sci. for Life, Hiroshima Univ.)

Genetic approaches for various organisms and cells have changed in response to progress in genome editing technology using programmable site-specific nucleases such as TALEN and CRISPR-Cas9. In particular, following the development of the CRISPR-Cas9 system in 2012, genome editing technology has rapidly become indispensable for all life science researchers and has been applied in many fields, especially medicine and therapeutics.

Genome editing is based on programmable site-specific nuclease-induced single or multiple DNA double strand breaks (DSBs) and in *cellulo* repair machineries. In addition to these conventional genome editing technologies, tools that enable customized site specific recognition of particular nucleic acid sequences are becoming more widely used, including transcriptional regulation and epigenome editing with the recruitment of epigenetic modifiers. In this symposium, we will focus on genome editing-related technologies that provide multilateral contributions to cancer science, including screening of cancer genes with CRISPR libraries, cell therapeutics in cancer using genome-edited T cells, and creation of database platform for cancer research.

**S2-1 Development of CRISPR-KO screening and its application in oncology research**
*Kosuke Yusa* (Inst. for Frontier Life & Med. Sci., Kyoto Univ.)

CRISPR-KOスクリーニングの開発とがん研究への応用

**S2-2 Designed cancer immunotherapy facilitated by genome-edited T-cell receptor-transduced T cells**

ゲノム編集を利用したTCR-T細胞開発とがん治療

**S2-3 A protein-based transient epithigenic repression of immune-checkpoint molecule and enhancement of anti-tumor activity**
*Yukihito Ishizaka*, *Yoichi Teratake*, *Tetsushi Sakuma*, *Tadashi Yamamoto* (Dept. Intractable Dis., NCGM, Grad. Sch. of Integrated Sci. for Life, Hiroshima Univ.)

組み換えプラト玉質を用いた一時的表現抑制による新規がん免疫療法開発

**S2-4 Development of transcriptional activation platforms of cancer-related genes using Class 1 and Class 2 CRISPR systems**
*Tetsushi Sakuma* (Grad. Sch. of Integrated Sci. for Life, Hiroshima Univ.)

クラス1およびクラス2CRISPRシステムを用いた癌関連遺伝子の転写活性化プラットフォームの開発

**S2-5 Suppression of cancer growth by transcriptional regulation based on gene editing technology**

ゲノム編集を応用した遺伝子の転写調節技術によるがんの増殖阻害

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**S2-6 MYCN/NCYM gene-specific transcription inhibition by CRISPR/dCas9 induces caspase-2-mediated cell death in neuroblastoma.**

CRISPR/dCas9によるMYCN/NCYM遺伝子特異的な転写阻害はcaspase-2を介した神経芽細胞死を誘導する

**S2-7 Development of genome editing data analysis environment for cancer research**
*Hidemasa Bono* (Grad. Sch. of Integrated Sci. for Life, Hiroshima Univ.)

癌研究におけるゲノム編集データ解析基盤の開発

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**Symposia**

Room 8  Oct. 1 (Thu.) 9:00-11:30

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**Chairpersons: Takashi Yamamoto (Div. Integrated Sci. for Life, Grad. Sch. of Integrated Sci. for Life, Hiroshima Univ.)
Tetsushi Sakuma (Grad. Sch. of Integrated Sci. for Life, Hiroshima Univ.)**
The Origin of Epigenetic Alterations: Application to Prevention and Diagnostics

Protecting the public from cancers is a vital mission of cancer research. As a cause of cancer, epigenomic alterations can be as weighty as mutations, as indicated by the insufficient number of driver mutations identified by whole genome sequencing and comparative analysis of genomic and epigenomic alterations. Among the limited agents known or suggested to induce epigenomic alterations, aging is a primary inducer, and chronic inflammation accelerates age-related alterations. In addition, infection can cause inflammation, and the direct impact of viral infection on the cellular epigenome has been unknown until recently. Hormonal exposure is associated with epigenomic alteration, but underlying mechanisms remain obscure. Physiological reprogramming and epigenomic reprogramming during development can lead to epigenomic alterations. In this Symposium, we will discuss etiology of epigenomic alterations, mechanisms of how they induce epigenomic alterations, and strategies to use the knowledge for cancer prevention and early-risk diagnosis.

**S3-2 Epigenetic and RNA regulatory mechanisms by hormones in prostate and breast cancers**


Prostate cancer and breast cancer are major causes of cancer in men and women, respectively. These cancers have been shown to develop from epigenetic alterations. In this session, we will discuss the mechanisms by which hormones regulate epigenetic and RNA regulatory mechanisms in prostate and breast cancers.

**S3-3 Dissecting cancer epigenome by studying in vivo reprogramming**

Yasuhiro Yamada (Inst. of Med. Sci., The Univ. of Tokyo)

Cancer epigenome is a complex system that includes DNA methylation, histone modifications, and non-coding RNAs. In this session, we will discuss the lessons learned from studying in vivo reprogramming in cancer epigenome.

**S3-4 Distinct subgroups of hepatoblastoma related to ectopic Wnt-signaling activation and cell of origin migration signatures**


Hepatoblastoma is a rare childhood cancer that arises from liver precursor cells. In this session, we will discuss the distinct subgroups of hepatoblastoma related to ectopic Wnt-signaling activation and cell of origin migration signatures.

**S3-5 Viral genome rewrites heterochromatin and enhancers of host genome to induce tumorigenesis**


Viruses can cause cancer by integrating their genome into the host genome, which changes the host chromatin structure and activates tumorigenic pathways. In this session, we will discuss how viral genome rewrites heterochromatin and enhancers of host genome to induce tumorigenesis.

**S3-6 Distinct methylation targets by aging and chronic inflammation, and underlying mechanism**


Aging and chronic inflammation are major risk factors for cancer. In this session, we will discuss how distinct methylation targets by aging and chronic inflammation are involved in tumorigenesis and their underlying mechanisms.

Hiyashihiro Shimoshiro (Mct.)
**Luncheon Seminars**

**Room 3**

**LS-1** Chugai Pharmaceutical Co., LTD.

Treatment and resistance of lung cancer with driver mutations
Seiji Yano (Division of Medical Oncology Cancer Research Institute, Kanazawa University)

Chair: Hirotoshi Akita (Department of Medical Oncology, Faculty of Medicine and Graduate School of Medicine, Hokkaido University)

座長：秋田 弘俊（北海道大学大学院医学研究院 附属病理学科）

**Room 4**

**LS-2** Japan Vilene Company, Ltd.

A novel three-dimensional culture for cancer research - Tissueoid cell culture system
Ken-ichi Mukaisho (Division of Human Pathology, Department of Pathology, Shiga University of Medical Science)

Chair: Satoshi Fujii (Department of Molecular Pathology, Yokohama City University Graduate School of Medicine)

座長：藤井 誠志（横浜市立大学大学院医学研究科・医学部 分子病理学）

**Room 5**

**LS-3** GenScript Corporation

The Breakthrough of BCMA-Targeted Immunotherapy in Treating Multiple Myeloma
Frank Fan (Legend Biotech Inc.)

Chair: Alex Liu (GenScript Corporation)

座長：デレックス リュウ（ジェンスクリプト株式会社）

**Room 7**

**LS-4** Eli Lilly Japan K.K.

Utility of CDK4/6 inhibitors in the treatment of breast cancer: from bench to clinics
Junichi Kurebayashi (Department of Breast and Thyroid Surgery, Kawasaki Medical School)

Chair: Maki Tanaka (JCHO Kurume General Hospital)

座長：田中 賢紀（JCHO 久留米総合病院）

**Room 8**

**LS-5** Charles River Laboratories Japan, INC

1) Current status and perspectives of patient-derived rare cancer models
2) Introduction of Fukushima patient derived tumor xenograft (F-PDX®)

1) Tadashi Kondo (Division of Rare Cancer Research, National Cancer Center Research Institute)
2) Motoki Takagi (Fukushima Medical University / Fukushima Translational Research Foundation)

Chair: Yoshikatsu Koga (Exploratory Oncology Research & Clinical Trial Center, National Cancer Center)

座長：古賀 喜勝（国立研究開発法人 国立がん研究センター 先端医療開発センター）
**Symposia**

**Room 1** Oct. 1 (Thu.) 13:00-15:30

**S4** Molecular mechanisms of TKI and ICI resistance and novel therapeutic strategies to overcome the resistance of cancer cell. Treatment in the clinic practice in cancer treatment. However, responsorial have been variable, and intrinsic resistance limits the efficacy. Moreover, in the tumors that do respond well, acquired resistance inevitably develops against target therapies including TKIs and ICIs. Therefore, identification of underlying resistance mechanisms and development of novel therapeutic strategies overcoming resistance have been awaited. In this session, five speakers will present mechanisms of resistance such as mutation/amplification affecting key survival signaling, factors modulating immune response, and also tumor heterogeneity associated with mixed response to target therapies in the same patient. We expect to learn the complexity of resistance, but also find a clue to overcome it.

**Chairpersons:** Naoya Fujita (Cancer Chemother. Ctr., Japanese Foundation for Cancer Res.). Hiromichi Ebi (Div. Mol. Therap., Aichi Cancer Ctr.).

**Speakers:**
- **S4-1** Fusion genes in EGFR-mutant lung cancer
- **S4-2** ARAF activates RAS by antagonizing its binding to the RASGAP NF1
- **S4-3** Inter- and intra-tumor heterogeneity of genetic and immune profiles in hereditary clear cell renal cell carcinoma.
- **S4-4** Novel therapeutic strategy for priming immunogenicity of KRAS/LKB1 mutant lung cancer through M豁1 inhibition
  Shimansu Kirijima (Cell Biol., Cancer Inst., JFRC)
- **S4-5** Regulatory mechanisms of T cell activation by immuno-inhibitory co-receptors

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**Special Programs**

**Room 1** Oct. 1 (Thu.) 15:30-17:30

**SP2** Development of Human Resources for Cancer Genome Medicine


**Speakers:**
- **SP2-1** JSMO activity and achievement for human resource development in cancer genome medicine
- **SP2-2** Our activity of Human Resource Development for Cancer Genome Medicine

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**Room 2** Oct. 1 (Thu.) 13:00-15:30

**SP3** Challenges of JCA towards the development of human resources for Cancer Genome Medicine

Chairpersons: Yoshinori Murakami (Div. Mol. Path., Inst. of Med. Sci., The Univ. of Tokyo)

**Speakers:**
- **SP3-1** Challenges of JCA towards the development of human resources for Cancer Genome Medicine
  Yoshinori Murakami (Div. Mol. Path., Inst. of Med. Sci., The Univ. of Tokyo)
- **SP3-2** Human Resource Development for Genome Medicine by the Japan Society of Human Genetics

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**Room 3** Oct. 1 (Thu.) 15:30-17:30

**SP4** Training of Hereditary Tumor Coordinators by the Japanese Society of Hereditary Tumors

Chairpersons: Yuko Kawakawa, Kouta Tanakaya, Daisuke Aoki, Shinichi Suzuki, Hideyuki Ishida (University of Hgyo, College of Nursing Art & Science, Department of Surgery, National Hospital Organization Iwakuni Clinical Center, Department of Obstetrics and Gynecology, Keio University School of Medicine, Department of Thyroid Endocrinology, Fukushima Medical University School of Medicine, Department of Digestive Surgery, Saitama Medical Center, Saitama Medical University)

**Speakers:**
- **SP4-1** Training of Hereditary Tumor Coordinators by the Japanese Society of Hereditary Tumors
  Yuko Kawakawa, Kouta Tanakaya, Daisuke Aoki, Shinichi Suzuki, Hideyuki Ishida (University of Hgyo, College of Nursing Art & Science, Department of Surgery, National Hospital Organization Iwakuni Clinical Center, Department of Obstetrics and Gynecology, Keio University School of Medicine, Department of Thyroid Endocrinology, Fukushima Medical University School of Medicine, Department of Digestive Surgery, Saitama Medical Center, Saitama Medical University)
The aim of this symposium is to share and discuss the achievements and experiences of rare cancer research and treatments. Matsuda T will discuss the promise and challenge of Asian collaboration. Outcomes in patients with rare cancers are worse, compared with common cancers, and research networks have key roles in the development of treatments and the integration of molecular characterization. Sarcomas are adequate examples of this topic. Kawai will discuss the framework of multicenter sarcoma research groups, reporting a nation-wide registration, multi-institutional joint research, and a cross-boundary society. Matsuda K will demonstrate his successful examples of sarcoma genomics through the Japan Sarcoma Genome Consortium. Rare cancers are more common than other malignancies in children. Hiyama will demonstrate nationwide clinical trials and international collaboration clinical studies for rare childhood malignant solid tumors. Takita will discuss the novel discoveries by the omics-approach, and propose rational therapeutic strategies for neuroblastoma and hepatoblastoma. Asano will talk about the issues young clinicians encounter and discuss how they can be addressed.

**S5-2 Treatment and research for sarcomas, the representative rare cancers, in Japan**
Akira Kawai (Dept. Musculoskeletal Oncol. Natl. Cancer Ctr.)

**S5-3 Japan Sarcoma Genome Consortium**
Keiichi Matsuda (Grad. Sch. of Frontier Sci., Tokyo Univ.)

**S5-4 Nationwide and International Cooperative Studies for Childhood Malignant Solid Tumors**

**S5-5 Genetic analysis of pediatric solid tumors**

**S5-6 Rare Cancer Research by Young Clinicians: A Case of Sarcoma Research**
### Special Symposia

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<td><strong>SS2</strong></td>
<td><strong>Women scientists in cancer research</strong></td>
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| **Chairpersons:** | Ricko Ohki (Lab. of Fundamental Oncology, Natl. Cancer Ctr. Res. Inst.)  
Etusko Kiyokawa (Oncologic Path., Kanazawa Med. Univ.) |
| **座長：** | 大木 理恵子（国立がん研究センター・基礎研究学ユニット）  
清川 悦子（金沢医大・医・病理学センター） |

It has long been a major issue that the number of women scientists, especially principal investigators (PIs), is low in Japan compared with other countries. Therefore, the Japanese Cancer Association (JCA) has been making an affirmative action to expand the population of women scientists in cancer research, and a series symposium “Women scientists in cancer research (WSCR)” has been held every year since 2014. The purpose of this symposium is to introduce high-quality scientists carried out by active women scientists to enlighten and encourage the next generation. For this 7th symposium, we have selected four women scientists from the open applicants, and the presenter will orally present their cutting-edge cancer research. The most outstanding presenter will be awarded the WSCR Symposium Award from JCA. We will also have two special lectures by Professors Kyoko Hida (Hokkaido University) and Keiko Nakayama (Tohoku University).

| **SS2-1** | Cell cycle-related kinase reprograms liver immune microenvironment to promote cancer metastasis  
Jingjing Zhou, Xuezhen Zeng, Alfred S.L. Cheng (Sch. of Biomed. Sci., The Chinese Univ. of Hong Kong) |
| **SS2-2** | CDX2 as a Prognostic and Predictive Biomarker in Colon Cancer  
Junko Mukohyama, Dalerba Piero (Dept. Path. & Cell Biol.)  
CDX2は大腸癌の予後・治療効果予測因子である  
向山 照子、ピエロ ダーブラ (Columbia Univ.) |
| **SS2-3** | Multi-modal cancer cell-intrinsic molecular programs correlate with immunotherapy efficacy  
Junna Ohy1) (Keio Univ. Sch. of Med., "The Univ. of Texas MD Anderson Cancer Ctr."  
多機能の制御機構を持つ癌細胞由来の分子学的特徵と免疫療法の効果との関連  
大場 純奈1) (慶應大・医・腫瘍セ, テキサス州立大・MD アンダーソン癌センター) |
| **SS2-4** | Alpha-radioimmunotherapy against HER2 positive liver metastasis of gastric cancer  
Huizi Li, Sumitaka Hasegawa (Radiation & Cancer Biol. Group, NIRS, QST)  
HER2陽性胃がん肝転移に対するα線放射免疫療法  
李 晗子, 菱谷川 純奈（理研・放射線研・放射線がん生物グループ） |
| **SS2-5** | Tumor endothelial cell abnormality as the therapeutic target  
治療標的としての腫瘍血管内皮細胞の異常性  
階田 京子（北海道大・院医・血管生物分子病理） |
| **SS2-6** | What we learned from a colorectal cancer patient  
Keiko Nakayama, Ryo Funayama, Yasushi Mochizuki, Minoru Kobayashi (Tohoku Univ., Grad. Sch. of Med.)  
大腸がん患者から学んだこと  
中山 啓子, 舟山 聡, 望月 保志, 小林 実（東北大・医） |

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### JCA Women Scientists Award Lecture

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<th>Room 3</th>
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<td><strong>JWSA</strong></td>
<td><strong>JCA Women Scientists Award Lecture</strong></td>
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| **Chairpersons:** | Yae Kanai (Dept. Pathol. Keio Univ. Sch. Med.)  
座長：金井 弥栄（慶應大・医・病理） |
| **JWSA** | Development of novel therapeutic strategies of intractable pediatric cancers based on the molecular basis  
Junko Takita (Dept. Pediatrics, Kyoto Univ.)  
難治性小児がんにおける分子病態に立脚した新規抗癌法の開発  
田田 重子（京都大・医・発達小児科学） |
**SST2**

**Breast cancer microenvironment and systemic response, and new therapeutic approaches**


座長：戸井 雅和（京都大・院医・乳腺外科学）
佐伯 結昭（堺玉医大・国際医療センター 乳腺腫瘍科）

In this session, we focus on breast cancer associated molecular events and systemic responses that occur in the tumor microenvironment, and on new therapeutic approaches. These topics will be presented by representative researchers in Japan in this field. The contents include role of estrogen in the induction of mammary ductal dysplasia, clonal evolution from ductal epithelial proliferative lesions to cancer, RNA regulatory mechanisms in hormone-dependent breast cancer, and their effects on treatment and role of autonomic nervous system in microenvironment.

The immune microenvironment, an extremely important topic, especially on its prognostic significance, will be then presented and discussed.

As to development of treatment, three major items will be high-lightened; frontier of anti-HER2 treatment, various new therapeutic targets in gene repair mechanism and the cutting edge in immuno-oncology therapies. Tumor heterogeneity arises in the tumor microenvironment. These findings are important in predicting the onset of breast cancer, prognosis, and predicting therapeutic effect, and also for identifying novel therapeutics and overcoming therapeutic resistance. We believe that this session would help to advance breast cancer researches and improve survival outcomes of breast cancer patients.

---

**SST2-1**

**Tumor promoting effect of macrophages in a mouse early breast cancer model**

Junji Ito (LMLS, IBRI, FBRI)

マウス初期乳癌モデルでのマクロファージの働き

伊東 達二 (FBRI・先端医療研究セ・老化機構)

**SST2-2**

**Clonal evolution of proliferative lesions into breast cancers**


乳癌上皮増殖性病変から乳癌へ至るのプローフイズ

西村 友美¹，拝内 伸之²，吉田 健一³，竹内 康英⁴，前田 結奈⁵，垣澤 裕之⁶，平田 勝啓⁶，片岡 鐘利⁷，松井 孝幸⁸，馬場 郎子⁹，竹内 賢吾¹⁰，羽賀 博典¹¹，宮野 信¹²，戸井 雅和¹³，小川 結司¹⁴（京都大・医・腫瘍生物学・京都大・医・乳腺外科・京都大・医・病理診療科）（九州）がん研究・研究・分子標的病理プロジェクト、（東京大・医・ヒトゲノム解析センター、（関東心電病院・病理部）

**SST2-3**

**Targeting DNA repair pathways for new cancer treatment**


遺伝子修復を標的とする新しい治療法の開発

三木 義男，沢田 成俊，中西 啓 （東京医科大・難病・分子遺伝）

**SST2-4**

**Roles of RNA regulatory mechanisms in progression of hormone-dependent breast cancer**


ホルモン依存性乳癌における治療抵抗性の獲得とRNA制御の役割

川口 義二，井上 聡（虎の門病院・乳腺内分泌外科・東京健康長寿医療センター・システム加脇医、堺玉医大・ゲノム医学研究センター・ゲノム応用医）

**SST2-5**

**The therapeutic capability of amino acid uptake in ER+ breast cancer, we focus on breast cancer-associator**

Yasuhiro Saito (Inst. Advanced Biosci., Keio Univ.)

ER陽性乳がんにおけるリシン取り込みとその治療標的としての可能性

齋藤 康弘（慶應大・先端生命科学研究）

**SST2-6**

**Development of HER2 targeted therapy**

Kenji Tamura (Innovative Cancer Ctr., Shimane Univ. Hosp.)

抗HER2療法の進展

田村 研治（福島県立医大・医・腫瘍内科）
**International Rare Cancer Symposium**

**IRCS**
International and domestic collaboration to promote rare cancer drug development with precision medicine (JCA-JSCO-JSMO-RCJ Joint Session)

Chairpersons: Toshirou Nishida (Surg., JCHO Osaka Hosp.)

座長：西田 俊朗（独立行政法人 地域医療機能推進機構 大阪病院・外科）
松山英三（広島大・自然科学研究支援開発センター・研究開発部門）

**IRCS-1**
Precision medicine and reference centers in sarcoma
Jean Yves Blay (Dept. Med., Ctr. Leon berard Lyon France)

**IRCS-2**
PMDA activities for facilitation of orphan drug development for rare cancers
Megumi Ishiguro (Pharmaceuticals and Medical Devices Agency (PMDA))

**IRCS-3**
Establishment of Rare Cancer Center for rare cancer networking
Nariaki Matsuura, Masyuki Ohue (Osaka Internatl. Cancer Inst.)

**IRCS-4**
Actions of Rare Cancers Japan to realize medical care that patients need
Yoshivui Majima (Rare Cancers Japan)

**IRCS-5**
Cancer in children and AYA generation
Atsushi Manabe (Dept. Pediatrics, Hokkaido Univ. Graduate School of Medicine)

**IRCS-6**
The approach of indication expansion in rare cancer by data utilization of investigator initiated Studies and data based studies
Hironobu Suito (Corporate Officer, Head of Med. Affairs Div., Daiichi Sankyo Co., Ltd.)

**Symposia**

**S6**
Microbiome, Cancer, and Immunoncology

Chairpersons: Takuki Yamada (2, Tokyo Inst. of Tech.)
Shinichi Yachida (Dept. Cancer Genome Informatics, Osaka Univ., Grad. Sch. of Med.)

座長：山田 拓司（東京工業大・生命理工学院）
谷内田 真一（大阪大・院医・がんゲノム情報学）

The microbiome is defined as the collective genomes of microbes within a community, whereas the gut microbiome had been used for several recent studies demonstrating the influence of the gut microbiome, specifically on the response to immunoncology. This current session, we invited five experts and active researchers in this field and would like to discuss the current statuses of links between microbiome, cancer, and immunity.

**S6-1**
Metagenomic and metabolomic analyses reveal stage specific phenotypes of the gut microbiota in colorectal cancer

**S6-2**
The gut microbiome and colorectal cancer.
Moreno Zollo, Andrew Maltez Thomas, Paolo Manghi, Levi Waldron, Alessio Naccarati, Nicola Segata (Dept. CIBIO, Univ. of Trento, Trento, Italy, 'Biochem. Dept., Chemistry Inst., Univ. of Sao Paulo, Brazil, 'Italian Inst. for Genomic Med., Turin, Italy, 'Grad. Sch. of Public Health, City Univ. New York, USA)

**S6-3**
TBD

**S6-4**
Toward Integrative Analyses of Microbiota, Environment, Immunity, and Tumor for Precision Medicine
Shuji Ogin (Dept. Path., Harvard Univ.)

**S6-5**
Gut microbiome as a novel biomarker among NSCLC patients treated with immune checkpoint inhibitor

がん免疫療法を受ける進行肺癌患者における腸内細菌叢のバイオマークーカーとしての有用性に関する検討
箱崎 優次, 藤見 博行, 大熊 一郎 (東京都立胸病院・呼吸器内科, 国立がん研・中央病院・呼吸器内科)
Research expansion in the field of patient-derived models of cancer

Lijian Hui (Shanghai Inst. of Biochem. & Cell Biol., Chines Academy of Sci.)

座長：岡本 康司（国立がん研究 研・がん分化制御解析分野）
Lijian Hui (Shanghai Inst. of Biochem. & Cell Biol., Chines Academy of Sci.)

Patient-derived cancer models are becoming essential platforms for both basic and translational cancer research. Recent development of patient-derived tumor in vitro cultures (e.g., sphere and organoid 3D models), as well as in vivo patient-derived xenograft (PDX) models, provides researchers an opportunity for in-depth investigations on molecular basis and therapeutic strategies of cancers. For basic research, the patient-derived models accelerate investigation on important aspects of cancer biology, such as intra-tumor and inter-tumor heterogeneity or the tumor microenvironment. For translational research, the models provide an improved platform to study clinically-relevant therapeutic response, thus facilitating personalized medicine of cancer via biomarker discovery and drug development at preclinical phases. In this session, we will present recent progress in the field of patient-derived cancer models and explore future directions of cancer research through these models.

IS3-1 Identification of subpopulations in patient-derived breast cancer stem-like cells by using RNA sequencing

IS3-2 In vitro models for liver cancer research
Lijian Hui (Shanghai Inst. of Biochem. & Cell Biol.)

IS3-3 Efficient use of patient-derived organoids for investigation of normal and neoplastic tissues of gynecologic organs

IS3-6 Identification of chemoresistant populations of refractory tumors via single-cell analyses of patient-derived models

IS3-7 Organoids as a digestive cancer model
Ye-Guang Chen (Sch. of Life Sci., Tsinghua Univ.)

International Sessions

Room 6 Oct. 1 (Thu.) 13:00-15:30

IS3-1 Identification of subpopulations in patient-derived breast cancer stem-like cells by using RNA sequencing

IS3-2 In vitro models for liver cancer research
Lijian Hui (Shanghai Inst. of Biochem. & Cell Biol.)

IS3-3 Efficient use of patient-derived organoids for investigation of normal and neoplastic tissues of gynecologic organs

IS3-6 Identification of chemoresistant populations of refractory tumors via single-cell analyses of patient-derived models

IS3-7 Organoids as a digestive cancer model
Ye-Guang Chen (Sch. of Life Sci., Tsinghua Univ.)
IS4-1 The role of tRNA derived small RNA in intestinal homeostasis and tumorigenesis

Jinghao Sheng, Yaxing Liu, Jun Sun, Xiaoliang Shi, Zhengrong Yao, Jingzhou Chen, Rongpan Bai (Dept. Surg. Oncology, SO)

IS4-2 Epitranscriptome Analysis Using Single-Molecule Quantum Sequencer

Masateru Taniguchi (ISIR, Osaka Univ.)

1 分子量子エッセンスによる化学修飾miRNAの解析

谷口正輝（大阪大・産研）

IS4-3 Unit polynon complex (uplC) nanocarrier for siRNA delivery to glioblastoma and pancreatic cancer


siRNAを特異性由来変異、脳腫瘍に特異的集積をさせ治療する分子

渡邉 秀美(1,2,3), 林 小太郎(1,2), 藤 佳子(1), キム ヒュンジン(1), 宍谷 宏行(1), 森島 亜希子(1), 胡 恭佑(1), 近藤 聖(2), 小倉 里美(3), カプラルオランオ(1,2), 西山 知弘(2), 萩谷 空地(3), 片岡 一則(2,3) (東京大・医・脳腫瘍生命工学、帝京大・医・内科、ナノ医療商品化センター、COINN、第一三共(株)信頼性保証本部、東京大・工、マテリアルソルューション、名古屋大・院医、工・イオンエンジニアリング、製薬工学、東京大・未来ビジョン)

IS4-4 Urinary microRNA ensemble for cancer detection and localization


安井 隆雄（名古屋大・院工・生命分子工学専攻）

IS4-5 MTOR signaling orchestrates stress-induced mutagenesis facilitating adaptive evolution in human cancers

David M Thomas (Cancer Theme, Garvan Inst. of Med. Res.)

IS4-6 New era of microRNA-based liquid biopsy for chemoresistance in gastric cancer


血中過剰型miRNAを用いた胃癌の抗がん剤感受性予測と抗がん薬治療

小松 周平(1), 西村芳史(1), 木内 純(2,3), 高岡 祐司(2), 今村 泰輔(4), 大橋 拓馬(5), 有田 智洋(6), 小西 博貴(6), 境田 英(7), 坂田 健(7), 藤原 聡(7), 郎本 和真(7), 大久 英浩(1)（京都府立医科大学・消化器外科、京都第一赤十字病院・外科）

IS4-7 Analysis of the prognostic effect of CIK cell immunotherapy in cancer patients


IS4-8 Evaluation of Genexus NGS system that automates specimen-to-report for cancer genomic profiling using liquid biopsy

Siew-Kee Low, Ken Uehibori, Rei Hayashi, Hiu Ting Chan, Ryo Ariyasu, Satoru Kizadono, Noriko Yanagita, Makoto Nishio, Yusuke Nakamura (Cancer Precision Med. Ctr., JFCR, Tokyo, Japan, “The Cancer Inst. Hosp. of JFCR, Tokyo, Japan”)

Room 6-7
The insider’s guide to Nature Cancer
Alexia-Ileana Zaromytidou (Nature Cancer, Nature Research)

Moderator: Sayaka Yamane (Institutional Marketing, Springer Nature)

The true nature of cancer cells that can be revealed only by live imaging
Chairpersons: Michiyuki Matsuda (Lab. of Bioimaging & Cell Signaling, Grad. Sch. of Biostudies, Kyoto Univ.)
Takeshi Imamura (Dept. Mol. Med. for Pathogenesis, Ehime Univ. Grad. Sch. of Med.)

座長：松田 道行（京都大・院生科学・生体診断学）
今村 健志（愛媛大・医学・分子病理医学講座）

Heterogeneity is one of the most popular keywords in the modern cancer research. For example, resistance to chemotherapy has long been attributed to the heterogeneity of cancer cells. Immunostaining routinely shows differential expression of proteins among cancer cells, of which importance has rarely been addressed. Is that caused by the heterogeneity in genomes, transcriptional states, transient activation of signaling molecules, or else? The easiest approach to answer this question is “Let's see for a while”. If the difference is caused by the mutations, the difference among cells will sustain for hours and days. If the difference is caused by signaling states, you will see changes in a short time range. Recent advent in live cell imaging technique enables the researchers not only to observe the same cells as long as months, but also to visualize the cellular function and molecular activities. These live imaging techniques are now unravelling the cause and result of the heterogeneity among cancer cells and will pave a way to invent novel approaches for cancer treatment.

S7-1 Microfluidic single-cell microscopy and Raman spectroscopic omics applied to the study of cancer persistence
Yusuke Wakamori (Grad. Sch. of Arts & Sci., Univ. of Tokyo)

S7-2 Separase deregulation-induced chromosome nondisjunction in cancer cells
Noroisa Shindo, Toru Hirota (Div. Exp. Pathol. Cancer Inst, JFCR)

S7-3 Imaging of Hypoxic Tumor

S7-4 Defects in kinetochore property in cancer cells related to chromosomal instability
Masanori Ikeda, Kozo Tanaka (Dept. Mol. Oncol., IDAC, Tohoku Univ.)

S7-5 Reversible EMT-MET biosensor-mediated imaging visualizes inducible resistance to chemotherapy with hybrid E/M phase

EMT-MET 可視化バイオセンサを用いたヒybridE/M 状態での化学療法抵抗性をリアルタイムイメージングにより解明する

S7-6 Observing individuality in cell society
Asako Sakaue-Sawano, Atsushi Miyawaki (Lab. for Cell Function Dynamics, CBS, RIKEN)

細胞の個性を理解するための技術開発

The transcriptional differential to...
### Symposia

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<td><strong>S8</strong></td>
<td>Cardio-Oncology research ~ How to start bidirectional studies between bench and bedside</td>
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Hiroshi Hosoda (Dept. Regenerative Med. & Tissue Engineering, Natl. Cerebral & Cardiovascular Ctr. Res. Inst.)

座長：上田 保仁（国立がん研究センター・がん患者病態生理研究分野）

The past few decades have seen substantial improvements in cancer survival. With longer survival, however, cardiovascular diseases (CVD) such as cardiomyopathy, arrhythmia, arterial disease, and hypertension can manifest due to cancer treatment-related toxicities, and impact quality of life and overall survival. Given improving the growing burden of CVD in the survivor population, attention to cardiovascular reserve has become increasingly important. Cardiovascular reserve may be affected by multiple treatment and patient factors. Similar trends are seen in childhood and young adult cancer survivors, largely attributable to exposure to cardiovascular toxic effects of therapies as well as the development of cardiovascular risk factors later in life. The effective strategies for cancer treatment-related cardiovascular diseases (CTRCD) remain to be elucidated in the emerging field of cardio-oncology. We remain in need of studies to elucidate the pathological mechanism of various cardiovascular toxicities and understand of monitoring and management of CTRCD. The purpose of this symposium is to advance new, innovative and appropriate methods for prevention, diagnosis, and therapy of CTRCD.

<table>
<thead>
<tr>
<th><strong>S8-1</strong></th>
<th>Relationship between cancer and arrhythmia</th>
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<td>Masaaki Shoji (Int. Med., NCC)</td>
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がんと不整脈

庄兵 正昭（国立がんセンター・中央病院・総合内科）

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<th><strong>S8-2</strong></th>
<th>New strategy for Cardio-Oncology study; the combination of big data analysis and basic research</th>
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<td>Yuki Iwata-Ishizawa, Yoshio Zamami, Takahiro Niimura, Mitsuhiro Goda, Kenta Yagi, Masayuki Chuma, Masaki Imamishi, Keisuke Ishizawa</td>
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ビッグデータ解析と基礎研究を融合した新たな研究手法による腫瘍循環器学へのアプローチ

石澤 有紀（国立がんセンター・中央病院・総合内科）

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<th><strong>S8-3</strong></th>
<th>Current challenges of iPSC-Based cardio oncology research</th>
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<td>Yasunari Kanda (Div. Pharmacol., NIH)</td>
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IPS細胞技術を活用したCardio oncology 研究

中園 泰成（国立療研・薬理）

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<th>Cardiac Late Effects of Childhood Cancer</th>
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<td>Chikako Kiyotani (Children’s Cancer Ctr., Natl. Ctr. for Child Health &amp; Development)</td>
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小児がん循環器晚期合併症

原谷 知貴子（国立成育医療研究センター・小児がん）
**The Young Investigator Awards Lectures**

**Room 10**  
Oct. 1 (Thu.) 13:00-15:30

**YIA The Young Investigator Awards Lectures**  
日本癌学会奨励奖受賞講演

Chairpersons:  
Okio Hino (Juntendo Univ.)  
Masaki Mori (Dept. Surg., Kyushu Univ.)

**YIA-1**  
Development of diagnostic models for solid cancers using circulating microRNAs  
Junataro Matsuzaki (Diabetes Ctr., Univ. of California, San Francisco)

血中microRNAによる固形臓器の早期診断モデルの構築  
松崎 俊太郎 (カリフォルニア大学 サンフランシスコ総合医学研究所)

**YIA-2**  
Exploring the biological roles of extracellular vesicles carrying nucleic acids in ovarian cancer  

卵巣がんにおける核酸運搬細胞外小胞の機能解析と臨床応用  
横井 晃 (名古屋大学・医学総合研究所)

**YIA-3**  
A novel metabolic pathway enhancing colorectal cancer growth  
Kenji Oshima (Dept. Pathol. Osaka Univ.)

大腸がんの増殖を促進する新たな代謝経路の解明  
大島 健司 (大阪大学・医学部病理学)

**YIA-4**  
The past and future of cancer genome analysis platform  

がんゲノム解析プラットフォーム開発のこれまでとこれから  
白石 友一 (国立がん研究センター・ゲノム解析基礎)

**YIA-5**  
Elucidation of the antigen-specific immunosuppression mechanism in the tumor microenvironment  

腫瘍微小環境における抗原特異的免疫抑制機構の解明  
前田 優香 (国立がん研究センター・腫瘍免疫研究分野)

**YIA-6**  
Tissue remodeling by positively selected clones in esophagus and colon  

遺伝子変異クローンによる食道および大腸組織の再構築の解明  
垣内 勝之, 横山 鈴音, 内野 基, 木原 多佳子, 赤木 宏太朗, 井上 滋, 平野 智也, 廣田 謙一, 田中 浩志, 内田 浩, 宮野 晃, 島村 洋, 小川 賢司 (京大・医・腫瘍生物学, 京大・医・消化器, 京大・医・腫瘍内科, 京大・医・癌化学, 京大・病院病理学, 京大・医・医学, 京大・医・ヒトゲノムセンター)

**YIA-7**  
Development of new biomarker for pancreatic cancer based on epitranscriptome  
Masamitsu Konno (Grad. Sch. of Med. Osaka Univ.)

エピトランスクリプトーム情報に基づいた新規標識分子バイオマーカーの開発  
今野 隆人 (大阪大学・医学・先端癌生物療法開発学)

**YIA-8**  
Elucidation of mechanism of near infrared photoimmunotherapy and its applied research development  

近赤外光免疫療法の機構解明と応用開発研究  
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