Day 2
October 2 (Friday)
Cutting edge of stomach carcinogenesis

Gastric cancer is globally the third most common cause of cancer-related death. Although the incidence has been declining, nearly one million new cases are reported worldwide every year. The highest incidence is found in Eastern Asia, Eastern Europe and South America. Gastric cancer develops as a result of multiple genetic and epigenetic alterations. Using high-throughput sequencing technology, molecular subtypes have been identified that link to therapeutic strategies. Trans-ethnic genome analysis reveals uncharacterized impact of germline variants and their interactions with lifestyle in high-risk areas. CagA protein of Helicobacter pylori plays a crucial role in stomach carcinogenesis. Because the process of stomach carcinogenesis is in a stepwise fashion, appropriate mouse models are needed. One important issue is the diffuse-type gastric cancer in young populations. In this symposium, top researchers in this field will present their most recent research findings. Deeper insights of genetics and biology will bring suitable prevention and optimal cures for gastric cancer.

**CS2-1**
**Pathogenesis of Chromosomal Instability in Gastric Cancer: Links to Therapeutic Strategies**
Adam J Bass (Dept. Med. Oncology, Dana-Farber Cancer Inst.)

**CS2-2**
**TBD**
Daehye Hwang (Dept. Biological Sci., Seoul Natl. Univ.)

**CS2-3**
**Mechanism underlying “Hit-and-Run” gastric carcinogenesis by the Helicobacter pylori CagA oncoprotein**

**CS2-4**
**Genomically defined Environmental and Germline Factors for Asian Gastric Cancer**
Shumpei Ishikawa (Preventive Med. Univ. of Tokyo)

**CS2-5**
**Mouse models of gastritis and gastric cancer and relationship to human pathogenesis**
Yuku Hayakawa, Masahiro Hata, Mayo Tsuibo, Kazuhiko Koike (Dept. Gastroenterology, The Univ. of Tokyo)

**CS2-6**
**Special Remarks**
Fiichi Tahara (Chairman, Hiroshima Cancer Seminar Public Interest Incorporated Foundation)

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**JCA-AACR Joint Symposia**
**Sponsored by Princess Takamatsu Cancer Research Fund**

**Room 2**
Oct. 2 (Fri.) 9:00-11:30

**AACR2**
**Cancer Model System: Organoid**

Chairperson: Toshiro Sato (Dept. Organoid Med., Keio Univ. Sch. of Med.)
座長：佐藤 徹朗 (慶應大・医・オルガノイド医学)

Recent advances in sequencing technology delineated the genetic abnormality of human cancers. However, there remains a gap between genetic abnormalities and clinical cancer phenotypes due to a paucity of disease models that can recapitulate a variety of biological aspects of clinical cancers. Organoid technology was originally developed to regenerate tissue-like structures from pluripotent stem cells or tissue stem cells. Recent works demonstrated that organoids can be derived from patient cancer tissues without losing their original biological traits, such as drug sensitivity, pathohistology, cancer stem cell hierarchy, and metastatic potentials. Furthermore, prospective genetic engineering with CRISPR-Cas9 has begun to reveal causal relationships between genetic abnormalities and cancer phenotypes. In this symposium, four distinguished speakers will present their novel findings using cancer organoids. These presentations will cover how we apply organoid technology to cancer research, how genetic abnormalities lead to the biological phenotypes, and how we develop a therapeutic strategy using patient-derived cancer organoids.

**AACR2-1**
**Deepening insights of cancer biology using patient-derived cancer organoids**
Toshiro Sato (Dept. Organoid Med., Keio Univ. Sch. of Med.)

**AACR2-2**
**Elucidation and control of cancer ecosystem using artificial cancer tissue**
Keisuke Sekine (Natl. Cancer Ctr. Res. Inst.)

**AACR2-3**
**Pancreatic Cancer Organoids: Models and Solutions**
David A. Tuveson (Cold Spring Harbor Lab., Cold Spring Harbor, New York)

**AACR2-4**
**Patient-Derived Organoids for Precision Oncology**
Nicola Valeri (The Inst. of Cancer Res., Belmont, Sutton Surrey, United Kingdom)
### Special Symposia

**SS3**  
Cancer immunotherapy -past, present, and future-  
がん免疫療法の成果・課題と今後の展開


**Room 3**  
Oct. 2 (Fri.) 9:00-11:30

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| SS3-1 | Dynamics of CD8+ T cell subsets correlated with clinical response to anti-PD-1 antibody  
PD-1抗体の治療効果と相関するCD8+T細胞サブセットの動態  
河上 裕雄 (国際医療福祉大学・医/免疫学講座・分子細胞免疫学研究室・基礎医療研究部) |
| SS3-2 | Development of biomarkers and cancer immunotherapies targeting immunosuppressive mechanisms in tumors  
免疫抑制機構を標的としたバイオマーカーと新規治療法開発  
西川 博男 (国立がん研究センター・免疫学研究部) |
| SS3-3 | Immune metabolism-based responsive biomarkers and mechanistic analysis of anti-tumor immunity  
免疫代謝を考慮したバイオマーカー開発と抗腫瘍免疫メカニズム解析  
島本 健司 (京都大学・院医・免疫ゲノム研究所) |
| SS3-4 | Adoptive Cell therapy with gene engineered T cells  
Hiroshi Shiku (Personalized Cancer Immunotherapy, Mie Univ. Grad. Sch.)  
遺伝子変換T細胞の輸注療法  
玖玖 洋 (三重大学院 医学系 総合免疫学) |
| SS3-5 | Cross talk between PRC2 and SWI/SNF in cancer immunity and immunotherapy  
Weiping Zou (The Univ. of Michigan)  
普位蔵 (北里大学)  
染色体の脳細胞免疫と免疫療法との関連性について |
Exosome-based cancer diagnosis and therapies


Cancer research has found a novel platform in studying exosomes, one of the 50–150 nm membrane-bound extracellular vesicles (EVs), secreted by cells as molecular messengers. These EVs may act as signaling conveyors between cells by transporting molecular cargo in the form of proteins, RNAs, DNAs, and lipids. The several complicated roles of exosomes in normal physiology and disease state are becoming clearer. Their role in cancer biology is being found to range from sending pro-migratory messages between cancer cells and to stromal cells to aid in the growth and invasion of tumor cells in tumor microenvironment. Tumor exosomes are implicated in angiogenesis, metastasis, drug resistance, immune circumvention, and tumor pathogenesis. In this International Session, researchers in Asia are discussing the importance of understanding exosomes, as they connect to cancer, as a tool for discovering cancer biomarkers, elucidating the molecular mechanisms of cancer biology, identifying therapeutic targets, and using exosomes themselves as a mode of therapy against cancer.

Exosomal protein in cancer: exosome-mediated metastasis and biomarker potential

Akihisa Yoshino (Dept. Life Sci. & Tech., Tokyo Inst. of Tech., Dept. Pediatrics, Well Corell Med.)

Extracellular matrix-mediated metastatic niche formation

Tang-Long Shen (Dept. Plant Pathol. & Microbiol., Natl. Taiwan Univ.)

New technology for analysis of extracellular vesicles towards clinical diagnosis


Bacterial Exosomes as Next-Generation Cancer Immunotherapy

Yong Song Gho (Dept. Life Sci., POSTECH, Republic of Korea)

MSC exosomes: a foe or friend of cancer?

Sai-Kiang Liu (Inst. of Molecular & Cell Biol.)

A novel approach for liquid biopsy by using nuclear derived exosomes in ovarian cancer


Exosome and DNA-damage repair deficit to promote ovarian cancer development

Tae Young Kim (Dept. Obstetrics & Gynecology, KU Hosp, Dept of Obstetrics & Gynecology, Seoul, Korea)

Innovative exosome-based therapeutics; Local oncolytic adenovirus therapy inducing the abscopal effect via exosome


Development of the exosomal mutated protein panel for colorectal cancer liquid biopsy


Extracellular vesicle chemical markers for liquid biopsy in gastric cancer

Kan Yanchung (MIRES Lab. Pte Ltd Singapore)
Takuro Poster

Impact of mouse models on cancer biology and therapeutics

Yasuhiro Yamada (Div. Stem Cell Path., Inst. of Med. Sci., The Univ. of Tokyo)

座長：中村 卓郎（公財）がん研・研・発がん研究部
山田 泰広（東京大・医科研・先端病態モデル研究分野）

Mouse models have provided valuable information to study the development and progression of cancers and to test new treatments. Although next-generation sequencing technology has brought remarkable advances in our understanding of the genome-wide profiles of mutations and epigenetic alterations in diverse types of cancer, the functional consequences of the observed genetic/epigenetic aberrations during cancer development are not fully understood, especially at an organismal level. Taking advantage of mouse genetics and genome editing technology in combination with comprehensive analysis of genome composition and epigenetic modifications, recent studies unveiled the impact of genetic/epigenetic aberrations during human cancer development in various organs comprising multiple cell types of the murine counterpart, which also uncovered promising therapeutic targets. This symposium aims to introduce recent progress in cancer research using mouse models and to discuss future challenges.

S10-1 Analysis of pancreatic cancer development in genetically engineered mice
Hiroshi Seno, Satoshi Ogawa, Ru Chen, Motoyuki Tsuda, Takahisa Maruno, Akihisa Fukuda (Dept. Gastroenterol & Hepatol, Kyoto Univ.)

遺伝子変異マウスを用いた膵がん進展過程の解析
妹尾 淑, 小川 弘, 陳 勇, 津田 慧之, 丸野 賢久, 福田 昊久（京都大・医・消化器内科）

S10-2 C11orf95 genomic rearrangements dictate oncogenic dependence in supratentorial brain tumors.

C11orf95 関連ゲノム再構成は腫瘍上皮細胞がんの発病に与する川内 大輔, Tuyu Zheng, David R. Ghasemi, Konstantin Okonechnikov, Stefan M. Pfister, Felix Sahm, Kristian Pajtler

S10-3 Modeling sarcoma to clarify enhancer reprogramming in disease progression

マウスモデルを用いた肉腫の進展におけるエンハンサーリプログラミング機構の解析
田中 美和, 本村 みさき, 村寺 易子, 山崎 ゆかり, 清水 未花, 中村 卓郎（公財）がん研・研・発がん

S10-4 KDM6A inactivation in germinal center B cells promotes the development of plasma cell neoplasms

ヒストロン修飾異常を背景とする多発性骨髄腫の発症機構
岩間 厚志（東京大・医科研・幹細胞医学研究）

S10-5 Uncovering the metabolic reprogramming of stem cell fates in leukemia
Takashio Ito (Inst. Frontier Life Med. Sci, Kyoto Univ.)

血液がんモデルによる幹細胞研究
伊藤 眞浩（京都大・ウイルス・再生医学研究所）

S10-6 A role of senescence in cell type-specificity of cancer development
Yasuhiro Yamada (Inst. of Med. Sci., The Univ. of Tokyo)

細胞老化による細胞種特異的発がん
山田 泰広（東京大・医科研）
Luncheon Seminars

Room 2
LS-14 Scrum/10x Genomics
株式会社スクラム/10X Genomics

Single-cell landscape of antitumor immune responses
Hiroshi Kagamu (Department of Respiratory Medicine, Saitama Medical University International Medical Center)

Chair: Ken Osaki (10x Genomics)

座長：大崎 研（10x Genomics）

Room 3
LS-6 Nippon Becton Dickinson Company, Ltd.
日本ベクトン・ディッキンソン株式会社

Multi-parametric analysis of antigen-specific T cells by using a super-multicolor flow cytometry
Hideki Ueno (Department of Immunology, Graduate School of Medicine, Kyoto University)

Chair: Keisuke Yuki (BD Biosciences)

座長：上野 英樹（京都大学 大学院医学研究科 免疫細胞生物学）

Room 4
LS-7 FUJIFILM Wako Pure Chemical Corporation
富士フィルム和光純薬株式会社

An in vitro system for evaluating anti-cancer drugs using patient-derived tumor organoids (F-PDO®)
Motoki Takagi (Fukushima Medical University)

Chair: Tadashi Kondo (National Cancer Center Research Institute)

座長：近藤 格（国立がん研究センター 研究所）

Room 7
LS-8 TAIHO PHARMACEUTICAL CO., LTD.
大野薬品工業株式会社

Management and selection method of advanced gastric cancer chemotherapy
Hiroaki Tanioka (Department of Clinical Oncology, Kawasaki Medical School)

Chair: Tatsuya Ioka (Yamaguchi University Hospital, Department of Oncology Center)

座長：井岡 達也（山口大学医学部附属病院 臨床胃腫瘤学教室）
Special Symposia

Room 1 Oct. 2 (Fri.) 13:00-15:30 J

SS4 Interactions of AI and cancer research and precision medicine
Alがん研究・癌者との対話

Chairpersons: Yusuke Nakamura (CPRM Ctr., JFCR)
Satoru Miyano (Human Genome Ctr., Inst. of Med. Sci., The Univ. of Tokyo)

座長：中村 茂（会場）がん研・精密治療医療研究セツ

The introduction of artificial intelligence (AI) is rapidly progressing in the medical fields. AI can help to analyze CT and MRI images, pathological images, clinical data and genomic data etc. to provide personalized best medical care. At present we need to construct a large-scale medical database and extract useful information from it. Although there are discussions on the processes to collect large-scale clinical and genomic information data, it is essential to build a highly secure medical information database in order for patients to cooperate without any concerns for privacy issues. As for the data management method, a secret sharing method is adopted, and it is necessary that individual information is stored in multiple servers in the cloud instead of in one location. In addition, a secret calculation method is adopted even when integrating them for statistical processing such as calculation. Today, various cutting-edge technologies are rushing to research and clinical sites such as precision medicine and genomics. We would like to introduce an outline of such AI programs.

SS4-1 Implementation of AI in the medical system
Yusuke Nakamura (CPRM Ctr., JFCR)

内閣府 SIP「AI Hosipital」プロジェクト
中村 茂 (公財)がん研 CPRMセツ

SS4-2 Cutting edge of the colonoscopy - Paradigm shift of the diagnosis approach.
Toyoki Kudo, Shin-ei Kudo, Yuichi Mori, Masashi Misawa (Digestive Disease Ctr., Showa Univ. Northern Yokohama Hosp.)

大腸内視鏡の最先端～診断アプローチのパラダイムシフト～
工藤 竜樹, 工藤 進英, 森 一雄, 森氏 哲 (昭和大・横浜市北部病院・消化器科)

SS4-3 Development of fine-tuning method of MR images of gliomas to normalize image differences among facilities

多施設間の画像差を埋めるFine-tuning方法の開発
髙橋 隆2, 髙橋 鉄道1, 木下 夕子, 産野 基人, 河口 剛平, 小林 和馬, 今井 美生, 藤谷 勝, 市村 正一, 三宅 正森, 洪本 隆二 (1理研・革新知能総合研究、2国立がん研, 3分科病理神経学、4国立がん研・中央病院・脳神経外科、5国立がん研・脳神経外科、6大阪大・医, 7神経外科, 8国立がん研・中央病院・放射線診断科)

SS4-4 Natural LanguageProcessingand Explainable AI for Basic Cancer Research and Cancer Genomic Medicine
Satoru Miyano (M&G Data Sci. Ctr., Tokyo Med. & Dent. Univ.)

がん研究・医療のための自然言語処理と説明可能なAI
宮野 晃 (東京医科歯科・M&Dデータ科学セツ)

SS4-5 Quantitative evaluation of chromatin pattern using mathematical algorithm
Kazuki Nakane, Yasuyoshi Tsutsumi, Yuhi Yokoyama, Eiichi Mori1, Sachiko Nanguno, Hirofumi Yamamoto1,2 (Osaka Univ. Med., 1Natl. Inst. of Tech., Oshima College)

数理的アルゴリズムを用いたクロマチンパターンの定量評価
中根 和昭, 塚谷 光男, 横山 章, 森井 亮一, 南雲 博子, 山本 孝文 (大阪大・医, 大阪商船高等専門学校)

Panel Discussion

Room 1 Oct. 2 (Fri.) 15:30-17:30 J

PD Cancer research in the Japanese medical systems
日本の医学・医療システムにおけるがん研究

Chairpersons: Ryuzo Ueda (Tumor Immunol., Aichi Med. Univ. Sch. of Med.)
Tetsuo Noda (Cancer Inst., Japan Foundation for Cancer Res.)

座長：上田 嘉三 (愛知医大・医・腫瘍免疫寄附講座)
野田 哲生 (公財)がん研・がん研

The pandemic of COVID-19 is terribly hitting the world since the end of 2019 and we are right in the middle of it now. Japanese medical systems have suffered from many issues in a wide variety of areas, such as cancer development, research promotion and medical care system itself. Medical systems for cancer treatment and research are no exception. In a face of new medical systems coming after this corona era, it is our task to propose innovative strategies which would realize ideal medical systems truly valuable for future cancer treatment and research in Japan. We expect to have fruitful discussions with outstanding invited speakers and JCA members.

PD-1 Current status and problems of medical system in Japan
Morito Monden (Sakai City Med. Ctr.)

日本のがんのシステムの現状と問題点
門田 哲男 (市立病院機構)

PD-2 Recent and future issues on training of physician scientists engaged in cancer research

医師がん研究者養成に関する現在と将来に向けての課題
石岡 千春 (1東北大・医・臨床腫瘍学分野, 2東北大・病院・腫瘍内科)

PD-3 Future Perspective and the Role of Japanese Cancer Association (JCA) in Cancer Research of Japan
Hitoshi Nakagama (Natl. Cancer Ctr.)

がん研究における学会の在り方
中金 博 (国立がん研究)

PD-4 Tasks for cancer centers in cancer treatment and research promotion in Japan.
Tetsuo Noda (Cancer Inst. of JFCR)

日本のがん医療・がん研究におけるがん専門機関の役割
野田 哲生 (公財)がん研・研

PD-5 Next step of Cancer Research, from the health policy perspective
Masami Sakoi (Health Policy Bureau Ministry of Health, Labour & Welfare)

今後のがん研究に向けて～ 医療政策の視点から
迫井 正顕 (厚生労働省医政局)

PD-6 Japanese contributions to oncology drug development and regulatory approval around the world
Yasuhiro Fujisawa, Takahiro Nonaka (Pharmaceuticals & Med. Devices Agency (PMDA))

抗がん剤開発（薬事承認）における日本の貢献度
藤原 康弘, 野中 孝浩 (独立行政法人医薬品医療機器総合機構 (PMDA))
Recent progress in anti-cancer therapeutics

Chairpersons: Hiroaki Suga (Grad. Sch. of Sci., The Univ. of Tokyo)
Mikihiko Naito (Devision of Mol. Target & Gene Therapy Products, Natl. Inst. of Health Sci.)

The modalities for anticancer therapeutics are progressively developed, which include novel technologies to discover functional molecules as well as immunotherapy and gene therapy. Accordingly, it is increasingly expected to develop innovative drugs against cancers. In this symposium, we are very happy to invite Dr. Kevan Shokat, University of California San Francisco, who is a world-renowned researcher for innovative drug development against Ras protein. After the introductory talk by Dr. Suga, a co-chairperson of this session, Dr. Shokat will present a novel approach against Ras. Then, Dr. Ikeda in Nagasaki University will present a recent progress in CAR-T therapy, and Dr. Todo in Tokyo University will make a talk on the development of oncolytic viruses. Finally, Dr. Naito in National Institute of Health Sciences will overview novel approaches for targeted protein degradation and their applications for anticancer drug development. We hope these presentations will inspire the researches for many audiences.

1. Revolutionizing the therapeutics by nonstandard peptides
Hiroaki Suga (Dept. Chem. Sci., U Tokyo)

2. Strategies for Drugging Undruggable Targets in Oncology: From K-Ras to Drug Resistance
Kevin M. Shokat (Professor, Dept. Chemistry, UC Berkeley)

3. New era of gene-modified T cell therapy

4. Development of anti-cancer virus products using genetically engineered viruses

5. Targeted Protein Degradation by Small Molecules
Recent single-cell genomics has improved our understanding of the complex and unique biology of human cancer at the highest resolution. These include the epigenetic and clonal heterogeneities of cancer cell populations as well as cancer stromal cells, mutual interactions of cancer and stromal cells, spatial transcriptional patterns of immune and stromal cells in the cancer tissues, and metastatic process of single cancer cells. This field is also rapidly changing by the development and application of new technologies such as spatial transcriptomic analysis and comprehensive cell profiling in the whole body. This session invites seven experts in this filed and they will present the most cutting-edge studies. We suggest next directions on how we can apply single-cell analysis to understand the biology of cancer. We hope that this session will provide any help for the audience to learn these new technologies and utilize them for future research.

**S12-1** Epigenetic heterogeneity of cancer
Hiroki Katsui (Genome Sci. Lab., RCAST, The Univ. of Tokyo)

**S12-2** Early Clonal evolution of myeloid malignancies
Masahiro Nakagawa, Ryuokazu Inagaki, Yasushi Nannya, Lanying Zhu, Yotaro Ochi, June Takeda, Xingxing Qi, Akinori Yoda, Ayana Kon, Nobuyuki Kakiuchi, Hitomi Makishima, Shinichi Matsuda.

**S12-3** Dissecting multicellular ecosystems of HTLV-I infection and ATL by multi-omics single cell analysis

**S12-4** Cancer - immune cell interactions drive transitions to mesenchymal-like states in glioblastoma
Toshio Hara (Dept. Path., GMG/ Broad)

**S12-5** Identification of transcriptomic and multi-omics network modules of cancers using spatial transcriptome analysis
Ayako Suzuki, Satoshi Nagasawa, Yutaka Suzuki (Grad. Sch. of Front. Sci., Univ. of Tokyo)

**S12-6** Single cell analysis of the stomach
Hiroto Katoh, Daihaku Komura, Ayumu Tsubosaka, Haruki Kokuho, Shumpei Ishikawa (Dept. Preventive Med., Grad. Sch. Med., The Univ. of Tokyo)

**S12-7** Whole-organ quantitative analysis of cancer metastasis with single cell resolution
Shimpei Kubota, Kei Takahashi, Jun Nishida, Shogo Ehata, Kohki Miyazono (Dept. Mol. Pathol., The Univ. of Tokyo)

**Authors**

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<td>Eukaryotic system</td>
<td>Tatsuhiko Shibata (Lab. of Mol. Med., The Inst. of Med. Sci., The Univ. of Tokyo)</td>
<td>Eukaryotic system</td>
<td>Hiroki Katsui (Genome Sci. Lab., RCAST, The Univ. of Tokyo)</td>
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<td>Single-cell technology</td>
<td>Masahiro Nakagawa, Ryuokazu Inagaki, Yasushi Nannya, Lanying Zhu, Yotaro Ochi, June Takeda, Xingxing Qi, Akinori Yoda, Ayana Kon, Nobuyuki Kakiuchi, Hitomi Makishima, Shinichi Matsuda</td>
<td>Single-cell technology</td>
<td>Junji Kowai, Yuki Sairo, Takaru Kamada, Yasunori Kogure, Marni B. McClure, Sumito Shingaki, Kota Yoshifujii, Mariko Tabara, Kazuya Shimoda, Keisuke Kataoka</td>
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<td>Multi-omics</td>
<td>Junji Kowai, Yuki Sairo, Takaru Kamada, Yasunori Kogure, Marni B. McClure, Sumito Shingaki, Kota Yoshifujii, Mariko Tabara, Kazuya Shimoda, Keisuke Kataoka</td>
<td>Multi-omics</td>
<td>Ayako Suzuki, Satoshi Nagasawa, Yutaka Suzuki</td>
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<td>Gastrointestinal cancer</td>
<td>Shimpei Kubota, Kei Takahashi, Jun Nishida, Shogo Ehata, Kohki Miyazono</td>
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**Room 2-3**
JCA-ISEV Special Joint Symposium

Room 3  Oct. 2 (Fri.) 15:30-17:30  E

ISEV  JCA-ISEV Special Joint Symposium
日本癌学会・国際細胞外小胞学会 特別合同シンポジウム

Hidetoshi Tahara (Grad. Sch. of Biomed. & Health Sci., Hiroshima Univ.)

田原 栄俊 (広島大・医・細胞分子生物学)

ISEV-1  Rigor and Standardization Efforts of the International Society for Extracellular Vesicles
Kenneth F. Witwer (Dept. Mol. & Comparative Pathobiol. & Neurology. JHU SOM)

ISEV-2  Role of Secreted Exosomes in Cancer Aggressiveness
Alissa M. Weaver (Dept. of Cell and Developmental Biology, Vanderbilt University Medical School)

ISEV-3  TBD
Irina Nazarenko (Institute for Infection Prevention and Hospital Epidemiology, Medical Center–University of Freiburg)

ISEV-4  Targeting DUSP2-mediated extracellular vesicle-VEGF-C secretion ameliorates pancreatic cancer early dissemination
Sean Tsai, Chu-An Wang (Inst. Molecular Medicine, College of Medicine, NCKU, 2Dept. of Physiology, college of Medicine, NCKU)

ISEV-5  Comprehensive analyses of small extracellular vesicles carrying nucleic acids in ovarian cancer

卵巣がんにおける核酸搭載細胞外小胞の包括的解析
横井 隆，落合 孝広（名古屋大・医・産婦人科，東京医大・分子細胞治療）

Symposia

Room 4  Oct. 2 (Fri.) 13:00-15:30  E

S13  Real world of tumor microenvironment
がん微小環境のリアルワールド


座長: 濱田 浩志 (国立がん研・先端医療開発センター)
篠田 京子（北海道大・院長・血管外細胞生物学）

Tumor tissue consists of not only a heterogeneous population of cancer cells, but also a various resident and infiltrating host cells, and extracellular matrix, known as the tumor microenvironment. The accumulated evidence has revealed that tumor stroma cells are affected by cancer cells and communicate with them. Furthermore, the tumor microenvironment can also influence cancer progression and it determines the therapeutic responses or resistance. It is surely true that tumor microenvironment is no longer a supporting role, but is in an important position in cancer treatment strategies.

We need to approach the real world of a microenvironment in order to utilize the results of basic research so far as scientific evidence and to utilize them in the clinical field of cancer.

At this symposium, five experts from CAF, immunology, macrophages, blood vessels, and nervous system will be invited to give a lecture. We would like each presenter to introduce the recent research results, and at this symposium, and we would like to discuss how control of the tumor microenvironment could be used in cancer treatment strategies.

S13-1  The significance of cancer associated fibroblasts in tumor re-progression in post-chemotherapy tumor microenvironment

化学療法後の微小環境におけるがん関連線維芽細胞の機能解析
石井 源一郎（国立がん研・癌病院・病理・臨床検査科）

S13-2  The significance of macrophages in cancer progression and immune response
Yoshihiro Komohara (Dept. Cell Path., Kumamoto Univ.)

がん病態におけるマクロファージの役割と治療標的としての可能性
高原 義弘（熊本大・細胞病理学）

S13-3  The role of tumor endothelial cells in the immune environment

腫瘍血管内皮細胞がもたらすがん免疫環境への影響
横田 京子（北海道大・院長・血管外細胞生物学）

S13-4  Cancer and nerves interaction: toward "Cancer Neural Therapy"
Atsunori Kamiya (Dept. Cell Physiol., Okayama Univ. Med. Sch.)

がん神経関連: がん神経医療を目指して
神谷 厚男（岡山大・医・細胞生理学）

S13-5  Proposal for novel immunological classification of lung cancer based on the molecular basis of tumor microenvironment

肺がん免疫微小環境の分子基盤解明に基づいた、新たな免疫学的分類の提案
高木 敏一, 西藤 ゆかり, 水野 美明, 落合 淳志（国立がん研究・研・免疫細胞, 他外製薬(株)・創薬基盤研究部, 国立がん研究・先端医療開発センター）
**Special Programs**

<table>
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<th>Room 4</th>
<th>Oct. 2 (Fri.) 15:30-17:30</th>
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<td><strong>SP5</strong></td>
<td>Open debate on breakthroughs of cancer research in next decades</td>
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**Chairpersons:**


Satoshi Yamazaki (Stem cell Biol., The Univeristy of Tokyo)


**座長：**

(東京理科大・生命医研・発生及び老化研究部)

山崎 瞳 (東京大・幹細胞生物学分野)

大西 伸幸 (株式会社関西製薬所・基盤技術研／慶應大・医・ライフサイエンス研／先端研・遺伝子制御研究部門)

"Wakate Tokubetsu-Kikaku", one of the unique symposia among the annual meeting of the Japanese Cancer Association, has been held since 2017, and aimed to bring together young cancer researchers to do open debate on breakthroughs of cancer research and has received good notices from audiences. This year's symposium will also get several young leaders with diverse fields of expertise in cancer research together to discuss on innovative and epoch-making basic cancer researches, diagnosis and treatments that we would develop in the next decades. Profound improvements in cancer screening, diagnosis and treatment have been accomplished through scientific and technical advancements. For instance, the availability and affordability of sequencing genetic information has given us valuable information. Another major leap forward came with the cancer immunotherapy by utilizing immune check point inhibitors. Yet, cancer still occupies the first place in the ranking of deaths in our nation as the number of deaths caused by cancer reached 380,000 in 2019. Thus, the posture that young researchers engaged in cancer issues put and collaborate together more closely to fight against cancer keeps required. Unfortunately, the virtual meeting will take place due to COVID-19 on this symposium. However, we will surely present a lively discussion, and it will be engrossing to see how we will share a new vision on cancer biology in the next era.

**International Sessions**

<table>
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<th>Room 5</th>
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<td><strong>IS7</strong></td>
<td>Beyond CD19, now aim at solid cancers?</td>
</tr>
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</table>

**Chairpersons:**

Hiroshi Fujiwara (Dept. Personalized Cancer Immunotherapy, Mie Univ., Grad. Sch. of Med.)

Zonghai Li (Shanghai Cancer Inst. State Key Lab. of Oncogenes & related genes)

**座長：**

(三重大・院医・個別化がん免疫治療学)

Zonghai Li (Shanghai Cancer Inst. State Key Lab. of Oncogenes & related genes)

In contrast to B-lymphoid blood cancers, CAR-T therapy against solid cancers still faces challenges, which are mainly composed of paucity of rational targets and functional deterioration in immuno-suppressive tumor microenvironment. To address those issues, huge efforts continues to be exerted from a variety of perspectives.

In this context, this international session, co-chaired by prof. Li and I, aim to provide an opportunity for audience to get a leading-edge knowledge from experts and discuss with them. I will focus on the target antigen selection and immune cells CAR gene-modified. Dr. Yagyu will present their CAR-T strategy using piggyBac transposon technology. Dr. Kangyo will focus on epigenetic and metabolic aspects of CAR-T cells. Prof. Wang will present their excellent CRISPR/Cas9 technology, especially targeting TGF β signaling. Prof. Shin will show their novel findings regarding the resistance to PD-1 blockade. Finally, prof. Li will present their established system for target choice, and attempt to manage CAR-T cell exhaustion.

We believe all presenters will have to help audience to understand what's actually going on now in this field.

**IS7-1** CAR-T bioengineering for solid cancers; choice of therapeutic targets and immune cells engineered.

Hiroshi Fujiwara (Dept. Personalized Cancer Immunotherapy, Mie Univ., Grad. Sch. of Med.)

**IS7-2** piggyBac transposon-mediated CAR T cells for solid tumors - A promising and realistic approach for clinical application.

Shigei Yagyu (Kyoto Pref. Univ. of Med., Dept. Pediatrics)

**IS7-3** Epigenetic and metabolic modification of CAR-T cells for optimal adoptive immunotherapy.

Yuki Kangyo (Div. Immune Response, Aichi Cancer Ctr. Res. Inst.)

**IS7-4** Regulation of progenitor-like and terminally exhausted T cells.

Fui-Cheol Shin (Grad. Sch. of Med. Sci. & Engineering, KAIST)

**IS7-5** Enhancing CAR-T cell metabolic fitness to improve anti-tumor function in solid tumors.

Roddy O’Connor (Path. & Lab. Med., Univ. of Pennsylvania)

**IS7-6** Challenges and Opportunities of CAR-T cell therapy against solid tumors.

Zonghai Li (State Key Lab. of Oncogenes & Related Genes, Shanghai Cancer Inst., Renji Hosp., Shanghai Jiaotong Univ. Sch. of Med., CARgen Therap.)
**International Sessions**

**Room 7**  
**Oct. 2 (Fri.) 13:00-15:30**

**IS8**  
Role of redox-active metals for the prevention and treatment of cancer in the era of precision medicine  
Des R Richardson (Univ. of Sydney & Bosch Inst.)

Cancer is one of the leading causes of mortality worldwide. Cancer is understood as the disease of the genome, and indeed astronomical number of mutations were reported with NGS until now. But, it is not easy to respond to each mutation with the idea of precision medicine. Considering the evolution of the life, cancer can be understood as iron addiction with ferroptosis-resistance. In this symposium we seek to understand the carcinogenesis from the context of cutting-edge reduct biology and introduce several novel trials to specifically kill cancer cells with reducto-active metals or with advanced reduct chemistry and nanotechnology. Des Richardson would discuss on targeting cellular signaling to inhibit tumor cell metastasis and growth from the viewpoint of iron and NDRG1 connection. Guangjun Nie would discuss on the nanoformulation of iron chelators, which are effective in various animal models. Sally-Ann Poulsen would report that carbonic anhydrase XII inhibitors overcome drug resistance in tumor cells. Yuichi Hara would discuss on the role of iron in hepatocarcinogenesis. Finally, Fumiya Ito would report on the role of iron in asbestosis-induced mesothelial carcinogenesis.

**IS8-1**  
Role of the novel NDRG1-MI6G axis in down-regulating the epidermal growth factor receptor and other tyrosine kinases  
Des Richardson (Griffith Inst. for Drug Discovery, Brisbane, Australia)

**IS8-2**  
Intelligent Nanomedicines: Nanochelator of iron for improved iron removal efficacy in various disease models  
Guangjun Nie (Nat. Ctr. for NanoSci. & Tech., China, Univ. of Chinese Academy of Sci.)

**IS8-3**  
Overcoming P-glycoprotein mediated drug resistance in glioblastoma  
Sally-Ann Poulsen (GRIDD, GU)

**IS8-4**  
Iron loss induce-mitophagy via mitochondrial ferritin  

**IS8-5**  
Mechanism of asbestos-induced carcinogenesis via dysregulation of redox-active iron  

**Symposia**

**Room 8**  
**Oct. 2 (Fri.) 13:00-15:30**

**S14**  
Elucidation of cancer etiology and prevention strategies based on mechanisms  
Chairpersons: Dai Nakae (Lab. of Food Safety Assessment Sci., Dept. Nutritional Sci. & Food Safety, Faculty of Applied Biosci., Tokyo Univ. of Agriculture)  

座長：中江 大（東京農大・応用生物・食品安全健康学科・食品安全評価学研究室）  
戸塚 ゆ加里（国立がん研セ・研・がんモデル開発部門）

It is well known that environmental factors substantially contribute to human cancer development. Cancer research, including recently progressed omics studies and genomic analyses, has been widely and deeply revealing genetic/epigenetic alterations in proto-oncogenes and/or tumor suppressor genes during the course of the development and progression of human cancers. These efforts give us fruit as innovation for cancer treatment strategies. Nevertheless, it must be emphasized that even such innovative treatments have limitations and are not necessarily effective for all cancer patients and cancer types. In order to overcome these limitations, the concept of cancer prevention has been attracting attention to prevent the morbidity of cancers, and to reduce their mortality rate. This concept is now being updated to become precision cancer prevention. In the present symposium, 9 distinguished speakers will introduce the latest topics concerning the symposium title, the elucidation of cancer etiology and prevention strategies based on mechanisms, which include epidemiological findings, the relationship between environmental factors and human carcinogenesis with their underlying molecular mechanisms, and the current status of the evidence-based strategies of precision cancer prevention. We hope that this symposium will be a good opportunity to learn the current status and to discuss future perspectives of this new paradigm, precision cancer prevention.

**S14-1**  
Prospects for elucidating the cancer etiology and prevention by multidisciplinary approach  

**S14-2**  
Mutational signature analysis elucidates the association between environmental factors and human cancer development  
Tiri Zavadi (Incl Agency Res. Cancer, WHO)

**S14-3**  
Understanding a mechanism of an onset of colorectal cancer by colibactin and its cancer prevention  
Kenji Watanabe (Pharm. Sci., Univ. Shizuoka)

**S14-4**  
The role of primary cilia in cell differentiation, tumorigenesis and chemoprevention  

**S14-5**  
Cancer chemoprevention by antioxidant luteolin  

**S14-6**  
Over-activation of hepatocyte p53 promotes progenitor cell-derived liver cancer, which is prevented by acetylic retinoid  
Yuki Makino, Hayato Hikita, Takahiro Kodama, Ryojro Sakamori, Tomohide Tsutsumi, Tetsu Takehara (Osaka Univ. Dept. Gastroenterology & Hepatology)

肝細胞のp53活性化による肝前駆細胞由来肝発癌及び非環式レチノイドによる発癌抑制  
牧野 拓紀, 内木 卓, 小玉 尚宏, 阪根 亮太郎, 熊智秀, 竹原 徹郎 (大阪大学消化器内科)
S14-7 Whole-genome characterization of adult T-cell leukemia/lymphoma.

ATLの全ゲノム解析
木暮 泰寛, 龜田 拓郎, 古屋 淳史, 野坂 生輝, 今泉 芳孝, 羽崎 優樹, Marni B. McClure, 田畑 圭梨子, 高崎 晃史, 宮崎 泰司, 松岡 凛香, 石黒 良治, 小川 雄司, 下田 和哉, 片岡 圭亮 (国立がん研究センター, ①分子腫瘍・消化器血液学科, ②腫瘍・医・消化器血液学, ③腫瘤・医, ④血液内科, ⑤腫瘤大・医・消化器血液学, ⑥腫瘍大・医, ⑦腫瘍内科, ⑧血液内科, ⑨腫瘍大・医, ⑩腫瘍内科, ⑪腫瘍大・医, ⑫腫瘍内科, ⑬腫瘍大・医, ⑭腫瘍内科, ⑮腫瘍大・医, ⑯腫瘍内科, ⑰腫瘍大・医, ⑱腫瘍内科)

S14-8 GP2 variants are associated with pancreatic cancer risk: from GWAS association to function

GWASによる腸がん新規感受性遺伝子GP2の同定と機能解析
林 稔松, 眞原 昌弘, 細野 祥之, 伊藤 秀美, 鎌谷 充一郎, 井本 造洋, 岩崎 基, 門脇 孝, 石井 秀秀, 若井 僑志, 吉田 敦彦, 松田 文彦, 久保 充明, 菊地 正悟, 松尾 恵太郎 (①愛知医科大学・医・公衆衛生学, ②名古屋大学・院医・愛知県がんセンター, ③東京大・院・新領域・創薬科学研究科, ④国立がん研究センター, ⑤東京大・院・薬制・薬学科, ⑥大阪大・基礎薬理学, 国立がん研究センター, ⑦遺伝子診療部門, ⑧京都大・院医・臨床医科学研究, ⑨理研, ⑩生命医科学研究センター)

S14-9 Obesity in the control of cancer; countermeasures against East Asian non-obese type lifestyle-related disease

がんの制御における肥満の意義：東アジア型非肥満型生活習慣病への対策
中江 大 (東京農大・応生・食品安全科学学科)
Symposia on Specific Tumors

**SST4-1** Multi omics analyses of the adenoma carcinoma sequence of colorectal cancer
Takatoshi Sugii, Mitsumasa Osakabe, Ryo Sugimoto, Hiromu Suzuki

**SST4-2** Metagenomics and metabolomics of feces focused on stage-specific gut microbiota in colorectal cancer
Hirofumi Takamaru, Satoshi Shibata, Shinichi Yachida, Yutaka Saito

**SST4-3** Molecular characteristics and experimental models of colorectal cancer
Naoya Sakamoto, Wataru Yasui

**SST4-4** Wnt5a signaling and Colitis-associated tumor formation
Akira Kikuchi

**SST4-5** Multi-gene panel testing using NGS for Lynch syndrome and MSI-H cancer
Kiwamu Akagi, Gou Yamamoto
(Dept. Mol. Diagnosis & Cancer Prevention)

**SST4-6** Analysis of clonal expansion in epithelium affected by ulcerative colitis reveals novel cancer vulnerability
Nobuyuki Kakinouchi, Motoi Uchino, Takako Kihara, Kotaro Akaki, Yoshikage Inoue, Akira Yokoyama, Tomonori Hirano, Seichi Hirota, Hiroki Ikucho, Osamu Takeuchi, Satoru Miyano, Hiroshi Seno, Seishi Ogawa

**SST4** New Insights into colorectal cancer tumorigenesis and clinical practice

座長：井戸 拓（広島大・病院・遺伝子診療科）
田中 信治（広島大・院内・内視鏡医学）

Colorectal cancer (CRC) is one of the most commonly diagnosed cancer throughout the world. The impact that molecular biology and next generation sequencing has had on elucidating the genetic basis of tumorigenesis is best illustrated by the paradigm of colorectal cancer. Thus, unique features of CRC biology have served to accelerate the discovery process. The development of precursor lesions, such as adenomatous polypl, serrated lesion and ulcerative colitis, have made it possible to construct models of the sequential genetic events in cancer initiation and progression. Tumorigenesis of hypermutated CRC modified by microsatellite instability and mismatch repair deficiency is accurate biomarkers to predict response to immune checkpoint inhibition. Recent large-cohort multi-omics data with metagenomic/metabolomics analysis revealed that shifts in the human gut microbiome and metabolomics is linked to the development of CRC. In this symposium, we have six distinguished researchers with the cutting-edge research projects for better understandings and new insights into CRC tumorigenesis and clinical practice. We hope that audience can share the latest information.

**SST4-1** Multi omics analyses of the adenoma carcinoma sequence of colorectal cancer
Tamotsu Sugii, Mitsumasa Osakabe, Ryo Sugimoto, Hiromu Suzuki

**SST4-2** Metagenomics and metabolomics of feces focused on stage-specific gut microbiota in colorectal cancer
Hiroyuki Takamaru, Satoshi Shibata, Shinichi Yachida, Yutaka Saito

便メタゲノムおよびメタボローム解析による大腸多段階発癌における腸内環境の特徴
高丸 博之, 宮 吾史, 高内田 真一, 斎藤 颯
(国立がん研究センターや中央病院, 内視鏡科, 国立がん研究センター, がんゲノミクス, 大阪大, 医, ガノン生物, がんゲノム情報)

**SST4-3** Molecular characteristics and experimental models of colorectal cancer
Naoya Sakamoto, Wataru Yasui

大腸癌の分子学的特徴と実験モデル
坂本 喜也, 安井 弘
(広島大・院内・分子病理, 国立がん研センター, 先端医療開発・発展, 臨床病理)

**SST4-4** Wnt5a signaling and Colitis-associated tumor formation
Akira Kikuchi

炎症を伴った大腸がんにおけるWnt5aシグナルの役割
柴池 謙
(大阪大・医, 分子細胞生化学)

**SST4-5** Multi-gene panel testing using NGS for Lynch syndrome and MSI-H cancer
Kiwamu Akagi, Gou Yamamoto
(Dept. Mol. Diagnosis & Cancer Prevention)

遺伝子パネル検査時代のMSI大腸癌とリンチ症候群
赤木 穣, 山本 剛
(埼玉県がんセンター, 臨床診断・予防科)