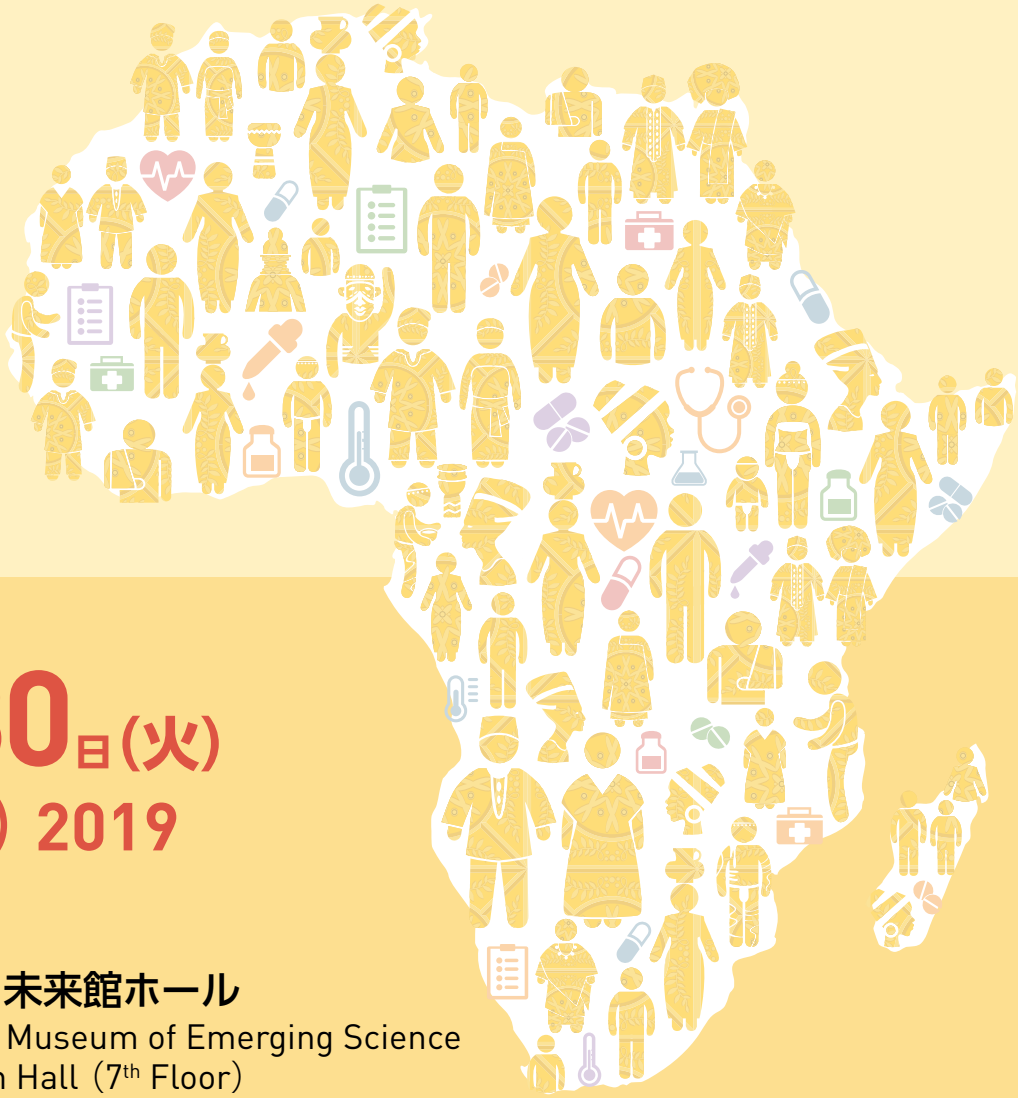
TICAD7 Official Pre-Event, ICREP-NTDs International Symposium

第7回アフリカ開発会議公式プレイベント、ICREP-NTDs国際シンポジウム

感染症研究に根ざす 日本・アフリカ科学技術 イノベーション協力推進に向けて

Promoting Cooperation on Infectious Disease Research between Africa and Japan for Science, Technology and Innovation (STI)

報告書



開催日時 Date

2019年7月30日(火)

July 30 (Tue) 2019

開催場所 Venue

日本科学未来館 7階 未来館ホール

Miraikan – The National Museum of Emerging Science and Innovation. Miraikan Hall (7th Floor)

開 催 報 告

2019年7月30日（火）、日本科学未来館7階の未来館ホールにおいて、予定通り表記シンポジウムが開催された。アフリカから14名を招聘し、公募したポスターセッションにもアフリカと日本からほぼ同数ずつの計29のポスター発表が集まった。

当初100名程度の開催規模を想定していたが、開催周知ならびに事前登録のための専用ホームページを作成し、チラシ800部、ポスター90部を製作して関係各所に事前に配布した。さらに、第7回アフリカ開発会議（TICAD7）パートナー事業（外務省）、第7回アフリカ開発会議横浜開催連携事業（横浜市）への登録、関連企業や団体等への個別案内などを行なった結果、当日の参加者は様々な機関から10カ国160人が集まり、事前の広報宣伝効果があったものと考えられる。

午前10時30分に開始したシンポジウムでは、主催者および企画運営委員会を代表して鈴木幸一（帝京大学教授）の開会挨拶に続き、末松誠AMED理事長からご挨拶をいただいた。サハラ以南アフリカにおける出生率のトレンドから、今後乳幼児人口が増えるとともに感染症のリスクが上がるなどの興味深い知見が紹介された。

また、来賓を代表して菱山豊氏（文部科学省科学技術・学術政策局長）およびH.E. Mr. Estifanos Afeworki氏（在京アフリカ外交団団長、駐日エリトリア国大使）からご挨拶をいただいた。菱山氏からはPan African Networkに関わるプロジェクトやSDGsにおける科学技術の重要性など広範なお話しをいただいた。H.E. Mr. Estifanos Afeworki氏は、感染症対策におけるアフリカ人研究者が果たす役割や日本との協調体制の重要性などについて述べられた。その後、アフリカからの招聘者の紹介を経て、Kingsley Bampoe Asiedu博士（世界保健機関）から送られたWHOのNTDs対策や日本とアフリカの連携の重要性などについて述べた約4分間のビデオメッセージが上映された。

引き続いて、基調講演1としてAbraham Kwabena Anangガーナ共和国 野口記念医学研究所所長から、研究所の歴史やその経験を踏まえ、国際間のパートナーシップの重要性についての講演があった。追加発言として、Kizito Mabisi Lubano博士（Kenya Medical Research Institute）から、国際共同研究におけるネットワークの重要性が述べられた。

その後、招聘者および関係者の集合写真撮影と昼食休憩をはさんで開始された午後の部は、アフリカにおけるAMED NTDs・感染症関連分野プロジェクトの研究紹介のセッションから開始された。先ず、西垣隆AMED POから研究支援のこれまでの歩みや全体像の説明があり、現在進行中のICREP-NTDsの4課題の研究代表者（金子聡 長崎大学教授、鈴木定彦 北海道大学教授、嘉糠洋陸 東京慈恵会医科大学教授、鈴木幸一 帝京大学教授）からのそれぞれの研究内容の紹介があった。続いて、森田公一教授（長崎大学）からSATREPS、岩永史朗教授（東京医科歯科大学）からJ-GRIDの研究紹介があり、堀井俊宏教授（大阪大学）からは既に終了したプロジェクトとしてマラリアワクチン開発のお話しがあった。

その後のコーヒーブレイクを兼ねたポスターセッションでは、集まった29のポスター会場で熱心な研究紹介や意見交換が行われた。

15時に再開した基調講演2では、岸輝雄氏（外務大臣科学技術顧問）から、科学技術外交に果たす外務省の役割やSTI for SDGsなどのお話しと共に、アフリカと日本が同じ目線に立つことの大切さを説かれた。

その後、本シンポジウム最後のセッションとして、遠藤弘良 聖路加国際大学公衆衛生研究科長をコーディネーターとしてパネルディスカッションが行われた。6人のパネリストがそれぞれの立場からスピーチを行ったが、鈴木幸一教授（帝京大学）からは、研究者の研究活動効率化のためのネットワーク作りの重要性が示され、Victor Mukonka博士（Zambia National Public Health Institute）からは、アフリカCDCが果たす役割や国際間コミュニケーションの重要性が提起された。Juliette Mutheu-Asego氏（African Academy of Sciences）からファンディング、科学コミュニケーション、パートナーシップなどの重要性が述べられ、遠藤衛氏（アフリカ開発銀行アジア代表事務所）からは、アフリカへの投資の状況や優先項目などのお話しをいただいた。また、大浦佳世理氏（GHIT Fund CEO）からは、GHITの活動と研究成果の社会実装のための、企業などとのコラボレーションの重要性が述べられ、渡辺治雄AMED PSからは、社会実装されることを見据えた研究開発の重要性などが述べられた。

最後に、外務省アフリカ部の金子万里子氏からTICAD7の告知とともにその目的や背景についてもご説明いただいた。
当日の様子については、巻末に写真を掲載する。

全体を通して、研究者、政府関係者、国際機関、ファンディングエージェンシーなど多くの立場からの専門的知識に基づいた意見が出され、今後の各事業展開に対しても有意義な機会となった。参加者からも、“Very important point was raised especially for scientists”“Excellent presentation and clear message”などのコメントが寄せられ、とても良く企画されていたとの声も聞くことが出来た。

現在展開を図っているPan African Networkでは、国際共同研究の推進・普及、並びに社会実装と現地の人材育成にも有効に働いていることが報告されたが、今回のシンポジウム「感染症研究に根ざす日本・アフリカ科学技術イノベーションの協力推進に向けて」を通じて、これまで構築されたNTDs関連の共同研究基盤や研究拠点をベースに、今後、研究プログラムの枠を超えて、日本・アフリカのさらなる協力や連携の深化とともに、多様なステークホルダーによるネットワーク形成が大きな推進力になることが期待でき、基盤構築を図る上で非常に良い機会であった。

第7回アフリカ開発会議公式プレイベント、ICREP-NTDs国際シンポジウム
「感染症研究に根ざす日本・アフリカ科学技術イノベーション協力推進に向けて」

大会代表・企画運営委員会委員長
鈴木 幸一（帝京大学医療技術学部教授）

企画運営委員会事務局長
谷村 優太（帝京大学医療技術学部研究員）

主催者代表ご挨拶

TICAD7公式プレイベント、ICREP-NTDs国際シンポジウムへようこそ。
このシンポジウムは、日本医療研究開発機構（AMED）が支援する「アフリカにおける顧みられない熱帯病（NTDs）対策のための国際共同研究プログラム：ICREP-NTDs」が中心となって企画・開催するものです。

我が国は、これまでにアフリカ諸国との緊密な連携を基に、数々の感染症対策研究事業を展開して参りました。三大感染症であるAIDS、結核、マラリアはもちろんのこと、世界保健機関（WHO）が指定する「顧みられない熱帯病：NTDs」にも力を入れて来ています。

これまでに、我が国の大学等の研究機関とそのパートナーであるアフリカ諸国の研究機関や政府との間で良好な関係を築き上げてきておりますが、本シンポジウムでは、それらのネットワーク化を図り横のつながりをさらに強化することで、これまでの成果をアフリカ全土に広め、さらなる情報や技術の獲得や拡散を目指すための方策を議論することを大きな目的の1つに掲げています。

シンポジウムの前半では、過去および現在進行中の様々な研究プロジェクトを総括し、後半のパネルディスカッションで今後のネットワーク形成に向けた基盤を作り、感染症研究に根ざす日本とアフリカの科学技術イノベーション協力推進に向けた次のステップへと進む足掛かりになる議論ができることを期待しております。

本日ご参加いただいた皆さまがそれぞれの立場と責任の下に意見交換を行い、その成果が今後の日本とアフリカの新たな発展につながることを祈念しております。

鈴木 幸一
「西アフリカにおけるブルーリ潰瘍とその他の皮膚NTDs対策のための統合的介入」
研究代表者
帝京大学医療技術学部教授

Koichi Suzuki
Principal Investigator, Integrated research to fight against Buruli ulcer and other skin NTDs in West Africa
Professor, Faculty of Medical Technzology, Teikyo University, Japan

Welcome Address

We are very pleased and honoured to welcome you to the official TICAD7 Pre-Event, ICREP-NTDs International Symposium. This symposium is planned and hosted by "International Collaborative Research Program for Tackling the NTDs Challenges in African Countries (ICREP-NTDs)" supported by Japan Agency for Medical Research and Development (AMED).

Japan has been performed varieties of research projects on infectious diseases in African countries with close collaborations. Those include not only AIDS, tuberculosis and malaria, the three major infectious diseases, but also "neglected tropical diseases (NTDs)" named by the World Health Organization (WHO).

Based on the close collaborations already established between African countries and Japan, we aim to discuss the ways to further strengthen the bonds by building an intimate network throughout the continent and to acquire and spread new information and technologies.

In this symposium, we will first summarize the previous and ongoing research projects. We then discuss the steps needed for the promotion of research cooperation on science, technology and innovation between Africa and Japan focusing on infectious diseases in the panel discussion.

I hope that all of you here today will share your thoughts on the roles to be played and responsibilities, and that the discussions we have today will serve as the next step toward a new development for Africa and Japan.

Promoting Cooperation on Infectious Disease Research between Africa and Japan for Science, Technology and Innovation (STI)

Organizer Teikyo University

Co-organizer Nagasaki University, Hokkaido University, Jikei University School of Medicine

Supported by Ministry of Education, Culture, Sports, Science and Technology (MEXT), African Diplomatic Corps in Tokyo (ADC), African Development Bank, Japan International Cooperation Agency (JICA), GHIT Fund, JAGntd, DNDi Japan, Japan Pharmaceutical Manufacturers Association

Sponsor Japan Medical Research and Development Organization (AMED)

TICAD7 Partner Project (MOFA), TICAD7 YOKOHAMA (Yokohama City)

●主 催：帝京大学
●共 催：長崎大学、北海道大学、東京慈恵会医科大学
●後 援：文部科学省、在京アフリカ外交団(ADC)、アフリカ開発銀行、国際協力機構 (JICA)、グローバルヘルス技術振興基金(GHIT Fund)、JAGntd、DNDi Japan、日本製薬工業協会
●協 賛：日本医療研究開発機構(AMED)

第7回アフリカ開発会議(TICAD7)パートナー事業(外務省)、第7回アフリカ開発会議横浜開催連携事業(横浜市)

プログラム

ページ

第1部

10:30 **開会挨拶：鈴木 幸一**（主催者代表　帝京大学医療技術学部教授）

10:35 **挨　　拶：末松 誠**（AMED 理事長）　5
来賓挨拶：菱山 豊（文部科学省 科学技術・学術政策局長）
H.E. Mr. Estifanos Afeworki（在京アフリカ外交団（ADC）団長、駐日エリトリア国大使）
来賓紹介
ビデオメッセージ：Kingsley Bampoe Asiedu（世界保健機関（WHO））　9

11:00 **基調講演1：**Abraham Kwabena Anang（ガーナ共和国 野口記念医学研究所所長）　6〜7
Juliette Mutheu-Asego（Head of Communications and PR, African Academy of Sciences）
追 加 発 言：Kizito Mabisi Lubano（Director of Scientific Programmes, Partnerships & Grant Management, Kenya Medical Research Institute（KEMRI））　10

11:40 **関係者記念撮影 ★**
ランチ ★

第2部

12:45 アフリカにおけるAMED NTDs・感染症関連分野プロジェクトの研究紹介

日本とアフリカ諸国で展開している感染症関連や、顧みられない熱帯病（NTDs）国際共同研究プログラムの最新の研究成果・社会実装についての紹介　11〜14

●**イントロダクション：西垣 隆**（AMED PO）

●**ICREP-NTDs**（アフリカにおける顧みられない熱帯病（NTDs）対策のための国際共同研究プログラム。各プロジェクトの代表者とアフリカ相手国より）
金子 聡（長崎大学熱帯医学研究所教授）
鈴木 定彦（北海道大学人獣共通感染症研究センター教授）
嘉糠 洋陸（東京慈恵会医科大学衛生動物学研究センター教授）
鈴木 幸一（帝京大学医療技術学部教授）

●**SATREPS**（地球規模課題対応国際科学技術協力プログラム）
森田 公一（長崎大学熱帯医学研究所所長）

●**J-GRID**（感染症研究国際展開戦略プログラム）
岩永 史朗（東京医科歯科大学大学院医歯学総合研究科教授）

●**修了プロジェクト**
堀井 俊宏（大阪大学微生物病研究所教授）

14:15 **休憩・ポスターセッション**　16〜25

15:00 **基調講演2：岸 輝雄**（外務大臣科学技術顧問）　8

15:20 パネルディスカッション

感染症研究に根ざす日本・アフリカ科学技術イノベーション協力推進に向けて　15
コーディネーター：遠藤 弘良（聖路加国際大学公衆衛生研究科長）
パネリスト：鈴木 幸一（帝京大学医療技術学部教授）
Victor Mukonka（Director, Zambia National Public Health Institute）
Juliette Mutheu-Asego（Head of Communications and PR, African Academy of Sciences）
遠藤 衛（アフリカ開発銀行アジア代表事務所次席）
大浦 佳世理（グローバルヘルス振興基金 CEO兼専務理事）
渡邊 治雄（AMED PS, 国際医療福祉大学大学院教授）

16:05 **TICAD7告知、閉会の挨拶**
金子 万里子（外務省 アフリカ部アフリカ第二課長）

16:15 **閉会**

16:20 **日本科学未来館見学 ★**

第3部

18:00 **（招待者、関係者のみ）**
ネットワーキングイベント ★

一般参加者は★印のプログラムには参加できません。

Program

Page

Part1

10:30 **Opening Remarks**: Koichi Suzuki (Professor, Faculty of Medical Technology, Teikyo University)

10:35 **Welcome Greetings**: Makoto Suematsu (President, AMED) — 5

Special Remarks: HISHIYAMA Yutaka (Director-General, Science and Technology Policy Bureau, Ministry of Education, Culture, Sports, Science and Technology (MEXT))

H.E. Mr. Estifanos Afeworki (Dean, African Diplomatic Corps in Tokyo; Ambassador, the State of Eritrea)

Introduction of Guests — 9

Video Message: Kingsley Bampoe Asiedu (World Health Organization (WHO))

11:00 **Keynote speech 1**: Abraham Kwabena Anang (Director, Noguchi Memorial Institute for Medical Research, Republic of Ghana) — 6～7

Juliette Mutheu-Asego (Head of Communications and PR, African Academy of Sciences)

Bonus Moment: Kizito Mabisi Lubano (Director of Scientific Programmes, Partnerships &Grant Management, Kenya Medical Research Institute (KEMRI)) — 10

11:40 **Group Photo** (Guests and Organizers) ★

Lunch ★

Part2

12:45 Collaborative Research Projects in Africa Supported by AMED

Introduction of the ongoing research and practical applications in the International Collaborative Research Programs on the NTDs and infectious diseases between Japan and Africa — 11～14

- **Brief Introduction of AMED Programs and Pan-African Network in Africa**: Takashi Nishigaki (Program Officer, AMED)
- **ICREP-NTDs** (Presented by African and Japanese researchers on each project)
  - Satoshi Kaneko (Professor, Institute of Tropical Medicine, Nagasaki University)
  - Yasuhiko Suzuki (Professor, Research Center for Zoonosis Control, Hokkaido University)
  - Hirotaka Kanuka (Professor, Center for Medical Entomology, Jikei University School of Medicine)
  - Koichi Suzuki (Professor, Faculty of Medical Technology, Teikyo University)
- **SATREPS** (in Africa)
  - Kouichi Morita (Dean, Institute of Tropical Medicine, Nagasaki University)
- **J-GRID** (in Africa)
  - Shiroh Iwanaga (Professor, Department of Environmental Parasitology, Tokyo Medical and Dental University)
- **Graduated Projects**
  - Toshihiro Horii (Professor, Research Institute for Microbial Research, Osaka University)

14:15 **Coffee Break, Poster Viewing** — 16～25

15:00 **Keynote speech 2**: KISHI Teruo (Science and Technology Advisor to the Minister for Foreign Affairs) — 8

15:20 Panel Discussion

Promoting Cooperation on Infectious Disease Research between Africa and Japan for Science, Technology and Innovation (STI) — 15

Coordinator: Hiroyoshi Endo (Dean, Graduate School of Public Health, St. Luke's International University)

Panelists: Koichi Suzuki (Professor, Faculty of Medical Technology, Teikyo University)
Victor Mukonka (Director, Zambia National Public Health Institute)
Juliette Mutheu-Asego (Head of Communications and PR, African Academy of Sciences)
Mamoru Endo (Deputy Head, External Representation Office for Asia, African Development Bank)
Catherine Ohura (CEO & Executive Director, Global Health Innovative Technology Fund (GHIT Fund))
Haruo Watanabe (Program Supervisor, AMED, Professor, Graduate School, International University of Health and Welfare)

16:05 **Announcement of TICAD7 and Closing Remarks**

KANEKO Mariko (Director of Second Africa Division, African Affairs Department, Ministry of Foreign Affairs (MOFA))

16:15 **Closing**

16:20 **Miraikan Tour** ★

Part3

18:00 (Guests and Organizers)

Networking event ★

★Guests and Organizers only

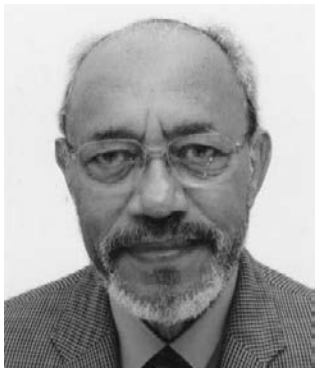
G R E E T I N G S

Makoto Suematsu

President, AMED, Japan

HISHIYAMA Yutaka

Director-General, Science and Technology Policy Bureau, Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan



H.E. Mr. Estifanos Afeworki

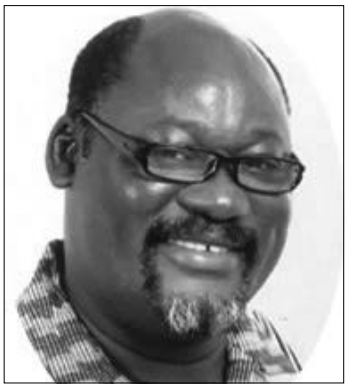
Dean, African Diplomatic Corps in Tokyo; Ambassador, the State of Eritrea

KANEKO Mariko

Director of Second Africa Division, African Affairs Department, Ministry of Foreign Affairs (MOFA), Japan

Sustaining Global Health Gains through Partnerships in Biomedical Research: The Noguchi Memorial Institute for Medical research (NMIMR) experience.

The Noguchi Memorial Institute for Medical Research (NMIMR) is a flagship biomedical research institute and a reference laboratory in Ghana, West Africa. The institute was established at the University of Ghana, in November 1979. The origin of the institute is interwoven into key events such as the birth of Dr. Hideyo Noguchi, in Inawashiro, Fukushima, Japan; and the work of scientific achievers such as Shibasaburo Kitasato and great institutions like the Institute of Infectious Diseases, Japan, and Rockefeller Institute, Philadelphia, USA. This keynote speech will highlight how Hideyo Noguchi's success as a scientist and major public health emergencies continue to generate knowledge and stimulate innovative action that promotes global health security. The establishment of NMIMR coupled with a series of special collaborative research between Japanese and Ghanaian scientists promoted through JICA, TMDU, SATREPS, AMED, J-GRID, and other international health partners (WHO/TDR, Bill and Melinda Gates Foundation, Yale University, DANIDA, IRD, NIH, Africa CDC, WAHO) has transformed the NMIMR into a centre of Global health excellence. The institute promotes a three-fold agenda: conducting research into infectious and non-infectious diseases of public health importance; building capacity of the next generation of scientists/ health professionals through training; and providing specialized diagnostics and monitoring services. Through sustained health service, training and research, the NMIMR has established full blown collaboration with Japanese universities and other institutions around the world and provides leadership for health and development in West Africa and beyond. This presentation will shed light on building sustainable health security through partnerships in biomedical research and breaking new grounds through an initiative to establish a "Hideyo Noguchi Together Endowment Fund". Data presented will show how the contribution by Dr. Hideyo Noguchi, to find the cause of Yellow Fever in the 1920s has created opportunities for training of thousands of young scientists (diplomas, HNDs, BSc, Medical Students, M.Phil, PhD and postdoctoral fellows), as well as interns and national service personnel. Breakthroughs in surveillance has produced critical interventions into malaria treatment and control, discovery of MDR and XDR microbes, detection and diagnosis of HIV AIDS, hemorrhagic viral infections (Lassa fever, Ebola, Dengue etc), and Neglected Tropical Diseases NTDs. Furthermore, various advances in basic research has generated outcomes including: measles, polio and rotavirus, and school-based parasitic diseases control through WACIPAC. The keynote speech is in honour of Dr. Hideyo Noguchi, the founding Fathers of NMIMR (Prof. Charles Obamtten Easmon and Prof. Kenji Honda) as well as the numerous friends and partners.



Abraham Kwabena Anang[1)] and Frank Okyere[2)]

1) Noguchi Memorial Institute for Medical Research (NMIMR), University of Ghana, Legon, Ghana

2) Embassy of the Republic of Ghana

Science, Technology and Innovation in Africa

Juliette Mutheu-Asego
Head of Communications and PR, African Academy of Sciences, Kenya

Juliette Mutheu-Asego is The African Academy of Sciences Head of Communications and PR. She leads the development of an engaging and compelling AAS brand in Africa through developing and implementing a Pan-African communication and marketing strategy that will leverage on the unique strengths of AAS to achieve Africa's ambitious targets for research and innovation growth. Previously, she worked as a communication, media and advocacy specialist at PATH providing strategic communication leadership and technical assistance to the Kenyan Ministry of Health, the Management Sciences for Health (MSH) leading deliberate communication initiatives and training to strengthen internal and external communications capacity and at the African Institute for Development Policy (AFIDEP) as the Science Communication and Policy specialist involved in designing and implementing a communication and policy dialogue program.

About The African Academy of Sciences (AAS)

The African Academy of Sciences (AAS) is a non-aligned, non-political, not-for-profit pan African organization whose vision is to see transformed lives on the African continent through science.

Our tripartite mandate is recognizing excellence through The AAS' highly prestigious fellowship and award schemes, providing advisory and think tank functions for shaping Africa's Science, Technology and Innovation (STI) strategies and policies and implementing key Science, Technology and Innovation (STI) programmes addressing Africa's developmental challenges.

The STI that the Academy supports focuses on five strategic focus areas: Environment and climate change, health and wellbeing, natural sciences, policy and governance and social sciences and humanities.

The AAS recognizes excellence through the election of AAS Fellows and Affiliates who are distinguished researchers who represent the continent's talented and promising men and women from across the globe. The 460 Fellows, who are elected based on their publication record, innovation, leadership roles and contribution to policy, provide the strategic leadership to shape The AAS's programs, engage with governments to enable wise investment on the continent, serving as reviewers for AAS grant applications and mentor early career scientists. The AAS also awards the Obasanjo Prize every two years to an outstanding scientist who contributes to the development of the continent.

STI for SDGs from the view point of Science Diplomacy

KISHI Teruo
Science and Technology Advisor to the Minister for Foreign Affairs, Japan

Prof. Teruo Kishi has been working in the field of materials science for over 40 years and currently serving as the President of the "Innovative Structural Materials Association" funded by METI (Ministry of Economy, Trade and Industry), which promotes R&D mainly for materials used in automobiles. He has been also involved in Science, Technology and Innovation (STI) policy for a long time and has made invaluable contributions from scientific perspective. Especially, in these three years, he has been serving as the first Science and Technology Advisor to the Minister for Foreign Affairs of Japan.
As the Science and Technology Advisor, he has three main roles; 1) advice and recommendations to the Minister; 2) promoting Japan's STI and 3) networking building among S&T advisors, scientists and academics. He now focuses on the promotion of STI for SDGs, United Nations Sustainable Development Goals. He has already come up with recommendations to the Minister on how to promote STI for SDGs. These ideas have been shared with and acknowledged by global partners on the occasion of the United Nations 3rd STI forum in June 2018 and other international and domestic fora. Such activities also contributed a great deal to the success of developing the "Guiding Principles for the Development of STI for SDGs Roadmaps" endorsed by the G20 Osaka Summit in June 2019. Towards the TICAD 7 of August 2019, he made the "Recommendation: Achieving an innovation ecosystem together with Africa" including activities on STI for SDGs.
At this symposium, he will introduce such recommendations and activities for promoting STI for SDGs and encouraging discussions at TICAD 7. With more than 60 occasions to speak at the podium around the world since 2015, the Science and Technology Advisor came to acknowledge the importance of promoting Japan's STI from the standpoint of Science Diplomacy.

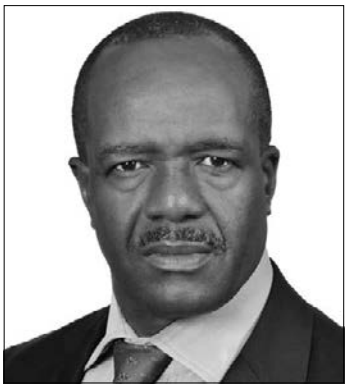
WHO approach to tackling skin-neglected tropical diseases

Kingsley Asiedu
Department of Neglected Tropical Diseases, World Health Organization (WHO), Geneva, Switzerland

Since 2016, WHO has been promoting the integrated skin-neglected tropical diseases (Skin-NTDs) approach to control, eliminate or eradicate these diseases. Until now, these diseases have been addressed through vertical disease control programmes. Several NTDs are characterized by cutaneous manifestations that are associated with long-term disfigurement, disability and stigma. These include Buruli ulcer, cutaneous leishmaniasis, leprosy, mycetoma and other fungal infections, yaws, onchocerciasis and lymphatic filariasis complications resulting in hydrocele and lymphoedema. All these diseases require similar community education, detection and case-management approaches that present opportunities for integration, which both increases efficient use of resources and expands coverage. Early detection is the cornerstone for achieving a good treatment outcome. However, low and late case detection remain a challenge for most of these diseases. As a start, WHO together with experts has developed an integrated manual to help train health workers in the field on skin-diseases. A framework policy document to guide countries in planning and implementing integrated activities.

The interest in the integrated skin-NTDs approach is growing. A number of non-governmental organizations have also embraced this approach of integration and are going beyond their disease-specific interests to provide support to countries to implement integrated activities. The NTD NGO Network (NNN) has created a sub-group on Skin-NTDs to promote this approach. Research on integrated approaches are also being pursued now particularly the development of integrated diagnostic platform to test different diseases from swabs for example. Other efforts underway include the development of survey and mapping strategy for skin-NTDs.

Knowledge Management in open Innovation Paradigm: Collaborative Research for Health



Kizito Mabisi Lubano
Director of Scientific Programmes, Partnerships & Grant Management, Kenya Medical Research Institute (KEMRI), Kenya

Collaborative research has become the mainstay in knowledge production across many domains of science and is widely promoted as a means of cultivating research quality, enhanced resource utilization, and high impact.

Within the context of growing health inequities, collaborative research embracing open innovation (OI) and knowledge management (KM) can play a critical role in improving health, equity and development. The OI paradigm may be conceptualized as “a distributed innovation process that involves purposively managed knowledge flows across the organizational boundary”

Collaborative research plays a critical role in production, storage, transfer, management and application of knowledge and technologies, towards social and economic growth in developing countries. Developing countries largely lack capabilities in science, technology and innovation, that developed countries have established and applied to steer economic growth. Collaborative research establishes partnerships that facilitate development of specialized human resource capable of initiating and sustaining progress in developing countries.

Nagasaki University for instance has had a long and meaningful collaboration with Kenya and more so KEMRI, starting from medical cooperation to establishment of a collaborative project with KEMRI in an open innovation paradigm. To increase the impact of collaborative research, networks are critical.

Brief Introduction on AMED Programs and Pan-African Network in Africa

Takashi Nishigaki
Program Officer, Japan Agency for Medical Research and Development (AMED), Japan

AMED was established in 2015, to promote integrated R&D from basic research to clinical trials for practical applications. It also stresses promoting international cooperation, particularly in the field of infectious disease research. Regarding such activities, ICREP-NTDs (International Collaborative Research Program for tackling NTDs in Africa), SATREPS (Science and Technology Research Partnership for Sustainable Development), and J-GRID (Japan Initiative for Global Research Network on Infectious Diseases) have been implementing in Africa by AMED.
One of the aims of these programs, is to enhance the contribution of Japan, using its science and technology capabilities, to address infectious disease issues, such as NTDs, emerging and re-emerging infectious diseases and so on. To promote such contribution, joint symposium has been held annually in Africa from 2014. After the start of AMED, it was expanded under the hostage by ICREP-NTDs. It is noteworthy that the establishment of Pan-African Network was agreed among the research projects in above mentioned programs, members of MOH from more than 20 African countries, and some companies, at the symposium held at the year of TICAD6.
The network looks highly effective in expanding not only the collaborative research activities but also the process of the social implementation of the results.

Serological surveillance system for multiple tropical infectious diseases in Africa

Satoshi Kaneko
Institute of Tropical Medicine, Nagasaki University, Japan

Institute of Tropical Medicine, Nagasaki University and Kenya Medical Research Institute (KEMRI) have worked together to develop a multiplex assay system for tropical infectious diseases. This system can measure more than 20 antibody titers simultaneously from a dried blood spot sample. The sample collection is based on a filter paper for blood sampling with no need for refrigeration. In order to expand our activities to other African areas, we set up a Pan African Infectious disease research Hub in KEMRI and we are in the process of preparing a training course for the surveillance program. For community-based survey programs in regions without the house-registration program, we developed an automatic house structure detection system using deep learning method with the supercomputer (TSUBAME) in collaboration with the University of Tokyo; and this system will provide a base for community-based survey program. Information of the multiple assays from communities will be used for monitoring the estimated disease distribution for policy making and evaluation of infectious disease control programs.

The project for establishment of the model for controlling neglected tropical diseases

Yasuhiko Suzuki
On behalf of leprosy and human African trypanosomiasis research roject members,
Hokkaido University, Research Center for Zoonosis Control, Japan

Development of the point-of-care diagnostic systems
We have developed low cost diagnostic methodologies for leprosy and human African trypanosomiasis (HAT) by applying a gene diagnostic method named Loop mediated isothermal AMPlification, LAMP. And we are now utilizing the LAMP system for field survey of leprosy and HAT.
Epidemiological study of leprosy and human HAT in Zambia
To determine the prevalence of leprosy and HAT in Zambia, we are performing field surveys focusing on human, domestic animals, wildlife, insect vectors and the environment. Teams consist of Zambian medical doctors, veterinarians and researchers, and Japanese researchers have been dispatched to the certain field to investigate the prevalence of both diseases at endemic regions as well as surrounding areas in order to evaluate the risks of disease transmission. By number of survey, risk factors have been elucidated. By utilizing the survey data, we are now drafting effective countermeasures packages for both diseases.

Integrated research program for the control of dengue fever mosquito in Burkina Faso, West Africa

Hirotaka Kanuka
Center for Medical Entomology, The Jikei University School of Medicine, Japan

Dengue fever is a viral vector-borne disease caused by infection of four dengue virus serotypes (DENV1-4) via the blood-sucking of Aedes mosquito. In Burkina Faso, dengue represents an added burden in an epidemiological landscape dominated by malaria. Additional new strategy to control the vector should absolutely be developed and involved in integrated vector management (IVM), because it is one of the most effective means to deal with the problem while waiting for a vaccine or another effective dengue control strategy. In the current project based on collaboration between Japan and Burkina Faso, entomological studies promoting multilateral approaches are being performed to gather fine knowledge of diagnosis, ethology, immunity, and epidemiology of vector species on effective vector control. The framework in our project focuses particularly on four key elements for a holistic IVM strategy: a) development of rapid diagnosis methods for pathogen and its vector, b) surveillance with systematic monitoring of vector population, c) understanding mechanisms related to vector competency and related to its control by microbe-based paratransgenesis, and d) neuro-ethological analysis of vector behavior in particular host sensing and blood-feeding. These IVM strategies are additional to, and compatible with, conventional measures (such as use of bed nets) and medicinal therapies.

Integrated research to fight against Buruli ulcer and other skin NTDs in West Africa

Koichi Suzuki
Professor, Faculty of Medical Technology, Teikyo University, Japan

Buruli ulcer (BU) is one of the major skin-related neglected tropical diseases (skin NTDs) with a considerable gap in its disease control. This research program aims at establishing an integrated approach to fight against BU and other skin NTDs in co-endemic areas of West Africa through synergic collaboration between Ghana, Côte d'Ivoire and Japan. Specific targets and objectives of research and development are: 1) Development of rapid diagnostic tools for BU. 2) Identification of route of transmission of BU. 3) System development and enhancement of surveillance for BU and other skin NTDs. 4) Clinical diagnostic support and establishment of wound management methods for BU with implications for other skin NTDs and ulcers. Our vision is to contribute in the global fight against NTDs with highly innovative and original science and technology. Successful achievement of these targets will aid in maximizing human resource capacity in West Africa to contribute in reducing the disease burden from BU and other skin NTDs / ulcers in the areas of basic science and medicine. It will lead to improvements in case-detection, diagnosis, and evidence-based management of BU.

SATREPS Projects on infectious diseases in Africa

Kouichi Morita
Dean, Institute of Tropical Medicine, Nagasaki University, Japan

SATREPS is a Japanese government program that promotes international joint research. The program on infectious disaeses is funded by the Japan Agency for Medical Research and Development (AMED) which provides competitive research funds for medical research and development and the Japan International Cooperation Agency (JICA) which provides development assistance (ODA). Based on the needs of developing countries, the program structured by AMED and JICA aims to address global health issues and lead to research outcomes of practical benefit to both local and global society. In the past, five projects have been completed and two are ongoing in Africa,

I conducted a project in Kenya namely, "Development of rapid diagnostics and the establishment of an alert system for outbreaks of Yellow fever and Rift Valley fever in Kenya" from 2011 to 2016 aiming to develop an novel early warning system using mobile phone network (mSOS) and rapid test kits in collaboration with the Kenya Medical Research Institute (KEMRI) and the Ministry of Health, Kenya. The mSOS system is currently being integrated into the national health information system (mSOS/IDSR Weekly Mobile System: A Tool to Enhance IHR Compliance). Some other successful projects are also introduced in the oral presentation.

Overview of the J-GRID project in Africa.

Shiroh Iwanaga
Department of Environmental Parasitology, Tokyo Medical and Dental University, Japan

The J-GRID project leverages relationships with overseas research centers by promoting epidemiological research on pathogens of prevalent infectious diseases and basic research on its diagnostic methods and drugs. Two J-GRID projects are now conducted in Africa.
In Ghana, Tokyo Medical and Dental University and Noguchi Memorial Institute for Medical Research carry out the following three researches: 1) surveillance and isolation of dengue viruses; 2) genetic analysis of the rota virus which is the causative agent of acute diarrhea; 3) surveillance of carbapenem resistance bacteria.
In Zambia, Hokkaido University has actively worked with the University of Zambia for over 30 years. We have collaborated intensively to control zoonotic diseases by utilizing research and educational infrastructures and to promote epidemiological and basic research of infectious diseases using the BSL-3 facility in Hokudai Center for Zoonosis Control in Zambia. For preemptive measures to predict zoonotic outbreaks and to prevent epidemics, we have identified and isolated various zoonotic pathogens, including West Nile virus, Marburgvirus, Borrelia sp., Bacillus anthracis, multi-drug resistant Mycobacterium tuberculosis and Trypanosoma sp., and elucidated the routes of transmission. Based on these findings, we have contributed to the public health of Zambia by introducing robust, portable, point-of-care diagnostics methods for infectious diseases.

Clinical development of NPC-SE36 malaria vaccine

Toshihiro Horii
Department of Malaria Vaccine Development, RIMD, Osaka University, Japan

Malaria is one of the biggest health concerns, more so in sub-Saharan Africa. In the countries with the highest malaria burden, over 0.4 million young children die due to combination of challenges that includes unsustainability and logistical burdens in the supply of anti-malarials and bed nets. While antimalarial drug resistance typically emerges soon after drug introduction, vaccine resistance rarely emerges. An effective, long lasting malaria vaccine would be cost effective and easily administered/implemented in different health care settings.
NPC-SE36 malaria vaccine consists of SE36 recombinant protein, which comes from P.f. SERA5, adsorbed on aluminum hydroxide gel. It is reconstituted with the CpG adjuvant. Promising results in Uganda Phase 1b trial showed that the immune response against this vaccine prevented volunteers from having high parasitemia and fever, and hindered them from having repeated malaria infections. We are now conducting Phase Ib clinical trials in Burkina Faso and planning Phase II clinical trials.
The target population are children in malaria endemic areas, particularly sub-Saharan Africa and malaria naïve individuals visiting endemic areas. For pediatric population in malaria endemic areas, after obtaining pre-qualification from WHO, the vaccine will be delivered through international health care organizations and also coordinated with different African regulatory authorities.

Promoting Cooperation on Infectious Disease Research between Africa and Japan for Science, Technology and Innovation (STI)

Coordinator:

Hiroyoshi Endo
Dean, Graduate School of Public Health, St. Luke's International University, Japan

Panelists:

Koichi Suzuki
Professor, Faculty of Medical Technology, Teikyo University, Japan

Victor Mukonka
Director, Zambia National Public Health Institute, Zambia

Juliette Mutheu-Asego
Head of Communications and PR, African Academy of Sciences, Kenya

Mamoru Endo
Deputy Head, External Representation Office for Asia, African Development Bank, Japan

Catherine Ohura
CEO & Executive Director, Global Health Innovative Technology Fund (GHIT Fund), Japan

Haruo Watanabe
Program Supervisor, AMED, Professor, Graduate School, International University of Health and Welfare, Japan

P-01 Bionomics variations and genetic diversity of Aedes aegypti populations from Burkina Faso.

Badolo Athanase[1], Hirotaka Kanuka[2]
1) Laboratoire d'Entomologie Fondamentale et Appliquée, Université Joseph Ki-Zerbo, Ouagadougou, Burkina Faso
2) Department of Tropical Medicine, The Jikei University School of Medicine, Tokyo, Japan

Burkina Faso experienced two severe consecutive outbreaks of dengue, in 2016-2017; the lack of information on Aedes aegypti populations has impaired the response to outbreaks. Data have been collected on the bionomics of Aedes aegypti.
An increasing density from urban to rural is recorded, consistent with the abundance and productivity of breeding sites. Ae. aegypti exhibited more outdoor than indoor biting and, human and mixed blood meals were detected. Morphological identification did not suppory the aegypti/formosus subdivision. The analysis of genetic variations using microsatellites did not reveal structure in the populations, Aedes aegypti is resistant to pyrethroid insecticides; supported by high frequency of the 1534C kdr mutation and 1014I kdr mutations. The populations are still susceptible to organophosphate and carbamate insecticides.

P-02 Implication of non- *M.ulcerans* pathogens in skin diseases liked Buruli ulcer using PCR targeting the insertion sequences and the *ketoreductase* gene.

Kouame Kouadio[1], David Coulibaly N'Golo[2,4], N'Guetta Aka[3,4], Aby Christiane Amon[2], Aubin Koffi Yao[5], Solange N'Gazoa-Kacou[2], Mireille Dosso [1,2,3,4]
1) Ecoepidemiology unit, Pasteur institute of Côte d'Ivoire
2) Molecular biology platform, Pasteur Institute of Côte d'Ivoire
3) Tuberculous and atypical mycobacteria unit, Pasteur Institute of Côte d'Ivoire
4) National reference center for Buruli ulcer of Côte d'Ivoire
5) Hope Commission International of Côte d'Ivoire

Mycobacterium ulcerans is an environmental mycobacterium with an elusive mode of transmission to humans. Its virulence is related to the secretion of the mycolactone,
The objective of this study is to use some targets referenced to detect Mu and show that many pathogens could be implicated in skin lesions seems to be BU cases characterizing the presence of the plasmid virulence.
Ivorian's Patient diagnosed BU were enrolled. Samples were cultured on Löwenstein- Jensen and 48 isolated strains were diagnosed using 4 PCR target.
Twenty eight isolated strains were positive for all the insertion sequences and the KR gene.
This study showed that other pathogens and *M.ulcerans* apparented Mycobacteria are implicated in skin lesions attributed to be Buruli ulcer cases.

P-03 Skin disease prevalence survey as a part of integration activities for skin NTDs in Côte d'Ivoire: results from the Adzopé and Gagnoa health districts

Rie Roselyne Yotsu[1,2], Bamba Vagamon[3,4]
1) School of Tropical Medicine and Global Health, Nagasaki University, Japan
2) National Center for Global Health and Medicine, Japan
3) Raoul Follereau Institute, Côte d'Ivoire
4) University off Alassane Ouattara of Bouake, Côte d'Ivoire

Many neglected tropical diseases – including Buruli ulcer, leprosy, and yaws – present with skin symptom(s) (skin NTDs). This characteristic feature may facilitate early detection by health-related fieldworkers in endemic areas. Our project aim to leverage fieldworkers to implement an integrated skin survey in early detection of skin NTDs in Côte d'Ivoire; a country with the highest reported number of Buruli ulcer cases globally. We are presenting our program implementation, results, and challenges to date since initiation of the project in May 2014.

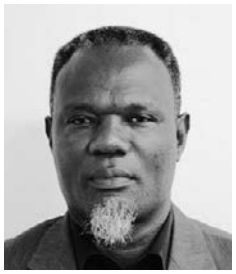
P-04 Introduction of Hope Commission International projects in Cote d'Ivoire

Aubin Yao
Hope Commission International, Abidjan, Côte d'Ivoire

HOPE Commission International Cote d'Ivoire (HCI-CI) is a Christian organization working to mobilize the churches, Organizations; and individuals to be involved in evangelism, discipleship ministry and humanitarian work in Africa and other nations by giving their time, resources and talents.
In April 2018, HCI-CI signed a agreement with MAP International to take other MAP International's local office's operation. So, MAP transferred its local office assets, staff and programs to HCI-CI.
HCI -CI keeps and even reinforce the working and operation standards of MAP International in areas such as Neglected Tropical Diseases (NTDs); Mother and child health; Water, Sanitation and Hygiene (WASH).

P-05 Development of Dry-reagent based IS2404 Loop mediated Isothermal Amplification test for rapid diagnosis of Buruli ulcer disease.

Beissner M.[1)], de Souza D.K.[2)], Maman I.[3)], Saar M.[1)], Zwirglmaier K.[4)], Wiedemann F.[5)], Bretzel G.[1)], Ndung'u J.M.[6)], Cruz I.[6)], Ablordey A.[2)]
1) 1Department of Infectious Diseases and Tropical Medicine (DITM), University Hospital, Ludwig-Maximilians-University, Munich, Germany
2) Noguchi Memorial Institute for Medical Research (NMIMR), University of Ghana, Accra, Ghana
3) Institut National d'Hygiène, Lomé, Togo
4) Bundeswehr Institute of Microbiology, Munich, Germany
5) German Leprosy and Tuberculosis Relief Association, Togo office, Lomé, Togo
6) Foundation for Innovative New Diagnostics (FIND), Geneva, Switzerland



Buruli ulcer (BU) caused by *Mycobacterium ulcerans* is a public health problem in sub-Sahara Africa.
The WHO recommends PCR confirmation of at least 70% of clinically suspected cases before antibiotic treatment. Unavailability of PCR led us to develop the dry reagent IS2404-LAMP test for BU diagnosis at primary health care level.
Dry-reagent IS2404-LAMP was tested for specificity, sensitivity (LOD) and time to positivity (Tp). *M. ulcerans* DNA was detected in all culture extracts and clinical BU samples, and showed 100% specificity. The LOD was 0.5 *M. ulcerans genome* equivalent. The Tp was 3-19 min. depending on the amount of template DNA.
The dry-reagent IS2404-LAMP test is highly specific, sensitive and can be further developed into a POC test for Buruli ulcer.

P-06 Outcomes of Buruli Ulcers and Non-Buruli Ulcers on Basic Wound Care

Nana Konama Kotey
National Buruli Ulcer Control & National Yaws Eradication Programme, Disease Control, Ghana Health Service, Accra, Ghana

Buruli ulcer (BU) has been regarded by the WHO as a significant cause of human suffering. Patients with ulcers generally report to health facilities for healing of their ulcers but they do not get the expected results due to delay in getting laboratory confirmation which further leads to lack of confidence in the health system. We set out to assess the outcomes of ulcers irrespective of laboratory results.
BU confirmed patients were given clarithromycin and rifampicin. Regular dressings were done for all using a mixture of povidone iodine, metronidazole and vinegar.
There was no significant difference between the duration of healing of ulcers that were BU and those that were not.
We therefore recommended that:
•All ulcers must be given equal attention
•Patients ulcers should be encouraged to report early

P-07 A new approach in detection of trypanosome species and mammalian blood meal sources in wild caught tsetse flies

Alex Gaithuma[1)], Alex Gaithuma[1)], Junya Yamagishi[1)2)], Kyoko Hayashida[1)], Chihiro Sugimoto[1)2)]
1) Division of Collaboration and Education, Research Center for Zoonosis Control, Hokkaido University, Sapporo, Japan
2) Global Institution for Collaborative Research and Education – GI-CoRE, Research Center for Zoonosis Control, Hokkaido University, Sapporo, Japan

Tsetse flies are vectors of trypanosomes, parasites which cause sleeping sickness and nagana diseases in sub-Saharan Africa. We present a method for detecting trypanosome species in tsetse flies and identifying mammalian species that tsetse flies feed on. It uses a two-step PCR DNA metabarcoding approach and next-generation sequencing. The method is specific enough to distinguish between trypanosomes at sub-species/genotype level which is only achieved by microsatellite genotyping. For the first time we report the detection of fruit- bat DNA in tsetse flies among other mammals (humans, wild and domestic animals). We hope that this method will be useful in determination of trypanosome species distribution in endemic areas, understanding tsetse fly ecology and aiding in the control of trypanosomiasis.

P-08 Development of vDNA loop-mediated isothermal amplification method (vDNA-LAMP) to detect arbovirus-derived DNA in mosquitoes

Hiroka Aonuma[1)], Athanase Badolo[2)], Hirotaka Kanuka[1)]
1) Department of Tropical Medicine, Center for Medical Entomology, The Jikei University School of Medicine, Tokyo, Japan
2) Laboratoire d'Entomologie Fondamentale et Appliquée, U Université Ouaga 1 Pr Joseph Ki-Zerbo, Burkina Faso

Mosquitoes infected with arboviruses persistently carry viruses throughout life without severe symptoms. In infected mosquitoes, virus-derived DNA (vDNA), a DNA form of RNA viruses, is generated by reverse transcriptase. vDNA restricts viral replication through RNAi pathway in mosquitoes and likely play an important role in mosquito's tolerance mechanism against viral infections. In this study, loop-mediated isothermal amplification (LAMP) method was applied to detect vDNA, and vDNA of dengue virus type 2 (DENV-2) was detected from both Aedes aegypti artificially-infected with DENV-2 and wild Aedes mosquitoes collected in Burkina Faso. Utility of vDNA-LAMP was also demonstrated by detecting zika virus (ZIKV) from artificially infected Aedes aegypti. Our results suggest the potential of vDNA-LAMP as a diagnostic tool of mosquitoes for xenomonitoring.

P-09 Molecular survey of *Rickettsia felis* in Zambia.

Lavel Chinyama Moonga
Division of Collaboration and Education, Research Center for Zoonosis Control, Hokkaido University

Flea-borne spotted fever is a zoonosis caused by *Rickettsia felis* with a worldwide distribution. However, the epidemiology and the public health risks it poses remain neglected especially in developing countries including Zambia. Thus, the aim of this study was to detect and characterize *R. felis* in Zambia. Dog blood and rodent tissue samples as well as cat fleas and mosquitoes were screened for *Rickettsia spp*. by PCR and amplicon sequence analysis. *R. felis* was detected in dogs, rodent samples and cat fleas infesting dogs. Furthermore, cat flea samples showed positive for *Rickettsia asembonensis*. These observations suggest that *R. felis* is circulating among domestic dogs, rodents and cat fleas in Zambia, posing a potential public health risk to humans.

P-10 Development of easy diagnostic tool dried CZC-LAMP for human African trypanosomiasis

Kyoko Hayashida, Junya Yamagishi, Chihiro Sugimoto
Research Center for Zoonosis Control (CZC), Hokkaido University, Hokkaido, Japan

Human African trypanosomiasis is one of the neglected tropical diseases that can be fatal if not treated. We aimed at developing easy point-of-care diagnostic test for this parasite using improved LAMP method. The essential improvement was that LAMP reagents were dried in a single tube to prolong shelf life at ambient temperature. The sample preparation step was also simplified so that nucleotide could be amplified directly from detergent-lysed blood. Furthermore, to achieve accurate mass-production, we employ semi-automated process to produce test kits using an ink-jet printing machine. The developed LAMP assay system (CZC-LAMP) was confirmed to be sensitive, and was stable more than 6 months. The CZC-LAMP system had been validated in Zambia and Malawi.

P-11 Seroepidemiology of strongyloidiasis to reveal an accurate distribution in Kenya.

Ayako Hyuga[1], Samson Muuo Nzou[2], Satoshi Kaneko[1]
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Strongyloidiasis is one of the soil-transmitted helminthiases listed in Neglected Tropical Diseases. In Africa, few reports are available on Strongyloides occurrence although ecological and socio-economic conditions are possible for its transmission. One of the reasons that the actual epidemiology remains unclear is the low sensitivity of conventional stool tests for Strongyloides. Thus, surveillance using high sensitivity methods is required. Aiming at elucidating more reliable Strongyloides prevalence in Kenya, we have been developing a multi-antigen serological test using a microbeads technology. The recombinant antigens that had been published to have high sensitivity and specificity to detect Strongyloides antibodies were selected. These proteins were expressed in *E.coli* and used in the assay. After the development, the immunoassay will be evaluated.

P-12 Alteration of midgut microbiota following to the induction of short-term blood host adaptation in yellow fever mosquito, Aedes aegypti

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Mosquitoes transmit zoonoses as a bridge vector by regarding plural animals as blood hosts. Relating to the bridging, it is empirically known that laboratory reared mosquitoes can adapt to a new blood host generally within five generations. To unveil molecular basis of plasticity in mosquito host preference, we induced artificial adaptation of yellow fever mosquito, Aedes aegypti, using five animal species represented by a horse. Differentially expressing genes found in an RNA-seq analysis were roughly classified into two groups; 1) memory, learning, and neural activity, and 2) antibacterial immunity. A microbiome analysis showed an alteration in midgut microbiota of chicken reared mosquitoes. These results suggest that correlation between host alteration and blood host preference might be maintained by midgut symbionts.

P-13 Skin NTDs in Japan

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We analyzed cases of skin NTDs that were reported in Japan from 2000 to 2018. We focused on patients with leprosy, cutaneous/mucocutaneous leishmaniasis and Buruli ulcer (BU). We performed sub-analyses by sex, age, type of lesion, and treatment. The search was performed using the Japan Medical Abstracts Society and the database at the Leprosy Research Center, National Institute of Infectious Diseases (NIID). The number of new cases of leprosy has been observed with less than 10 cases per year during the past decade, including few cases of domestically acquired. All cases of leishmaniasis were imported cases. Total number of BU case were 70 in Japanese, most of them received rifampicin, clarithromycin and levofloxacin.

P-14 Development of an Automated Building Mapping System using High-Resolution Satellite Images and Deep Learning

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We developed an automated system of building with the use of high-resolution satellite images and deep learning, comprising a geospatial data management system, an image data processing system, and a quality control system. The system development has achieved the component of the geospatial data management and image data processing, and performed building mapping of some large extents, while the development of quality control systems is ongoing. Because we developed the system with open-source and web-based software, anyone can participate in the preparation of training data just only with a computer and the Internet. The system is expected to be a platform for the large-scale mapping of buildings and other ground objects with international collaborations of local partners.

P-15 Preliminary Evaluation of Recombinant Antigen; Cathepsin L1 of Fasciola hepatica (rFHCatL1), for application to Simultaneous Surveillance System by Multiplex Beads Assay

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Our group has developed the simultaneous surveillance system using multiplex beads assay and has been operating continent-wide NTDs surveillance in Africa. Fascioliasis, one of the zoonotic NTDs, causes significant economic loss to the livestock market. In Kenya, meat inspection surveys have estimated its prevalence of 16-43% in cattle. WHO warns that “where animal cases are reported, human cases also exist”, however, disease burden in human is still unclear in Africa. To include fascioliasis into our surveillance system, we identified FHCatL1 as a promising antigen for serodiagnosis, but found that there were many false positive among Kenyan samples due to cross-reactions with nonspecific antibodies. We report the results of preliminary studies of secondary antibodies against IgG subclasses to reduce cross-reactivity.

P-16 A case of Buruli ulcer successfully treated with negative pressure wound therapy

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A 56-year-old Japanese woman progressed a necrotic, ulcerative lesion on the right ankle. In the biopsy specimens from the ulcer, acid-fast bacilli were detected with Ziehl-Neelsen staining. PCR examination showed that the skin sample was positive for *Mycobacterium ulcerans* subsp. *shinshuense*, and the diagnosis of Buruli ulcer (BU) was made. Administration of clarithromycin, rifampicin and levofloxacin was performed. Subsequently, the patient was administrated for surgical debridement. We performed negative pressure wound therapy (NPWT) as a pretreatment for skin grafting. A free skin graft was successfully engrafted.
Although the present lesion was extended deeply and required surgical debridement, we were able to avoid amputation and to achieve good wound healing by skin grafting after NPWT.

P-17 Possible interaction between mosquitoes and arboviruses by vDNA, a DNA form of RNA virus

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Arboviruses transmitted by mosquitoes cause serious human diseases. Although arboviruses replicate in mosquitoes, mosquitoes are asymptomatic and infected persistently. It is little Known how mosquitoes resist and/or tolerate viral infections. vDNA is a DNA form of RNA viruses produced by host insect cells. vDNA restricts viral replication by RNAi in Drosophila and Aedes cells. Inhibition of producing vDNA leads death of host cells following loss of antiviral immunity. However, the proper functions of vDNA are poorly understood in vivo. We tried to infect Flock house virus (FHV) with Drosophila melanogaster and Aedes aegypti and compare the survival. While all Drosophila died within 6 days, 80% of Aedes survived over 1 week. The results showed mosquitoes resist and/or tolerate FHV infection.

P-18 Biological control strategies against arboviruses using symbiotic bacteria Wolbachia

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Symbiotic microorganisms prevail in huge varieties of insect species, supporting insect adaptations to diverse habitats mainly based on nutritious interactions. Wolbachia are the most prevalent endosymbiotic bacteria in invertebrates, which are estimated to be infecting over 60% of insect species. Recently, promising practical approaches using Wolbachia have emerged to control Aedes populations in current or potential risk areas of dengue or Zika. Our research is focusing on revealing molecular bases of the Wolbachia-host interactions and, concomitantly, the impact of Wolbachia on the insect evolution and ecology.

P-19 Preventing malaria by adjusting amino-acid intake

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Plasmodium parasites take a plethora of nutrients from their host. Amino acid in plasma has been considered to be important role for parasite because the parasites lack almost amino acid synthesis and obtain a part of amino acid from plasma. In spite of the importance, the relationship between Plasmodium parasites and amino acids has not been fully elucidated. For the better understanding of host-parasite interactions, we focused on amino acids and performed aminogram analyses, the multivariate analyses using statistical modeling of free amino acid concentrations. We demonstrated that Plasmodium infection caused drastic alteration of plasma aminogram in infected mice and severe malaria patients. Here, we argue the amino acid-related interaction between Plasmodium and host with current data.

P-20 Dissecting the function of transient receptor potential like (TRPL) in blood sucking behavior of dengue virus-vector mosquito, Aedes aegypti

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Exploring the molecular mechanism of blood sucking behavior of female mosquitoes is one of the critical steps to fight against vector-borne disease, since pathogens are transmitted when mosquitoes are gorging on blood. To dissect the molecular mechanism of blood sucking behavior, we performed RNAseq analysis and compared the expression pattern of genes in dengue virus-vector mosquito (Aedes aegypti) brains between pre and post blood suction. The expression level of transient receptor potential like (TRPL) was increased immediately after engorgement. We generated TRPL mutant mosquitoes by utilizing CRISPR/Cas9 system. Furthermore, we investigated the effect of camphor on mosquitoes, the ligand for TRPL, which was previously reported in Drosophila. Here, we would like to discuss the function of TRPL in blood suction.

P-21 Identification of Appropriate Cut-offs for Prevalence Mapping of HIV1, Human African Trypanosomiasis, and Schistosomiasis in Six Different Regions of Kenya

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Infectious diseases continue as a public health concern in Africa, substantially affecting the African economic development. The prevalence data on each disease is essential to construct strategic plans for elimination, however, such data is either absent or inaccurate. Our team has developed a cost-effective Multiplex-beads-assay to simultaneously detect immunoglobins highly specific to each disease against serum sample extracted from the dry blood spot (DBS). In this study total of 10,558 DBS samples were collected from Kitale, Kwale, Laikipia, Makueni, Marsabit, Mbita, and Taita in Kenya. K-means clustering and finite mixture models were performed by region to identify the best cut-offs to deduce the prevalence of HIV1, human African trypanosomiasis, and schistosomiasis. Prevalence map with new insight may have been identified.

P-22 Dissecting overwintering mechanism of Asian tiger mosquito, Aedes albopictus

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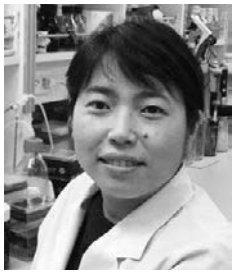

Ae. albopictus is one of Ades species and widely distributed in Asia. In tropic area, Ae. albopictus repeats their life cycle throughout the year. On the other hand, in temperate area, when adult females are exposed to short daylength and low temperature in late autumn, they lay diapause eggs. In diapause eggs, development is paused at the pharate first-instar larval stage and this larva survives winter. To reveal the genetic mechanism under diapause egg formation, specific to temperate strain, we performed RNA-seq using eggs from tropic strain and diapause eggs from temperate strain. Our results suggested the possibility that neuropeptide gene, Capability (Capa) induce hatching behavior. Now, we are trying to evaluate the function of Capa protein in diapause eggs.

P-23 Proposal of optimization of Buruli ulcer wound management feasible in communities with limited recourses.

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The two mainstays of Buruli ulcer treatment are antimycobacterial therapy and wound management. An inadequate wound treatment causes not only wound healing delay but also secondary infection and other complications including wound pain, osteomyelitis, cutaneous squamous cell carcinoma, etc. Based on our experience of inspection regarding Buruli ulcer wound care in Ghana and Republic of Côte d'Ivoire in 2018, we assumed that there is considerable room for technical and medical improvement in wound care management. As a part of AMED project, we propose optimization of Buruli ulcer wound management which is sustainable and can be easily implemented in even communities with limited resources. We especially focused on feasibility and cost-effectiveness of wound management from the dermatological point of view.

P-24 Loop-mediated isothermal amplification applied to SFTSV vDNA detection in the ticks

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Severe fever with thrombocytopenia syndrome virus (SFTSV) is a newly identified Phlebovirus causing an acute hemorrhagic fever in East Asia, China, Korea, and Japan. As for the study of epidemiological analysis, we collected ticks from 20 point localities, on the Kyushu Island, Japan, in 2018-2019. A total of 2024 questing ticks were collected using flagging vegetation. In addition, we detected SFTSV vDNA (virus-derived DNA; a part of DNA derived from the arbovirus) in ticks. Since vDNA is more stable by nature than RNA, this may also lead to new methods of epidemiology for SFTSV. These results provided the first evidence of SFTSV vDNA synthesis in wild tick, which may imply to the effective management of tick-borne diseases by xenomonitoring using vDNA.

P-25 A community based application platform for Surveillance of Neglected Tropical Diseases in Kenya.

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We developed a filter paper sample collection and household system to register structures automatically using satellite images. Using open data kit (ODK), we collected socio-demographic characteristics from communities and linked it to filter paper of each individual. A microsphere-based immuno-assay system was developed to simultaneously measure individual levels of plasma antibody (IgG). The assay system was validated using appropriate control samples.We have registered, collected socio-demographic data and sampled over 3500 random household in seven counties in Kenya. For the assay system utility testing, the sensitivities and specificities for each antigen ranged between 71 and 100%. This model can provide an opportunity to comprehensively grasp epidemiological features for NTDs. It can also been adopted for the rest of Africa.

P-26 Infectious diseases in Malawi: Where we are and Where we are going

Janelisa Musaya
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Malawi is one of the poorest countries in the world with a high burden of infectious diseases. The average life expectancy of a person living in Malawi is 57 years for males, and 58 years for females, making it the country with the twentieth lowest life expectancy in the world. The main infectious diseases being HIV, Malaria, diarrhea diseases and lower respiratory infections. Though Malawi is committed to addressing the challenges of these diseases at the national level with cooperation and innovation in order to have a lasting impact, there is need to perform high quality research and strengthening the underpinning infrastructure to deliver solutions that reduces transmission at the same time promoting the development of the next generation of researchers.

P-27 Actual situation of Leprosy in Mozambique, June 2019

Francisco Guilengue
Leprosy Control Program Manager, Mozambique

Introduction:Mozambique is an African country endemic to Leprosy. In 2008 declared elimination when it reached the prevalence of <1/10,000 inhabitants and active case finding reduced. Consequently, new infections and grade 2 deformities increased.
In 2015, the country has restarted the active case finding of the suspects and support to community groups and volunteers.

Results: The detection rate has increased from 1,200 new cases per year to more than 2,400 in 2018.
Conclusion: For the control of Leprosy in Mozambique, active case finding, training of technicians, should be maintained for early diagnosis and treatment as well as greater availability of MDT.

P-28 Implementation of Leprosy Survey in Sinazongwe and Mongu Disticts of Zambia

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3) National Institute of Infectious Disease, Japan
4) National Leprosy Museum, Japan
5) Ministry of Health, Zambia

Background: To demonstrate the impact of Leprosy in Zambia among all age groups and gender within the Frame work of the National Tuberculosis and Leprosy control Programme (NTLP) and to document the impact of this survey.
Intervention: The survey was done in 2 districts of Zambia: Sinazongwe in Southern Province and Mongu in Western Province. All age groups and gender were physically screened for signs and symptoms of Leprosy. Blood, Nasal swabs, skin scrapings and urine samples were collected for laboratory investigations .
Results: 790 participants were screened. Seven (7) new cases were diagnosed. Laboratory investigation showed that 47/371 samples tested using LAMP had leprosy genes. Two (2) relapse cases were also seen.
Conclusion: These results indicate that Leprosy might be prevalent within the Zambian population.

P-29 Tsetse and trypanosomiasis control in Zambia in the last two decades

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Tsetse and Trypanosomiasis Control Section, Department of Veterinary Services, Zambia

About 30 – 40% of Zambia's landmass is infested with tsetse flies (*Glossina spp.*), which are cyclical transmitters of human and animal trypanosomiases. A review study of the history of tsetse and trypanosomiasis control in Zambia showed that the last two decades belong to a period when more environmentally friendly techniques have been made available and resistance to trypanocides is more widespread. Hence, the last two decades have been characterized by a heightened desire to eliminate tsetse over areas so defined as to minimize re-invasion. Notable achievement is the elimination of *Glossina morsitans centralis* from 11,300 km2 area, using SAT in 2009 and 2014 and the area is still tsetse free. Tsetse control operations than eliminates/minimize re-invasion are the way forward.

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来賓挨拶：H.E. Mr. Estifanos Afeworki

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基調講演1：Juliette Mutheu-Asego

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