RIGHT Foundation

2023 Annual Report

RiGHT Foundation

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RiGHT Foundation

TABLE OF CONTENTS

GREETINGS

Myoungsei Sohn, Ph.D M D.
Research Investment for Global Health Technology Foundation Chairman

Hani Kim, Ph.D
Research Investment for Global Health Technology Foundation Executive Director

The Research Investment for Global Health Technology Foundation (hereafter "RIGHT") is widely recognized as the only foundation in Korea implementing Official Development Assistance (ODA) to advance global health equity through research and development. In 2023, we celebrated our fifth anniversary with some remarkable achievements. Most notably, the Bill & Melinda Gates Foundation (BMGF), one of our core funders since 2018, doubled its commitment, pledging $22 million over the next five years. This follows the increased support from the Ministry of Health and Welfare of Korea in 2021.

This year, we welcomed Noul and QuadMedicine as our new Council members. Noul's AI-powered malaria point-of-care diagnostic solution and QuadMedicine's microarray patch (MAP) technology are pivotal in malaria elimination programs overseas and improving healthcare access in low- and middle-income countries (LMICs) overall.

In addition, we signed a memorandum of understanding with the Foundation for Innovative New Diagnostics (FIND) to jointly support research grants for effective and affordable diagnostics. FIND is an internationally renowned organization for its role in the World Health Organization (WHO)-led efforts during the COVID-19 pandemic. It will provide technical cooperation and facilitate global public procurement for our supported projects.
In 2023, we expanded collaborations with domestic and international companies, research institutions, and LMIC partners. Our support has brought several health products closer to WHO prequalification licensure, a crucial step for global market access. We remain committed to ensuring essential health technologies reach those in need in LMICs.
As always, we stay committed to working with Korean life sciences companies, research institutes, and government offices in bringing Korea's R&D capability and prowess to enhance global health equity.

On June 2, 2023, RIGHT celebrated its fifth anniversary with overwhelming support and enthusiasm from partners and collaborators who have supported or toiled with RIGHT since 2018. Notably, Vice Minister MinSoo Park and Mr. Bill Gates, via Ms. Jessica Martinez, conveyed their congratulatory remarks and reiterated their support and enthusiasm for RIGHT's unique role as Korea's only funding agency dedicated to supporting global health R&D. We ushered in our sixth year with a profound sense of gratitude and purpose as we continue to strive to support the development and availability of essential medical countermeasures as global public goods. In 2023, RIGHT committed 27,071 million KRW (approximately 20.8 million USD) to 15 new projects involving 13 new international partners. The new investments added two new candidates to our portfolio, with a high probability of technical and regulatory success for WHO prequalification by 2028.
Importantly, RIGHT's investments began to bear fruit in 2023. The STANDARD G6PD Analyzer developed by SD Biosensor and Program for Appropriate Technology in Health (PATH) received policy recommendations from the Brazilian government for mandatory G6PD testing before tafenoquine treatment for Plasmodium vivax malaria. RIGHT's funding supported SD Biosensor and PATH in generating additional data from the clinical validation of the test and extended the shelf-life from 12 to 18 months, thus contributing to ensuring the test's quality and suitability for equitable access in LMICs. The story of STANDARD G6PD Analyzer demonstrates the crucial importance of initiating R&D efforts with global access in mind from the start and will serve as an example for RIGHT to emulate with other funded products.
Additionally, RIGHT's two new programs, the Evidence Generation Award (EGA) and Training Award (TA) programs have continued to advance. Following the launch of the EGA in 2022, RIGHT selected six EGA projects from eight countries for funding in 2023, which will critically appraise the outcomes of applying digital tools to prevent and control infectious diseases or improve the delivery of primary health services in LMICs as well as context-specific mechanisms.
Once completed, these projects will guide RIGHT's future funding strategy for developing digital tools as global public goods. The TA was launched to support self-sufficiency in the regional-level manufacturing of essential medical countermeasures, with an initial focus on vaccines. RIGHT's three programs, Product Development Award (PDA), EGA, and TA, are intended to complement each other in a virtuous cycle, such that R&D efforts with End-to-End approach involve sharing resources and knowledge. We look forward to seeing greater synergy among the three programs in generating an influence on global public health and health equity.

KEY HIGHLIGHTS FROM 2023

2023 global health R&D portfolio in infectious diseases

58 Supported a total of 58 projects between 2018 and 2023

15 Supported 15 new projects in 2023

6 Supported six new EGA projects in digital health

Types of disease targeted by projects RIGHT supported

23 Number of infectious diseases targeted by projects RIGHT supported through 2023

12 Number of infectious diseases targeted by new projects in 2023

Revitalizing global partnerships with Korea to promote global health R&D

36 A total of 36 domestic and international organizations are participating in new projects beginning in 2023

13 Thirteen new projects are being implemented with at least one international partner organization

9 Number of new projects in which global Productive Development Partnership organizations participated as principal investigators or collaborators in the R&D process

Strengthening contribution to global health equity through the participation of LMICs

9 Number of LMICs engaged in new projects in 2023

73% Percentage of new projects with participation from LMICs (11 projects)

15 Increased collaboration with LMICs 15 organizations from LMICs participating in new projects

Finances

27,000,000,000 KRW

15 new projects funded with total ₩27 billion

58,100,000,000 KRW

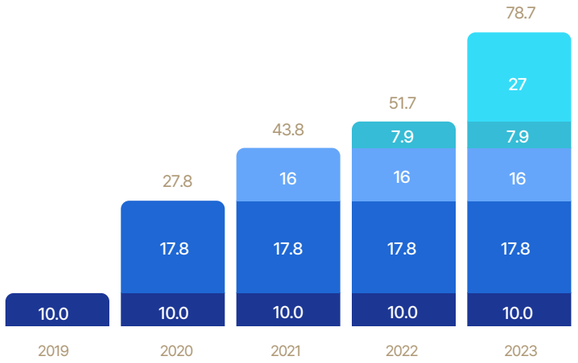
15 new projects totaling ₩58.1 billion in co-funding

USD 22,000,000

Successfully secured $22 million funding from BMGF for the next 5 years

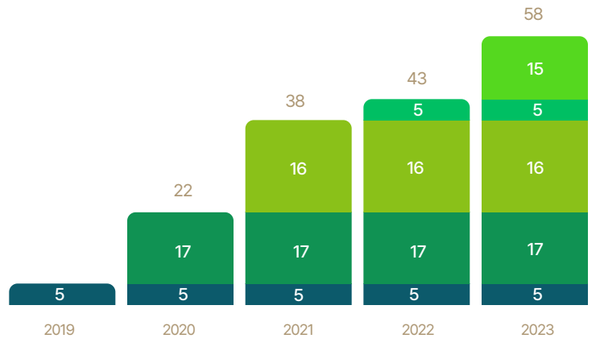
PORTFOLIO OVERVIEW

Committed Funds Each Year



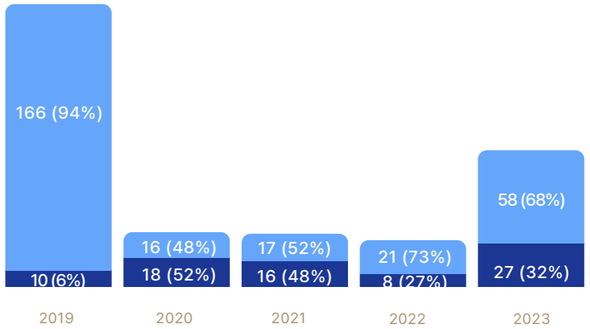
Unit : Bill KRW
- 2023
- 2022
- 2021
- 2020
- 2019

Number of Funded Projects



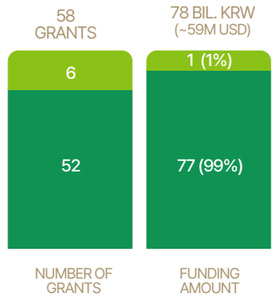
Unit : Number of projects
- 2023
- 2022
- 2021
- 2020
- 2019

Achievements in Co-funding Each year



Unit : Bill KRW
- Co-funding
- RIGHT funding

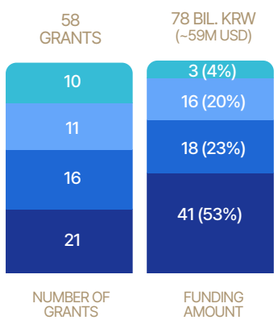
Distribution by Award Type



Unit : Bill KRW
- EGA : Evidence Generation Award
- PDA : Product Development Award

* PDA includes PDA, TAA, and BA under the Product Development Award

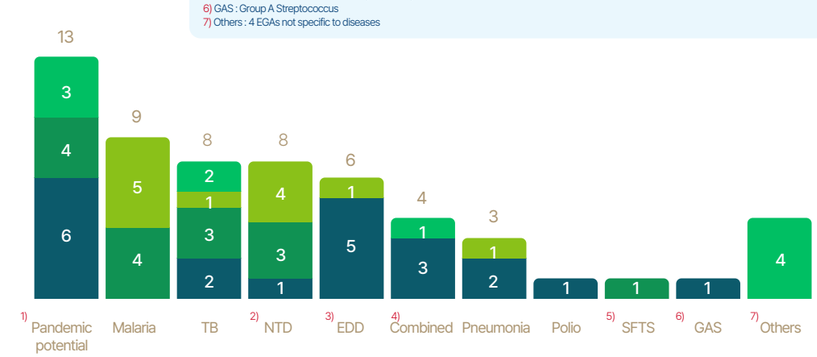
Distribution by Product Type



Unit : Bill KRW
- Digital Health
- Therapeutics
- Diagnostics
- Vaccines

Distribution by Diseases

1) Pandemic potential, COVID19 + Influenza
2) NTD : Neglected Tropical Diseases, Chikungunya + Dengue + Leishmaniasis + Schistosomiasis + Onchocerciasis
3) EDD : Enteric and Diarrheal Diseases, Cholera + Hep A + Rotavirus + Typhoid
4) Combined : Hexavalent vaccine (DTwP-HepB-IPV-Hib), Pentavalent vaccine (DTwP-HepB-Hib), Measles-Rubella, Multiple infectious diseases
5) SFTS : Severe Fever with Thrombocytopenia Syndrome
6) GAS : Group A Streptococcus
7) Others : 4 EGAs not specific to diseases



Unit : Number of projects
- Digital Health
- Therapeutics
- Diagnostics
- Vaccines

PRODUCT DEVELOPMENT AWARD

ACTIVE | COMPLETED | TERMINATED

VACCINES

PRECLINICAL	PHASE 1	PHASE 2	PHASE 3	REGISTRATION /WHO PQ
Measles-Rubella MAP vaccine		Typhoid conjugate vaccine		
Group A Streptococcus vaccine		Pentavalent meningitis conjugate vaccine		
DTwP-HepB-Hib pentavalent MAP vaccine		Novel Cholera conjugate vaccine	DTwP-HepB-IPV-Hib Hexavalent Vaccine	
Low-cost HepA vaccine manufacturing platform		Schistosomiasis vaccine		
Novel Cholera conjugate vaccine		Quadrivalent meningitis conjugate vaccine		
COVID-19 vaccine using viral vector system				
DNA vaccine using electro-portable microneedle patch				
Intranasal universal respiratory virus vaccine				
Microneedle-mediated SARS-CoV-2 DNA vaccine				
Mpg loaded TB MAP vaccine				
Non-replicating protein nanoparticles-based Rotavirus vaccine				
Development of a sublingual COVID-19 subunit vaccine				
Prime-Boost BCG vaccine				
SARS-CoV-2 nanogel sublingual vaccine				
Virus-free recombinant polio vaccine				

THERAPEUTICS

PRECLINICAL	PHASE 1	PHASE 2	PHASE 3	REGISTRATION /WHO PQ
Single exposure radical cure for blood stage malaria		Antimalarial combination therapy for malaria prevention		
Novel route of synthesis of antimalarial drug		Treatment development for severe malaria	Novel antibiotic combinations to address AMR burden in neonatal sepsis	
Safety assessment of TTCA antitubercular agents		Continuous manufacturing process for visceral leishmaniasis drug	Continuous manufacturing process for human use helminth infection treatment	
Development of a therapeutic anti-dengue polymeric IgG antibody			Continuous manufacturing process for new antimalarial	
Niclosamide intramuscular depot injection for dengue virus disease				

PRODUCT DEVELOPMENT AWARD

ACTIVE | COMPLETED | TERMINATED

	EARLY VALIDATION	LATE VALIDATION	CLINICAL VALIDATION / UTILITY	Registration /WHO PQ
DIAGNOSTICS	Leishmaniasis RDT Cartridge and Mobile Pocket Analyzer	2nd Generation TB LAM Assay		
	Instrument-free molecular diagnostic platform for COVID-19	POCT for Multidrug-Resistant TB		
	Mobile Diagnostic Platform for Influenza and SARS-CoV-2	POCT for COVID19, Influenza and RSV		
	POCT for Pyrazinamide (PZA) Susceptibility Testing	AI-driven All-in-One Diagnostic platform for Malaria Species Differentiation		
	Quantitative POC Test Using mBFP for G6PD Deficiency	2nd Generation G6PD Test		
	Rapid Diagnostic Test for Chikungunya Antigen	Validation of All-in-One Device for Malaria Diagnosis		
	Surearly Smart Pro COVID-19			
	In vitro Diagnostics Test for Severe Fever and thrombocytopenia Syndrome			
	Rapid Diagnostic Test for Visceral Leishmaniasis Antigen			
	Rapid Diagnostic Test for Both S.Typhi and S.Paratyphi A			
DIGITAL HEALTH	AI-Driven Platform for Anti-Tubercular Drug Discovery			
	Data Platform to Improve Diagnosis of Infectious Diseases			
	ICT based Self-risk Assessment Platform for COVID-19		Chest X-ray AI for COVID-19	

EVIDENCE GENERATION AWARD

Kiribati, Ethiopia, Nepal
Analyzing digital solutions for health system gaps in crisis-affected areas

Vietnam
Quantifying the added value of lunit software in advancing TB elimination efforts

Vietnam, Mongolia
Understanding the end-user perspectives of implementing TB-CAD in high TB burden settings and improving fit for use in children*

*The grant agreement signed in February 2024

Malawi
The Public-Health assessment of Malawi's one digitized infrastructure COVID-19 study

Mozambique
Evaluating digital health solutions for laboratory diagnosis of endemic and pandemic diseases

Nigeria
Evaluating digital tools applicability for infectious disease surveillance in community

Uganda
The impact of digital health technologies on the delivery of maternal and child health services

Development Stage : Preclinical

Measles-Rubella MAP vaccine

Grantee(PI)	QuadMedicine
Collaborators	Yonsei University, International Vaccine Institute (IVI)

This project aims to develop a measles and rubella (MR) vaccine loaded onto a novel microneedle array patch (MAP) delivery system. Stages funded through this grant include evaluation of the safety, immunogenicity, and efficacy of a novel MR-MAP in mice. This MR-MAP is designed to improve delivery efficiency, reduce wear time, and have greater antigen stability during storage. Vaccines delivered through MAPs have the potential to increase vaccine coverage, particularly in remote and underserved areas, by reducing the need for extensive cold chain networks and specially trained healthcare workers to administer vaccine doses. The MAP platform has potential applicability beyond MR and other lyophilized vaccines, such as mRNA vaccines.

Development Stage : Preclinical

Group A Streptococcus vaccine

Grantee(PI)	University of Dundee
Collaborators	London School of Hygiene and Tropical Medicine, IVI, Gyeongbuk Institute for Bio industry

The project aims to develop a multidose, low-cost, universal vaccine against Group A Streptococcus (GAS). This work will apply an innovative glycoconjugate vaccine development platform able to produce vaccines at low cost. The vaccine will be based on a Group A carbohydrate backbone (Rhamnose polysaccharide, RhaPS) previously characterized by the study team and shown to be highly preserved across a wide range of serotypes. This grant funds pre-clinical activities, including the development of several glycoconjugate vaccine candidates and the selection of the most suitable candidate based on efficacy and long-lasting immunogenicity in animal models. GAS causes significant death and morbidity, particularly in low-income settings. Despite this health burden, no vaccine is currently available; therefore, a safe, effective, and affordable GAS vaccine is urgently needed.

Development Stage : Phase 1~3

Pentavalent Meningitis Conjugate Vaccine

Grantee(PI)	EuBiologics Co., Ltd
Collaborator	PATH

This grant aims to develop and obtain WHO prequalification for an affordable meningococcal conjugate vaccine, NmCV-5 (ACWYX), suitable for use in infants through adults. This grant funds a comprehensive clinical development program that includes a first-in-human clinical trial in South Korea to assess the safety and immunogenicity and a Phase II/III clinical trial in Africa to assess the safety, immunogenicity, and lot-to-lot consistency of the NmCV-5 candidate compared to a licensed multivalent conjugate vaccine. Three consecutive commercial-scale vaccine lots will also be produced and released for clinical evaluation in Phase II/III clinical trials. The existence of multiple suppliers to the global market is critical for ensuring the availability of sufficient doses at competitive pricing for public markets in the Sub-Saharan Meningitis Belt. Successful completion of this project will encourage competitive pricing and enhance supply security, thereby aligning with the goals of the Defeating Meningitis by 2030: a global road map

Development Stage : Phase 2~3

Continuous manufacturing process for human use helminth infection treatment

Grantee(PI)	Drugs for Neglected Diseases initiative (DNDi)
Collaborator	Kolon Life Science Inc.

The project aims to develop a low-cost, safe, eco-friendly, and sustainable manufacturing process for an oxfendazole drug substance suitable for human health. The scope of this grant includes the identification of inexpensive starting materials, optimization of synthetic processes, and incorporation of Continuous Flow Technology as a safer and more economical alternative to traditional batch-type processes. Repurposing oxfendazole, which is currently used in veterinary medicine, for human use could greatly affect the treatment of helminth infections by providing a curative, broad-spectrum treatment option. Current control strategies rely on preventive chemotherapy with safe but non-curative drugs, necessitating repeated treatments over decades. Repurposing oxfendazole for humans will provide a curative, pan-helminthic treatment (i.e., killing adult worms), potentially also targeting diseases not yet on the Neglected Tropical Disease list (Loiasis, mansonellosis) and shortening elimination timelines compared to current larvicidal drugs (e.g., ivermectin).

Development Stage : Phase 3

Novel antibiotic combinations to address AMR burden in neonatal sepsis

Grantee(PI)	GARDP Foundation
Collaborator	JEIL Pharmaceutical

This project uses an innovative approach to identify and evaluate the safety and effectiveness of novel combinations of three existing antibiotics (flomoxef, fosfomycin, and amikacin), licensed for neonates. The use of these drugs will be compared against existing recommended and commonly used regimens in their ability to reduce mortality due to neonatal sepsis. This grant includes cost-effective Active Pharmaceutical Ingredient manufacturing processes and strengthening manufacturing capacity for flomoxef. Additionally, the project aims to advance access strategies for flomoxef, including WHO prequalification and direct national registration routes. This project not only addresses the critical issue of AMR but also represents a significant advancement in the fight against neonatal sepsis by providing improved and new treatment recommendations across diverse settings.

Development Stage : Phase 1

Treatment development for severe malaria

Grantee(PI)	Medicines for Malaria Venture (MMV)
Collaborator	Seoul National University Hospital

This project aims to develop a novel, non-artemisinin combination therapy that addresses the concerns of emerging artemisinin partial resistance and the clinical observation of delayed parasite clearance. It also seeks to prevent the misuse of artesunate monotherapy for treating acute uncomplicated malaria. The project's specific objectives include the development of delivery method formulations, non-clinical tolerability studies, stability studies, and a phase I first-in-human clinical study. This new combination therapy aims to improve upon existing artesunate options by offering enhanced ease of use, efficacy, and cost-effectiveness. The development of this novel treatment for severe malaria responds to the urgent global health need for new therapeutic options in the face of growing resistance to artemisinin-based combination therapies (ACT), which are currently WHO's recommended treatment for uncomplicated *Plasmodium falciparum* malaria.

Development Stage : Preclinical

Single exposure radical cure for blood stage malaria

Grantee(PI)	H3D University of Cape Town
Collaborator	Korean Institute of Toxicology

The project's aim is to advance UCT594 as a valuable new medicine for the treatment of uncomplicated malaria, addressing the critical issue of increasing drug resistance. UCT594 stands out for its high oral bioavailability, long half-life, minimal off-target pharmacology, and novel mechanism of action through the inhibition of phosphatidylinositol 4-kinase (PI4K), distinguishing it from antimalarials currently used or in development. This differentiation suggests that UCT594 would not be prone to cross-resistance with existing therapies. UCT594 is positioned as a first-in-class, single-dose cure for malaria due to its high anti-*Plasmodium* activity and favorable pharmacokinetics, featuring a predicted human half-life of over 50 hours—significantly longer than that of current frontline therapies. The project envisions UCT594 as a frontline oral therapy for malaria in endemic regions, offering a safe and cost-effective treatment for children, pregnant women, and women of childbearing potential.

Development Stage : Late Validation, Clinical Validation, Licensure

POCT for COVID19, Influenza and RSV

Grantee(PI)	SD Biosensor Inc.
Collaborator	PATH

This project aims to develop and evaluate the performance and usability of the STANDARD™ M10 system, a versatile molecular diagnostic platform suitable for decentralized, near-patient settings. The focus is on developing a multi-target RT-PCR-based Flu/RSV/SARS-CoV-2 Fast cartridge, designed to deliver rapid and accurate diagnostics for these critical respiratory diseases. In this project, data on analytical, clinical, and user performance will be generated to support submissions to Stringent Regulatory Authorities. This product's suitability for use in near-patient settings by minimally trained operators, ability to eliminate the need for external computing, and capability to run cartridges for various health conditions on a single machine will help enhance the availability of accurate molecular diagnostics for high-risk populations in LMICs.

Development Stage : Late Validation, Clinical Validation, Licensure

AI-driven all-in-one diagnostic platform for malaria species differentiation

Grantee(PI)	Noul Co., Ltd.
Collaborators	Eck Institute for Global Health, University of Notre Dame, Malawi National Malaria Control, Malawi Ministry of Health

The miLab platform seeks to revolutionize malaria diagnostics by offering reliable, rapid parasitological confirmation of malaria within 15 minutes, making this test significantly cheaper and faster than traditional microscopy methods. Targeting health facilities in LMICs without the infrastructure for complex and expensive diagnostics, miLab combines automated microscopic examination, digital imaging, and AI analysis for accurate malaria detection. This system surpasses the limitations of rapid diagnostic tests and eliminates the need for specially trained laboratory personnel, setting a new standard in diagnostic accuracy. The project's goals include demonstrating miLab's full value proposition, improving malaria diagnostic systems, and building evidence for its clinical- and cost-effectiveness to support market penetration and regulatory approval. miLab has the potential to reduce anti-malarial drug misuse, enhance case management, and decrease the financial burden on malaria programs by lowering diagnostic and treatment costs, representing a significant advancement in combating malaria globally.

The impact of digital health technologies on the delivery of maternal and child health services

Target Region/Country	Uganda
Grantee(PI)	Compelling Works

This is a cross-sectional study utilizing mixed methods that explores how digital technologies affect public health outcomes. The study evaluates *Family Connect*, a MOH-backed digital platform that aims to improve maternal and child health. Outcomes of this assessment will support the development of targeted strategies to improve access to care and health indicators in Uganda.

Evaluating Digital Health Solutions for Laboratory Diagnosis of Endemic and Pandemic Diseases

Target Region/Country	Mozambique
Grantee(PI)	Mozambique Instituto Nacional de Saúde (INS)

This project evaluates the use of digital health tools for laboratory and surveillance programs within primary healthcare throughout Mozambique. Qualitative and quantitative methods will be used to assess digital infrastructure availability, clarify the facilitators and barriers to digital health tool adoption, and identify opportunities for enhancing digital capabilities in health systems. The aim is to leverage digital health tools for real-time data access, improving clinical decision-making and enhancing outbreak detection.

The Public Health Assessment of Malawi's One DigitiZed Infrastructure COVID-19 Study

Target Region/Country	Malawi
Grantee(PI)	Luke International
Collaborators	Public Health Institute of Malawi (PHIM), Malawi Ministry of Health, MZUZU University

This study evaluates the effectiveness and impact of digital health tools used during the COVID-19 response, focusing on the national and community levels. At the national level, the study will assess the Malawi COVID Response Digital Solutions/Services Architecture by examining decision-making processes and the varying success levels of its components. This research intends to inform stakeholders on digital tool effectiveness and user experience, including benefits and gaps. The findings will guide implementers and donors on digital health development strategies, aiming to strengthen disease surveillance and response capabilities.

Evaluating digital tool applicability for infectious disease surveillance in Community

Target Region/Country	Nigeria
Grantee(PI)	University of Ibadan
Collaborators	Nigeria Center for Disease Control, IVI, Healthstack Solutions

This project aims to evaluate the effectiveness of digital technologies in enhancing the Early Warning, Alert, and Response System for infectious disease surveillance at health facility and community levels in Nigeria. Focusing on the gaps exposed by the COVID-19 pandemic, this project seeks to assess the usability, learnability, and applicability of digital tools for improving disease surveillance and control efforts in low-resource settings. The project utilizes quantitative and qualitative analyses to explore the challenges and opportunities for digital applications in public health.

Analyzing Digital Solutions for Health System Gaps in Crisis-Affected Areas

Target Region/Country	Ethiopia, Nepal, Kiribati
Grantee(PI)	Korea Advanced Institute of Science and Technology (KAIST)
Collaborators	University of Gondar, PRIME Nepal, University of Minnesota

This multidisciplinary study will identify and address health system gaps in crisis-affected populations in Ethiopia, Kiribati, and Nepal. Recognizing the increasing global mobility driven by factors like climate change and conflicts, the project focuses on digitally preventable gaps in health service delivery, information, and financing within primary healthcare settings for mobile and other vulnerable groups. The purpose of this approach is to improve the resilience of health systems against crises by leveraging digital technologies to ensure continuity of care in regions facing significant accessibility and resource challenges.

Quantifying the Added Value of Lunit Software in Advancing TB Elimination Efforts

Target Region/Country	Vietnam
Grantee(PI)	Friends for International TB Relief (FIT)
Collaborators	Vietnam Center for the Development of Community Health Initiatives, Lunit

FIT is undertaking a mixed-methods evaluation in Vietnam to assess the use of Lunit computer-aided detection (CAD) software as a decisional support tool for radiologists during tuberculosis screening. The work hopes to enhance chest X-ray interpretation accuracy and efficiency. This study will compare the added value of combining CAD software with radiologist readings against the standard practice of radiologist-only readings. Additionally, it will explore the acceptability and implementation experiences of using CAD software among stakeholders, including health professionals, policymakers, and TB patients.

Understanding the end-user perspectives of implementing TB-CAD in high TB burden settings and improving fit for use in children*

Target Region/Country	Mongolia, Vietnam
Grantee(PI)	Seoul National University
Collaborators	FIND, FIT, Mongolia National Center for Communicable Diseases

This study focuses on generating evidence on the end-user perspective of TB-CAD use to interpret chest radiographs as a part of the diagnostic toolkit for TB. The work includes a landscape analysis to understand TB-CAD implementation and use cases in high burden settings. Pediatric use of TB-CAD is an important priority for future guidelines; this project will also identify key characteristics for developers to prioritize, benchmark current TB-CAD products against these standards, and highlight gaps to guide future improvements and development.

*The grant agreement signed in February 2024.

COMPLETED PROJECTS

Development of a cost-effective Hepatitis A vaccine on a low-footprint, low-cost platform

Target Disease	Hepatitis A	Grantee(PI)	SK Bioscience
Collaborator	Univercells	Project duration	36 months

Hepatitis A virus (HAV) vaccines are expensive and undersupplied owing to challenges in the manufacturing process such as slow kinetics and low yields. This project aimed to design a lower-cost manufacturing platform for rapid clinical application by adapting HAV to Vero cells and applying a novel bioreactor system. This project successfully produced a research cell and virus bank, established research-level processes, developed and validated relevant analytical methods, and conducted preclinical testing. However, despite the project's success, the anticipated yield improvement was not achieved. Nevertheless, the low-cost and low-footprint production model developed in this project has applicability to the production of cells used in manufacturing vaccines for other cell culture-based viruses.

Development of sublingual COVID-19 subunit vaccine

Target Disease	COVID-19	Grantee(PI)	CHA Vaccine Institute
Collaborator	BioLingus, PanGen Biotech	Project duration	15 months

Sublingual vaccines offer not only ease of administration but also enhanced thermostability and the ability to be stored at room temperature, thus reducing distribution costs and addressing vaccine accessibility barriers. This project aimed to develop a sublingual receptor binding domain-dimer protein subunit COVID-19 vaccine targeting the delta variant, enhanced with a proprietary adjuvant, L-pampo™. The team formulated the vaccine and conducted immunogenicity and efficacy studies in animal models. Leveraging this data, the team plans to further evaluate the vaccine's protective efficacy using mouse challenge models and explore an improved delivery substance to enhance the sublingual vaccine platform. This innovative vaccine platform has the potential to make a significant contribution beyond COVID-19, aiming to reduce vaccine inequity across a broad spectrum of vaccines.

Continuous Manufacturing Process for Visceral Leishmaniasis Drug

Target Disease	Visceral leishmaniasis	Grantee(PI)	DNDi
Collaborator	ST Pharm	Project duration	16 months

This project aimed to demonstrate the feasibility of a safe and cost-effective manufacturing process for an oxaborole compound developed as a treatment against visceral leishmaniasis. This compound has been under Phase I clinical investigation since 2020. The team's goal was to conduct process development and optimization using continuous flow technology, with the aim of reducing the cost of regulatory starting materials. The team has successfully shown the scalability and suitability of the manufacturing process, with batch production up to a 1kg scale under non-Good Manufacturing Practice (GMP) conditions, improved yield, and reduced active pharmaceutical ingredients production costs. Based on these results, the team plans to undertake further commercial process development and pilot-scale GMP manufacturing to facilitate Investigational Medicinal Products supply for Phase III studies.

Novel Route of Synthesis of Antimalarial Drug

Target Disease	Malaria	Grantee(PI)	MMV
Collaborator	Kolon Life Sciences	Project duration	12 months

Developing an effective single-dose treatment would significantly benefit vulnerable populations, such as children under 5 years and pregnant women. This project focused on optimizing the synthetic route for scaling up a pantothenamide analog, a novel acetyl-CoA synthetase inhibitor and preclinical candidate for a single-exposure radical cure for malaria with the potential to block transmission. The team has improved the synthesis route and a cGMP batch has been successfully manufactured to the required specifications, demonstrating the project's success in process optimization aimed toward lowering production costs and enabling affordable pricing. With these advancements, the team has successfully progressed into Phase I/first-in-human clinical trials through the Bridging Award of RIGHT, utilizing the cGMP drug substance produced from the optimized route.

The development of rapid diagnostic test for chikungunya antigen

Target Disease	Chikungunya	Grantee(PI)	Genbody
Collaborator	Konkuk University	Project duration	20 months

While Chikungunya continues to expand its geographic reach and incidence rates, access to PCR-based testing remains confined to hospital settings, with point-of-care testing for the disease still unavailable in endemic regions. This project aimed to develop a potential companion diagnostic tool for vaccine trials to address prior infection and antibody-dependent enhancement risk for Chikungunya. The team collaborated with Konkuk University to develop the first Chikungunya antigen rapid test, disease identification and management through increased sensitivity compared to existing antibody tests. The team has developed an advanced Chikungunya diagnosis with improved clinical sensitivity and specificity compared to existing products. This diagnostic test will continue to be to refined to maximize accessibility in LMICs through facilitating cost reduction.

Automated Point-of-Care Testing for pyrazinamide drug susceptibility

Target Disease	Tuberculosis	Grantee(PI)	Bioneer
Collaborator	International Tuberculosis Research Center	Project duration	18 months

The pyrazinamide (PZA) drug resistance testing recommended by WHO for tuberculosis treatment is seldom conducted due to stringent laboratory requirements making it unreliable in most settings. The team has developed an automated test on its diagnostic system to detect mutation in the *pncA* gene, significantly reducing the time to result from three weeks to nine hours. This approach was expected to measure PZA enzymatic activity from sputum or cell culture, with the potential for making a significant impact on Tuberculosis treatment. Furthermore, this technology's wider application in measuring enzymatic activity holds promise for addressing similar needs in various fields. The prototype of the Pyrazinamide-resistant Mycobacterium tuberculosis Detection kit achieved more than 90% sensitivity, demonstrating comparability to conventional methods.

MMV Medicines for Malaria Venture

Project	Novel Route of Synthesis of Antimalarial Drug
Collaborator	Kolon Life Sciences

Medicines for Malaria Venture (MMV) received a Technical Accelerator Award from RIGHT Foundation in 2022 for the "route optimization and scale-up of MMV183 synthesis." MMV183 is an important compound in the MMV pipeline and is currently being developed for the treatment of severe malaria. However, the cost of the drug substance had to be decreased to make it viable as an antimalarial treatment. With the support of RIGHT, MMV found a capable and willing partner in Kolon Life Sciences (Kolon). MMV and Kolon worked together to identify an alternative low-cost synthetic route for manufacturing MMV183 that provided improved yield and purity of the drug substance compared to the previous method. The process was successfully scaled up to 3kg, and a GMP batch was manufactured in early 2023 for use in clinical studies.

The award for MMV183 synthesis development was the second award MMV has received for the development of a new antimalarial. RIGHT Foundation's mission to alleviate the burden of infectious diseases in LMICs aligns closely with that of the MMV to reduce the burden of malaria by developing new, effective, and affordable antimalarial drugs, which was a key reason why MMV applied to this foundation for funding. The awards helped MMV tap into the expertise of Korean pharmaceutical partners with the technical know-how for developing cost-effective manufacturing processes viable for novel antimalarials. Therefore, the MMV considers RIGHT to be an important ally in the fight against malaria.

SK bioscience

Project	Development of a cost-effective Hepatitis A vaccine on a low-footprint, low-cost platform
Collaborator	Univercells

The production process for the Hepatitis A vaccine (HAV) is currently inefficient, resulting in issues such as high costs and limited global supply. The reasons for these inefficiencies include a long production process and low productivity. Consequently, HAV is not affordable and shortages are frequently reported.

SK bioscience is a vaccine company that owns a proprietary cell line and virus stock for vaccine development, while Univercells is a technology company that has developed a novel bioreactor system. Both companies combined their strengths to overcome the technical challenges in HAV manufacturing. The outcome of this project is a cost-effective HAV using a low-cost, low-footprint manufacturing platform. In addition, a preclinical evaluation of the HAV was conducted and animal study data, including toxicity and immunogenicity, generated. Currently, SK bioscience is preparing to produce to initiate a clinical study.

Celebrating RIGHT Foundation's 5th Anniversary

To celebrate RIGHT's fifth anniversary, we held the "International Partnership for Pandemic Preparedness and Global Health Equity" forum on June 2, 2023. The forum reviewed RIGHT's achievements from its inception to the present, expressed gratitude to partners who contributed to RIGHT's development, and explored ways in which the Korean government, Korean life science industries, and RIGHT can move forward together for international public health.

The forum was attended by more than 100 participants from government ministries, such as the Ministry of Health and Welfare of Korea (MOHW), Korea Disease Control and Prevention Agency (KDCA), and the Ministry of Food and Drug Safety of Korea, international organizations, such as BMGF the FIND and Asian Development Bank (ADB) and leading of Korea companies in the Korean life science industry, including the Korea Pharmaceutical and Bio-Pharma Manufacturers Association, LG Chem, SK Bioscience, and EuBiologics.

In his opening remarks, Dr. Myungsei Sohn, Chairman of RIGHT, described the foundation as an "innovative ODA funding model" that has served as a platform for the life science industry to contribute to global health." He continued, "RIGHT Foundation will work with life science companies to contribute to the expansion and development of innovative technologies so that Korea can contribute to the development of global health technologies."

In his congratulatory remarks, Vice Minister Minsoo Park of the MOHW highlighted, "RIGHT Foundation has formed a virtuous belt of global health cooperation by supporting innovative vaccine research and rapid diagnostic technologies. This endeavor also involves Korean life science companies, significantly enhancing their research capabilities··· .We look forward to more Korean life science companies joining RIGHT Foundation, contributing to global health justice while simultaneously elevating their own expertise and value. The Korean government will also strive to play a role worthy of its status in global civil society."

"RIGHT Foundation has raised awareness of Korea's health capabilities in the global health field over the past five years," said Dr. Jee Youngmee, Chairman of the KDCA, and "We highly appreciate the efforts to support infectious disease vaccines and related technologies for global public health···.With the goal of positioning Korea as a leader in the vaccine biotechnology field and establishing it as an international center, the Korean government will strengthen international cooperation to prepare for the next pandemic."

Three topics were addressed at the roundtable discussion: "What are the Korean industry's perspectives on engaging in global health R&D? How can the Korean government harness Korean industry's strengths towards global public health through RIGHT; New international partnerships with RIGHT foundation", and "Seizing Korea's opportunities to develop essential health technologies as global public good." The roundtable included Dr. Peter Hotez, a 2022 Nobel Peace Prize nominee from Baylor College of Medicine; Dr. Hee Chang Jang, Director of the KDCA; Dr. Youngju Choi, Director of the National Institute of Food and Drug Safety Evaluation; Dr. Ann Mills Dugan, Chair of RIGHT's Selection Committee; and Dr. Jessica Martinez of the BMGF.

Dr. Hortez introduced the world's first patent-free COVID-19 vaccine, developed by the Baylor College of Medicine and Texas Children's Hospital in the US, stating "We have seen that it is possible to develop and supply vaccines at scale without being a multinational pharmaceutical company. RIGHT Foundation also explained that this model can contribute to improving health in low- and middle-income countries by producing and developing vaccines that cannot be commercially profitable."

OTHER UPDATES FROM 2023

Supporting G6PD deficiency diagnostic begins rolling out to low- and middle-income countries

SD Biosensor's STANDARD G6PD Analyzer, a diagnostic device funded by RIGHT for G6PD deficiency, was selected by the Brazilian government for use in the national health system in 2023. The Brazilian government selected the STANDARD G6PD Analyzer for use in the treatment of Plasmodium vivax malaria in 2023, marking the first time a RIGHT-funded product has been adopted by a national health system and delivered to real-world users in LMICs. This is the culmination of RIGHT's commitment to global health and ensuring from the research design stage the outcome of R&D reaches real-world users.

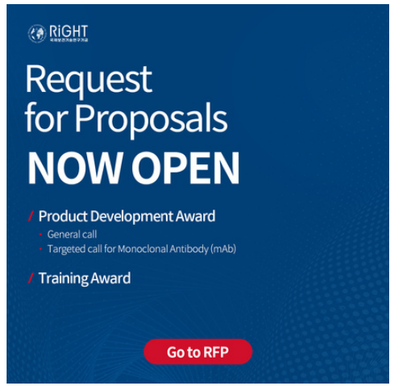
From 2019 to 2022, RIGHT supported a study to confirm the usability of a diagnostic device for broader geographic application. Based on the study's results, SD Biosensor enhanced the product's performance, facilitating its distribution to end users in collaboration with international partners.

Signing MoU with FIND and K-NIBRT

RIGHT is collaborating with major domestic and international organizations for global health. In June, we signed a Memorandum of Understanding with FIND to promote R&D in the field of diagnostics for global health, and to pave the way for FIND's technology and know-how to be shared with Korean diagnostic companies.

Furthermore, in August, RIGHT signed a business agreement with K-NIBRT at the College of Science & Technology Convergence to support RIGHT Foundation's Vaccine Manufacturing Training Program at K-NIBRT". Based on this agreement, RIGHT announced the TA in November to select up to 40 awardees to receive training in Korea.

Announcing new year-round call for Product Development Award



For the product development award general call, RIGHT now accepts applications all year round from November 2023. This change, from accepting applications only during specified periods of a year, was implemented to reduce time constraints for projects showing great potential for improving global health equity and alleviating public health burdens in LMICs.

Securing $22 million in funding; Bill & Melinda Gates Foundation doubles contribution

In 2023, RIGHT successfully secured $22 million in funding from the BMGF, one of our core funders, to be distributed over the next five years. This funding represents a two-fold increase over its contribution during the first phase (2018–2022) and will be used in the second phase of RIGHT's work. Notably, before the BMGF's increased commitment, RIGHT had also attracted funding of KRW 50 billion from the Ministry of Health and Wellbeing of Korea (MOHW) to be distributed over five years up to 2025, which is double its initial funding.

Korean life science companies have also continued to show keen interest in, and robust support as well. This is clearly illustrated in cases such as SK Bioscience, LG Chem, and Bioneer, our major industry partners since the inception of RIGHT, renewing their funding for another five years, while EuBiologics doubled its commitment to extend its contribution. Moreover, Noul and QuadMedicine have recently joined us as new funders and SD Biosensor has continued its funding support thus far.

OTHER UPDATES FROM 2023

RIGHT's expanding its partnership network regionally and globally

One major role of RIGHT is to provide researchers and developers with insights from current issues in global health R&D. Having been invited to a series of global health R&D events last year, we witnessed Korea's elevated status on a global R&D stage, which was not for RIGHT alone. In line with the increasing expectations, RIGHT actively participates in these meetings to seek opportunities for Korean researchers and developers to contribute to global health R&D.

Forum for Examining the R&D Ecosystem : Shifts Needed to Catalyze Progress and Save Lives Over the Next 20 Years

RIGHT was invited to a forum organized by the BMGF. Other organizations present included the Wellcome Trust, the South African Medical Research Council (SAMRC), and the Africa Centres for Disease Control and Prevention (CDC). Dr. Hani Kim, the executive director of RIGHT, participated in a panel on "Sustainable R&D Funding Solutions," where she introduced RIGHT's approach to global health R&D and advocated for Korea's potential in this field.

Visit to LPDP, TSRI

Dr. Kim visited Southeast Asia's leading health research funding agencies, Lembasa Pengelola Dana Pendidikan (LPDP) founded by the Indonesian government and Thailand Science Research and Innovation (TSRI) established by the Ministry of Science and Technology of Thailand. These visits aimed to explore collaborative opportunities among researchers from Korea, Thailand, and Indonesia to enhance regional and global public health.

ASLM

RIGHT participated in ASLM 2023, organized by the African Society for Laboratory Medicine. Dr. Hoon Sang Lee, the Chief Strategy Officer of RIGHT, met with officials from the Africa CDC and Ghana Ministry of Health, and engaged with RIGHT Foundation's Council member companies to foster African partnerships.

The World Bio Summit 2023

RIGHT participated in the World Bio Summit 2023 in Seoul, co-hosted by MOHW and WHO. During the summit, RIGHT highlighted Korea's potential in strengthening global diagnostic capacity session moderated by Dr. Lee and hosted a networking luncheon session for in vitro diagnostics companies.

ONE Health AMR International Symposium

RIGHT participated in the One Health AMR International Symposium, where Dr. Kim delivered the opening speech, and Dr. Lee led a dialogue on "Global Health R&D on AMR: Next Generation R&D."

KRW 1,289.4=USD1(The exchange rate as at Dec 31, 2023)

Statement of Financial Positions

2023	KRW	USD
Current Assets	29,710	23.04
Non-current Assets	312	0.24
Total Assets	**30,022**	**23.28**
Current Liabilities	1,421	1.10
Non-current Liabilities	289	0.22
Total Liabilities	**1,710**	**1.33**
Total Equity	**28,311**	**21.96**
Total Liabilities and Equity	**30,022**	**23.28**

Unit : Million

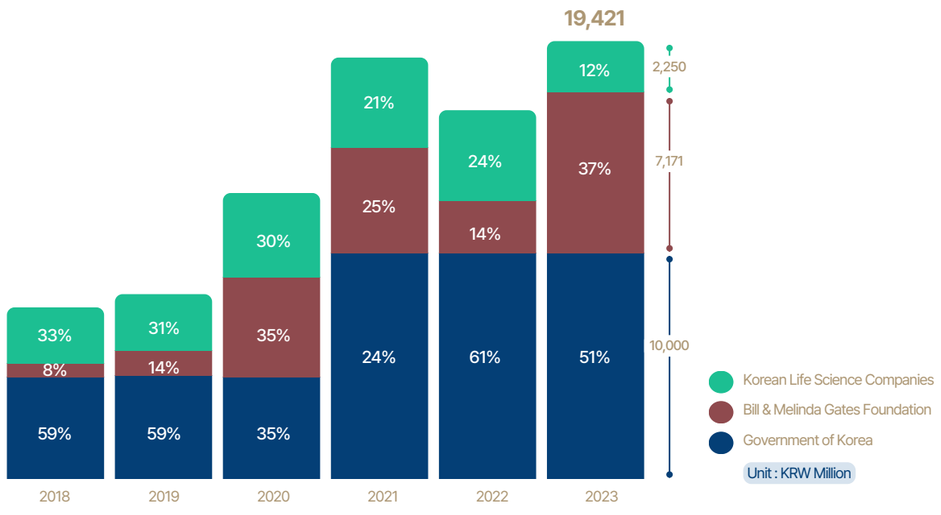
KRW 1,289.4=USD1(The exchange rate as at Dec 31, 2023)

Statements of Activities

2023		
Business Revenue	**19,421**	**15.06**
Fund	17,171	13.32
Donation	2,250	1.74
Business Expenses	**17,449**	**13.53**
Project Expenses	16,017	12.42
Operational Expenses	1,431	1.11
Net Business Income	**1,973**	**1.53**
Other Income	976	0.76
Other Expenses	199	0.15
Net Income	**2,749**	**2.13**

Unit : Million

Yearly Secured Revenue by the Types of Funders



Total Cumulative Funding Amount Committed until 2023 by Award Type

Award	2023 (KRW)	%
Product Development Award	55.8	71%
Bridging Award	9.3	12%
Technical Accelerator Award	12.3	16%
Evidence Generation Award	1.2	2%
Total	**78.6**	**100%**

Unit : Million

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Bill & Melinda Gates foundation
eubiologics
International Vaccine Institute
LG Chem
SK bioscience
SD BIOSENSOR

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Glenn Rockman
Member at Large

Peter Hotez
Member at Large

Jessica Martinez
Ex-Officio Observer

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AMD Biomedical Consulting
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Betsy Wonderly Trainor
Combat Antibiotic Resistant Bacteria Biopharmaceutical Accelerator (CARB-X)

Christian Lienhardt
French National Research Institute for Sustainable Development (IRD)

Kee-jong Hong
Korea mRNA VACcine Initiative (KmVAC)

Lynda Stuart
Institute for Protein Design (IPD), University of Washington

Melissa Malhame
MM Global Health Consulting LLC

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Valerie Nkamgang Bemo
Bill & Melinda Gates Foundation

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Global Partners

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