MINUTES OF MEETING BETWEEN JAPAN INTERNATIONAL COOPERATION AGENCY AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF THE REPUBLIC OF GHANA ON JAPANESE TECHNICAL COOPERATION FOR THE STUDIES OF ANTI-VIRAL AND ANTI-PARASITIC COMPOUNDS FROM SELECTED GHANAIAN MEDICINAL PLANTS

Chief Representative of Japan International Cooperation Agency (hereinafter referred to as "JICA") Ghana Office had a series of discussions with the authorities concerned of Ghana about the formation of Technical Cooperation Project for "The Studies of Anti-viral and Anti-parasitic Compounds from Selected Ghanaian Medicinal Plants" (hereinafter referred to as "the Project").

As a result of the discussions, Chief Representative of JICA Ghana Office and the Ghanaian authorities concerned agreed on the matters referred to in the document attached hereto. This Minutes of Meeting is considered to as a supplement document of the Record of Discussions (hereinafter referred to as "the R/D") which is signed at the same time.

Accra, April 1st, 2010

Mr. Kunihiro Yamauch

Chief Representative

Ghana Office

Japan International Coop

Japan

Professor Alexander K. Nyarko

Director

NOGUCHI MEMORIAL INSTITUTE

Noguchi Memorial Institute for Medical Research

The Republic of Ghana

Witnessed by

Professor Shoji Yamaoka

Department of Virology

Tokyo Medical and Dental University

Japan

Professor Laud K. N. Okine

Director

Centre for Scientific Research into Plant Medicine

The Republic of Ghana

Mr. Okyere-Nyarko

Director

External Resource Mobilization, Bilateral Division

Representativ

ion Agency

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Ministry of Finance and Economic Planning

The Republic of Ghana

THE ATTACHED DOCUMENT

1. Project Implementation Scheme

Both sides confirmed that the Project was implemented under the 'Science and Technology Research Partnership for Sustainable Development*' promoted by JICA and Japan Science and Technology Agency (hereinafter referred to as "JST") in collaboration.

JICA will take necessary measures for the technical cooperation such as dispatch of Japanese experts, provision of equipment and training of personnel, and other supports related to the Project in the Republic of Ghana. JST will support the Japanese research institutes for the project activities held in Japan.

Ghanaian counterpart research institutes will take necessary measures for technical cooperation, such as research facilities and utilities, personnel, and other support related to the Project**.

*"Science and Technology Research Partnership for Sustainable Development" aims to develop new technology and its applications, and also aims at capacity development of researchers and research institutes in both countries.

**Inputs from Ghanaian side are listed on R/D.

2. Pre-conditions

2-1. Approval of the research activities

Prior to the commencement of the Project, all research activities conducted in the Project shall be approved by the Scientific and Technical Committee (hereinafter referred to as "STC") of the Noguchi Memorial Institute for Medical Research (hereinafter referred to as "NMIMR") and Research Committee and Board of the Centre for Scientific Research into Plant Medicine (hereinafter referred to as "CSRPM"), as applicable.

2-2. Approval of the specific activities

Both sides agreed that the necessary approvals as mentioned below shall be obtained from relevant authorities after the clearance of STC, Research Committee and Board.

- (1) Clearance for animal use from Institutional Review Board (hereinafter referred to as "IRB") of the NMIMR.
- (2) Clearance for material transfer (import/export) from relevant ministries/authorities, as deemed necessary by applicable laws and regulations. The materials may include plant

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genetic resources, plant-derived compounds and biological materials.

3. Administration of the Project

3-1. Research Group Meeting

Research Group Meeting is convened once every four (4) months. Its function and composition are as follows:

(1) Functions

- 1) To review progress and outputs of research activities
- 2) To coordinate and exchange information among the counterpart institutes
- 3) To discuss issues including technical, ethical, safety and any matters, arising from or concerning the Project

(2) Composition

1) Chairpersons:

Director, NMIMR (chair) Director, CSRPM (vice-chair)

2) Members:

Groups Leaders

TAMD

Project Coordinator

Representatives from Japanese researchers

3-2. Monthly Progress Report

In order to ensure effective monitoring of the research progress and timely feedback of the technical advice from the experts, all group leaders engaged in the Project will report their monthly activity and progress including administrative affairs to Project Director and Chief Advisor via Project Coordinator. The report is prepared in English and will be shared with the relevant researchers.

4. Contents of Collaborative Research

Both sides confirmed the contents of collaborative research covered in the Project are as follows:

 Studies of identified novel compounds from Ghanaian medicinal plants for safety, anti-HIV activity and structure-activity relationship

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(2) Studies of identified novel compounds from Ghanaian medicinal plants for safety, anti-trypanosomal activity and structure-activity relationship

5. Project Design Matrix and Tentative Plan of Operation

A basic framework of the Project is as shown in a Project Design Matrix (hereinafter referred to as "PDM") in Annex III. The Plan of Operation is as shown in Annex IV.

6. Special Issues

6-1. Collaborative Research Agreement between research institutes

Both sides agreed that the research institutes in Japan and Ghana should reach an agreement to execute the collaborative research in accordance with the Master Plan of the Project. The agreed document (e.g. Collaborative Research Agreement) should contain the following items of the collaborative research:

- a. Objective and Plan
- b. Implementation
 - c. Confidentiality and Intellectual Property Rights
 - d. Access to Genetic Resources
 - e. Publication
- f. Dispute Resolution
 - g. Duration of the Agreement
 - h. Compliance with Laws and Regulations
 - i. Other items concerning both institutes

Both sides agreed that NMIMR and CSRPM are the representatives of Ghanaian side, and TMDU is that of Japanese side.

6-2. Intellectual Property Rights

Both sides confirmed that matters on intellectual property rights should follow the Collaborative Research Agreement to be signed between the research institutes.

6-3. Exclusion of Clinical Trials

Both sides agreed that clinical trials shall not be included in the Project.

JICA is indemnified for any and all liabilities, losses, and expenses on claims for injury or damages arising out of or resulting from, the actions or omissions by the Ghanaian and Japanese research institutes or of any of their officers, agents, employees, or subcontractors with respect to the clinical trials.

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Therefore, JICA will not bear any expenses or honorarium for implementing clinical trials.

LIST OF ANNEXES

Annex I Project Implementation Structure

Annex II Research Contents and Researchers/ Organizations in charge

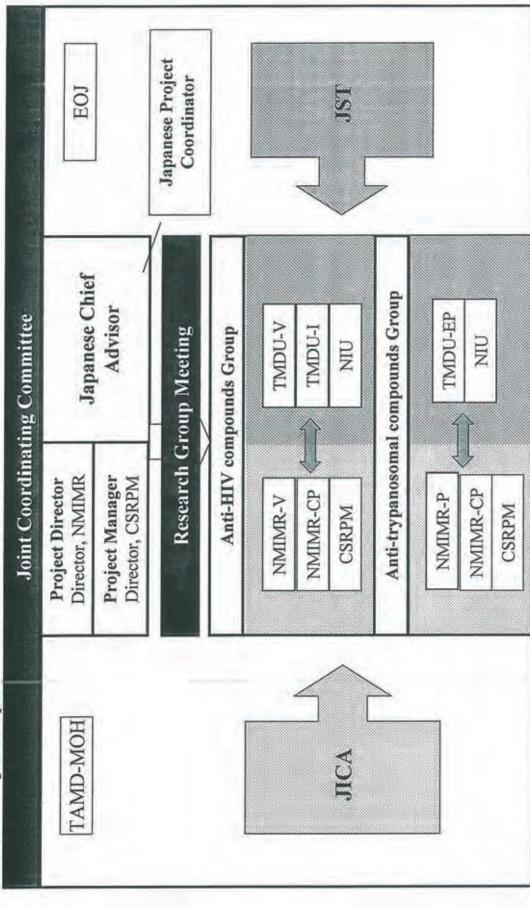
Annex III Project Design Matrix (PDM) Version 0

Annex IV Plan of Operation (PO) Version 0

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Annex I: Project Implementation Structure



NMIMR-V: Department of Virology, NMIMR
NMIMR-CP: Department of Clinical Pathology, NMIMR
NMIMR-P: Department of Parasitology, NMIMR
CSRPM: Centre for Scientific Research into Plant Medicine
TMDU-Y: Department
TMDU-P: Department
TMDU-I: Department
TMDU-P: Department
TMDU-FP: Department
TMDU-I: Depa

TMDU: Tokyo Medical and Dental University TMDU-V: Department of Virology, TMDU

TMDU-EP: Department of Environmental Parasitology, TMDU TMDU-I: Department of Immunotherapeutics, TMDU

NIU: Nagasaki International University e, Ministry of Health EOJ: Embassy of Japan

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Research Subject	Research Contents	Ghanaian side	Japanese side	
Anti- HIV compounds from medicinal plants	Search for medicinal plants that suppress HIV infection	Nyarko (NMIMR) **Brandful (NMIMR) *Ofosuhene (NMIMR) Appiah-Opong (NMIMR) Ankrah (NMIMR) Okine (CSRPM) Sittie (CSRPM) *Duker-Eshun (CSRPM) Ampaw (CSRPM)	Yamaoka (TMDU) Saitoh (TMDU) Uota (TMDU) Shoyama (NIU) Morinaga (NIU) Uto (NIU)	
	Search for medicinal plants that activate expression of latent HIV-1 provirus	Nyarko (NMIMR) *Ampofo (NMIMR) Barnor (NMIMR) Ofosuhene (NMIMR) Appiah-Opong (NMIMR) Ankrah (NMIMR) Okine (CSRPM) Sittie (CSRPM) *Duker-Eshun (CSRPM) Ampaw (CSRPM)	Kannagi (TMDU) Masuda (TMDU) Hasegawa (TMDU) Hayashi (TMDU) Shoyama (NIU) Morinaga (NIU) Uto (NIU)	
	Search for medicinal plants that enhance expression of antiviral factors	Nyarko (NMIMR) Brandful (NMIMR) *Barnor (NMIMR) Odoom (NMIMR)	Yamaoka (TMDU) Sakuma (TMDU) Shoyama (NIU) Morinaga (NIU)	

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Organizations in charge
Contents and Researchers/ C
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nnex II Research
Annex I

		Ofosuhene (NMIMR) Appiah-Opong (NMIMR) Ankrah (NMIMR) Okine (CSRPM) Sittie (CSRPM) *Duker-Eshun (CSRPM) Ampaw (CSRPM)	Uto (NIU)
Anti- trypanosomal compounds from medicinal plants	Anti- trypanosomal compounds Search for medicinal plants that suppress from medicinal plants parasite proliferation		Ohta (TMDU) Kumagai (TMDU) Tokiwa (TMDU) Bethel (TMDU) Shoyama (NIU) Morinaga (NIU) Uto (NIU)

Note: NMIMR-V: Department of Virology, NMIMR
NMIMR-CP: Department of Clinical Pathology, NMIMR
NMIMR-P: Department of Parasitology, NMIMR
CSRPM: Centre for Scientific Research into Plant Medicine

TMDU: Tokyo Medical and Dental University
TMDU-V: Department of Virology, TMDU
TMDU-EP: Department of Environmental Parasitology, TMDU

TMDU-I: Department of Immunotherapeutics, TMDU NIU: Nagasaki International University

**; Group Leaders *: Sub Leaders

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Date: April 1st, 2010 Project Duration: 5 years from April 1st, 2010

Annex III: Project Design Matrix (PDM) (Version 0)

Project Title: Studies of Anti-viral and Anti-parasitic Compounds from Selected Ghanaian Medicinal Plants

Target Area: The Republic of Ghana

Target Group : Approximately 50 researchers
[Noguchi Memorial Institute for Medical Research (NMIMR)] Approximately 30 researchers
[Centre for Scientific Research into Plant Medicine (CSRPM)] Approximately 20 researchers

(1) Experts' project reports (2) Research group meeting records (3) Monthly progress reports (1) Experts' project reports (2) SOP (3) Research group meeting records (4) Monthly progress reports (5) Annual plan documents for research operation	(1) Experts' project reports (2) Research group meeting records (3) Monthly progress reports (2) SOP (3) Research group meeting records (4) Monthly progress reports (5) Annual plan documents for research operation Counterparts (1) Project Director (2) Project Director (3) Crount and and anger	(1) Experts' project reports (2) Research group meeting records (3) Monthly progress reports (2) SOP (3) Research group meeting records (4) Annual plan documents for research operation (5) Annual plan documents for research operation (6) Annual plan documents for research operation (7) Project Manager (8) Project Manager (9) Group Leaders (1) Researchers (Department of Virology, Department of Parasitology and Department	000
2-1. At least one novel compound with anti-trypanosomal (1) Experts' project report activity is identified by the year of 2012. 2-2. At least one novel compound with anti-trypanosomal (2) Research group meeting activity is analyzed for their effects on callular phenotypes and structure-activity relationship by the year of 2014. 3-1. SOP in each research subject is made and revised. 3-2. Research group is established to discuss progress of (2) SOP the research group is established to discuss progress of (3) Research group meeting every four months. (4) Monthly progress report is made by group leaders. (5) Annual plan documents for research operation are operation	nti-trypanosomal altular phenotypes e year of 2014. e and revised. cuss progress of anagement once group leaders. operation are inputs ferth	nti-trypanosomal altular phenosypes e year of 2014. e and revised. cuss progress of anagement once group leaders. operation are finguts fert) eartin of active year	nti-trypanosomal nti-trypanosomal ellular phenotypes e year of 2014, e and revised, cuss progress of anagement once group leaders, operation are inputs figures ation of active yer setion condition, by (HPLC)
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									Pre-Conditions	1. The approval is obtained from Scientific and Technical Committee of NMIMR and Research Committee CSRPM for the	research activities conducted in the Project. 2. Clearance for animal use is obtained from IRB of NMIMR.	3. Clearance for material transfer (import/export) from relevant	ministry/authority. The materials may include plant genetic resources, plant derived compounds and biological materials.			
- Specialists for plant development research		Facilities, equipment and materials (1) Office space in NMIMR (2) Research space in Department of Clinical			activities, etc. Local Costs	Running costs for research activities (e.g. costs for water, electricity and landline	phone).									
(6) Screening of plant extracts for antiparasitic compounds (Short-terme Expert)	(7) Screening of plant extracts for anti-parasitic compounds (Long-term Expert)		Training in Japan (1) Training for extraction, identification and purification	of active compounds from plant extracts (2) Training for screening of plant extracts for suppression of HIV replication	to training for screening of plant extracts for entanced expression of factors restricting HIV replication (4) Training for screening of plant extracts for provinal	expression in latently HIV infected cell lines Running costs for research activities (e. (5) Training for screening of plant extracts for antiparasit costs for water, electricity and landline	Equipment and Materials Necessary equipment for research activities in the Projec	Local Costs								
	Analyze the active compounds with their structure-activity (relationship and study virological mechanism of action.	Develop methods for propagation of selected plants with high concentration of the active compounds.	Safety, anti-trypanosomal activity and structure-activity relationship of identified novel compounds from Chanaian medicinal plants are determined.	Establish crude extraction methods for candidate compounds, such as gallic acid and curcumin, from Ghanaian candidate plants.	Establish safety of crude extract and isolated compounds with anti-trypanosomal activity.	Establish bio-assay systems of crude plant extracts for anti- trypanosomal activity.	Identify by bio-assay systems established in the Project crude plant extracts that suppress proliferation of, and induce morphological changes of trypanosomal protozoa.	Separate and purify novel compounds with anti-trypanosomal activity from crude extracts,	Analyze the active compounds with their structure-activity relationship and study effects on cellular phenotypes.	Develop methods for propagation of selected plants with high concentration of the active compounds.	Implementation systems for research regarding Chanalan medicinal plant-derived anti-viral and anti-parasitic compounds are established.	Set up laboratory environment for the research activities.	Prepare and revise Standard Operating Procedure (SOP) in each research subject.	Convene research group meetings to discuss progress of the research, achievements and safety management once every four months.	All group leaders submit monthly progress reports to Project Director and Chief Advisor via Project Coordinator.	Prepare annual plan documents for research operation.
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Annex IV Plan of Operation (PO) (Version 0)
Project Title:Studies of Anti-viral and Anti-parasitic Compounds from Selected Ghanaian Medicinal Plants

Output 1: Safety, anti-HIV activity and structure-activity relationship, of Identified novel compounds from Ghanaian medicinal plants, are determined.

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1-1. Establish crude extraction methods for eandidate compounds, such as procyanidins and phorbol esters, from Ghanaian candidate plants.														-	-		_	-		N	CSRPM	
1-2. Establish safety of crude extract and isolated compounds with anti-HIV activity.	-	1	1			1	1	1		1	1		1	1	1	+	1	1	1	VIU TANDU-V	NMIMR-CP	
1-3. Establish bio-assay systems of crude plant extracts for anti-HIV activity.	+								1							-	-		-	V-UOMT.	NMIMBLY	
1-4. Identify by bio-assay systems established in the Project crude plant extracts that suppress HIV-1 replication, activate expression of host restriction factors against HIV-1 or activate latent proviral expression.																			1	TMDU-V TMDU-I	NMIMR-V	
1-5. Separate and purify novel compounds with anti-HIV activity from crude extracts.				1						1							-		1	N	CSRPM	
1-6. Analyze the active compounds with their structure- activity relationship and study virological mechanism of action.																			1	TMDUA	NMIMR-V	
1-7. Develop methods for propagation of selected plants with high concentration of the active compounds.											1					-			1	NIC	CSRPM	

Abbreviations.
TADU: Tokyo Medical and Dental University, TADU-V: Department of Virology, TADU-EP. Department of Environmental Parasitology, TADU-E. Department of Tannunotherspenies, NIU: Napasaki International University, NAIMR-Negothi Memorial Institute for Medical Research, NAIMR-CP. Department of Clinical Pathology, NMIMR-V: Department of Virology, NMIMR-P. Department of Parasitology, CSRPM: Centre for Scientific Research into Plant Medicine, J.F.Y.: Japanese Fiscal Year (starting from April 1 to March 31.)

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Annex IV Plan of Operation (PO) (Version 0)

Project Title: Studies of Anti-viral and Anti-parasitic Compounds from Selected Ghanaian Medicinal Plants

Safety, anti-trypanosomal activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined.

Remark Person in Charge Ghana TMDU-EP NMIMR-P NMIMR-P CSRPM NMIMR-NMIMR-P CSRPM CSRPM 60 TMDU-EP TMDU-EP TMDU-EP Japan PIN NE BIN NIU R Jan - Mai Aper - Juni Jail - Sep Oct - Dec Jan - Juni Jail - Sep Oct - Dec Jan - Juni Jail - Sep Oct - Dec Jan - Juni Jail - Sep Oct - Dec Jan - Juni Jail - Sep Oct - Dec Jan - Juni Jail - Sep Oct - Dec Jan - Juni Jail - Â 1 10 20 30 I 40 1 1 10 20 30 2013 1 40 10 20 30 Plan of Operation 2012 1 40 ı 30 1 20 2011 10 40 30 10 20 ŧ 2010 F i extract and isolated compounds 2-3. Establish bio-assay systems Project crude plant extracts that compounds with their structurecompounds, such as gallic acid with anti-trypanosomal activity. of crude plant extracts for anti-2-1. Establish crude extraction and curcumin, from Ghanaian induce morphological changes with high concentration of the 2-5. Separate and purify novel effects on cellular phenotypes. activity relationship and study propagation of selected plants 2-2. Establish safety of crude suppress proliferation of, and trypanosomal activity from systems established in the 2-4. Identify by bio-assay of trypanosomal protozoa. 2-7. Develop methods for 2-6. Analyze the active methods for candidate trypanosomal activity. compounds with anti-Activities active compounds. candidate plants. crude extracts.

Abbreviations.
TMDU-Y: Department of Virology, TMDU-EP: Department of Environmental Parasitology, TMDU-E: Department of Immunotherapeutics, NIU: Nagasaki International University, NMIMR-N: Department of Virology, NMIMR-P: Department of Parasitology, CSRPM: Centre for Scientific Research into Plant Medicine, J.F.Y.: Japanese Fiscal Year (sarting from April 1 to March 31.)

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Output 2:

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Annex IV Plan of Operation (PO) (Version 0)

Project Title: Studies of Anti-viral and Anti-parasitic Compounds from Selected Ghanaian Medicinal Plants

Implementation systems for research regarding Ghanaian medicinal plant-derived anti-viral and anti-parasitic compounds are established.

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* * * * * * * * * * * * * * * * * * *	3-2. Prepare and revise																		1	1			NIO	CSRPM	
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*	3-4. All group leaders submit monthly progress reports to Project Director and Chief Advisor via Project Coordinator.	*	*	*	x x	*			*	*	*	*	*	*	*	*	x	z	*	x	-		TMDU-8 TMDU-8 TMDU-8	NMIMR-CP NMIMR-Y NMIMR-P CSRPM	
	3-5. Prepare annual plan documents for research operation.	×				*				×				*				-	×				TMDU-EP TMDU-EP TMDU-T	NMIMR-CP NMIMR-V NMIMR-P	

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TANDU-V: Department of Vivology, TANDU-EP: Department of Environmental Parasitology, TANDU-I: Department of Immunotherapeutes, NIL: Nagazaki International University,
NMIMR-Nogachi Memorial Institute for Medical Research, NAIMR-CP: Department of Vivology, NMIMR-P: Department of Parasitology, CSRPM: Centre for Scientific Research into Plant Medicine,
J.F.Y.: Japanese Fiscal Year (starting from April 1 to March 31.)

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MINUTES OF MEETING BETWEEN THE JAPANESE DETAILED PLANNING SURVEY TEAM AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF THE REPUBLIC OF GHANA ON JAPANESE TECHNICAL COOPERATION FOR THE PROJECT FOR CONTROL OF INFECTIOUS DISEASES OF VIRAL AND PARASITIC AETIOLOGY IN GHANA

Japan International Cooperation Agency (hereinafter referred to as "JICA") organized the Detailed Planning Survey Team (hereinafter referred to as "the Team"), headed by Dr. Mitsuhiro Ushio from August 9 to 20, 2009 for the purpose of discussing the framework of the technical cooperation project entitled "Control of Infectious Diseases of Viral and Parasitic Aetiology in Ghana" (hereinafter referred to as "the Project").

The Team had a series of discussions and exchanged views on the Project with the authorities concerned of Ghana. During the discussions, both sides agreed that it is appropriate to modify the original project title indicated above to "Studies of Anti-viral and Anti-parasitic Compounds from Selected Ghanaian Medicinal Plants".

As a result of the discussions, the Team and the Ghanaian authorities concerned agreed on the matters referred to in the document attached hereto.

Accra, August 20, 2009

Dr. Mitsuhiro Ushio

Team Leader

Detailed Planning Survey Team

Japan International Cooperation Agency

Japan

Professor Alexander K. Nyarko

Director

Noguchi Memorial Institute for Medical Research

The Republic of Ghana

Witnessed by

Professor Shoji Yamaoka Department of Virology

Tokyo Medical and Dental University

Japan

Professor Laud K. N. Okine

Director

Centre for Scientific Research into Plant Medicine

The Republic of Ghana

Mr. Samuel Abu-Bonsrah

Acting Director

External Resource Mobilization, Bilateral Division

Ministry of Finance and Economic Planning

The Republic of Ghana

THE ATTACHED DOCUMENT

I OBJECTIVE OF THE DETAILED PLANNING SURVEY

The objectives of the survey are to confirm background and contents of the request from the Government of the Republic of Ghana and to make a cooperation plan (project design) through discussions with the Ghanaian authorities concerned. The Team will also collect and analyze necessary information for ex-ante evaluation.

The contents of the survey are as follows:

- 1. To confirm the contents and changes of the request from the Government of the Republic of Ghana and the research plan of the Tokyo Medical and Dental University (hereinafter referred to as "TMDU") and to harmonize the two.
- 2. To have discussions with the Ghanaian authorities concerned on the project design (including project purpose, implementing structure, Project Design Matrix, Plan of Operation and inputs) and to reach an agreement.
- 3. To confirm the current situation on ethical aspect, structure of approval for implementation of research activities, primarily regarding medicinal plants.
- 4. To confirm actions and schedule leading up to the Project's commencement.
- 5. To sign the Minutes of Meeting so as to confirm the result of the discussions.

II BASIC FRAMEWORK OF THE PROJECT

1. Project Implementation Scheme

Both sides confirmed that the Project was implemented under the 'Science and Technology Research Partnership for Sustainable Development*' promoted by JICA and Japan Science and Technology Agency (hereinafter referred to as "JST") in collaboration.

JICA will take necessary measures for the technical cooperation such as dispatch of Japanese experts, provision of equipment and training of personnel, and other supports related to the Project in the Republic of Ghana. JST will support the Japanese research institutes for the project activities held in Japan.

Ghanaian counterpart research institutes will take necessary measures for technical cooperation, such as research facilities and utilities, personnel, and other support related to the Project**.

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dr am *"Science and Technology Research Partnership for Sustainable Development" aims to develop new technology and its applications, and also aims at capacity development of researchers and research institutes in both countries.

2. Project Title

Both sides agreed that it is appropriate to modify project title from the one indicated in the application entitled "Control of Infectious Diseases of Viral and Parasitic Aetiology in Ghana" to "Studies of Anti-viral and Anti-parasitic Compounds from Selected Ghanaian Medicinal Plants," so that the agreed contents of the Project are accurately reflected.

Both sides will propose the title modification to the authorities concerned of each government and, if approved, the title will be changed officially through diplomatic procedure.

3. Term of Cooperation

The duration of the technical cooperation for the Project will be five (5) years from the date, which will be mentioned in the Record of Discussions (hereinafter referred to as "R/D").

4. Pre-conditions

4-1. Approval of the research activities

Prior to the commencement of the Project, all research activities conducted in the Project shall be approved by the Scientific and Technical Committee (hereinafter referred to as "STC") of the Noguchi Memorial Institute for Medical Research (hereinafter referred to as "NMIMR") and Research Committee and Board of the Centre for Scientific Research into Plant Medicine (hereinafter referred to as "CSRPM"), as applicable.

4-2. Approval of the specific activities

Both sides agreed that the necessary approvals as mentioned below shall be obtained from relevant authorities after the clearance of STC, Research Committee and Board.

- (1) Clearance for animal use from Institutional Review Board (hereinafter referred to as "IRB") of the NMIMR.
- (2) Clearance for material transfer (import/export) from relevant ministry/authority. The

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^{**}Inputs from Ghanaian side are listed on 8-2.

materials may include plant genetic resources, plant-derived compounds and biological materials.

5. Administration of the Project

5-1. Administration

Both sides agreed the administration of the Project will be arranged as shown in Annex I and as follows:

(1) Project Director (who will bear overall responsibility for the administration and implementation of the Project):

Director, NMIMR

(2) Project Manager (who will be responsible for the managerial and technical matters of the Project):

Director, CSRPM

- (3) The Japanese Chief Advisor will provide necessary recommendations and advice to the Project Director and the Project Manager on any matters pertaining to the implementation of the Project.
- (4) Japanese Project Coordinator will coordinate the Project, supporting the Chief Advisor.
- (5) The Japanese experts will cooperate with Ghanaian counterparts to provide training of Ghanaian personnel in the implementation of the Project.

5-2. Joint Coordinating Committee

For the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee will be established whose functions and composition are described as follows:

- (1) Functions
 - 1) To formulate and authorize the annual activity plan of the Project
 - 2) To endorse major achievements and products of the Project
 - 3) To monitor and review overall progress and supervise the Project
 - 4) To review and discuss on major issues arising from or concerning the Project
- (2) Composition

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1) Chairperson:

Director, NMIMR (chair)

Director, CSRPM (vice-chair)

2) Members:

Group Leaders

Project Coordinator and Japanese Chief Advisor and/or representatives

from TMDU and/or Nagasaki International University (hereinafter referred to as "NIU")

Director, Traditional and Alternative Medicine Directorate (hereinafter referred to as "TAMD"), Ministry of Health (Observer)

Representatives from JICA Ghana Office

Representatives from JST (Observer)

Representatives from Embassy of Japan (Observer)

5-3. Research Group Meeting

Research Group Meeting is convened once every four (4) months. Its function and composition are as follows:

(1) Functions

- 1) To review progress and outputs of research activities
- 2) To coordinate and exchange information among the counterpart institutes
- 3) To discuss issues including technical, ethical, safety and any matters, arising from or concerning the Project

(2) Composition

1) Chairpersons:

Director, NMIMR (chair)

Director, CSRPM (vice-chair)

2) Members:

Groups Leaders

TAMD

Project Coordinator

Representatives from Japanese researchers

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5-4. Monthly Progress Report

In order to ensure effective monitoring of the research progress and timely feedback of the technical advice from the experts, all group leaders engaged in the Project will report their monthly activity and progress including administrative affairs to Project Director and Chief Advisor via Project Coordinator. The report is prepared in English and will be shared with the relevant researchers.

6. Contents of Collaborative Research

6-1. Contents of Collaborative Research

Both sides confirmed the contents of collaborative research covered in the Project are as follows:

- (1) Studies of identified novel compounds from Ghanaian medicinal plants for safety, anti-HIV activity and structure-activity relationship
- (2) Studies of identified novel compounds from Ghanaian medicinal plants for safety, anti-trypanosomal activity and structure-activity relationship

6-2. Reservation for the Mid-term review

Regarding research activities on the development of guidelines for herbal medicines, both sides agreed that their scope and methodology require further examination; therefore, their inclusion into the Project shall be reconsidered during the Mid-term review.

7. Project Design Matrix and Tentative Plan of Operation

A basic framework of the Project is as shown in a Project Design Matrix (hereinafter referred to as "PDM") in Annex III. The tentative Plan of Operation is as shown in Annex IV.

8. Inputs

The inputs from each side are as follows:

- 8-1. Japanese side
- (1) Chief Advisor (short-term expert)
- (2) Project Coordinator (long-term expert)
- (3) Other Short-term experts: Researchers to be dispatched for each research topic
- (4) Equipment necessary for research activities
- (5) Training of counterpart researchers in Japan
- (6) Other necessary costs for research activities

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- 8-2. Ghanaian side
- (1) Counterpart researchers of NMIMR and CSRPM
 - -Specialists for HIV research
 - -Specialists for Trypanosomiasis research
 - -Specialists for pharmacological/toxicological research
 - -Specialists for phytochemical research
 - -Specialists for plant development research
- (2) Office space in NMIMR.
- (3) Research space in Department of Clinical Pathology, NMIMR
- (4) Research space in Department of Virology, NMIMR
- (5) Research space in Department of Parasitology, NMIMR
- (6) Research space in CSRPM.
- (7) Existing equipment for research activities
- (8) Running costs for research activities (e.g. costs for water, electricity and landline phone).

9. Special Issues

9-1. Collaborative Research Agreement between research institutes

Both sides agreed that the research institutes in Japan and Ghana should reach an agreement to execute the collaborative research in accordance with the Master Plan of the Project. The agreed document (e.g. Collaborative Research Agreement) should contain the following items of the collaborative research:

- a. Objective and Plan
- b. Implementation
- c. Confidentiality and Intellectual Property Rights
- d. Access to Genetic Resources
- e. Publication
- f. Dispute Resolution
- g. Duration of the Agreement
- h. Compliance with Laws and Regulations
- i. Other items concerning both institutes

Both sides agreed that NMIMR and CSRPM are the representatives of Ghanaian side, and TMDU is that of Japanese side.

9-2. Intellectual Property Rights

Both sides confirmed that matters on intellectual property rights should follow the

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Collaborative Research Agreement to be signed between the research institutes.

9-3. Exclusion of Clinical Trials

Both sides agreed that clinical trials shall not be included in the Project.

JICA is indemnified for any and all liabilities, losses, and expenses on claims for injury or damages arising out of or resulting from, the actions or omissions by the Ghanaian and Japanese research institutes or of any of their officers, agents, employees, or subcontractors with respect to the clinical trials.

Therefore, JICA will not bear any expenses or honorarium for implementing clinical trials.

III WAY FORWARD

- 1. Based on this Minutes of Meeting and the draft R/D as shown in Annex V, Ghanaian and Japanese sides will prepare for the final version of the R/D.
- 2. Before starting the Project, the research institutes of both sides should take necessary actions including the application to STC, Research Committee and Board, and allocation of the budget.
- 3. Based on the mutual agreement reached, the R/D will be signed by both sides around December 2009. The schedule is subject to change in accordance with approval processes of the Project.

LIST OF ANNEXES

Annex I Project Implementation Structure

Annex II Research Contents and Researchers/ Organizations in charge

Annex III Project Design Matrix (PDM) Version 0

Annex IV Tentative Plan of Operation (PO) Version 0

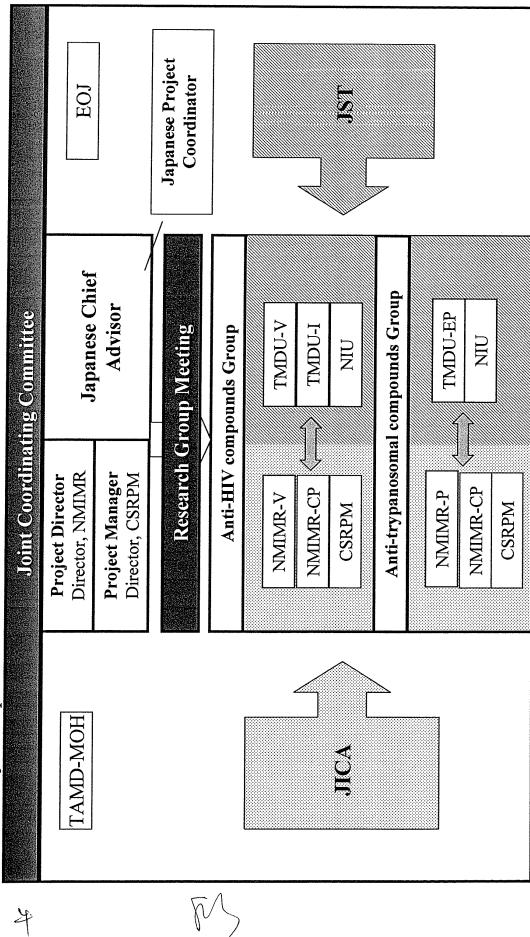
Annex V Draft Record of Discussions (R/D)





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Annex I: Project Implementation Structure



NMIMR: Noguchi Memorial Institute for Medical Research
NMIMR-V: Department of Virology, NMIMR
NMIMR-P: Department of Parasitology, NMIMR
NMIMR-P: Department of Parasitology, NMIMR
CSRPM: Centre for Scientific Research into Plant Medicine
TMDU-I: Department
TMD

TMDU: Tokyo Medical and Dental University TMDU-V: Department of Virology, TMDU

TMDU-EP: Department of Environmental Parasitology, TMDU

TMDU-I: Department of Immunotherapeutics, TMDU

NIU: Nagasaki International University te, Ministry of Health EOJ: Embassy of Japan

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Annex II Research Contents and Researchers/ Organizations in charge

Research Subject	Research Contents	Ghanaian side	Japanese side
Anti- HIV compounds from	Search for medicinal plants that suppress	Nyarko (NMIMR)	Yamaoka (TMDII)
medicinal plants	HIV infection	**Brandful (NMIMR)	Saitoh (TMDU)
		*Ofosuhene (NMIMR)	Uota (TMDU)
		Appiah-Opong (NMIMR)	Shoyama (NIU)
		Ankrah (NMIMR)	Morinaga (NIU)
		Okine (CSRPM)	Uto (NIU)
		Sittie (CSRPM)	
		*Duker-Eshun (CSRPM)	
		Ampaw (CSRPM)	
		Quasie (CSRPM)	
	Search for medicinal plants that activate	Nyarko (NMIMR)	Kannagi (TMDU)
	expression of latent HIV-1 provirus	*Ampofo (NMIMR)	Masuda (TMDU)
		Barnor (NMIMR)	Hasegawa (TMDU)
		Ofosuhene (NMIMR)	Hayashi (TMDU)
		Appiah-Opong (NMIMR)	Shoyama (NIU)
		Ankrah (NMIMR)	Morinaga (NIU)
		Okine (CSRPM)	Uto (NIU)
		Sittie (CSRPM)	
		*Duker-Eshun (CSRPM)	
		Ampaw (CSRPM)	
		Quasie (CSRPM)	
	Search for medicinal plants that enhance	Nyarko (NMIMR)	Yamaoka (TMDU)
	expression of antiviral factors	Brandful (NMIMR)	Sakuma (TMDU)
		*Barnor (NMIMR)	Shoyama (NIU)
		Odoom (NMIMR)	Morinaga (NIU)

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Annex II Research Contents and Researchers/ Organizations in charge

		Ofosuhene (NMIMR)	Uto (NIU)
		Appiah-Opong (NMIMR)	
		Ankrah (NMIMR)	
		Okine (CSRPM)	
		Sittie (CSRPM)	
		*Duker-Eshun (CSRPM)	
		Ampaw (CSRPM)	_
		Quasie (CSRPM)	
Anti- trypanosomal compounds Search for medicinal	Search for medicinal plants that suppress	Nyarko (NMIMR)	Ohta (TMDU)
from medicinal plants	parasite proliferation	**Boakye (NMIMR)	Kumagai (TMDU)
		Appawu (NMIMR)	Tokiwa (TMDU)
		Ayi (NMIMR)	Bethel (TMDU)
		Ofosuhene (NMIMR)	Shoyama (NIU)
		*Appiah-Opong (NMIMR)	Morinaga (NIU)
		Ankrah (NMIMR)	Uto (NIU)
		Okine (CSRPM)	
		*Sittie (CSRPM)	
		Duker-Eshun (CSRPM)	
		Ampaw (CSRPM)	
		Quasie (CSRPM)	
Note: NMIMR: Noguchi Memoria NMIMR-V: Department of Virolog NMIMR-CP: Department of Clinic NMIMR-P: Department of Parasitt CSRPM: Centre for Scientific Res	Note: NMIMR: Noguchi Memorial Institute for Medical Research NMIMR-V: Department of Virology, NMIMR NMIMR-CP: Department of Clinical Pathology, NMIMR NMIMR-P: Department of Parasitology, NMIMR CSTPM: Centre for Scientific Research into Plant Medicine *: Group Leaders *: Sub Leaders	h TMDU: Tokyo Medical and Dental University TMDU-V: Department of Virology, TMDU TMDU-EP: Department of Environmental Parasitology, TMDU TMDU-I: Department of Immunotherapeutics, TMDU NIU: Nagasaki International University	ital University igy, TMDU ronmental Parasitology, TMDU otherapeutics, TMDU

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Date: August 20, 2009
Project Curation: 5 years from XX/XX/2010

Annex III: Project Design Matrix (PDM) (Version 0)
Project Title: Control of Infectious Diseases of Viral and Parasitic Aetiology in Ghana

Target Area: The Republic of Ghana
Target Group : Approximately 50 researchers
[Noguchi Memorial Institute for Medical Research (NMIMR)] Approximately 30 researchers
[Centre for Scientific Research into Plant Medicine (CSRPM)] Approximately 20 researchers

Narrative Summary		Objectively Verifiable Indicators	Moone of Vorification	, , , , , , , , , , , , , , , , , , , ,
Project Purpose Research and development capacity of Chanaian research institutes for Chanaian medicinal plants-derived anti-viral and anti-parasitic compounds are improved through collaborative research activities with Japanese research institutes.		At least one candidate anti-HIV compound is determined for pre-clinical trial. At least one candidate anti-trypanosomal compound is determined for pre-clinical trial.	(1) Experts' project reports (2) Research group meeting records (3) Monthly progress reports	inportant Assumptions
Outputs 1 Safety, anti-HIV activity and structure-activity relatio of identified novel compounds from Ghanaian medicinal plants are determined.	vity relationship	Safety, anti-HIV activity and structure-activity relationship activity is identified by the year of 2012. plants are determined. activity is analyzed for its mechanism and structure-activity relationship by the year of 2014.	(1) Experts' project reports (2) Research group meeting records (3) Monthly progress reports	1. Government c. Ghana provides necessary budge-ary support to maintain the relevant institutes.
 Safety, anti-trypanosomal activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined. 		2-1. At least one novel compound with anti- trypanosomal activity is identified by the year of 2012. 2-2. At least one novel compound with anti- trypanosomal activity is analyzed for their effects on cellular phenotypes and structure-activity relationship by the year of 2014.	(1) Experts' project reports (2) Research group meeting records (3) Monthly progress reports	
3 Implementation systems for research regarding Ghanaian medicinal plant-derived anti-viral and anti-parasitic compounds is established.		3-1.SOP in each research subject is made and revised. 3-2.Research group is established to discuss progress of the research, achievements and safety management once every four months. 3-3.Monthly progress report is made by group leaders. 3-4.Annual plan documents for research operation are prepared collaboratively.	(1) Experts' project reports (2) SOP (3) Research group meeting records (4) Monthly progress reports (5) Annual plan documents for research operation	
Activities		Inputs		
 Safety, anti-HIV activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined. 		Japan	Ghana	1. Trained counterparts do not leave their position so as to affect the outputs of the Project.
1-1. Establish crude extraction methods for candidate compounds, such as procyanidines and phorbol esters, from Ghanaian candidate plants. 1-2. Establish safety of crude extract and isolated compounds with anti-HIV activity. 1-3. Establish bio-assay systems of crude plant extracts for anti-HIV activity by bio-assay systems of crude plant extracts for anti-HIV activity by bio-assay systems established in the Project crude plant extracts that suppress HIV-1 replication, activate expression of host restriction factors against HIV-1 or activate latent proviral expression. 1-5. Separate and purify novel compounds with anti-HIV activity from crude extracts. 1-6. Analyze the active compounds with their structureactivity relationship and determine virological mechanism of action.	for	Experts (1) Chief Advisor (Short-time Expert) (2) Project Coordinator (Long-term Expert) (3) Extraction, identification and purification of active compounds from plant extracts: Thin layer chromatography, determination of extraction condition, High-performance liquid chromatography (HPLC) (Short-time Expert) (4) Screening of plant extracts for suppression of HIV replication (Short-time Expert, double as chief advisor) (5) Screening of plant extracts for proviral expression in latently HIV infected cell lines (Short-time Expert) (6) Screening of plant extracts for antiparasitic compounds (Short-time Expert)	Counterparts (1) Project Director (2) Project Manager (3) Group Leaders (4) Researchers (Department of Virology, Department of Parasitology and Department of Clinical Pathology, NMIMR, and CSRPM) - Specialists for HIV research - Specialists for Trypanosomiasis research - Specialists for Trypanosomiasis research pharmacological/toxicological research - Specialists for phytochemical research - Specialists for phytochemical research - Specialists for plant development research	

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1-7. Develop methods for propagation of selected plants with high concentration of the active compounds. Safety, anti-trypanosomal activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined. 2-1. Establish crude extraction methods for candidate compounds, such as gallic acid and curcumin, from Ghanaian candidate plants. 2-2. Establish safety of crude extract and isolated compounds with anti-trypanosomal activity. 2-3. Establish bio-assay systems of crude plant extracts for anti-trypanosomal activity. 2-4. Identify by bio-assay systems established in the Project crude plant extracts that suppress project crude plant extracts that suppress project ration of, and induce morphological changes of trypanosomal protozoa. 2-5. Separate and purify novel compounds with their structure-activity relationship and determine effects on cellular phenotypes. 2-6. Analyze the active compounds with their structure-activity relationship and determine effects on cellular phenotypes. 2-7. Develop methods for propagation of selected plants with high concentration of the active compounds. Implementation systems for research regarding Ghanaian medicinal plant-derived anti-viral and anti-parasitic compounds is established. 3-1. Set up laboratory environment for the research experts to (SOP) in each research subject. Convene research group meetings to discuss progress of the research, achievements and safety management once every four months. All group leaders submit monthly progress reports to All group leaders submit monthly project Coordinator. 2-6. Prepare annual plan documents for research operation.	Eacilities, equipment and materials (1) Office space in NMIMR (2) Research space in Department of Clinical Pathology, NMIMR (3) Research space in Department of Virology, NMIMR (4) Research space in Department of Parasitology, NMIMR (5) Research space in CSRPM (6) Research space in CSRPM	(6) Existing equipments for research activities, etc. Local Costs Running costs for research activities (e.g. costs for water, electricity and landline phone).						
2-1. 2-1. 2-1. 2-2. 2-4. Impleme medicin medicin medicin medicin medicin medicin compou compou and and an an and an	Training in lapan (1) Training for extraction, identification and purification of active compounds from plant extracts (2) Training for screening of plant extracts for suppression of HIV replication (3) Training for screening of plant extracts for enhanced expression of factors restricting HIV replication	(4) Training for screening of plant extracts for proviral expression in latently HIV infected cell lines (5) Training for screening of plant extracts for anti Equipment and Materials Necessary equipment for research activities in the	Local Costs					
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Project Title: Control of Infectious Diseases of Viral and Parasitic Aetiology in Ghana Annex IV Plan of Operation (PO) (Version 0)

Output 1.:
Safety, anti-HIV activity and structure-activity relationship, of Identified novel compounds from Ghanalan medicinal plants, are determined.

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Project Title: Control of Infectious Diseases of Viral and Parasitic Aetiology in Ghana Annex IV Plan of Operation (PO) (Version 0)

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Output 2:

Safety, anti-trypanosomal activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined.

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	active compounds.			********														•••		•			

Abbreviations:
TMDU: Tokyo Medical and Dental University, TMDU-V: Department of Virology, TMDU-EP: Department of Environmental Parssitology, TMDU-I: Department of Immunotherapeutics, NIU: Nagasaki International University, NMIMR: Persearch, NMIMR-CP: Department of Clinical Pathology, NMIMR-V: Department of Virology, NMIMR-P: Department of Parasitology, CSRPM: Centre for Scientific Research into Plant Medicine, I.F.Y.: Japanese Fiscal Year (starting from April 1 to March 31.)

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Annex IV Plan of Operation (PO) (Version 0)

Project Title: Control of Infectious Diseases of Viral and Parasitic Actiology in Ghana

Output 3:
Implementation systems for research regarding Ghanaian medicinal plant-derived anti-viral and anti-parasitic compounds is established.

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			Activities J	-Ai		3-1. Set up laboratory	environment for the research	activities.	3.2 Prepare and revies	Standard Operating Procedure	(SOP) in each research subject	::ofco:	3-3. Convene research group	meetings to discuss progress of	the research, achievements and	safety management once every	four months.	3-4. All group leaders submit	monthly progress reports to	Project Director and Chief	Advisor via Project	Coordinator.
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operation.

3-5. Prepare annual plan documents for research Abbreviations.

TMDU: Tokyo Medical and Dental University, TMDU-Y. Department of Virology, TMDU-EP. Department of Environmental Parasitology, TMDU-I. Department of Immunotherapeutics, MU. Nagasaki International University,
NMIMR-Noguchii Memorial Institute for Medical Research, NMIMR-CP. Department of Clinical Pathology, NMIMR-V: Department of Virology, NMIMR-P. Department of Parasitology, CSRPM: Centre for Scientific Research into P. ant Medicine,
J.F. Y.: Japanese Escal Year (starting from April 1 to March 31.)

NMIMR-CP NMIMR-V NMIMR-P CSRPM

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(Draft)

RECORD OF DISCUSSIONS BETWEEN JAPAN INTERNATIONAL COOPERATION AGENCY AND AUTHORITIES CONCERNED OF THE GOVERNMENT OF THE REPUBLIC OF GHANA ON JAPANESE TECHNICAL COOPERATION FOR THE PROJECT FOR <Project title>

Japan International Cooperation Agency (hereinafter referred to as "JICA") through its Chief Representative, Ghana Office had a series of discussions with the Ghanaian authorities concerned with respect to desirable measures to be taken by JICA and Government of the Republic of Ghana for the successful implementation of the Project for "<Project title>" (hereinafter referred to as "the Project").

As a result of the discussions, the Chief Representative of JICA and the Ghanaian authorities concerned agreed on the matters referred to in the document attached hereto.

Accra, < month, date, year>

Mr. Kunihiro Yamauchi Chief Representative Ghana Office Japan International Cooperation Agency Japan Professor Clifford N.B. Tagoe Vice Chancellor University of Ghana The Republic of Ghana

Madam Salimata Abdul-Salam Acting Chief Director Ministry of Health The Republic of Ghana Professor Paul Buatsi Chief Director Ministry of Education The Republic of Ghana

Mr. Okyere Nyarko Director External Resource Mobilization, Bilateral Division Ministry of Finance and Economic Planning The Republic of Ghana

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Witnessed by

Professor Shoji Yamaoka Department of Virology Tokyo Medical and Dental University Japan Professor Alexander K. Nyarko Director Noguchi Memorial Institute for Medical Research The Republic of Ghana

Professor Laud K. N. Okine Director Centre for Scientific Research into Plant Medicine The Republic of Ghana

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ANNEX V Draft Record of Discussions (R/D) THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN BOTH COUNTRIES

- 1. The Government of the Republic of Ghana will implement the Project in cooperation with JICA.
- 2. The Project will be implemented in accordance with the Master Plan which is given in Annex I.

II. MEASURES TO BE TAKEN BY JICA

In accordance with the laws and regulations in force in Japan, JICA will take, at its own expense, the following measures according to the normal procedures under the Technical Cooperation Scheme in Japan.

1. DISPATCH OF JAPANESE EXPERTS

JICA will provide the services of the Japanese experts as listed in Annex II.

2. PROVISION OF MACHINERY AND EQUIPMENT

JICA will provide such machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project as listed in Annex III. The Equipment will become the property of the Government of the Republic of Ghana upon being delivered C.I.F. (cost, insurance and freight) to the Ghanaian authorities concerned at the ports and/or airports of disembarkation.

3. TRAINING OF GHANAIAN PERSONNEL IN JAPAN

JICA will receive the Ghanaian personnel connected with the Project for technical training in Japan.

III. MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE REPUBLIC OF GHANA

1. The Government of the Republic of Ghana upon will take necessary measures to

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ensure that the self-reliant operation of the Project will be sustained during and after the period of Japanese technical cooperation, through full and active involvement in the Project by all related authorities, beneficiary groups and institutions.

- 2. The Government of the Republic of Ghana upon will ensure that the technologies and knowledge acquired by the Ghanaian nationals as a result of Japanese technical cooperation will contribute to the economic and social development of the Republic of Ghana.
- 3. The Government of the Republic of Ghana upon will grant in Ghana privileges, exemptions and benefits as listed in Annex IV and will grant privileges, exemptions and benefits no less favorable than those granted to experts of third countries or international organizations performing similar missions to the Japanese experts referred to in II-1 above and their families.
- 4. The Government of the Republic of Ghana will ensure that the Equipment referred to in II-2 above will be utilized effectively for the implementation of the Project in consultation with the Japanese experts referred to in Annex II.
- 5. The Government of the Republic of Ghana will take necessary measures to ensure that the knowledge and experience acquired by the Ghanaian personnel from technical training in Japan will be utilized effectively in the implementation of the Project.
- 6. In accordance with the laws and regulations in force in Ghana, the Government of the Republic of Ghana will take necessary measures to provide at its own expense:
 - (1) Services of the Ghanaian counterpart personnel and administrative personnel as listed in Annex V;
 - (2) Land, buildings and facilities as listed in Annex VI;
 - (3) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the Equipment provided by JICA under II-2 above;



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- (4) Means of transport and travel allowances for the Japanese experts for official travel within Ghana; and
- (5) Suitably furnished accommodation for the Japanese experts and their families.
- 7. In accordance with the laws and regulations in force in Ghana, the Government of the Republic of Ghana will take necessary measures to meet:
 - (1) Expenses necessary for transportation within Ghana of the Equipment referred to in II-2 above as well as for the installation, operation and maintenance thereof:
 - (2) Customs duties, internal taxes and any other charges, imposed in Ghana on the Equipment referred to in II-2 above; and
 - (3) Running expenses necessary for the implementation of the Project.

IV. ADMINISTRATION OF THE PROJECT

- 1. The Director, Noguchi Memorial Institute for Medical Research (hereinafter referred to as "NMIMR"), as the Project Director, will bear overall responsibility for the administration and implementation of the Project.
- 2. The Director, Centre for Scientific Research into Plant Medicine (hereinafter referred to as "NMIMR"), as the Project Manager, will be responsible for the managerial and technical matters of the Project.
- 3. The Japanese Team Leader will provide necessary recommendations and advice to the Project Director and the Project Manager on any matters pertaining to the implementation of the Project.
- 4. The Japanese experts will give necessary technical guidance and advice to the Ghanaian counterpart personnel on technical matters pertaining to the implementation of the Project.





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5. For the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee will be established whose functions and composition are described in Annex VII.

V. JOINT EVALUATION

Evaluation of the Project will be conducted jointly by JICA and the Ghanaian authorities concerned, at the middle and during the last six months of the cooperation term in order to examine the level of achievement.

VI. CLAIMS AGAINST JAPANESE EXPERTS

The Government of the Republic of Ghana undertakes to bear claims, if any arises, against the Japanese experts engaged in technical cooperation for the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in the Republic of Ghana except for those arising from the willful misconduct or gross negligence of the Japanese experts.

VII. MUTUAL CONSULTATION

There will be mutual consultation between JICA and the Government of the Republic of Ghana on any major issues arising from, or in connection with this Attached Document.

VIII. MESURES TO PROMOTE UNDERSTANDING OF AND SUPPORT FOR THE PROJECT

For the purpose of promoting support for the Project among the people of Ghana, the Government of the Republic of Ghana will take appropriate measures to make the Project widely known to the people of Ghana.

IX. TERM OF COOPERATION

The duration of the technical cooperation for the Project under this Attached Document will be five (5) years from XXXX 2010.

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ANNEX I MASTER PLAN
ANNEX II LIST OF JAPANESE EXPERTS

ANNEX III LIST OF MACHINERY AND EQUIPMENT

ANNEX IV LIST OF GHANAIAN COUNTERPART AND ADMINISTRATIVE

PERSONNEL

ANNEX V LIST OF BUILDINGS AND FACILITIES

ANNEX VI JOINT COORDINATING COMMITTEE

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ANNEX I MASTER PLAN

Project Purpose

Research and development capacity of Ghanaian research institutes for Ghanaian medicinal plants-derived anti-viral and anti-parasitic compounds are improved through collaborative research activities with Japanese research institutes.

Outputs

- 1. Safety, anti-HIV activity and structure activity relationship of identified novel compounds from Ghanaian medicinal plants are determined.
- 2. Safety, anti-trypanosomal activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined.
- 3. Implementation systems for research regarding Ghanaian medicinal plant-derived anti-viral and anti-parasitic compounds is established.

Activities

- 1-1. Establish crude extraction methods for candidate compounds, such as procyanidines and phorbol esters, from Ghanaian candidate plants.
- 1-2. Establish safety of crude extract and isolated compounds with anti-HIV activity.
- 1-3. Establish bio-assay systems of crude plant extracts for anti-HIV activity.
- 1-4. Identify by bio-assay systems established in the Project crude plant extracts that suppress HIV-1 replication, activate expression of host restriction factors against HIV-1 or activate latent pro-viral expression.
- 1-5. Separate and purify novel compounds with anti-HIV activity from crude extracts.
- 1-6. Analyze the active compounds with their structure-activity relationship and determine virological mechanism of action.
- 1-7. Develop methods for propagation of selected plants with high concentration of the active compounds.
- 2-1. Establish crude extraction methods for candidate compounds, such as gallic acid and curcumin, from Ghanaian candidate plants.
- 2-2. Establish safety of crude extract and isolated compounds with anti-trypanosomal activity.
- 2-3. Establish bio-assay systems of crude plant extracts for anti-trypanosomal activity.
- 2-4. Identify by bio-assay systems established in the Project crude plant extracts that suppress proliferation of, and induce morphological changes of trypanosomal protozoa.
- 2-5. Separate and purify novel compounds with anti-trypanosomal activity from crude extracts.
- 2-6. Analyze the active compounds with their structure-activity relationship and

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ANNEX V Draft Record of Discussions (R/D) determine effects on cellular phenotypes.

- 2-7. Develop methods for propagation of selected plants with high concentration of the active compounds.
- 3-1. Set up laboratory environment for the research activities.
- 3-2. Prepare and revise Standard Operating Procedure (SOP) in each research subject.
- 3-3. Convene research group meetings to discuss progress of the research, achievements and safety management once every four months.
- 3-4. All group leaders submit monthly progress reports to Project Director and Chief Advisor via Project Coordinator.
- 3-5. Prepare annual plan documents for research operation.

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ANNEX II LIST OF JAPANESE EXPERTS

- 1. Long-term experts
- (1) Project Coordinator
- 2. Short-term experts
- (1) Chief Advisor
- (2) Extraction, identification and purification of active compounds from plant extracts: Thin layer chromatography, determination of extraction condition, High-performance liquid chromatography (HPLC)
- (3) Screening of plant extracts for suppression of HIV replication (double as chief advisor)
- (4) Screening of plant extracts for proviral expression in latently HIV infected cell lines
- (5) Screening of plant extracts for anti-parasitic compounds
- (6) Other researchers to be dispatched several times for each research topic according to a plan to be developed based on mutual agreement of both sides

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ANNEX III LIST OF MACHINERY AND EQUIPMENT

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ANNEX IV LIST OF GHANAIAN COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. Project Director:

Director, Noguchi Memorial Institute for Medical Research

2. Project Manager:

Director, Centre for Scientific Research into Plant Medicine

- 3. Group Leaders
- 4. Researchers of Department of Virology, Department of Parasitology and Department of Clinical Pathology, Noguchi Memorial Institute for Medical Research and Centre for Scientific Research into Plant Medicine
- (1) Specialists for HIV research
- (2) Specialists for Trypanosomiasis research
- (3) Specialists for pharmacological/toxicological research
- (4) Specialists for phytochemical research
- (5) Specialists for plant development research

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ANNEX V Draft Record of Discussions (R/D) ANNEX V LIST OF BUILDINGS AND FACILITIES

- 1. Office space in Noguchi Memorial Institute for Medical Research
- 2. Research space in Department of Clinical Pathology, Noguchi Memorial Institute for Medical Research
- 3. Research space in Department of Virology, Noguchi Memorial Institute for Medical Research
- 4. Research space in Department of Parasitology, Noguchi Memorial Institute for Medical Research
- 5. Research space in Centre for Scientific Research into Plant Medicine
- 6. Existing equipments for research activities, etc.



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ANNEX VI JOINT COORDINATING COMMITTEE

1. Functions

- (1) To formulate and authorize the annual activity plan of the Project
- (2) To endorse major achievements and products of the Project
- (3) To monitor and review overall progress and supervise the Project
- (4) To review and discuss on major issues arising from or concerning the Project

2. Composition

(2) Composition

1) Chairperson:

Director, Noguchi Memorial Institute for Medical Research (chair) Director, Centre for Scientific Research into Plant Medicine (vice-chair)

2) Members:

<Ghanaian side>

Group Leaders

Director, Traditional and Alternative Medicine Directorate, Ministry of Health (Observer)

<Japanese side>

JICA long-term expert and Japanese Chief Advisor and/or representatives from Tokyo Medical and Dental University and/or Nagasaki International University

Representatives from JICA Ghana Office

Representatives from Japan Science and Technology Agency (Observer)

Representatives from Embassy of Japan (Observer)

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