

2. 協議議事録 (Minutes of Meeting)、プロジェクト・デザイン・マトリックス (PDM)、活動計画 (PO)

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

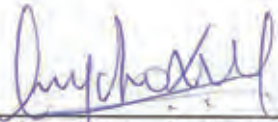
Chief Representative of Japan International Cooperation Agency (hereinafter referred to as "JICA") Ghana Office had a series of discussions with the authorities concerned of Ghana about the formation of Technical Cooperation Project for "The Studies of Anti-viral and Anti-parasitic Compounds from Selected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

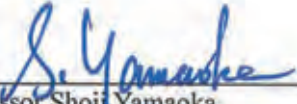
Accra, April 1st, 2010



Mr. Kunihiro Yamauchi
Chief Representative
Ghana Office
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. Okyere-Nyarko
Director
External Resource Mobilization, Bilateral Division
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:

- (1) 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.

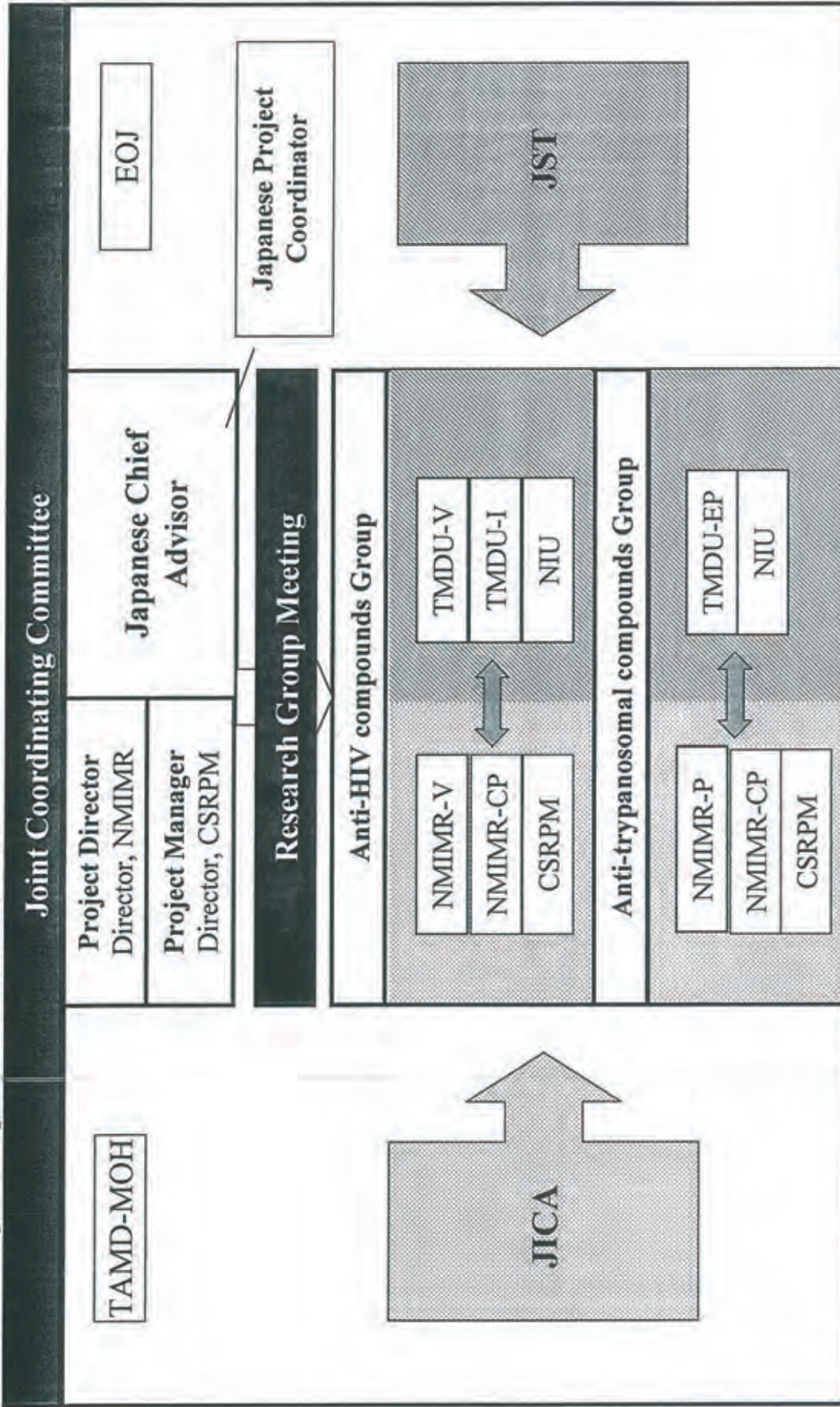
LIST OF ANNEXES

- 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: 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
 CSRPM: Centre for Scientific Research into Plant Medicine
 TAMD-MOH: Traditional and Alternative Medicine Directorate, Ministry of Health

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
 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 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) Quasie (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) Quasie (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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Annex II Research Contents and Researchers/ Organizations in charge

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

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
 CSRPM: Centre for Scientific Research into Plant Medicine
 **: Group Leaders *: Sub Leaders

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

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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

Date: April 1st, 2010

Project Duration: 5 years from April 1st, 2010

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>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.</p>	<p>1. At least one candidate anti-HIV compound is determined for pre-clinical trial. 2. At least one candidate anti-trypanosomal compound is determined for pre-clinical trial.</p>	<p>(1) Experts' project reports (2) Research group meeting records (3) Monthly progress reports</p>	
<p>Outputs 1. Safety, anti-HIV activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined.</p>	<p>1-1. At least one novel compound with anti-HIV-1 activity is identified by the year of 2012. 1-2. At least one novel compound with anti-HIV-1 activity is analyzed for its mechanism and structure-activity relationship by the year of 2014.</p>	<p>(1) Experts' project reports (2) Research group meeting records (3) Monthly progress reports</p>	<p>I. Government of Ghana provides necessary budgetary support to maintain the relevant institutes.</p>
<p>2. Safety, anti-trypanosomal activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined.</p>	<p>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.</p>	<p>(1) Experts' project reports (2) Research group meeting records (3) Monthly progress reports</p>	
<p>3. Implementation systems for research regarding Ghanaian medicinal plant-derived anti-viral and anti-parasitic compounds are established.</p>	<p>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.</p>	<p>(1) Experts' project reports (2) SOP (3) Research group meeting records (4) Monthly progress reports (5) Annual plan documents for research operation</p>	
<p>Activities 1. Safety, anti-HIV activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined.</p> <p>1-1. Establish crude extraction methods for candidate compounds, such as procyanidins 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 proviral expression.</p>	<p>Inputs Japan Experts (1) Chief Advisor (Short-term 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-term Expert) (4) Screening of plant extracts for suppression of HIV replication (Short-term Expert, double as chief advisor) (5) Screening of plant extracts for anti-HIV compounds (Long-term Expert)</p>	<p>Ghana 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 pharmacological/toxicological research - Specialists for phytochemical research</p>	<p>I. Trained counterparts do not leave their position so as to affect the outputs of the Project.</p>

<p>1-5. Separate and purify novel compounds with anti-HIV activity from crude extracts.</p> <p>1-6. Analyze the active compounds with their structure-activity relationship and study virological mechanism of action.</p> <p>1-7. Develop methods for propagation of selected plants with high concentration of the active compounds.</p>	<p>(6) Screening of plant extracts for antiparasitic compounds (Short-term Expert)</p> <p>(7) Screening of plant extracts for anti-parasitic compounds (Long-term Expert)</p>	<p>- Specialists for plant development research</p>	
<p>2 Safety, anti-trypanosomal activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined.</p> <p>2-1. Establish crude extraction methods for candidate compounds, such as gallic acid and curcumin, from Ghanaian candidate plants.</p> <p>2-2. Establish safety of crude extract and isolated compounds with anti-trypanosomal activity.</p> <p>2-3. Establish bio-assay systems of crude plant extracts for anti-trypanosomal activity.</p> <p>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.</p> <p>2-5. Separate and purify novel compounds with anti-trypanosomal activity from crude extracts.</p> <p>2-6. Analyze the active compounds with their structure-activity relationship and study effects on cellular phenotypes.</p> <p>2-7. Develop methods for propagation of selected plants with high concentration of the active compounds.</p>	<p>Training in Japan</p> <p>(1) Training for extraction, identification and purification of active compounds from plant extracts</p> <p>(2) Training for screening of plant extracts for suppression of HIV replication</p> <p>(3) Training for screening of plant extracts for enhanced expression of factors restricting HIV replication</p> <p>(4) Training for screening of plant extracts for proviral expression in latently HIV infected cell lines</p> <p>(5) Training for screening of plant extracts for antiparasitic</p> <p>Equipment and Materials</p> <p>Necessary equipment for research activities in the Project</p> <p>Local Costs</p>	<p>Facilities, equipment and materials</p> <p>(1) Office space in NMIMR</p> <p>(2) Research space in Department of Clinical Pathology, NMIMR</p> <p>(3) Research space in Department of Virology, NMIMR</p> <p>(4) Research space in Department of Parasitology, NMIMR</p> <p>(5) Research space in CSRPM</p> <p>(6) Existing equipments for research activities, etc.</p> <p>Local Costs</p> <p>Running costs for research activities (e.g. costs for water, electricity and landline phone).</p>	
<p>3 Implementation systems for research regarding Ghanaian medicinal plant-derived anti-viral and anti-parasitic compounds are established.</p> <p>3-1. Set up laboratory environment for the research activities.</p> <p>3-2. Prepare and revise Standard Operating Procedure (SOP) in each research subject.</p> <p>3-3. Convene research group meetings to discuss progress of the research, achievements and safety management once every four months.</p> <p>3-4. All group leaders submit monthly progress reports to Project Director and Chief Advisor via Project Coordinator.</p> <p>3-5. Prepare annual plan documents for research operation.</p>			<p>Pre-Conditions</p> <p>1. The approval is obtained from Scientific and Technical Committee of NMIMR and Research Committee CSRPM for the research activities conducted in the Project.</p> <p>2. Clearance for animal use is obtained from IRB of NMIMR.</p> <p>3. Clearance for material transfer (import/export) from relevant ministry/authority. The materials may include plant genetic resources, plant-derived compounds and biological materials.</p>

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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

Date: 1st April, 2010

Output 2:

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

Activities	Plan of Operation																								Person in Charge		Remark
	2010				2011				2012				2013				2014				2015				Japan	Ghana	
	Jan-Mar (J.F.Y.)	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar (J.F.Y.)	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar (J.F.Y.)	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar (J.F.Y.)	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar (J.F.Y.)	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec			
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 study effects on cellular phenotypes.																											
2-7. Develop methods for propagation of selected plants with high concentration of the active compounds.																											

Abbreviations:

TMDU: Tokyo Medical and Dental University; TMDU-V: Department of Virology; TMDU-EP: Department of Environmental Parasitology; TMDU-I: Department of Immunotherapeutics; NIU: Nagasaki International University; NMIMR: Noguchi 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 Plant Medicines; 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

Output 3:

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

Activities	Plan of Operation																								Person in Charge		Remarks	
	2010				2011				2012				2013				2014				2015				Japan	Ghana		
	Jan - Mar (J.F.Y.)		Apr - Jun (J.F.Y.)		Jul - Sep (J.F.Y.)		Oct - Dec (J.F.Y.)		Jan - Mar (J.F.Y.)		Apr - Jun (J.F.Y.)		Jul - Sep (J.F.Y.)		Oct - Dec (J.F.Y.)		Jan - Mar (J.F.Y.)		Apr - Jun (J.F.Y.)		Jul - Sep (J.F.Y.)		Oct - Dec (J.F.Y.)					
	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q			
3-1. Set up laboratory environment for the research activities.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TMDU-V TMDU-EP TMDU-I NIU	NMIMR-CP NMIMR-V NMIMR-P CSRPM	
3-2. Prepare and revise Standard Operating Procedure (SOP) in each research subject.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TMDU-V TMDU-EP TMDU-I NIU	NMIMR-CP NMIMR-V NMIMR-P CSRPM	
3-3. Convene research group meetings to discuss progress of the research, achievements and safety management once every four months.	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	TMDU-V TMDU-EP TMDU-I NIU	NMIMR-CP NMIMR-V NMIMR-P CSRPM	
3-4. All group leaders submit monthly progress reports to Project Director and Chief Advisor via Project Coordinator.	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	TMDU-V TMDU-EP TMDU-I NIU	NMIMR-CP NMIMR-V NMIMR-P CSRPM	
3-5. Prepare annual plan documents for research operation.	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	TMDU-V TMDU-EP TMDU-I NIU	NMIMR-CP NMIMR-V NMIMR-P CSRPM	

Abbreviations:
 TMDU: Tokyo Medical and Dental University, TMDU-V: Department of Virology, TMDU-EP: Department of Environmental Parasitology, TMDU-I: Department of Immunotherapeutics, NIU: Nagasaki International University.
 NMIMR: Nogiichi 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 Plant Medicine,
 J.F.Y.: Japanese Fiscal Year (starting from April 1 to March 31).

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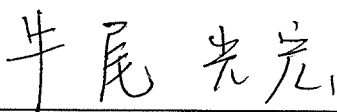
**MINUTES OF MEETING BETWEEN
THE JAPANESE DETAILED PLANNING SURVEY TEAM AND
THE AUTHORITIES CONCERNED OF
THE GOVERNMENT OF THE REPUBLIC OF GHANA ON
JAPANESE TECHNICAL COOPERATION FOR THE PROJECT FOR
CONTROL OF INFECTIOUS DISEASES OF
VIRAL AND PARASITIC AETIOLOGY IN GHANA**

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").

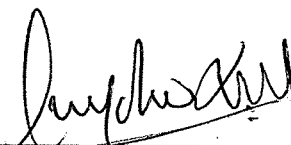
The Team had a series of discussions and exchanged views on the Project with the authorities concerned of Ghana. During the discussions, both sides agreed that it is appropriate to modify the original project title indicated above to "Studies of Anti-viral and Anti-parasitic Compounds from Selected Ghanaian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

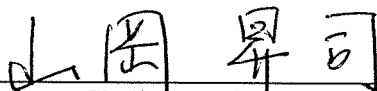


Dr. Mitsuhiro Ushio
Team Leader
Detailed Planning Survey Team
Japan International Cooperation Agency
Japan



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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*“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 8-2.

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

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

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

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.

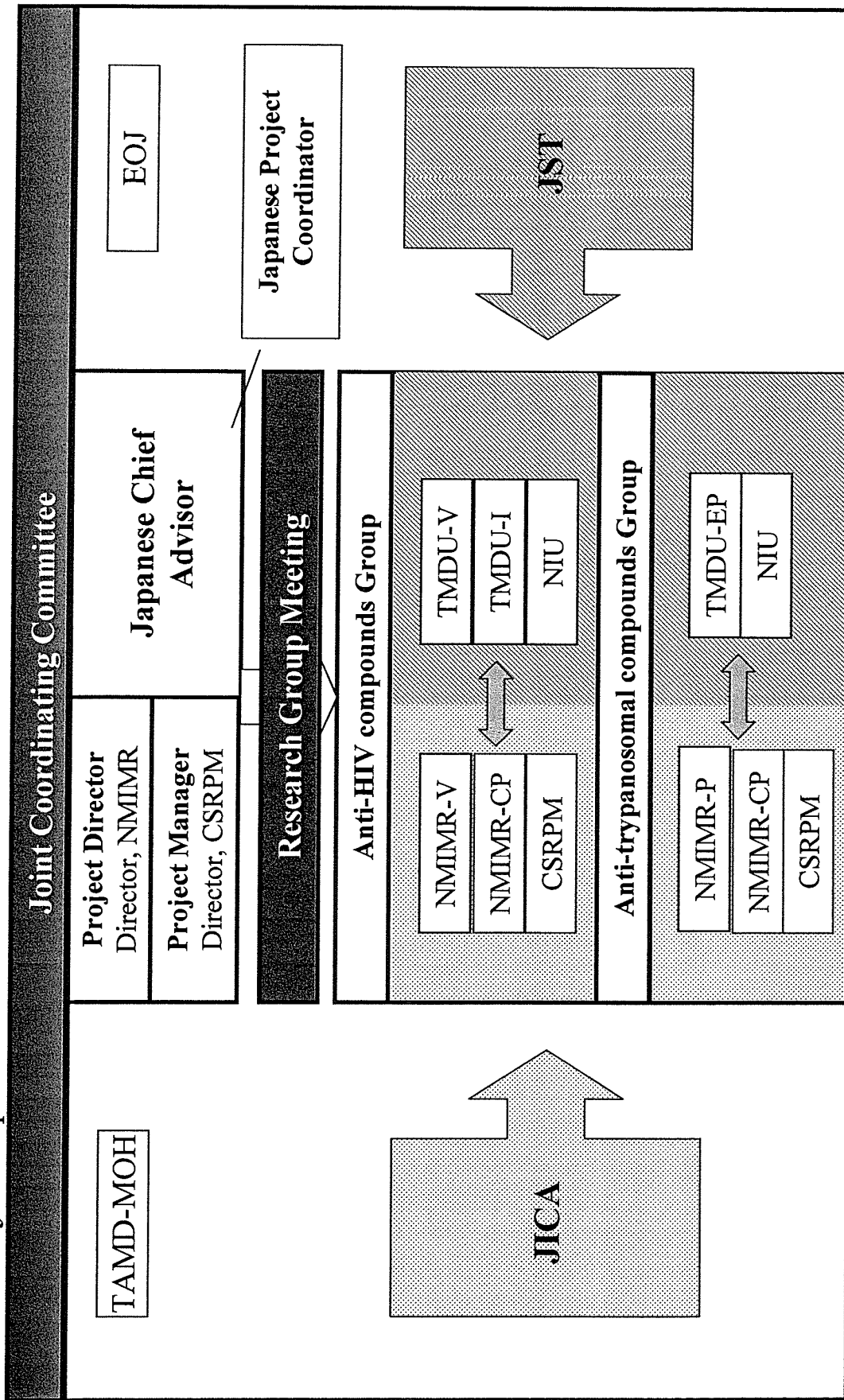
III WAY FORWARD

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) |

Annex I: Project Implementation Structure



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
 CSRPM: Centre for Scientific Research into Plant Medicine
 TAMD-MOH: Traditional and Alternative Medicine Directorate, Ministry of Health

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

EOJ: Embassy of Japan

Annex II Research Contents and Researchers/ Organizations in charge

Research Subject	Research Contents	Ghanaian side	Japanese side
Anti- HIV compounds from medicinal plants	Search for medicinal plants that suppress HIV infection	Nyariko (NMIMR) **Brandful (NMIMR) *Ofosuhene (NMIMR) Appiah-Opong (NMIMR) Ankrah (NMIMR) Okine (CSRPM) Sittie (CSRPM) *Duker-Eshun (CSRPM) Ampaw (CSRPM) Quasie (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	Nyariko (NMIMR) * Ampofo (NMIMR) Barnor (NMIMR) Ofosuhene (NMIMR) Appiah-Opong (NMIMR) Ankrah (NMIMR) Okine (CSRPM) Sittie (CSRPM) *Duker-Eshun (CSRPM) Ampaw (CSRPM) Quasie (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	Nyariko (NMIMR) Brandful (NMIMR) *Barnor (NMIMR) Odoom (NMIMR)	Yamaoka (TMDU) Sakuma (TMDU) Shoyama (NIU) Morinaga (NIU)

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Annex II Research Contents and Researchers/ Organizations in charge

		<p>Ofosehene (NMIMR) Appiah-Opong (NMIMR) Ankrah (NMIMR) Okine (CSRPM) Sittie (CSRPM) *Duker-Eshun (CSRPM) Ampaw (CSRPM) Quasie (CSRPM)</p>	<p>Uto (NIU)</p>
<p>Anti- trypanosomal compounds from medicinal plants</p>	<p>Search for medicinal plants that suppress parasite proliferation</p>	<p>Nyarako (NMIMR) **Boakye (NMIMR) Appawu (NMIMR) Ayi (NMIMR) Ofosehene (NMIMR) *Appiah-Opong (NMIMR) Ankrah (NMIMR) Okine (CSRPM) *Sittie (CSRPM) Duker-Eshun (CSRPM) Ampaw (CSRPM) Quasie (CSRPM)</p>	<p>Ohta (TMDU) Kumagai (TMDU) Tokiwa (TMDU) Bethel (TMDU) Shoyama (NIU) Morinaga (NIU) Uto (NIU)</p>

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
 CSRPM: Centre for Scientific Research into Plant Medicine
 **: Group Leaders *: Sub Leaders

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

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	Means of Verification	Important Assumptions
<p>Project Purpose</p> <p>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.</p> <p>Outputs</p> <p>1 Safety, anti-HIV activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined.</p> <p>2 Safety, anti-trypanosomal activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined.</p> <p>3 Implementation systems for research regarding Ghanaian medicinal plant-derived anti-viral and anti-parasitic compounds is established.</p>	<p>1. At least one candidate anti-HIV compound is determined for pre-clinical trial.</p> <p>2. At least one candidate anti-trypanosomal compound is determined for pre-clinical trial.</p> <p>1-1. At least one novel compound with anti-HIV-1 activity is identified by the year of 2012.</p> <p>1-2. At least one novel compound with anti-HIV-1 activity is analyzed for its mechanism and structure-activity relationship by the year of 2014.</p> <p>2-1. At least one novel compound with anti-trypanosomal activity is identified by the year of 2012.</p> <p>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.</p> <p>3-1. SOP in each research subject is made and revised.</p> <p>3-2. Research group is established to discuss progress of the research, achievements and safety management once every four months.</p> <p>3-3. Monthly progress report is made by group leaders.</p> <p>3-4. Annual plan documents for research operation are prepared collaboratively.</p>	<p>(1) Experts' project reports (2) Research group meeting records (3) Monthly progress reports</p> <p>(1) Experts' project reports (2) Research group meeting records (3) Monthly progress reports</p> <p>(1) Experts' project reports (2) Research group meeting records (3) Monthly progress reports</p> <p>(1) Experts' project reports (2) SOP (3) Research group meeting records (4) Monthly progress reports (5) Annual plan documents for research operation</p>	<p>1. Government of Ghana provides necessary budgetary support to maintain the relevant institutes.</p>
<p>Activities</p> <p>1 Safety, anti-HIV activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined.</p> <p>1-1. Establish crude extraction methods for candidate compounds, such as procyanidines and phorbol esters, from Ghanaian candidate plants.</p> <p>1-2. Establish safety of crude extract and isolated compounds with anti-HIV activity.</p> <p>1-3. Establish bio-assay systems of crude plant extracts for anti-HIV activity.</p> <p>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.</p> <p>1-5. Separate and purify novel compounds with anti-HIV activity from crude extracts.</p> <p>1-6. Analyze the active compounds with their structure-activity relationship and determine virological mechanism of action.</p>	<p>Inputs</p> <p>Japan</p> <p>Experts</p> <p>(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)</p>	<p>Ghana</p> <p>Counterparts</p> <p>(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 pharmacological/toxicological research - Specialists for phytochemical research - Specialists for plant development research</p>	<p>1. Trained counterparts do not leave their position so as to affect the outputs of the Project.</p>

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<p>1-7. Develop methods for propagation of selected plants with high concentration of the active compounds.</p>	<p><u>Training in Japan</u> (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-plant extracts</p>	<p><u>Facilities, equipment and materials</u> (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) Existing equipments for research activities, etc.</p>	
<p>2 Safety, anti-trypanosomal activity and structure-activity relationship of identified novel compounds from Ghanaian medicinal plants are determined.</p> <p>2-1. Establish crude extraction methods for candidate compounds, such as gallic acid and curcumin, from Ghanaian candidate plants.</p> <p>2-2. Establish safety of crude extract and isolated compounds with anti-trypanosomal activity.</p> <p>2-3. Establish bio-assay systems of crude plant extracts for anti-trypanosomal activity.</p> <p>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.</p> <p>2-5. Separate and purify novel compounds with anti-trypanosomal activity from crude extracts.</p> <p>2-6. Analyze the active compounds with their structure-activity relationship and determine effects on cellular phenotypes.</p> <p>2-7. Develop methods for propagation of selected plants with high concentration of the active compounds.</p>	<p><u>Equipment and Materials</u> Necessary equipment for research activities in the project</p> <p><u>Local Costs</u> Running costs for research activities (e.g. costs for water, electricity and landline phone).</p>		
<p>3 Implementation systems for research regarding Ghanaian medicinal plant-derived anti-viral and anti-parasitic compounds is established.</p> <p>3-1. Set up laboratory environment for the research activities.</p> <p>3-2. Prepare and revise Standard Operating Procedure (SOP) in each research subject.</p> <p>3-3. Convene research group meetings to discuss progress of the research, achievements and safety management once every four months.</p> <p>3-4. All group leaders submit monthly progress reports to Project Director and Chief Advisor via Project Coordinator.</p> <p>3-5. Prepare annual plan documents for research operation.</p>	<p><u>Local Costs</u> Necessary equipment for research activities in the project</p>		
			<p><u>Pre-Conditions</u></p> <p>1. The approval is obtained from Scientific and Technical Committee of NMIMR and Research Committee of 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.</p>

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

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

Date: Aug 20, 2009

Output I:

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

Activities	Plan of Operation																								Person in Charge		Remarks
	2010				2011				2012				2013				2014				Japan	Ghana					
	Jan - Mar (J.F.Y.)	Apr - Jun (J.F.Y.)	Jul - Sep (J.F.Y.)	Oct - Dec (J.F.Y.)	Jan - Mar (J.F.Y.)	Apr - Jun (J.F.Y.)	Jul - Sep (J.F.Y.)	Oct - Dec (J.F.Y.)	Jan - Mar (J.F.Y.)	Apr - Jun (J.F.Y.)	Jul - Sep (J.F.Y.)	Oct - Dec (J.F.Y.)	Jan - Mar (J.F.Y.)	Apr - Jun (J.F.Y.)	Jul - Sep (J.F.Y.)	Oct - Dec (J.F.Y.)	Jan - Mar (J.F.Y.)	Apr - Jun (J.F.Y.)	Jul - Sep (J.F.Y.)	Oct - Dec (J.F.Y.)							
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 proviral 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.																											

Abbreviations:

TMDU: Tokyo Medical and Dental University, TMDU-V: Department of Virology, TMDU-EF: Department of Environmental Parasitology, TMDU-I: Department of Immunotherapeutics, NIU: Nagasaki International University, NMIMR: Noguchi 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 Plant Medicine, J.F.Y.: Japanese Fiscal Year (starting from April 1 to March 31).

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

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

Date: Aug 20, 2009

Output 2:

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

Activities	Plan of Operation												Person in Charge		Remark			
	2010			2011			2012			2013			2014			Japan	Ghana	
	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun				Jul-Sep
	2010 (J.F.Y.)			2011 (J.F.Y.)			2012 (J.F.Y.)			2013 (J.F.Y.)			2014 (J.F.Y.)					
4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q			
2-1. Establish crude extraction methods for candidate compounds, such as gallic acid and curcumin, from Ghanaian candidate plants.																	NIU	CSRPM
2-2. Establish safety of crude extract and isolated compounds with anti-trypansomal activity.																	NIU	NMIMR-CF
2-3. Establish bio-assay systems of crude plant extracts for anti-trypansomal activity.																	TMDU-EP	NMIMR-P
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.																	TMDU-EP	NMIMR-P
2-5. Separate and purify novel compounds with anti-trypansomal activity from crude extracts.																	NIU	CSRPM
2-6. Analyze the active compounds with their structure-activity relationship and determine effects on cellular phenotypes.																	TMDU-EP	NMIMR-P
2-7. Develop methods for propagation of selected plants with high concentration of the active compounds.																	NIU	CSRPM

Abbreviations:

TMDU: Tokyo Medical and Dental University, TMDU-V: Department of Virology, TMDU-EP: Department of Environmental Parasitology, TMDU-I: Department of Immunotherapeutics, NIU: Nagasaki International University, NMIMR-Noguchi Memorial Institute for Medical Research, NMIMR-CF: 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: Control of Infectious Diseases of Viral and Parasitic Aetiology in Ghana

Date: Aug 20, 2009

Output 3:

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

Activities	Plan of Operation												Person in Charge		Remarks			
	2010			2011			2012			2013			2014			Japan	Ghana	
	Jan - Mar	Apr - Jun	Jul - Sep	Jan - Mar	Apr - Jun	Jul - Sep	Jan - Mar	Apr - Jun	Jul - Sep	Jan - Mar	Apr - Jun	Jul - Sep	Jan - Mar	Apr - Jun				Jul - Sep
	2009	2010	2010	2010	2011	2011	2011	2012	2012	2012	2013	2013	2013	2014		2014	2014	
3-1. Set up laboratory environment for the research activities.	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	TMDU-V TMDU-EP TMDU-I NIU	NMIMR-CP NMIMR-V NMIMR-P CSRPM
3-2. Prepare and revise Standard Operating Procedure (SOP) in each research subject.																	TMDU-V TMDU-EP TMDU-I NIU	NMIMR-CP NMIMR-V NMIMR-P CSRPM
3-3. Convene research group meetings to discuss progress of the research, achievements and safety management once every four months.	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	TMDU-V TMDU-EP TMDU-I NIU	NMIMR-CP NMIMR-V NMIMR-P CSRPM
3-4. All group leaders submit monthly progress reports to Project Director and Chief Advisor via Project Coordinator.	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	TMDU-V TMDU-EP TMDU-I NIU	NMIMR-CP NMIMR-V NMIMR-P CSRPM
3-5. Prepare annual plan documents for research operation.	*				*				*				*				TMDU-V TMDU-EP TMDU-I NIU	NMIMR-CP NMIMR-V NMIMR-P CSRPM

Abbreviations:

TMDU: Tokyo Medical and Dental University, TMDU-V: Department of Virology, TMDU-EP: Department of Environmental Parasitology, TMDU-I: Department of Immunotherapeutics, NIU: Nagasaki International University, NMIMR: Noguchi 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 Parasitic Medicine, J.F.Y.: Japanese Fiscal Year (starting from April 1 to March 31.)

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ANNEX V Draft Record of Discussions (R/D)
(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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ANNEX V Draft Record of Discussions (R/D)

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. MEASURES 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 GHANAIAAN 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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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 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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