

WRAIR CRADA COVER SHEET

Project Title: Collaborative Genetic Characterization of NCDCPH Strain Collections of Bacillus anthracis, Brucella species, Francisella tularensis and Yersinia pestis.

Effective Date: 1/30/2013

W81XWH: 13-0141

Expiration Date: 1/30/2015

DAMD Control No:

Funded: Unfunded

DA TTPO Control No:

Primary NTIS Subject Code

Secondary NTIS Subject Code:

RAD:

Director, Walter Reed Army Institute of Research
ATTN: MRMCMC-UWZ-I (Office of Research and Technology Applications)
503 Robert Grant Avenue
Silver Spring, MD 20910-7500
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Lab Technical POC: Dr. Mikeljon Nikolich

Rank:

WRAIR PI Division: Bacterial & Rickettsial Diseases

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WRAIR Legal Counsel: Commander, U.S. Army Medical Research and Materiel Command
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2nd Partner Administrator

3rd Partner Administrator	

Project Summary

The Central Public Health Reference Laboratory in Tbilisi, Georgia (CPHRL) is a newly built BSL-2 and BSL-3 laboratory constructed by the Defense Threat Reduction Agency (DTRA) for the Government of Georgia that will soon have a permanent presence of both WRAIR and the National Center for Disease Control and Public Health (NCDCPH) in Georgia. This study will directly contribute to the establishment of laboratory capabilities at the CPHRL for pathogens of WRAIR interest. This pathogen characterization project also contributes to the better understanding of infections that could affect military personnel if deployed in this region. This project also provides an excellent complement to the objectives of DTRA Cooperative Threat Reduction efforts in Georgia (formerly Biological Threat Reduction Program, now Cooperative Biological Engagement Program/CBEP).

The NCDCPH in Georgia has a collection of unique regional *Yersinia pestis*, *Francisella tularensis*, *Brucella* species and *Bacillus anthracis* strains that require further genetic characterization including genotyping and genomic sequencing. In the future these strains will be consolidated in the CPHRL as part of current DTRA CBEP efforts. WRAIR is funded by DTRA in project CBCALL12-DIAGB1-2-0194, "Diagnostic and Genetic Characterization of Global BSAT Strain Collections." (PI: Dr. Mikeljon Nikolich) to genetically characterize strains in pathogen collections of countries of the Former Soviet Union (FSU) including those in Georgia, and DTRA has agreed that this joint WRAIR-NCDCPH work should proceed under this project. NCDCPH and WRAIR have already worked collaboratively in the characterization of pathogen strains under DTRA project CBM.DIAGB.03.10.WR.002, "Coordinated Assessment of FSU BSAT Strain Collections and Targeted Genomic Sequencing" (PI: Nikolich, FY10-11) and wish to formalize and extend this particular collaborative effort to allow expanded collaboration as defined in the scope below. This collaboration will benefit the mission of WRAIR in the ongoing collection of information on these pathogens and will also be a part of and provide new seeds for future collaborative efforts between WRAIR and NCDCPH in the establishment of the long-term WRAIR military research presence in the CPHRL. These collaborative efforts also encourage cooperation and collaboration between WRAIR and Georgian medical research institutes on multiple fronts and provide examples of the successful US diplomatic engagement in Georgia.

From this collaborative project we expect that future projects targeting specific pathogens will be developed, and that these projects will provide opportunities to develop and test new DoD diagnostic products in real-world clinical infections endemic in Georgia, as well as for other applied and fundamental medical research. Copy of the SOW of this collaboration (FGE CRADA) will be in the supporting documents.

A COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENT

Between

**National Center for Disease Control and Public Health of the Republic of Georgia
(NCDCPH)**

9 M. Asatiani Str.
Tbilisi 0186, Georgia
(Cooperator)

And

Walter Reed Army Institute of Research (WRAIR)

503 Robert Grant Avenue
Silver Spring, MD USA 20190-7500
(Laboratory)

And

Article 1. Background

1.00 This Agreement is entered into under the authority of the Federal Technology Transfer Act of 1986, 15 U.S.C. 3710a, et seq., between the Cooperator and the Laboratory, the parties to this Agreement.

1.01 Laboratory, on behalf of the U.S. Government, and Cooperator desire to cooperate in research and development on "Collaborative Genetic Characterization of NCDCPH Strain Collections of *Bacillus anthracis*, *Brucella* species, *Francisella tularensis* and *Yersinia pestis*", according to the attached Scope of Work (SOW) described in Appendix A. NOW, THEREFORE, the Parties agree as follows:

Article 2. Definitions

2.00 The following terms are defined for this Agreement as follows:

2.01 "Agreement" means this cooperative research and development agreement.

2.02 "Invention" and "Made" have the meanings set forth in Title 15 U.S.C. Section 3703(7) and (8).

2.03 "Proprietary Information" means information marked with a proprietary legend which embodies trade secrets developed at private expense or which is confidential business or

financial information, and that may allow a person having such information to derive an economic benefit from it or to obtain a competitive advantage over those who do not have it, provided that such information:

(i) is not generally known or publicly available from other sources during the period of this Agreement;

(ii) has not been previously made available by the owners to others without imposing in a timely manner an obligation to keep it confidentiality; and

(iii) is not already available to the receiving party without obligation concerning its confidentiality.

2.04 "Subject Data" means all recorded information first produced in the performance of this Agreement.

2.05 "Subject Invention" means any Invention Made as a consequence of, or in relation to, the performance of work under this Agreement.

Article 3. Research Scope and Administration

3.00 Statement of Work. Research performed under this Agreement shall be performed in accordance with the SOW incorporated as a part of this Agreement at Appendix A. It is agreed that any descriptions, statements, or specifications in the SOW shall be interpreted as goals and objectives of the services to be provided under this Agreement and not requirements or warranties. Laboratory and Cooperator will endeavor to achieve the goals and objectives of such services; however, each party acknowledges that such goals and objectives, or any anticipated schedule of performance, may not be achieved.

3.01 Review of Work. Periodic conferences shall be held between the parties for the purpose of reviewing the progress of work. It is understood that the nature of this research is such that completion within the period of performance specified, or within the limits of financial support allocated, cannot be guaranteed. Accordingly, all research will be performed in good faith.

3.02 Principal Investigator. Any work required by the Laboratory under the SOW will be performed under the supervision of Dr. Mikeljon Nikolich, Chief, Department of Emerging Bacterial Infections, Walter Reed Army Institute of Research, 503 Robert Grant Avenue, Silver Spring, MD USA 20190-7500; *Email*: mikeljon.nikolich@amedd.army.mil; *Phone*: 301-319-9469; who, as co-principal investigator has responsibility for the scientific and technical conduct of this project on behalf of the Laboratory. Any work required by the Cooperator under the SOW will be performed under the supervision of Gvantsa Chanturia, Main Specialist, National Center for Disease Control and Public Health (NCDCPH) of Georgia, 9 M. Asatiani Str., Tbilisi 0186, Country of Georgia, *Email*: gvantsa.chanturia@ncdc.ge; *Phone*: (+995) 322 31 14 06.

ext. 154; who, as co-principal investigator has responsibility for the scientific and technical conduct of this project on behalf of the Cooperator.

3.03 Collaboration Changes. If at any time the co-principal investigators determine that the research data dictates a substantial change in the direction of the work, the parties shall make a good faith effort to agree on any necessary change to the SOW and make the change by written notice to the address listed in section 13.05 Notices.

3.04 Final Report. The Parties shall prepare a final report of the results of this project within six months after completing the SOW.

Article 4. Ownership and Use of Physical Property

4.1 Ownership of Materials or Equipment. All materials or equipment developed or acquired under this Agreement by the parties shall be the property of the party which developed or acquired the property, except that U.S. Government equipment provided by Laboratory (1) which through mixed funding or mixed development must be integrated into a larger system, or (2) which through normal use at the termination of the Agreement has a salvage value that is less than the return shipping costs, shall become the property of Cooperator.

4.2 Use of Provided Materials. Both Parties agree that any materials relating to them which were provided by one party to the other party will be used for research purposes only. The materials shall not be sold, offered for sale, used for commercial purposes, or be furnished to any other party without advance written approval from the Provider's official signing this Agreement or from another official to whom the authority has been delegated, and any use or furnishing of material shall be subject to the restrictions and obligations imposed by this Agreement.

4.3 Procedure of reagent providing

Reagents considered on Article 4.1 will be provided on the following address 9 M. Asatiani, Tbilisi;

4.4 Reagents should be provided with documentation of their cost.

4.5 When providing reagents any required recording documents will be signed by responsible representatives from both parties.

Article 5. Financial Obligation

5.00 Funding. The Parties shall each be individually responsible for funding its own respective researchers throughout this Agreement, including laboratory facilities, salaries, overhead and indirect costs, etc. Each party may determine at its own discretion, the amount of resources, personnel, materials or funds it will devote to the work under this Agreement.

5.01 Expenses. The Parties shall each be individually responsible for expenses incurred by their respective researchers. Neither party shall be liable or obligated to any third party contractual agreement undertaken by the other party.

Article 6. Patent Rights

6.00 Reporting. The Parties shall promptly report to each other all Subject Inventions reported to either party by its employees. All Subject Inventions Made during the performance of this Agreement shall be listed in the Final Report required by this Agreement.

6.01 Cooperator Employee Inventions. Laboratory waives any ownership rights the U.S. Government may have in Subject Inventions Made by Cooperator employees and agrees that Cooperator shall have the option to retain title in Subject Inventions Made by Cooperator employees. Cooperator shall notify Laboratory promptly upon making this election and agrees to timely file patent applications on Cooperator's Subject Invention at its own expense. Cooperator agrees to grant to the U.S. Government on Cooperator's Subject Inventions a nonexclusive, nontransferable, irrevocable, paid-up license in the patents covering a Subject Invention, to practice or have practiced, throughout the world by, or on behalf of the U.S. Government. The nonexclusive license shall be evidenced by a confirmatory license agreement prepared by Cooperator in a form satisfactory to Laboratory.

6.02 Laboratory Employee Inventions. Laboratory shall have the initial option to retain title to, and file patent application on, each Subject Invention Made by its employees. The Laboratory agrees to grant an exclusive license to any invention arising under this Agreement to which it has ownership to the Cooperator in accordance with Title 15 U.S. Code Section 3710a, on terms negotiated in good faith. Any invention arising under this Agreement is subject to the retention by the U.S. Government of nonexclusive, nontransferable, irrevocable, paid-up license to practice, or have practiced, the invention throughout the world by or on behalf of the U.S. Government.

6.03 Joint Inventions. Any Subject Invention patentable under U.S. patent law which is Made jointly by Laboratory employees and Cooperator employees under the Scope of Work of this Agreement shall be jointly owned by the Parties. The parties shall discuss together a filing strategy and filing expenses related to the filing of the patent covering the Subject Invention. If a party decides not to retain its ownership rights to a jointly owned Subject Invention, it shall offer to assign such rights to the other Party, pursuant to Paragraph 6.05, below.

6.04 Government Contractor Inventions. In accordance with 37 Code of Federal Regulations 401.14, if one of Laboratory's Contractors conceives an invention while performing services at Laboratory to fulfill Laboratory's obligations under this Agreement, Laboratory may require the Contractor, pursuant to the terms of its contract, to negotiate a separate agreement with Cooperator regarding allocation of rights to any Subject Invention that Contractor makes, solely or jointly, under this Agreement. The separate agreement (i.e., between the Cooperator and the Contractor) shall be negotiated prior to the Contractor undertaking work under this Agreement or, with the Laboratory's permission, upon the identification of a Subject Invention. In the absence of such a separate agreement, the Contractor agrees to grant the Cooperator an option for a license in Contractor's inventions of the same scope and terms set forth in this Agreement for inventions made by Laboratory's employees.

6.05 Filing of Patent Applications. The Party having the right to retain title to, and file patent applications on, a specific Subject Invention may elect not to file patent applications, provided it so advises the other Party within 90 days from the date it reports the Subject Invention to the other Party. Thereafter, the other Party may elect to file patent applications on the Subject Invention and the party initially reporting the Subject Invention agrees to assign its ownership

interest in the Subject Invention to the other Party.

6.06 Patent Expenses. The expenses attendant to the filing of patent applications shall be borne by the Party filing the patent application. Each party shall provide the other party with copies of the patent applications it files on any Subject Invention along with the power to inspect and make copies of all documents retained in the official patent application files by the applicable patent office. The Parties agree to reasonably cooperate with each other in the preparation and filing of patent applications resulting from this Agreement.

Article 7. Exclusive License

7.00 Grant. The Laboratory agrees to grant to the Cooperator an exclusive license in each U.S. patent application, and patents issued thereon, covering a Subject Invention, which is filed by the Laboratory subject to the reservation of a nonexclusive, nontransferable, irrevocable, paid-up license to practice and have practiced the Subject Invention on behalf of the United States.

7.01 Exclusive License Terms. The Cooperator shall elect or decline to exercise its right to acquire an exclusive license to any Subject Invention within six months of being informed by the Laboratory of the Subject Invention. The specific royalty rate and other terms of license shall be negotiated promptly in good faith and in conformance with the laws of the United States.

Article 8. Background Patent(s)

8.00 Laboratory Background Patent(s): Laboratory has filed patent application(s), or are the assignee of issued patent(s), listed below which contain(s) claims that are related to research contemplated under this Agreement. No license(s) to this/these patent applications or issue patents is/are granted under this Agreement, and this/these application(s) and any continuations to it/them are specifically excluded from the definitions of "Subject Invention" contained in this Agreement: NONE

8.01 Cooperator Background Patent(s): Cooperator has filed patent application(s), or is the assignee of issued patent(s), listed below which contain(s) claims that are related to research contemplated under this Agreement. No license(s) to this/these patent applications or issue patents is/are granted under this Agreement, and this/these application(s) and any continuations to it/them are specifically excluded from the definitions of "Subject Invention" contained in this Agreement: NONE

Article 9. Subject Data and Proprietary Information

9.00 Subject Data Ownership. Subject Data shall be jointly owned by the Parties. Either Party, upon request of the other Party, shall have the right to review and to request delivery of a copy of all Subject Data, and delivery shall be made to the requesting party within two weeks of

the request, except to the extent that such Subject Data are subject to a claim of confidentiality or privilege by a third Party.

9.01 Proprietary Information/Confidential Information. Each Party shall place a proprietary notice on all information it delivers to the other party under this Agreement which it asserts is proprietary. The Parties agree that any Proprietary Information or Confidential Information furnished by one Party to the other Party under this Agreement, or in contemplation of this Agreement, shall be used, reproduced and disclosed by the receiving Party only for the purpose of carrying out this Agreement, and shall not be released by the receiving Party to third Parties unless consent to such release is obtained from the providing Party.

9.02 Army limited-access database. Notwithstanding anything to the contrary in this Article, the existence of established CRADAs specifying areas of research and their total dollar amounts may be documented on limited access, password-protected websites of the U.S. Army Medical Research and Materiel Command (the parent organization of Laboratory), to provide the Command's leadership with a complete picture of military research efforts.

9.03 Laboratory Contractors. Each Party acknowledges and agrees to allow the other party to disclose proprietary information to that party's Contractors for the purposes of carrying out this Agreement. Each Party agrees that they have or will ensure that its Contractors are underwritten obligation not to disclose proprietary information, except as required by law or court order, before Contractor employees have access to proprietary information under this Agreement.

9.04 Release Restrictions. Each Party shall have the right to use all Subject Data for any Governmental purpose, but shall not release Subject Data publicly except: (i) Each Party in reporting on the results of research may publish Subject Data in technical articles and other documents to the extent it determines to be appropriate; and (ii) Each Party may release Subject Data where release is required by law or court order. The Parties agree to confer prior to the publication of Subject Data to assure that no Proprietary Information is released and that patent rights are not jeopardized. Prior to submitting a manuscript for review which contains the results of the research under this Agreement, or prior to publication if no such review is made, each Party shall be offered an ample opportunity to review any proposed manuscript and to file patent applications in a timely manner.

9.05 FDA Documents. If this Agreement involves a product regulated by the U.S. Food and Drug Administration (FDA), then the Cooperator or the U.S. Army Medical Research and Materiel Command, as appropriate, may file any required documentation with the FDA. In addition, the Parties authorize and consent to allow each other or their contractors or agents access to, or to cross-reference, any documents filed with the FDA related to the product.

Article 10. Termination

10.00 Termination by Mutual Consent. Cooperator and Laboratory may elect to terminate this Agreement, or portions thereof, at any time by mutual consent.

10.01 Termination by Unilateral Action. Either Party may unilaterally terminate this entire Agreement at any time by giving the other party written notice, not less than 30 days prior to the desired termination date.

10.02 Termination Procedures. In the event of termination, the Parties shall specify the disposition of all property, patents and other results of work accomplished or in progress, arising from or performed under this Agreement by written notice. Upon receipt of a written termination notice, the Parties shall not make any new commitments and shall, to the extent feasible, cancel all outstanding commitments that relate to this Agreement. Notwithstanding any other provision of this Agreement, any exclusive license entered into by the Parties relating to this Agreement shall be simultaneously terminated unless the Parties agree to retain such exclusive license.

Article 11. Disputes

11.00 Settlement. Any dispute arising under this Agreement which is not disposed of by agreement of the principal investigators shall be submitted jointly to the signatories of this Agreement. A joint decision of the signatories or their designees shall be the disposition of such dispute. If the Parties cannot reach a joint decision, any Party may terminate this Agreement immediately. To be clear, termination of this agreement is the only remedy or recourse available to any Party in the event of an irresolvable dispute. The Parties agree that no court, tribunal, or similar judicial or administrative body of the countries of any Party or of any international entity or country has jurisdiction or authority to consider, or rule on, or provide an enforceable judgment concerning disputes arising between the Parties under this Agreement.

Article 12. Liability

12.00 Property. Neither Party shall be responsible for damages to any property provided to, or acquired by, the other Party pursuant to this Agreement.

12.01 No Warranty. The Parties make no express or implied warranty as to any matter whatsoever, including the conditions of the research or any invention or product, whether tangible or intangible, Made, or developed under this agreement, or the ownership, merchantability, or fitness for a particular purpose of the research or any invention or product. The Parties further make no warranty that the use of any invention or other intellectual property or product contributed, made or developed under this agreement will not infringe any other United States or foreign patent or other intellectual property right. In no event will any Party be liable to any other Party for compensatory, punitive, exemplary or consequential damages.

Article 13. Miscellaneous

13.00 International Law not applicable. The Parties recognize and agree that THIS IS NOT AN INTERNATIONAL AGREEMENT, that international law is not applicable to this

Agreement, and that international law does not govern the interpretation of the provisions of this Agreement.

13.01 Effect on current or future agreements between the Parties. The terms of this Agreement affecting Intellectual Property rights, use of specimens, and ownership of data for activities under this Agreement are not intended to and do not affect any other existing or future agreements between any agency of the United States of America and any agency or regional or national authority of the Cooperator's government.

13.02 Independent Contractors. The relationship of the Parties to this Agreement is that of independent contractors and not as agents of each other or as joint venturers or partners.

13.03 Use of Name or Endorsements. (a) The Parties shall not use the name of the other Party on any product or service which is directly or indirectly related to either this Agreement or any patent license or assignment agreement which implements this Agreement without the prior approval of the other Party. (b) By entering into this Agreement, Laboratory does not directly or indirectly endorse any product or service provided, or to be provided, by Cooperator, its successors, assignees, or licensees. Cooperator shall not in any way imply that this Agreement is an endorsement of any such product or service. Press releases or other public releases of information shall be coordinated between the parties prior to release, except that the Laboratories may release the name of the Cooperator and the title of the research without prior approval from the Cooperator.

13.04 Survival of Specified Provisions. The rights specified in provisions of this Agreement covering Patent Rights, Subject Data and Proprietary Information, Governing Law, and Liability shall survive the termination or expiration of this Agreement.

13.05 Notices. All notices pertaining to or required by this Agreement shall be in writing and shall be signed by an authorized representative addressed as follows:

If to Cooperator:

Director General
National Center for Disease Control and
Public Health of the Republic of Georgia (NCDCPH)
9 M. Asatiani Str., Tbilisi 0186, Georgia

If to Laboratory:

Commander
Walter Reed Army Institute of Research
ATTN: Office of Research and Technology Applications
503 Robert Grant Avenue
Silver Spring, MD, 20910-7500, USA

Any Party may change such address by notice given to the other in the manner set forth above.

Article 14. Duration of Agreement and Effective Date

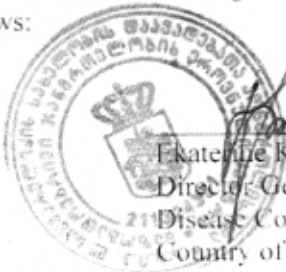
14.01 Effective Date. This Agreement shall enter into force as of the date it is signed by the last authorized representative of the Parties.

14.02 Signature Execution. This Agreement may be executed in one or more counterparts by the Parties by signature of a person having authority to bind the Party, which may be a facsimile signature, each of which when executed and delivered, by facsimile transmission, mail, or email delivery will be an original and all of which will constitute but one and the same Agreement.

14.03 Expiration Date. This Agreement will automatically expire two (2) years from effective date unless it is revised by written notice and mutual agreement.

IN WITNESS WHEREOF, the Parties have caused this agreement to be executed by their duly authorized representatives as follows:

For the **Cooperator**:




Ekaterine Kavtaradze,
Director General, National Center for
Disease Control and Public Health of the
Country of Georgia.

Date 24.01.2013

For the **U.S. Government**:


Ralph L. Erickson
Colonel, Medical Corps Commander,
Walter Reed Army Institute of Research

Date 30 Jan 13

P. Imnadze

T. Chanturidze

G. Qobalia

K. Ochigava

D. Mgebrishvili

G. Chanturia

აღნიშნულის დასტურად, მხარეები აფორმებენ ხელშეკრულებას მათი უფლებამოსილი წარმომადგენლების მიერ ხელმოწერით:

კოოპერატორების სახელით:



გაბრიელ ჯაფარიძე
გენერალური დირექტორი
დაავადებათა კონტროლის და
საყოველთაო ჯანმრთელობის
ეროვნული ცენტრი

თარიღი 24.01.2013

აშშ მთავრობის სახელით:

რალფ ლ. ერიკსონი
მეთაური, სამედიცინო სამხედრო
სარდალი, უოლტერ რიდის
საჯარისო კვლევითი ინსტიტუტი

თარიღი: 30.1.13

ვიზები: პ. იშნაძე

ტ. ჭანტურიძე

გ. ქობალია

კ. ოჩიაგავა

დ. მღებრიშვილი

გ. ჭანტურია

**Cooperative Research and Development Agreement between the Walter Reed Army
Institute of Research (WRAIR) and the National Center for Disease Control and Public
Health (NCDC) of the Republic of Georgia**

**APPENDIX A
SCOPE OF WORK**

Title: "Collaborative Genetic Characterization of NCDCPH Strain Collections of *Bacillus anthracis*, *Brucella* species, *Francisella tularensis* and *Yersinia pestis*"

Background: The National Center for Disease Control and Public Health (NCDCPH) in Georgia has a collection of unique regional *Yersinia pestis*, *Francisella tularensis*, *Brucella* species and *Bacillus anthracis* strains that require further genetic characterization including genotyping and genomic sequencing. WRAIR is funded by the Defense Threat Reduction Agency (DTRA) in project CBCALL12-DIAGB1-2-0194, "Diagnostic and Genetic Characterization of Global BSAT Strain Collections." (PI: Dr. Mikeljon Nikolich) to genetically characterize strains in pathogen collections of countries of the Former Soviet Union (FSU) including those in Georgia, and DTRA has agreed that this joint WRAIR-NCDCPH work should proceed under this project. NCDCPH and WRAIR have already worked collaboratively in the characterization of BSAT strains under DTRA project CBM.DIAGB.03.10.WR.002, "Coordinated Assessment of FSU BSAT Strain Collections and Targeted Genomic Sequencing" (PI: Nikolich/FY10-11) and wish to formalize and extend this particular collaborative effort to allow expanded collaboration as defined in the scope below. This collaboration will benefit the mission of WRAIR in the ongoing collection of information on these pathogens within this DoD project and will also be a part of future collaborative efforts between WRAIR and NCDCPH in the establishment of the long-term WRAIR military research presence in the Central Public Health Reference Laboratory in Tbilisi, Georgia.

SCOPE:

WRAIR (Laboratory) agrees to:

- 1) Provide to NCDCPH the reagents and supplies for genetic typing and other characterization of NCDCPH *Yersinia pestis*, *Francisella tularensis*, *Brucella* species and *Bacillus anthracis* strains as agreed by both partners, including Single Nucleotide Polymorphism (SNP) and Variable Number Tandem Repeat (VNTR) analysis, growth and phenotypic analysis and DNA sequencing.
- 2) Provide to NCDCPH training and travel as needed for diagnostic testing, genetic typing and other characterization of NCDC *Yersinia pestis*, *Francisella tularensis*, *Brucella* species and *Bacillus anthracis* strains as agreed by the partners, including Single Nucleotide Polymorphism (SNP) and Variable Number Tandem Repeat (VNTR) analysis, growth and phenotypic analysis, DNA sequencing and Geographic Information Systems (GIS) analyses.
- 3) Provide to NCDCPH diagnostic assays for testing NCDCPH *Yersinia pestis*, *Francisella*

tularensis, *Brucella* species and *Bacillus anthracis* strains and clinical and environmental samples as agreed by both partners. Collaboratively develop new diagnostic assays within this collaboration and characterize these assays as agreed by both partners.

- 4) Provide to NCDCPH genomic sequences of NCDCPH *Yersinia pestis*, *Francisella tularensis*, *Brucella* species and *Bacillus anthracis* strains. Allow public release of these genomic sequences to the greater scientific community if agreed by both partners.
- 5) Complete characterization and analysis of NCDCPH *Yersinia pestis*, *Francisella tularensis*, *Brucella* species and *Bacillus anthracis* strains and/or genomic DNA thereof as agreed by both partners.
- 6) Contribute results and analyses for reports to DTRA on the project and for joint publications of significant findings of the collaboration.

NCDC (Collaborator) agrees to:

- 1) Provide relevant information to WRAIR on NCDCPH *Yersinia pestis*, *Francisella tularensis*, *Brucella* species and *Bacillus anthracis* strains for the project including collection information (metadata).
- 2) Use the reagents and supplies provided by WRAIR for genetic typing and other characterization of NCDCPH *Yersinia pestis*, *Francisella tularensis*, *Brucella* species and *Bacillus anthracis* strains including growth and phenotypic analysis, SNP and VNTR analysis and DNA sequencing.
- 3) Complete training and travel provided by WRAIR as needed for diagnostic testing, genetic typing and other characterization of NCDCPH *Yersinia pestis*, *Francisella tularensis*, *Brucella* species and *Bacillus anthracis* strains as agreed by the partners, including SNP and VNTR analysis, growth and phenotypic analysis, DNA sequencing and Geographic Information Systems (GIS) analyses. Complete characterization and analyses of NCDCPH *Yersinia pestis*, *Francisella tularensis*, *Brucella* species and *Bacillus anthracis* strains and/or genomic DNA thereof as agreed by both partners.
- 4) Use diagnostic assays provided by WRAIR for testing NCDCPH *Yersinia pestis*, *Francisella tularensis*, *Brucella* species and *Bacillus anthracis* strains and application to NCDCPH clinical and environmental samples as agreed by the partners. Collaboratively develop new diagnostic assays within this collaboration and characterize these assays as agreed by both partners.
- 5) Allow public release of NCDCPH *Yersinia pestis*, *Francisella tularensis*, *Brucella* species and *Bacillus anthracis* strain genomic sequences to the greater scientific community if agreed to by both partners.
- 6) Allow for transfer of copies of selected NCDCPH pathogen strains to an internationally recognized repository if required for whole genome sequencing projects.