Award Number: W81XWH-18-1-0334

TITLE: A First-in-Human, Phase I Clinical Trial of Mitochondrial-Targeted Hsp90 Inhibitor, Gamitrinib, in Advanced and Metastatic Prostate Cancer

PRINCIPAL INVESTIGATOR: Dario C. Altieri, Ph.D.

CONTRACTING ORGANIZATION: The Wistar Institute of Anatomy & Biology

REPORT DATE: SEPTEMBER 2020

TYPE OF REPORT: Annual

PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
Sep 2020	Annual	01 Sep 2019 – 31 Aug 2020

4. TITLE AND SUBTITLE
A First-in-Human, Phase I Clinical Trial of Mitochondrial-Targeted Hsp90 Inhibitor, Gamitrinib, in Advanced and Metastatic Prostate Cancer

5a. CONTRACT NUMBER
W81XWH-18-1-0334

5b. GRANT NUMBER
PC170275

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
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5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
The Wistar Institute
3601 Spruce Street Philadelphia, PA 19104-4265

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
U.S. Army Medical Research and Materiel Command
Fort Detrick, MD 21702-5012

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for Public Release; Distribution Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

Research supported by the present application is designed to conduct a first-in-human, phase I clinical trial of the novel, mitochondrial-targeted small molecule Hsp90 inhibitor, Gamitrinib in patients with advanced cancer, including advanced, castration-resistant and metastatic prostate cancer. The clinical trial will be conducted at the Phase I Developmental Therapeutics Program of Fox Chase Cancer Center under the leadership of Anthony Olszanski, M.D., Director of the Program. These studies will be complemented by analysis of pharmacodynamics and biochemical characterization of target engagement of Gamitrinib therapy in an expansion cohort at maximal tolerated dose (MTD) in patients with advanced prostate cancer. Accomplishments obtained during the last reporting period have significantly advanced the fulfillment of the stated specific aims. Accordingly, a new formulation development of Gamitrinib has been successfully completed to include an innovative step of microfluidization designed to reduce particle size of the nanosuspension, and thus enable terminal sterilization for use in humans. Validated methods and three-month stability testing have also been established to support the large-scale manufacturing of GMP-grade Gamitrinib for clinical use, and protocols for drug substance identification and validation have been finalized. An Institutional Review Board (IRB) approval of the Gamitrinib clinical trial has been secured as well as Department of Defense (DoD) HRPO concurrence on human subject designation. Altogether, the program is on-track for submission of full Investigational New Drug (IND) application to the US Food and Drug Administration by December 2019 with patient enrollment scheduled to begin by March 2020. Although this is a single-site clinical trial, we expect a rapid accrual rate consistent with the timeline approved in the original Statement of Work. These studies will bring to the clinic a uniquely innovative therapeutic approach in the management of patients with advanced cancers, including prostate cancer.

15. SUBJECT TERMS
Mitochondria, cancer therapy, molecular chaperones, Heat Shock Protein-90, advanced and metastatic prostate cancer, tumor metabolism, first-in-human trial, pharmacodynamics

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			USAMRMC
Unclassified	Unclassified	Unclassified	Unclassified	16	19b. TELEPHONE NUMBER *(include area code)*

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

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1. **INTRODUCTION:** *Narrative that briefly (one paragraph) describes the subject, purpose and scope of the research.*

Research supported by the present application is designed to conduct a first-in-human, phase I clinical trial of the novel, mitochondrial-targeted small molecule Hsp90 inhibitor, Gamitrinib in patients with advanced cancer, including advanced, castration-resistant and metastatic prostate cancer. The clinical trial will be conducted at the Phase I Developmental Therapeutics Program of Fox Chase Cancer Center under the leadership of Anthony Olszanski, M.D., Director of the Program. These studies will be complemented by analysis of pharmacodynamics and biochemical characterization of target engagement of Gamitrinib therapy in an expansion cohort at maximal tolerated dose (MTD) in patients with advanced prostate cancer.

2. **KEYWORDS:** *Provide a brief list of keywords (limit to 20 words).*

Mitochondria, cancer therapy, molecular chaperones, Heat Shock Protein-90, advanced and metastatic prostate cancer, tumor metabolism, first-in-human trial, pharmacodynamics

3. **ACCOMPLISHMENTS:** *The PI is reminded that the recipient organization is required to obtain prior written approval from the awarding agency grants official whenever there are significant changes in the project or its direction.*

What were the major goals of the project?
List the major goals of the project as stated in the approved SOW. If the application listed milestones/target dates for important activities or phases of the project, identify these dates and show actual completion dates or the percentage of completion.

Specific aim 1. A first-in-human, phase I clinical trial of Gamitrinib in patients with advanced and metastatic prostate cancer. This will be an open-label, phase I clinical trial of weekly IV administration of Gamitrinib to (i) identify the maximum tolerated dose (MTD); (ii) determine the dose-limiting toxicities (DLT); and (iii) characterize the pharmacokinetics profile. The clinical protocol uses an accelerated dose titration scheme, a 3+3 dose escalation phase and a twelve-patient expansion cohort at MTD. The trial will be conducted at the Phase I Developmental Therapeutics Program at Fox Chase Cancer Center under the leadership of Anthony J. Olszanski, M.D., Director of the Program.

Specific aim 2. Characterize the pharmacodynamics profile of Gamitrinib. For exploratory pharmacodynamics studies, paired pre- and post-treatment prostate cancer biopsies and peripheral blood mononuclear cells harvested from the patient expansion cohort at MTD will be examined for a signature of "cellular starvation" as surrogate biomarker of Gamitrinib target inhibition, in vivo. This will involve global metabolomics profiling of 301 biochemicals intercalated in multiple mitochondrial bioenergetics pathways, evaluation of differential AMPK phosphorylation, induction of autophagy, modulation of a mitochondrial-Endoplasmic Reticulum (ER) unfolded protein response and suppression of mTOR signaling, by immunohistochemistry and quantitative Western blotting.

Specific Aim 1: A first-in-human, phase I clinical trial of Gamitrinib in patients with advanced and metastatic prostate cancer	**Timeline**	**Site 1**	**Site 2**
Major Task 1	Months		
Submission to Sponsor's IRB of documentation of research proposal, consent form, and clinical trial advertising material	1	Dr. Altieri	N/A
Submission of Gamitrinib Human Subject Research Protocol to USAMRMC ORP	1	Dr. Altieri	N/A
Sponsor's IRB approval of Gamitrinib clinical protocol	1	Sponsor's IRB	N/A
Manufacturing of GMP-grade Gamitrinib including microfluidization of API emulsion for I.V. injection	2	Dr. Altieri (contract with Axia Pharmaceuticals)	N/A
USAMRMC ORP HRPO Approval	2	Sponsor's IRB	N/A
Full Investigational New Drug (IND) submission to US Food and Drug Administration	2	Dr. Altieri	N/A
FDA approval of IND submission	3	Sponsor's IRB	N/A
Completed chemical synthesis, quality control CMC validation and shipment of 250 g of GMP-grade Gamitrinib	3	Dr. Altieri (contract with Arcinova, Inc.)	N/A
Milestone(s) Achieved: Enrollment of the first subject in Gamitrinib phase I clinical trial at Developmental Therapeutics Program, Fox Chase Cancer Center	4	N/A	Dr. Olszanski
Major Task 2			
Enrollment of 25% of projected recruitment (6 patients)	4 – 6	N/A	Dr. Olszanski
Enrollment of 50% of projected recruitment (12 patients)	7 – 9	N/A	Dr. Olszanski
Enrollment of 75% of projected recruitment (19 patients	10 – 12	N/A	Dr. Olszanski
Enrollment of 100% of projected recruitment (25 patients)	13 – 15	N/A	Dr. Olszanski

Completion of dose escalation, PK profile and exploratory pharmacodynamics in a 12-patient expansion cohort at MTD	16 – 18	N/A	Dr. Olszanski
Milestone Achieved: Completed patient accrual of Gamitrinib clinical trial	19	N/A	Dr. Olszanski
Specific Aim 2: Characterize the pharmacodynamics profile of Gamitrinib			
Major Task 3			
High-throughput metabolomics profiling of pre- and post-treatment biopsies harvested from the 12-patient expansion cohort	19 – 21	Dr. Altieri	N/A
Immunohistochemical staining of a cellular starvation signature in pre- and post-treatment biopsies from the 12-patient expansion cohort	22	Dr. Altieri	N/A
Western blot characterization of a cellular starvation signature in pre- and post-treatment peripheral blood mononuclear cells from the 12-patient expansion cohort	22	Dr. Altieri	N/A
Completion of primary and secondary endpoint data analysis	22 – 24	Dr. Altieri	Dr. Olszanski
Completion of final report of the primary outcome	22 – 24	Dr. Altieri	Dr. Olszanski
Milestone Achieved: Completion of Gamitrinib pharmacodynamics studies and primary and secondary endpoints of data analysis	24	Dr. Altieri	Dr. Olszanski

What was accomplished under these goals?

For this reporting period describe: 1) major activities; 2) specific objectives; 3) significant results or key outcomes, including major findings, developments, or conclusions (both positive and negative); and/or 4) other achievements. Include a discussion of stated goals not met. Description shall include pertinent data and graphs in sufficient detail to explain any significant results achieved.

Major Activities –

As indicated in the semi-annual progress report for this application, significant advances have been made in accomplishing the tasks set forth in the original SOW. These included specific objectives of drug product (successful completion of a sterile microfluidization step for the preparation of a Gamitrinib emulsion suitable for IV injection in humans), preparation of a complete CMC dossier for IND submission, method validation and method transfer for GMP-grade drug substance and attainment of IRB and HRPO approvals for clinical trial opening and anticipated patient enrollment. These advances had put the project on track for completion according to the above-referenced timeline. However, at the beginning of 2020, progress was delayed due to the failure of Arcinova to fulfill its contractual obligation and prepare 250 g of GMP-grade API for clinical use in humans.

As a result, the applicant had to secure a new commercial vendor, Albany Molecular Research International (AMRI) to accomplish the synthesis and release of GMP grade Gamitrinib. For the 8-month delay due to Arcinova's failure to execute, the applicant obtained a one-year no-cost extension of the present application to ensure successful completion of the tasks specified in the original SOW. As part of the activities of the last budget cycle, the specified tasks have now been successfully completed and high-purity, CoA-supported GMP-grade API (Gamitrinib) has been received by the compounding pharmacy (Axia Pharmaceutical) for the preparation of GMP drug product, IND submission and delivery of sterile GMP emulsion of Gamitrinib to the clinical site

Specific Objectives –

1. Completion of AMRI-Wistar quality agreement for the synthesis of 250 g of GMP-grade API (Gamitrinib)
2. Approval of AMRI Test Methods
3. Acquisition of CoA-supported bulk raw materials for Gamitrinib synthesis (Geldanamycin, triphenylphosphonium, bromide linker)
4. Issue of demonstration batch CoA for Gamitrinib synthesis
5. Completion of Gamitrinib method validation and reference standard
6. Completion of 3-recrystallization protocol for synthesis of GMP-grade Gamitrinib
7. Completion of microbial suitability report and elemental impurity of GMP API
8. Issue of CoA for GMP-grade API and shipment of drug substance to compounding pharmacy

Significant Results or Key Outcomes –

All of the specific objectives listed above were successfully completed during the last budget cycle of the application. A reference standard for GMP-grade Gamitrinib was released with the attached CoA.

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amri
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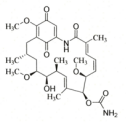
CERTIFICATE OF ANALYSIS

Name:	WIS-14181-1 Reference Standard
Type of Standard:	Identification
Batch (Lot) Number:	PB0001/26/02/20
Molecular Formula:	$C_{29}H_{40}N_2O_9$
Molecular Weight:	560.64
Retest Date:	May 2023
Analytical Reference Number (s):	20202129



TEST	RESULT/REFERENCE
Physical Characterization	
Physical Description	Bright yellow solid (TM.795)
Identification: A. 500 MHz ^{1}H NMR Spectrum (DMSO-d_6)	Conforms to skeletal structure (TM.52)
Certificate of Analysis review[1]	Reviewed

Storage/Special Handling: Store in a well-closed container between -10 °C and -20 °C, with desiccant.

[1]Certificate of Analysis provided by CFM Oskar Tropitzsch.

Issued By: Tracey Jennings (Print Name) Tracy Jennings / QST (Signature/Title) 6-3-2020 (Date)

Approved By: Victor Fsael (Print Name) [signature] QRS (Signature/Title) 6-3-2020 (Date)

For Research Purposes Only. Not Intended for Food or Drug Use.

21 Corporate Circle | Albany, NY 12203 USA
www.amriglobal.com

The synthesized GMP-grade Gamitrinib successfully passed endotoxin level testing as below:

CERTIFICATE OF ANALYSIS

Client: PAIGE KENESTON-GUMAER
AMRI
21 CORPORATE CIRCLE
ALBANY NY 12203

Assignment No.: 09A2011115
PO No.: PROJECT: 14181 TASK: 2A
Page: 1 of 3

Product: Misc. Product
Received Date: 31-Jul-2020
Qty Rec'd Per Sample No.: 1
Test/Method: BET Gel Clot- Powders, USP <85>

SGS Sample No.	Identification	Rep.	Endotoxin Limit	LAL Reagent Sensitivity	Minimum Valid Concentration	Test Concentration	Result	Positive Product Control	Test Result	Status
09S20029014-01*	Gamitrinib Lot: 14181-A-R0-01-109-01	1 - 1	4 EU/mg	0.03 EU/mL	0.078125 mg/mL	0.015625 mg/mL	Negative	Positive	<2 EU/mg	Pass
		1 - 2					Negative	Positive		

SGS Life Science Services | 616 Heathrow Drive, Lincolnshire, IL 60069 t (847) 821-8900 f (847) 821-8928 www.sgs.com/pharmaqc
Member of the SGS Group

COA ctab LS v7.3.5

The synthesized GMP-grade Gamitrinib successfully passed microbial suitability testing as below

CERTIFICATE OF ANALYSIS

Client: PAIGE KENESTON-GUMAER
AMRI
21 CORPORATE CIRCLE
ALBANY NY 12203

Assignment No.: 09A2011111
PO No.: PROJECT: 14181 TASK: 2A
Page: 1 of 1

Product: Misc. Product
Received Date: 31-Jul-2020
Qty Rec'd Per Sample No.: 1
Test/Method: Analysis

SGS Sample No.	Identification	Method	Test Performed	Specifications	Result	Status
09S20029006*	Gamitrinib Lot: 20AK0129N (trial 1) 14181-A-R0-01-109-01 (trial 2) Additional sample received 19Aug2020	USP <61>	Suitability Testing for Microbiological Examination of Non-Sterile Products	Recovery of the Microorganisms in the Presence of Product	Acceptable Recovery – see Evaluation	Pass

Evaluation / Comments

*09S20029006 — Suitability of the test methods is demonstrated if growth recovered from the inoculated product for each organism does not differ by more than a factor of 2 from the value of the control in absence of the product (recovery from the inoculated product is within 50 - 200% of the control).
Suitability of the test method for microbiological examination of this product has been demonstrated:
Total Aerobic Microbial Count - at a 1:1000 dilution in tryptic soy broth with 4% Tween 80 and 0.5% lecithin (TSB-M), pour plate method.
Total Combined Yeast and Mold Count - at a 1:100 dilution in tryptic soy broth with 4% Tween 80 and 0.5% lecithin (TSB-M), pour plate method.

This document was electronically approved by:
Ruby Rodriguez (Lincolnshire)
Date/Time: 01-Sep-2020, 03:55:03 PM

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COA Generic v6.1.4

The GMP-grade Gamitrinib as specified above has now been received by the compounding pharmacy (Axia Pharmaceutical) for the preparation of a sterile microfluidized emulsion suitable for IV injection in humans. This will complete the CMC section of the IND application. On this basis, we anticipate submission of the full Gamitrinib application (*PIND 132453*) to the US Food and Drug Administration (FDA) by the fourth quarter of 2020. The formulated drug product has a validated 9-month stability when stored at -20ºC and will be shipped to the clinical trial site (Fox Chase Cancer Center) for administration to humans once the clinical protocol is approved for opening by the FDA.

What opportunities for training and professional development has the project provided?
If the project was not intended to provide training and professional development opportunities or there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe opportunities for training and professional development provided to anyone who worked on the project or anyone who was involved in the activities supported by the project. "Training" activities are those in which individuals with advanced professional skills and experience assist others in attaining greater proficiency. Training activities may include, for example, courses or one-on-one work with a mentor. "Professional development" activities result in increased knowledge or skill in one's area of expertise and may include workshops, conferences, seminars, study groups, and individual study. Include participation in conferences, workshops, and seminars not listed under major activities.

Nothing to report

How were the results disseminated to communities of interest?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe how the results were disseminated to communities of interest. Include any outreach activities that were undertaken to reach members of communities who are not usually aware of these project activities, for the purpose of enhancing public understanding and increasing interest in learning and careers in science, technology, and the humanities.

Nothing to report

What do you plan to do during the next reporting period to accomplish the goals?
If this is the final report, state "Nothing to Report."

Describe briefly what you plan to do during the next reporting period to accomplish the goals and objectives.

As indicated above, a no-cost extension has been granted on this application to enable the completion of specific tasks #2 and #3 specified in the original SOW. Specific task #1 has been successfully completed and the delay in fulfilling the additional tasks according to the specified timeline was due to the failure of Arcinova to deliver on its contractual obligations on the synthesis and release of GMP-grade Gamitrinib. These hurdles have now been successfully resolved and high-quality, endotoxin-free Gamitrinib has been received by the designated compounding pharmacy, Axia Pharmaceutical. We anticipate that the full IND submission (*PIND 132453*) will be submitted by Q3 of 2020 and that clinical trial enrollment will start by Q1 2021.

4. **IMPACT:** D*escribe distinctive contributions, major accomplishments, innovations, successes, or any change in practice or behavior that has come about as a result of the project relative to:*

What was the impact on the development of the principal discipline(s) of the project?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe how findings, results, techniques that were developed or extended, or other products from the project made an impact or are likely to make an impact on the base of knowledge, theory, and research in the principal disciplinary field(s) of the project. Summarize using language that an intelligent lay audience can understand (Scientific American style).

The findings reported above establish the feasibility of high-purity synthesis and method release of GMP-grade Gamitrinib, a first-in-class mitochondrial-targeted small molecule inhibitor of the Hsp90 chaperones for cancer therapy. Subcellular targeting, including mitochondrial targeting has not been proposed before for cancer treatment and the present results validate the suitability of the proposed approach for potential clinical use in humans

What was the impact on other disciplines?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe how the findings, results, or techniques that were developed or improved, or other products from the project made an impact or are likely to make an impact on other disciplines.

The clinical development of Gamitrinib as summarized in the current report may open new possibilities for drug discovery and drug development approaches of subcellular targeting of active agents for therapy of human diseases other than cancer

What was the impact on technology transfer?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe ways in which the project made an impact, or is likely to make an impact, on commercial technology or public use, including:

- *transfer of results to entities in government or industry;*
- *instances where the research has led to the initiation of a start-up company; or*
- *adoption of new practices.*

Nothing to report

What was the impact on society beyond science and technology?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe how results from the project made an impact, or are likely to make an impact, beyond the bounds of science, engineering, and the academic world on areas such as:

- *improving public knowledge, attitudes, skills, and abilities;*
- *changing behavior, practices, decision making, policies (including regulatory policies), or social actions; or*
- *improving social, economic, civic, or environmental conditions.*

Nothing to report

5. CHANGES/PROBLEMS: *The PD/PI is reminded that the recipient organization is required to obtain prior written approval from the awarding agency grants official whenever there are significant changes in the project or its direction. If not previously reported in writing, provide the following additional information or state, "Nothing to Report," if applicable:*

There have been no significant changes in direction of the approved SOW. The delay incurred by Arcinova in the chemical synthesis of GMP Gamitrinib did not reflect problems in synthesis, method validation or release. In fact, switching the proposed tasks to another, more experienced and more reliable CRO (AMRI) resulted in the production and release of high-purity GMP-grade Gamitrinib suitable for clinical use in humans

Actual or anticipated problems or delays and actions or plans to resolve them
Describe problems or delays encountered during the reporting period and actions or plans to resolve them.

We do not anticipate additional problems in completing the remaining specific tasks #2 and #3 specified in the SOW. The GMP-grade Gamitrinib has been successfully received by the compounding pharmacy for the preparation of a sterile, microfluidized emulsion of Gamitrinib suitable for IV injection. These protocols are established and have been thoroughly validated in documentation included in the progress report of the last budget cycle

Changes that had a significant impact on expenditures
Describe changes during the reporting period that may have had a significant impact on expenditures, for example, delays in hiring staff or favorable developments that enable meeting objectives at less cost than anticipated.

Nothing to report

Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents
Describe significant deviations, unexpected outcomes, or changes in approved protocols for the use or care of human subjects, vertebrate animals, biohazards, and/or select agents during the reporting period. If required, were these changes approved by the applicable institution committee (or equivalent) and reported to the agency? Also specify the applicable Institutional Review Board/Institutional Animal Care and Use Committee approval dates.

Significant changes in use or care of human subjects

No significant changes in use or care of human subjects. Nothing to report

Significant changes in use or care of vertebrate animals

No significant changes in use or care of vertebrate animals. Nothing to report

Significant changes in use of biohazards and/or select agents

No significant changes in use of biohazard and/or select agents. Nothing to report

6. **PRODUCTS:** *List any products resulting from the project during the reporting period. If there is nothing to report under a particular item, state "Nothing to Report."*

- **Publications, conference papers, and presentations**
  Report only the major publication(s) resulting from the work under this award.

  Journal publications. *List peer-reviewed articles or papers appearing in scientific, technical, or professional journals. Identify for each publication: Author(s); title; journal; volume: year; page numbers; status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).*

Nothing to report

  Books or other non-periodical, one-time publications. *Report any book, monograph, dissertation, abstract, or the like published as or in a separate publication, rather than a periodical or series. Include any significant publication in the proceedings of a one-time conference or in the report of a one-time study, commission, or the like. Identify for each one-time publication: author(s); title; editor; title of collection, if applicable; bibliographic information; year; type of publication (e.g., book, thesis or dissertation); status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).*

Nothing to report

  Other publications, conference papers and presentations. *Identify any other publications, conference papers and/or presentations not reported above. Specify the status of the publication as noted above. List presentations made during the last year (international, national, local societies, military meetings, etc.). Use an asterisk (*) if presentation produced a manuscript.*

Nothing to report

- **Website(s) or other Internet site(s)**
  List the URL for any Internet site(s) that disseminates the results of the research activities. A short description of each site should be provided. It is not necessary to include the publications already specified above in this section.

Nothing to report

- **Technologies or techniques**
  Identify technologies or techniques that resulted from the research activities. Describe the technologies or techniques were shared.

Nothing to report

- **Inventions, patent applications, and/or licenses**
  Identify inventions, patent applications with date, and/or licenses that have resulted from the research. Submission of this information as part of an interim research performance progress report is not a substitute for any other invention reporting required under the terms and conditions of an award.

Nothing to report

- **Other Products**
  Identify any other reportable outcomes that were developed under this project. Reportable outcomes are defined as a research result that is or relates to a product, scientific advance, or research tool that makes a meaningful contribution toward the understanding, prevention, diagnosis, prognosis, treatment and /or rehabilitation of a disease, injury or condition, or to improve the quality of life. Examples include:
  - *data or databases;*
  - *physical collections;*
  - *audio or video products;*
  - *software;*
  - *models;*
  - *educational aids or curricula;*
  - *instruments or equipment;*
  - *research material (e.g., Germplasm; cell lines, DNA probes, animal models);*
  - *clinical interventions;*
  - *new business creation; and*
  - *other.*

Nothing to report

7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

What individuals have worked on the project?
Provide the following information for: (1) PDs/PIs; and (2) each person who has worked at least one person month per year on the project during the reporting period, regardless of the source of compensation (a person month equals approximately 160 hours of effort). If information is unchanged from a previous submission, provide the name only and indicate "no change".

Example:

Name: *Mary Smith*
Project Role: *Graduate Student*
Researcher Identifier (e.g. ORCID ID): *1234567*
Nearest person month worked: *5*

Contribution to Project: *Ms. Smith has performed work in the area of combined error-control and constrained coding.*
Funding Support: *The Ford Foundation (Complete only if the funding support is provided from other than this award.)*

Name:	Dario Altieri
Project Role:	Principal Investigator
Nearest whole person month worked:	1
Contribution to Project:	No Change
Funding Support:	No Change
Name:	Ekta Agarwal
Project Role:	Post-Doctoral Fellow
Nearest whole person month worked:	2
Contribution to Project:	No Change
Funding Support:	No Change

Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

If the active support has changed for the PD/PI(s) or senior/key personnel, then describe what the change has been. Changes may occur, for example, if a previously active grant has closed and/or if a previously pending grant is now active. Annotate this information so it is clear what has changed from the previous submission. Submission of other support information is not necessary for pending changes or for changes in the level of effort for active support reported previously. The awarding agency may require prior written approval if a change in active other support significantly impacts the effort on the project that is the subject of the project report.

Nothing to report

What other organizations were involved as partners?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe partner organizations – academic institutions, other nonprofits, industrial or commercial firms, state or local governments, schools or school systems, or other organizations (foreign or domestic) – that were involved with the project. Partner organizations may have provided financial or in-kind support, supplied facilities or equipment, collaborated in the research, exchanged personnel, or otherwise contributed.

Provide the following information for each partnership:
Organization Name:
Location of Organization: (if foreign location list country)
Partner's contribution to the project (identify one or more)

- *Financial support;*
- *In-kind support (e.g., partner makes software, computers, equipment, etc., available to project staff);*
- *Facilities (e.g., project staff use the partner's facilities for project activities);*
- *Collaboration (e.g., partner's staff work with project staff on the project);*
- *Personnel exchanges (e.g., project staff and/or partner's staff use each other's facilities, work at each other's site); and*

Nothing to report

8. SPECIAL REPORTING REQUIREMENTS

COLLABORATIVE AWARDS: *For collaborative awards, independent reports are required from BOTH the Initiating Principal Investigator (PI) and the Collaborating/Partnering PI. A duplicative report is acceptable; however, tasks shall be clearly marked with the responsible PI and research site. A report shall be submitted to* ***https://ers.amedd.army.mil*** *for each unique award.*

QUAD CHARTS: *If applicable, the Quad Chart (available on https://www.usamraa.army.mil) should be updated and submitted with attachments.*

9. **APPENDICES:** *Attach all appendices that contain information that supplements, clarifies or supports the text. Examples include original copies of journal articles, reprints of manuscripts and abstracts, a curriculum vitae, patent applications, study questionnaires, and surveys, etc.*