

1. STATEMENT OF WORK

Title: Rapid COVID-19 Plasmid Manufacturing for Phase 1 Clinical Programs

NOTE: Unless otherwise stated in this SOW, the terms of the 2373 Agreement, dated 21 February 2020 shall govern performance of work under this SOW and are hereby incorporated by reference. This SOW shall be added as an Appendix to the 2373 Agreement.

1.0 SCOPE

The purpose of this project is to manufacture vials of CGMP plasmid DNA DP suitable for use in a clinical trial (the supply), to support Department of Defense requirements for an FDA-approved COVID-19 vaccine (the best supplies). Based on information provided by Inovio, the final dose is anticipated to be 1 mg. Yield projection from Inovio indicate that at the (b) (4) doses can be manufactured per lot.

The project will include technology transfer of the Inovio plasmid DNA manufacturing process to the DoD ADM Facility; Process Establishment runs at the (b) scale (using COVID-19 plasmid RCB or MCB); manufacturing of WCB from Inovio-provided MCB; analytical assay development; an Engineering DS Run at the (b) scale; up to five 21 C.F.R Part 210 (hereinafter referred to as CGMP) compliant DS and DP Runs at the 50 L scale; scale-up and transfer of the Inovio downstream process at the (b) (4) scale; an Engineering DS Run (b) (4) scale; a CGMP DS Run at the (b) (4) scale, with an optional fill of DP; four additional optional 300 L CGMP DS and DP Runs; stability studies for six and 12 months, respectively, for Engineering DS and CGMP DS/DP from the 50 L runs; and optional six-month and 12-month stability studies for CGMP DS and DP, respectively, from the 300 L runs. The initial Technology Transfer Establishment 10 L runs will be performed with COVID-19 plasmid, either RCB or MCB depending on availability. All runs following the initial Process Establishment will be completed using Ology Bio WCB for the plasmid DNA.

2.0 REQUIREMENTS

2.1 Task 1: Project Initiation and Oversight

Notes:

- Labor for project oversight (Project Manager [PM], Principal Investigator [PI], contracts and finance) spans the lifecycle of the project.
- Data requirements span the lifecycle of the project through delivery of doses.
- If a due date for a deliverable is on a weekend or holiday, then the deliverable will be due on the next business day.

2.1.1 Planning

- 2.1.1.1** The Awardee shall host a project kick-off meeting within 14 business days following the effective date of contract award, provide an agenda at least three business days prior to the meeting, and provide a meeting report within five business days. The kickoff meeting will be held virtually.
- 2.1.1.2** The Awardee shall provide an Integrated Master Schedule (IMS) within 15 days of contract award. The Awardee shall provide an updated IMS 20 calendar days after the end of each month identifying task progress, percent completion and schedule slippage.
- 2.1.1.3** The Awardee shall provide a PMP that will contain, at a minimum, a Project

Charter, Communication Plan, IMS, Work Breakdown Structure (WBS), Cost Management/Spend Plan and List of Deliverables.

2.1.2 Execution

2.1.2.1 Meetings

2.1.2.1.1 The Awardee shall conduct IPT meetings no less than twice per month. The Awardee shall provide the agendas and IPT slide decks within 24 hours in advance of the IPT. Finalized meeting minutes shall be submitted to the USG within five business days following each teleconference.

2.1.2.1.2 The Awardee shall conduct *ad hoc* meetings as necessary, upon team member or USG request, to discuss issues as they arise. Minutes from these meetings shall be provided to the USG within five business days following the meeting.

2.1.2.2 Reports

2.1.2.2.1 The Awardee shall deliver a Monthly IMS and spend plan for the life cycle of the project. The Awardee shall submit each Monthly IMS and spend plan within 20 calendar days after the end of each month of performance. The USG will have 10 calendar days to respond to the report with any comments, and the Awardee will have an additional five calendar days to revise the deliverable or respond to those comments.

2.1.2.2.2 The Awardee shall provide Quarterly and Annual Progress Reports. The reports shall provide a technical summary of progress over the associated time period, as well as a summary analysis of any risks, issues and/or opportunities. Delivery dates for Quarterly and Annual Progress reports will be based on award date and not the calendar year.

2.1.2.2.3 The Awardee shall submit a Quarterly Financial Status Report no later than 20 calendar days after the end of each quarter of performance. The USG will have 30 calendar days to respond to the report with any comments, and the awardee will have an additional 10 calendar days to revise the deliverable or respond to those comments. Reports will cover work performed every three months for the duration of the period of performance.

2.1.2.2.4 The Awardee shall perform, record and report physical inventory results of all Contractor Acquired Property in the contractor's possession, if the Awardee purchases material or equipment using USG funds, as approved by the Agreement Officer's Representative (AOR) during performance of the project.

2.1.2.2.5 Incident Reporting

2.1.2.2.5.1 The Awardee shall report any incident to the USG that could result in more than a one-month delay in schedule from the most recent IMS critical path delivered to the USG in an incident report. In addition, the Awardee shall provide advance notice of critical path schedule changes resulting in more than a 15 calendar-day shift that are not

handled as Incident Reports. The Ology Bio PM shall provide written notification (via email) to the AOR.

2.1.2.2.5.2 The Awardee shall telephonically contact the program manager for the USG no later than 24 hours after the incident is identified.

2.1.2.2.5.3 The Awardee shall submit a written summary report within three business days of an incident, to include what happened, the impact, the availability of any available corrective actions, and a timeline for any corrective actions to be in place. If additional time is required for the Root Cause Analysis, the Ology Bio PM will work with the AOR to agree on timing of the written summary report.

2.1.2.2.6 The Project Agreement Holder (PAH) shall establish a Quality Agreement with the USG. The PAH shall provide the draft Quality Agreement within ten calendar days of project award. The draft Quality Agreement will be submitted via e-mail to the USG technical representatives. The USG shall respond with comments or acceptance ten calendar days following receipt of the draft Quality Agreement. The final agreement with incorporated changes shall be submitted five calendar days after receipt of USG comments. The USG will provide written acceptance.

2.1.2.2.7 The PAH shall also develop a Quality Agreement with Inovio that defines the roles and responsibilities of both parties. The Quality Agreement with Inovio will be provided to the USG for informational purposes rather than review and approval.

2.1.2.2.8 The Awardee shall support USG quality audits of the Awardee's systems and procedures, insofar as they relate to the service and control of the USG's product. These audits may be performed at times mutually agreed upon by the Awardee and the USG. The Awardee shall provide the USG with monthly follow-ups on the status of audit observation commitments found in the USG annual audit or regulatory inspection, as they apply to the USG's product.

2.1.3 Regulatory/CMC Support

2.1.3.1 The Awardee shall provide support to the product sponsor to enabling updating of their CMC sections with manufacturing data and technical information.

2.2 Task 2: Technology Transfer

Note:

- Process Establishment Runs will be performed with COVID-19 plasmid and upstream parameters and the existing Ology Bio cell lysis and purification methods to enable comparison of material generated by Ology Bio methods to existing product data.

2.2.1 Inovio Information Transfer, Gap Analysis and Risk Assessment

2.2.1.1 The awardee will perform technology transfer from Inovio. In accordance with a Consulting Agreement and Quality Agreement that will be finalized and signed after execution of this agreement, the awardee will manage the following support from Inovio:

2.2.1.1.1 Review of all required documentation including analytical assay protocols and specifications, development records, batch records, list of equipment and any other documentation to support this project

2.2.1.1.2 Receipt of the necessary cell lines to support the technology transfer and WCB development

2.2.1.1.3 Inovio Person in plant to support the technology transfer of the upstream and downstream processing for manufacture of their DNA plasmid vaccine candidate

2.2.1.1.4 Support for development of the equipment required for their proprietary lysis process

2.2.1.1.5 Test plan for analytical comparability and assistance in demonstration comparability

2.2.1.1.6 Under the terms of Quality Agreement with Inovio: 1) upon confirmation of comparability, Inovio will add Ology Bio as a manufacturer in their IND; 2) Inovio shall provide all correspondence to and from the FDA related to the addition of Ology's manufacturing facility. Awardee shall provide all FDA correspondence to the USG within 3 days of receipt from Inovio; and 3) Inovio shall provide a Letter of Authorization to their Master File as needed by the USG.

2.2.1.2 The Awardee shall complete an initial Risk Assessment and Mitigation Strategy including all tasks and supply chain management.

2.2.1.3 The Awardee shall conduct a Gap Analysis of the transferred information to identify any potential gaps or weaknesses associated with any of the tasks.

2.2.2 Review of Inovio Documentation

2.2.2.1 The Awardee shall review all project-related documents provided by Inovio.

2.2.2.2 The Awardee shall draft a Development Plan, including relevant information from the documents provided by Inovio, that will outline the relevant scope of work and revise it based on the client's feedback.

2.2.3 Transfer of Product-Specific Materials from Inovio and Procurement of Materials and Components

2.2.3.1 The Awardee shall develop a preliminary BOM using approved suppliers.

2.2.3.2 Upon completion of risk assessments and required permits, the Awardee shall coordinate with Inovio for the shipment of materials to the DoD ADM Facility. The Awardee shall receive the Inovio-provided materials and store them using inventory management practices in order to maximize performance integrity and shelf life.

2.2.3.3 The Awardee shall provide traceability of both consumable and non-consumable Inovio-provided materials from procurement until the end of the material's life.

2.2.3.4 The Awardee shall order and receive any other biologics and process materials and components to complete the project.

2.2.4 Process Establishment Runs

2.2.4.1 The Awardee shall provide a Process Establishment Plan for two Process Establishment Runs using the COVID-19 plasmid (RCB or MCB vials provided by Inovio) at the (b) (4) scale.

2.2.4.2 The Awardee shall provide Process Establishment Run Process Development Production Records (PDPRs) for the Process Establishment Runs.

2.2.4.3 The Awardee shall execute the two Process Establishment Runs, including upstream and downstream processes using the Inovio upstream process (including process parameters and media components) and the Ology Bio downstream process previously established.

2.2.4.4 The Awardee shall provide a Process Establishment Report.

2.3 Task 3: Working Cell Bank Manufacturing

2.3.1 The Awardee shall provide up to 300 vials of WCB based on COVID-19 MCB vials and process documentation received from Inovio.

2.3.2 The Awardee shall perform release testing and characterization of the WCB.

2.3.3 The Awardee shall provide a Working Cell Banking Report, including the WCB production batch record and a Certificate of Analysis (COA).

2.4 Task 4: Analytical Assay Development

Notes:

- Product-specific methods for in-process testing have been developed.
- Compendial methods are already in place and will only require verification.
- Ology Bio QC has current experience with the methods in **Table 2** and **Table 3**. Ology Bio assumes these are the methods that will be required for in-process and release testing.

2.4.1 The Awardee shall receive analytical SOPs and development reports from Inovio. Product-specific QC assay information will be transferred to the Awardee by Inovio in accordance with Ology Bio's Consulting Agreement with Inovio.

2.4.2 The Awardee shall update specifications and a final testing list upon receipt of Inovio analytical technology transfer package. Testing specification will allow for a direct comparison of previously produced plasmid material and reference standard.

2.4.3 The Awardee shall provide an Assay Qualification Plan. The Awardee will qualify the analytical methods in accordance with USP, FDA and Ph. Eur. requirements and guidance appropriate for use in clinical studies.

2.4.4 The Awardee shall perform Technology Transfer Feasibility assessments on Inovio-provided methods for product testing. In accordance with the Ology Bio and Inovio Consulting Agreement, analytical specialized reagents and Reference Standards will be provided by Inovio.

2.4.5 The Awardee will establish in-process and release testing methods for the plasmid DNA DS and DP to meet specifications mutually approved by Inovio and Ology Bio.

2.4.6 The Awardee shall assess the suitability of compendial methods.

2.4.7 The Awardee shall draft non-compendial test methods and execute non-compendial method qualification. If sufficient materials from Inovio **are not readily available for**

- 2.5.6.1 Engineering Run Report
- 2.5.6.2 Finalized CGMP Batch Record templates
- 2.5.6.3 Finalized CGMP specifications
- 2.5.6.4 Final BOM
- 2.5.6.5 Engineering non-CGMP DS CoT
- 2.5.6.6 Engineering non-CGMP DS MSDS

2.6 Task 6: CGMP DS Runs – (b) (A)

- 2.6.1 The Awardee shall update the Technology Transfer Protocol (TTP) and MBRs as needed.
- 2.6.2 The Awardee shall perform all CGMP manufacturing campaigns in accordance with CGMP per U.S. Code of Federal Regulations and all applicable regulatory guidance.
- 2.6.3 The Awardee shall execute up to five runs for the CGMP DS using MBRs, with the number of runs based on the discretion of the USG and suggestions from Ology Bio.
 - 2.6.3.1 The Awardee shall conduct the CGMP Run using the Ology Bio-manufactured WCB.
 - 2.6.3.2 The Awardee shall conduct the in-process and release testing outlined in **Table 2** and **Table 3**.
 - 2.6.3.3 The Awardee shall store the DS frozen pending DP fill/finish. All DS lots will be at the disposition of the USG and storage will be at the ADM Facility.
 - 2.6.3.4 The Awardee shall provide the final QA review of the PBR and QC data and release of the CGMP DS with a COA and MSDS, ensuring that it meets all technical specifications and is acceptable for subsequent CGMP formulation and fill.
 - 2.6.3.5 The Awardee shall write a CGMP DS Campaign Summary Report including Batch Production Documents, Process Flow Diagrams, final BOM, COA and MSDS.
- 2.6.4 The Awardee shall provide manufacturing and testing information (e.g., raw data or summary reports as required) related to Ology Bio-produced DS to Inovio for incorporation into their submission to their IND or Master File to support clinical development.
- 2.6.5 The Awardee shall provide the following for each CGMP DS Lot:
 - 2.6.5.1 QA-Approved DS Executed Batch Production Records
 - 2.6.5.2 QA-Approved DS COA
 - 2.6.5.3 QA-Approved DS MSDS
 - 2.6.5.4 CGMP DS Campaign Summary Report

2.7 Task 7: CGMP DP Runs

- 2.7.1 The Awardee shall determine the final dose and vial configuration in conjunction with the USG and Inovio.
- 2.7.2 The Awardee shall perform all CGMP manufacturing campaigns in accordance with CGMP per U.S. Code of Federal Regulations and all applicable regulatory guidance.
- 2.7.3 The Awardee shall perform three media fill qualification runs using the selected vial configuration and volume.
- 2.7.4 The Awardee shall provide a Media Fill Qualification Report.
- 2.7.5 The Awardee shall perform liquid fill operations using the CGMP DS from Task 6.

- 2.7.6 The Awardee shall fill up to 4,000 multi-dose vials of CGMP DP suitable for use in a Phase 1 clinical trial at a concentration TBD in collaboration with the client. This includes formulation, fill, inspection, labeling, packaging and QA review.
- 2.7.7 The Awardee shall conduct sampling and lot release testing per sponsor-provided specifications.
- 2.7.8 All DP lots will be at the disposition of the USG, and storage pending shipment will be at the ADM Facility.
- 2.7.9 The Awardee shall provide controlled and temperature-monitored transport of analytical samples and final released lot.
- 2.7.10 The Awardee shall provide manufacturing and testing information related to Ology Bio-produced DP to Inovio, for Inovio to their IND.
- 2.7.11 The Awardee shall provide a CGMP DP Campaign Summary Report, raw material COA(s), analytical testing summary and analytical report, executed CGMP batch records, and COA and MSDS for CGMP DP.

2.8 Task 8: Scale-up to (b) (4) and Transfer of Inovio Downstream Purification Process

- 2.8.1 The Awardee shall coordinate with Inovio for transfer the process for the cell lysis step using equipment information from their current CDMO, (b) (4), in parallel with Engineering and CGMP Runs in accordance with the Ology Bio and Inovio Consulting Agreement.
- 2.8.2 The Awardee shall procure, install and qualify cell lysis equipment with support from Inovio.
- 2.8.3 The Awardee shall provide a Process Scale-up Plan.
- 2.8.4 The Awardee shall prepare Process Scale-up PDPRs.
- 2.8.5 The Awardee shall conduct up to two Scale-up Runs at (b) (4) scale, with the number of runs based on the discretion of the USG and suggestions from Ology Bio.
- 2.8.6 The Awardee shall QC test the materials from these runs based on the analytical assays in **Table 2** and **Table 3**.
- 2.8.7 The Awardee shall prepare draft batch records for use in the Engineering Run(s).
- 2.8.8 The Awardee shall provide a Sampling Plan.
- 2.8.9 The Awardee shall provide a TTP.
- 2.8.10 The Awardee shall provide a Process Scale-Up Report.

2.9 Task 9: Engineering DS Run – (b) (4)

- 2.9.1 The Awardee shall prepare a TTP; draft MBRs; raw material, product and label specifications; and draft BOM and MBR setup.
- 2.9.2 The Awardee shall execute one (b) (4) Engineering DS lot using draft MBRs.
- 2.9.3 The Awardee shall use the scaled-up process from Task 8 and the Ology Bio-manufactured WCB.
- 2.9.4 The Awardee shall use resins and filters dedicated for this project. The Awardee shall use the same columns/resins for both the Engineering and CGMP Runs.
- 2.9.5 The Awardee shall conduct the runs in the CGMP manufacturing area of the DoD ADM Facility.
- 2.9.6 The Awardee shall test the Engineering DS based on the analytical tests from Task 4 and Inovio-provided specifications for purity and impurity levels.
- 2.9.7 The Awardee shall provide:

- 2.9.7.1 Engineering Run Report
- 2.9.7.2 Finalized CGMP Batch Record templates
- 2.9.7.3 Finalized CGMP specifications
- 2.9.7.4 Final BOM
- 2.9.7.5 Engineering non-CGMP DS CoT
- 2.9.7.6 Engineering non-CGMP DS MSDS

2.10 Task 10: CGMP DS Run – 300 L

- 2.10.1 The Awardee shall update the TTP and MBRs as needed.
- 2.10.2 The Awardee shall perform all CGMP manufacturing campaigns in accordance with CGMP per U.S. Code of Federal Regulations and all applicable regulatory guidance.
- 2.10.3 The Awardee shall execute one 300 L run for the CGMP DS using MBRs and Ology Bio-manufactured WCB.
 - 2.10.3.1 The Awardee shall conduct the in-process and release testing outlined in **Table 2** and **Table 3**.
 - 2.10.3.2 The Awardee shall provide the final QA review of the PBR and QC data and release of the CGMP DS with a COA and MSDS, ensuring that it meets all technical specifications and is acceptable for subsequent CGMP formulation and fill.
 - 2.10.3.3 The Awardee shall write a CGMP DS Campaign Summary Report including Batch Production Documents, Process Flow Diagrams, final BOM, COA and MSDS.
- 2.10.4 The Awardee shall provide:
 - 2.10.4.1 QA-Approved Executed DS Batch Production Records
 - 2.10.4.2 QA-Approved DS COA
 - 2.10.4.3 QA-Approved DS MSDS

2.11 Task 11: Optional: CGMP DP Fill/Finish (Large-scale)

- 2.11.1 The Awardee shall determine the final dose and vial configuration in conjunction with the USG and Inovio.
- 2.11.2 The Awardee shall perform all CGMP manufacturing campaigns in accordance with CGMP per U.S. Code of Federal Regulations and all applicable regulatory guidance.
- 2.11.3 The Awardee shall perform liquid fill operations using the CGMP DS from Task 10 using a subcontractor.
- 2.11.4 The Awardee shall fill up to 20,000 multi-dose vials of CGMP DP suitable for use in a Phase 1 clinical trial at a concentration TBD in collaboration with the client. This includes formulation, fill, inspection, labeling, packaging and QA review.
- 2.11.5 The Awardee shall conduct sampling and lot release testing.
- 2.11.6 The Awardee shall provide controlled and temperature-monitored transport of analytical samples and final released lot.
- 2.11.7 The Awardee shall provide a CGMP DP Campaign Summary Report, raw material COA(s), analytical testing summary and analytical report, and executed CGMP batch records, and CoA and MSDS for CGMP DP.

2.12 Task 12: Optional: CGMP DS Runs – (b) (4) (Additional runs)

- 2.12.1 The Awardee shall perform all CGMP manufacturing campaigns in accordance with CGMP per U.S. Code of Federal Regulations and all applicable regulatory guidance.
- 2.12.2 The Awardee shall execute up to four runs for the CGMP DS using MBRs; the number of runs will be based on the discretion of the USG and suggestions from Ology Bio.
 - 2.12.2.1 The Awardee shall conduct the in-process and release testing outlined in **Table 2** and **Table 3**.
 - 2.12.2.2 The Awardee shall provide the final QA review of the PBR and QC data and release of the CGMP DS with a COA and MSDS, ensuring that it meets all technical specifications and is acceptable for subsequent CGMP formulation and fill.
 - 2.12.2.3 The Awardee shall write a CGMP DS Campaign Summary Report including Batch Production Documents, Process Flow Diagrams, final BOM, COA and MSDS.
- 2.12.3 The Awardee shall provide:
 - 2.12.3.1 QA-Approved Executed DS Batch Production Records
 - 2.12.3.2 QA-Approved DS COA
 - 2.12.3.3 QA-Approved DS MSDS

2.13 Task 13: Optional: CGMP DP Fill/Finish (Additional large-scale runs)

- 2.13.1 The Awardee shall perform all CGMP manufacturing campaigns in accordance with CGMP per U.S. Code of Federal Regulations and all applicable regulatory guidance.
- 2.13.2 The Awardee shall perform liquid fill operations using the CGMP DS from Task 12.
- 2.13.3 The Awardee shall fill up to 20,000 multi-dose vials of CGMP DP suitable for use in a Phase 1 clinical trial at a concentration TBD in collaboration with the client. This includes formulation, fill, inspection, labeling, packaging and QA review.
- 2.13.4 The Awardee shall conduct sampling and lot release testing.
- 2.13.5 The Awardee shall provide controlled and temperature-monitored transport of analytical samples and final released lot.
- 2.13.6 The Awardee shall provide a CGMP DP Campaign Summary Report, raw material COA(s), analytical testing summary and analytical report, and executed CGMP batch records, and COA and MSDS for CGMP DP.

2.14 Task 14: Stability Testing of DS and DP (b) (4)

2.14.1 Engineering DS

- 2.14.1.1 The Awardee shall provide a Stability Protocol for the Engineering DS, including six-month real-time stability studies and accelerated and stressed temperature stability studies, to be determined in collaboration with the USG prior to the start of stability.
- 2.14.1.2 The Awardee shall execute the stability study using the Engineering Run DS.
- 2.14.1.3 The Awardee shall provide a Stability Report.

2.14.2 CGMP DS

- 2.14.2.1 The Awardee shall provide a Stability Protocol for the CGMP DS, including 12-month real-time stability studies and accelerated and stressed temperature stability studies, to be determined in collaboration with the USG prior to the start of stability.

Deliverable	Frequency	Schedule	SOW Ref.	Gov't Role*	Data Rights**
		(b) (4)			

3.2 Supply Deliverables

Deliverable	Frequency	Schedule	SOW Ref.	Gov't Role*	Data Rights**
		(b) (4)			

Deliverable	Frequency	Schedule	SOW Ref.	Gov't Role*	Data Rights**
Optional					
(b) (4)					

*I=Inform; TBD=To Be Determined

**Category A=Data developed with non-USG/private funding; Category B=Data developed partially with USG funding allotted for this project and partially with non-USG/private funding; Category C=Data developed solely with USG funding allotted for this project.

3.3 Acceptance of Deliverables

The USG will provide review of all data deliverables within 30 days of delivery. The USG will acknowledge receipt of all supply deliverables within 60 days of delivery.

4.0 DATA RIGHTS

The Government shall have no rights in the data associated with Ology Bio’s Background Intellectual Property (IP) and Materials or Inovio’s Background IP, described in Section 5, subject to IP disclosures. Any changes resulting will be incorporated in a separate modification.

5.0 BACKGROUND INTELLECTUAL PROPERTY AND MATERIALS

Ology Bio is not specifying any Background IP and Materials for this 2373 Agreement.

Subcontractor Background IP:

(b) (4)

Inovio will disclose its background intellectual property that is relevant to this Agreement separately in a Cooperative Research and Development Agreement between the Government and Inovio

6.0 AOR AND ALTERNATE AOR CONTACT INFORMATION

AOR:	Alternate AOR:
TBD	TBD

[End of SOW]