AGENDA

IALR Board of Trustees

APPLIED RESEARCH COMMITTEE

Wednesday, October 28, 2026 - 9:00–10:30 am – IALR Conference Room 203

I. **Convening of Meeting** — Dr. Mario Ferruzzi
   A. Welcome
   B. Call to Order and Confirmation of Quorum
   C. Call for Changes to Agenda

II. **Attendance of Committee Member(s) by Electronic Communication Means** (Vote Required) — Dr. Mario Ferruzzi

III. **Approval of Minutes** **(Vote Required)** — Dr. Mario Ferruzzi
   A. May 5, 2026
   B. July 30, 2026

IV. **Applied Research Report** — Dr. Scott Lowman

V. **Open Discussion of Concerns, Issues, and Observations** — Group

VI. **Adjournment** — Dr. Mario Ferruzzi

Reference material included: "Research-Related Updates"

Future Committee Meetings

Future Plenary/BOT Meetings
November 12, 2026

Applied Research Committee Members
Dr. Mario Ferruzzi, *Chair*
Mr. Don Gibson, *Ex Officio*
Dr. Tatia Granger
Ms. Emma Kozlowski
Mr. Charles Majors
Ms. Leslie Mantiply
Mr. Don Merricks
Mr. Kunal Patel

IALR Staff
Mr. Telly Tucker, President
Dr. John Hughes, Executive Vice President, Operations
Dr. Scott Lowman, Director of Applied Research
Ms. Pam Patterson, BOT Secretary & Executive Assistant

IALR BOARD OF TRUSTEES (BOT)
APPLIED RESEARCH COMMITTEE
Minutes – Tuesday, May 5, 2026 – 9:00 a.m. – IALR Conference Room 203

Members Present	**IALR Staff Present**
Dr. Mario Ferruzzi, *Chair, via Zoom*	Mr. Telly Tucker, President, IALR
Mr. Don Gibson, *Ex Officio*	Dr. John Hughes, EVP, Operations, *via Zoom*
Ms. Emma Kozlowski, *via Zoom*	Dr. Scott Lowman, VP of Applied Research
Mr. Charles Majors, *arrived at 9:20 a.m.*	Ms. Pam Patterson, BOT Secretary
Mr. Don Merricks	
Mr. Kunal Patel, *arrived at 9:29 a.m.*	**IALR Staff unable to attend**
Dr. Tom Powell	
Members unable to attend	**Guests**
Ms. Leslie Mantiply	None

Call to Order / Quorum / Changes to Agenda
Dr. Mario Ferruzzi called the meeting to order at 9:00 a.m. on Tuesday, May 5, 2026. No changes were made to the meeting agenda.

Attendance of Committee Member(s) by Electronic Communication Means
Dr. Ferruzzi and Ms. Kozlowski participated electronically. Dr. Ferruzzi joined remotely due to professional obligations at Virginia Tech. Ms. Kozlowski attended via Zoom due to the distance between her principal residence and the meeting location. The committee voted to approve their participation via Zoom.

Motion: Mr. Don Merricks made a motion to allow Dr. Mario Ferruzzi and Ms. Emma Kozlowski to attend the meeting via Zoom. Dr. Tom Powell seconded the motion, and it passed unanimously.

The results of the vote are shown below.

Committee Members Absent	-	1
Committee Votes For	-	5
Committee Votes Against	-	0
Committee Abstentions	-	0

Return to Agenda

Approval of Minutes

Motion: Dr. Tom Powell made a motion to accept the minutes for the February 3, 2026, meeting. Mr. Don Gibson seconded the motion. The motion passed unanimously.

Applied Research and Business Development Update

Dr. Scott Lowman presented the Narrative Report (Exhibit A). The report covered recent developments and activities across multiple research areas.

Dr. Lowman provided updates on the Co-Locating Data Centers and Greenhouses feasibility study, which had been paused due to similar projects already being planned in Virginia, and shared details about upcoming greenhouse construction funded by the Tobacco Commission and the Southern Crescent Regional Commission. The report covered ongoing internship programs, grant activities, including a $350,000 greenhouse expansion, and partnerships with various companies and institutions in biotechnology and controlled-environment agriculture. Discussion also included licensing agreements for endophytes, workforce development initiatives, and potential opportunities in biomanufacturing and precision fermentation, with particular attention to partnerships with Virginia Tech and regional community colleges.

Dr. Lowman discussed recent developments in greenhouse projects, including a new $350,000 greenhouse expansion approved by the Tobacco Commission and additional funding from the Southern Crescent Regional Commission. He mentioned potential collaborations with Dutch greenhouse companies and TC Control Group, Inc., for workforce development curricula.

Dr. Lowman outlined plans for seven summer internships, including positions in biotechnology, the CEA Center, and computer vision robotics, highlighting a promising study on plant movement and health detection. He noted that there is no systematic tracking mechanism in place for Governor's School students. Additionally, he discussed a new engineering design program being developed for the Governor's School and the research team's recent publications.

Dr. Lowman reported delays in RFP processing and notice-to-award timelines, expecting a fiscal year-end surge in submissions. He discussed the CEA Center's activities, highlighting Dr. Mike Evans' increased contributions following his departure from the role of director of the School of Plant and Environmental Sciences at Virginia Tech (VT). Discussion included efforts in ag tech and life sciences manufacturing, noting a $1 billion federal investment in biomanufacturing and $12 billion in new biopharmaceutical factory construction in Virginia. Dr. Lowman described a successful week-long workshop with Virginia Tech and Virginia Western Community College, which positioned the region for upcoming biotechnology opportunities, including a potential $120 million state investment in community college biotechnology programs.

Dr. Ferruzzi discussed public-private partnerships at the university, including opportunities in data centers and intellectual property development with companies such as Google.

Dr. Lowman shared details about the endophyte licensing program, explaining that they have licensed approximately 65 different endophytes with a tiered pricing structure ranging from $1,000 to $10,000 upfront fees, plus 1.5% of net sales.

Dr. Ferruzzi suggested that IALR learn from North Carolina State University's (NCSU) successful economic development partnerships and recommended connecting with Ms. Celeste Brogdon, the new Assistant Dean of Advancement at VT, to explore opportunities for collaboration.

Dr. Lowman provided updates on several biotech initiatives, including a successful ribbon-cutting event for Agrospheres, a $40 million production facility in Charlottesville, Virginia. The discussion covered the department's ongoing partnership with Bonumose, Inc., on a rare sugar product nearing FDA approval, made from agricultural waste using cell-free biomanufacturing. Additionally, Dr. Lowman mentioned the recent fermentation workshop's success and a new collaboration involving a National Quantum Nanotechnology Infrastructure Grant application with Matthew Hall from ICTAC Matter Labs.

Dr. Lowman discussed the status of BioMADE, a biomanufacturing initiative funded by the Department of Defense (DoD), which has been defunded and will not proceed with plans for a facility in North Carolina. He noted that while the DoD has allocated funds for biomanufacturing, including the creation of an Office of Biotechnology Management, there are concerns about relying too heavily on federal funding given its unpredictability. Dr. Ferruzzi emphasized the importance of building capacity in biomanufacturing and precision fermentation, suggesting it could benefit both government and private sector interests. The committee decided that a more detailed review of the current funding portfolio and future pipeline is needed to ensure a strategic project mix and sustainability.

Open Discussion of Concerns, Issues, and Observations
There was no further discussion.

Action Item(s)

- Summarize the history and development of the licensing agreement structure and pricing for endophytes, including steps taken and rationale, for review at the next meeting.
- Update and present a detailed summary of all grants received (including dollar amounts and sources) and the financial portfolio (including licensing, rent, and contract research revenue) for the committee at the next meeting.
- Put together and update the list of companies that have come through IALR, including outcomes and current status, for future discussion.

Adjournment

Dr. Ferruzzi asked for a motion to adjourn the meeting.

- **Motion**: Mr. Don Gibson made a motion to adjourn the meeting. Mr. Charles Majors seconded the motion, and it passed unanimously. The meeting adjourned at 10:19 a.m.

Return to Agenda

Minutes Recorded By:

Minutes Approved By:

_____

Ms. Pam Patterson
BOT Secretary

_____

Dr. Mario Ferruzzi
Chair, Applied Research Committee

_____

Date

_____

Date

Attachments Included as Official Part of Minutes

Exhibit A – Applied Research Narrative Report, May 5, 2026

Exhibit B - Applied Research - Discovering Breakthroughs Report, May 5, 2026

DRAFT

IALR BOARD OF TRUSTEES (BOT)
APPLIED RESEARCH COMMITTEE
Minutes – Thursday, July 30, 2026 – 9:00 a.m. – IALR Conference Room 203

Members Present	**IALR Staff Present**
Dr. Mario Ferruzzi, *Chair, via Zoom*	Mr. Telly Tucker, President, IALR
Mr. Don Gibson, *Ex Officio*	Dr. John Hughes, EVP, Operations, *via Zoom*
Mr. Charles Majors	Dr. Scott Lowman, VP of Applied Research
Mr. Don Merricks	
	IALR Staff unable to attend
Members unable to attend	Ms. Pam Patterson, BOT Secretary
Ms. Emma Kozlowski	
Ms. Leslie Mantiply	
Mr. Kunal Patel	
Dr. Tom Powell	**Guests**
	None

Call to Order / Quorum / Changes to Agenda
Dr. Mario Ferruzzi, Chair, called the meeting to order at 9:00 a.m. on Thursday, July 30, 2026. There were no changes to the agenda.

The Chair determined that a quorum was not present. The members participating in person and by electronic communication means engaged in discussion and received informational updates only. No votes were taken, and the committee approved no official actions.

Attendance of Committee Member(s) by Electronic Communication Means
Dr. Ferruzzi participated electronically.

Approval of Minutes
Dr. Ferruzzi announced that a quorum was not present; therefore, the committee deferred approval of the minutes from the May 5, 2026, Applied Research Committee meeting until the next meeting.

Return to Agenda

Applied Research and Business Development Update

Dr. Scott Lowman presented the Narrative Report (Exhibit A) and reported that Applied

Research secured 25 grant awards totaling approximately $4.5 million since 2018, and had 12 grant proposals pending. He added that the summary of income including grants, rental, testing services, equipment match, and licensing (2018 to present) totaled $6,374,784 though staffing had been reduced significantly from 14 to 5 people since 2014. He highlighted ongoing work in controlled environment agriculture (CEA), agricultural biotechnology, and biomanufacturing, as well as growth in contract research and rental income. Contract research rates were increased by 20 percent, and efforts were underway to align rental rates with market standards.

Dr. Lowman noted the recent publication of the *Co-locating Data Centers and Greenhouses* report and provided updates on related projects, collaborations, and participation in the Virginia Department of Energy's Data Center Waste Heat Work Group. He also reported that state leaders, including the Secretary of Agriculture and the Virginia Economic Development Partnership (VEDP), are involved in advancing the data center and greenhouse colocation initiative.

Additional updates included six Applied Research internships in biotechnology, CEA, and robotics; development of an engineering-focused pathway with the Governor's School; and a feasibility study evaluating the creation of a Virginia or Mid-Atlantic CEA Association.

Dr. Lowman reported that the Regional Investment in Startups and Entrepreneurs (RISE) Collaborative received funding to launch the RISE Accelerator and was exploring a partnership to bring the Regional Accelerator and Mentoring Program (RAMP) model to Southern Virginia with a focus on AgTech. He also noted participation in the 2025 Partnership for Innovation (PIN) Regional Leadership Cohort to support development of the Danville Entrepreneurial Ecosystem Pipeline.

Action Items

- Benchmark rental/lease rates for lab and research space against peer organizations (both urban and rural) and report findings at the next meeting.
- Add expenditure data to the metrics report and present a graph showing the relationship between revenues and expenditures.
- Review and share the current Material Transfer Agreement (MTA) template with the group at the next meeting.
- Dr. Ferruzzi and Dr. Lowman will meet to discuss opportunities for strategic growth and collaboration, with a particular focus on strengthening engagement with Dr. Warren Dixon, Dean of the Virginia Tech College of Engineering.
- Follow up with Virginia Bio and VIPC (please spell this out) regarding biomanufacturing support opportunities and keep the committee updated.

Adjournment

Dr. Ferruzzi adjourned the meeting at 10:25 a.m.

Minutes Recorded By:

_____

Dr. John Hughes
EVP, Operations

_____

Date

Minutes Approved By:

_____

Dr. Mario Ferruzzi
Chair, Applied Research Committee

_____

Date

Attachments Included as Official Part of Minutes

Exhibit A – Applied Research Narrative Report, July 2026
Exhibit B - Applied Research Income Report, July 14, 2026

DRAFT

Return to Agenda

Applied Research Committee Report
Dr. Scott Lowman
October 2026

Name of Program or Initiative: Building Virginia's Controlled Environment Agriculture (CEA) Industry Through Targeted Research, Workforce, and Economic Development Initiatives

(The Virginia Tech / IALR Controlled Environment Agriculture Innovation Center)

1) CEA Research



a. Six interns completed their projects and presented their findings during the annual intern luncheon.
b. The report titled "Co-locating Data Centers and Greenhouses" was published recently. Funded by Go Virginia Region 3, the report was prepared by the Resource Innovation Institute.
c. The Southern Virginia Data Center–Controlled Environment Agriculture (CEA) Greenhouse Colocation Opportunity as a Public Policy Model for Competitive Business Investment, Job Creation, and Accelerated Data Center Waste Heat Use (23 pages)
    - Submitted to - Virginia Department of Energy's Data Center Waste Heat Work Group
    - Introduction - This white paper is submitted in connection with the Department of Energy's study, mandated by Chapter 591 of the 2026 Acts of Assembly, to accelerate the use of waste heat from data centers across the Commonwealth. Mr. David participates in the associated work group as a representative of a specific, well-documented colocation opportunity in Southern Virginia and offers this submission to place that opportunity and the public policy case for it into the Department's record ahead of its September 1, 2026 report to the General Assembly. The case is made from a public policy perspective, grounded in objective data from an independent feasibility study. Co-locating data centers with controlled-environment agriculture (CEA) greenhouses advances several of the Commonwealth's public policy objectives, foremost among them creating a competitive environment for business investment and job creation at the local, regional, and state levels. This white paper offers one proposed public policy framework for accelerating the beneficial use of data center waste heat, and the

Return to Agenda

Department's work group process is well suited to surface other approaches and perspectives that may exist alongside it.

d. Farm Park Implementation Playbook
    - Overview - The Institute for Advanced Learning and Research (IALR), in partnership with the Resource Innovation Institute (RII) and GO Virginia Region 3, seeks GO Virginia planning funds to complete the Farm Park Implementation Playbook. The Playbook is a planning framework for a pilot in Southern Virginia that co-locates a data center with controlled-environment agriculture (CEA) greenhouses and complementary businesses, such as packaging, cold storage, and distribution, around shared combined heat and power (CHP) infrastructure.
    - Secretary of Agriculture and Forestry, Secretary of Commerce, and VEDP involvement
    - Partners
        a. Institute for Advanced Learning and Research. Applicant and grant recipient. IALR will procure the consultants and manage grant compliance. Its CEA Innovation Center provides applied research expertise in high-tech greenhouse operations.
        b. Resource Innovation Institute. Managing principal and project coordinator. RII authored the June 2025 feasibility study and co-developed the Playbook framework.
        c. GO Virginia Region 3. Funder of the prior feasibility study and staff collaborator on coordination and alignment with the Growth and Diversification Plan.
        d. Regional economic development organizations. Represent Region 3 localities on the Farm Park Workgroup.
        e. Education and workforce partners. Danville Community College, Patrick & Henry Community College, Southside Virginia Community College, and GO TEC/IALR, engaged through a workforce task group.
        f. Private-sector partners. Microsoft, bringing the data center operator's perspective. Proposed industry partners identified by RII include ARCO/Murray (facility planning, design, and construction), Certhon (greenhouse design, engineering, and automation), Red Sun Farms (commercial greenhouse operations), Bloom Energy (combined heat and power and distributed energy systems), and Dramm (greenhouse water management, irrigation, and climate control).
    - Across both applications, the combined project budget is $231,252.60, including $153,000 in GO Virginia funds and the required match from private and nonprofit sources

e. In collaboration with Emma Sellers, IALR submitted a proposal to the Microsoft Foundation to support data center and CEA colocation work

GO Virginia Region 3 Work Referenced in the Virginia Energy *Evaluation of Data Center Waste Heat Reuse Feasibility and Policy Recommendations*

Page	Report Section	How GO Virginia Region 3 Work Is Referenced
19–20	VA Landscape and Opportunity Overview: Virginia Data Center Waste Heat Reuse Initiatives	Describes Bryan David's presentation at the second stakeholder workgroup meeting on the 2025 *Colocating Data Centers & Greenhouses Feasibility Report* prepared with the Resource Innovation Institute. Summarizes the report's findings: colocating a data center with a single greenhouse is not economically viable due to heat load mismatch, while colocation with multiple large-scale greenhouses and complementary industrial businesses would provide economic and quality of life benefits. Notes that colocation at industrial farm parks can help counter negative sentiment toward data centers, sustain agricultural jobs, and help localities meet sustainability commitments.
20	Same	Identifies the white paper submitted to the Department, *The Southern Virginia Data Center–CEA Greenhouse Colocation Opportunity as a Public Policy Model for Competitive Business Investment, Job Creation, and Accelerated Data Center Waste Heat Use*, as a reference resource for the report. States that the white paper develops the public policy case, financing structure, and siting analysis in more depth than the workgroup presentation, including the case that rural Virginia's lower land costs and existing agricultural base make the technology a genuine economic development opportunity.
22	Key Opportunity Regions	Describes the Farm Park Implementation Playbook's replicable siting methodology, which screens VEDP's certified sites database and the Virginia Business Ready Sites Program, as a potential statewide model for identifying "waste heat ready" greenfield sites, with further detail in the white paper. Lists the Playbook's Site Readiness and Infrastructure Capacity Assessment criteria (energy and fiber capacity, water/wastewater and road infrastructure, zoning and permitting pathways, and phased-expansion capacity thresholds). Cites the white paper's industry estimates of roughly $45,000 per acre for rural Southern Virginia data center sites compared with $1–2 million per acre in Northern Virginia, positioning rural colocation sites as credible competitors for large-scale investment.
24	Economic Opportunities	Describes Bryan David's presentation on his work with the Resource Innovation Institute on the economic potential of colocating data centers with controlled environment agriculture (CEA) on industrial farm parks, building on the region's existing agricultural industry and the Controlled Environment Agriculture Innovation Center in Danville, a partnership of Virginia Tech and the Institute for Advanced Learning and Research.
25	Economic Opportunities	Identifies the most economical model as "an integrated Farm Park model that utilizes a combined heat power (CHP) microgrid to provide cooling of the data center water loop while providing power, heating, cooling and CO2 enrichment for the greenhouse and other collocated businesses in the farm park hub," citing the *Colocating Data Centers & Greenhouses Feasibility Report*. Includes Figure 6, US Farm Park Economic Framework, illustrating the economic model of the farm park.
25	Economic Opportunities	Presents the Farm Park financing and governance model: public ownership of shared power and heat infrastructure, a competitively procured private operator, and tax-exempt public infrastructure bonds, with tenants drawing power and heat at cost. States that this structure is developed in more detail in the white paper and in the Playbook's Public Infrastructure Financing and Site Improvement Strategy and Governance, Infrastructure Stewardship, and Strategic Coordination Framework elements.
25–26	Economic Opportunities	Lists the potential economic benefits of the farm park model: job creation and workforce diversification, an economic multiplier effect from attracting like industries, local food production and resilience, and tax base and investment. Notes that GO Virginia Region 3 and the Resource Innovation Institute created a Farm Park Implementation Playbook as a reference for developing waste heat adoption at scale.
26–27	Economic Opportunities: Data Center Considerations	States that the Resource Innovation Institute's research with GO Virginia Region 3 highlights the importance of matching appropriate technologies with waste heat reuse potential. Includes Figure 7, Data Center Waste Heat by Type, from the *Colocating Data Centers & Greenhouses Feasibility Report*, showing that liquid and immersion cooling capture more heat and can deliver higher heat levels to off-takers.
29	Knowledge Sharing Framework: Existing Tools & Resources for Planners & Localities	Lists the Resource Innovation Institute *Colocating Data Centers & Greenhouses Feasibility Report* (June 2025) and the Resource Innovation Institute, Institute for Advanced Learning and Research, and GO Virginia Region 3 *Elements of the Farm Park Implementation Playbook* (Working Draft, Planning Framework) as reference tools for technical staff at planning departments, planning commissions, and localities.
42	Acknowledgements	Recognizes Bryan David (GO Virginia Region 3) among the workgroup presenters and participants.

f. Virginia Tech and IALR submitted a grant to the United States Department of Agriculture focused on disease management in controlled environment agriculture.
g. Contracted with VP Strategy Consulting LLC to conduct feasibility study related to the creation of a CEA Association focused on Va or the Mid-Atlantic.

2) Entrepreneurship and Industry Support

a. The RISE Collaborative received funding from TRRC to launch the RISE Accelerator and are in early talks with the folks from RBTC/RAMP about partnering to bring their RAMP accelerator model to SOVA. They are particularly interested in the AgTech sector.
    - Dr. Lowman has been invited to participate in advising the first group
b. PlantEdits, a biotech company from Nebraska, visited and toured the labs at IALR. They are interested in relocating to Danville. They plan to move in in October.
c. A new controlled environment ag workforce partnership was established with the National Center for Healthy Veterans.
d. In collaboration with the Regional Investment in Startups and Entrepreneurs (RISE) team, Dr. Lowman spoke on a panel, led a breakout session, and hosted a tour of the CEA Center at the RISE Conference held at IALR.
e. Dr. Lowman participated in day long interviews with entrepreneurs in collaboration with the Southern Virginia Innovation Hub and the Roanoke Blacksburg Technology Council. The interviews were focused on selecting entrepreneurs to participate in a funded accelerator program.



f. Mitchell Doss's paper "Effect of Potassium Source and Increasing Concentration on Lettuce Growth Produced in a Controlled Environment" was accepted for publication in the peer reviewed journal HortScience.

3) Conferences, Events, and Tours





a. Dr. Lowman and Dr. South attended the Fall BILT meeting at Virginia Western Community College. BILT is an NSF funded workforce training program in controlled environment agriculture.
b. Virginia Secretary of Agriculture and Forestry, Katie Fraizer, along with Deputy Secretary Ben Rowe, Michelle Bridges, Virginia Department of Agriculture and Consumer Services (VDACS) Ag & Forestry Development, Sarah Jane Thomsen, VDACS Domestic Marketing Manager, Robert Mills, Jr., and Delegate Whittle visited and toured the research labs and CEA Innovation Center.
c. The 4th CEA Summit East was held September 14-16th. The conference is a collaboration with IndoorAgCon out of Las Vegas and this year 290 people attended from across the US and beyond.
d. Dr. Lowman attended the Greentech Summit in Philadelphia and was part of a group that presented on the Data Center Colocation Study that was completed last year.
e. Dr. Lowman attended the Ag and Forestry Stakeholders Meeting at UVA. The group was invited by the Secretary of Ag and Forestry to participate in an Economic Impact Study.
f. HHS Secretary Kennedy visited with Congressman McGuire
g. A new collaboration with the Food Security Leadership Council. They are focused on advocating for increased funding for Federal Agriculture Related Research.
h. The UVA Weldon Center for Public Service acting Executive Director visited and toured Research and the CEA Center.

4) Grants

a. Awarded - TRRC, $350,000 for greenhouse expansion
b. Submitted full proposal- SHIELD-CEA: Systems-based Holistic Integrated Early-warning, Learning, and Disease Management Platform for Gray Mold in CEA, Program: USDA-NIFA Agriculture and Food Research Initiative (AFRI) – Strengthening Agricultural Systems (SAS)
   Lead Institution: Virginia Tech (PI: Dr. Kaylee South)
   IALR Budget: $67,640 over 5 years

- Overview: This project focuses on developing an improved, systems-based management framework for gray mold (*Botrytis cinerea*) in controlled-environment agriculture. The work includes evaluating commercial and novel biocontrol agents, UV-based disinfection tools, and cultural practices, and integrating the most effective approaches into a comprehensive disease-management platform. Workforce training and outreach are also major components.
- IALR & Partner Roles**:** Dr. Amaradasa (5% effort) and Amy Turner (15% effort) will contribute to pathogen biology, disease-management trials, and integration of biological and physical control tools during the first four years of the project.

c. IALR was awarded $500,000 from the Southern Cresent Regional Commission for Greenhouse expansion and Entrepreneurship support. Next steps will be to secure a Tobacco Commission Grant as a match.

d. Dr Mei and Lowman received a grant from the Virginia Department of Agriculture and Consumer Services for $62,000. The grant is focused on developing new crops for the CEA industry.

e. IALR partnered with the University of Kansas to submit a proposal to the United States Department of Agriculture

Name of Program or Objective: AgTech and Life Sciences Manufacturing Support to Grow Industries Through Testing, Contract Research, and Lab Access

Current Activities

1) **Background**

a. To support the IALR Strategic Plan Goal of Strategically Expanding Applied Research, the rapidly growing biomanufacturing industry has been a focus.

b. In 2024, strategic partnerships were established with the following entities:
- NC Biotechnology Center
- NC Life Science Corporation
- Va Bio
- Virginia Tech Applied Research Corporation
- George Mason University
- Capra BioSciences
- Virginia Tech Biochemistry

c. To develop a plan statewide, a Biomanufacturing Summit was held in Richmond Va. The conference took place in Richmond, and the Keynote was Senator Mark Warner.

2) **Supporting the Biomanufacturing Industry**

a. Met with the education company Festo to provide an overview of biomanufacturing activities happening at IALR
b. Dr. Lowman attended the Ninth Annual Mid-Atlantic Biomanufacturing Summit at VCU on July 15th and 16th
c. Dr. Lowman, along with Dr. Lewis and Jake Taylor, attended the Vital Biomanufacturing Conversations and Industry Roundtable at Virginia Western Community College.
d. Dr. Lowman met with members of the Virginia Innovation Partnership Corporation's Training Network to discuss potential partnering opportunities related to biomanufacturing.
e. Dr. Lowman attended the Biodiscovery Summit at the University of Virginia (UVA).
f. A new work group has been formed that includes VT Biochemistry, Virginia Western Community College, and IALR. The focus of the group is to support the rapidly growing biomanufacturing industry in the state. The next meeting will be held at the end of July.

3) **Grants/Funding**

a. New UGA Grant co-application
b. A grant application was submitting to address off flavor compounds in bio manufactured food. The team includes Sable Fermentation, Ferment Systems, University of Arkansas, IALR, and VT
c. A new grant is being applied for with Dr. Matthew Hull, Director of ICTAS Matter Labs, focused on expanding the partnership with the AI-QUANTAM NQNI Site Led by Virginia Tech. IALR Applied Research along with Jason Wells from AM plan to participate in this NSF National Quantum Nanotechnology Infrastructure (NQNI) project aimed at increasing support for regional businesses.
d. **Received** – TRRC Greenhouse expansion to support entrepreneurs.
e. **Received** – USDA Specialty Crop Block Grant, $67,000 to study new crops for CEA production
f. **Received** – Southern Cresent Regional Commission, $500,000 for construction of a new greenhouse
g. **Received** – GoVa Region 3 - "The Synergistic Co-location of Data Centers and Controlled Environment Agriculture Greenhouses to Boost Competitiveness"
h. **Received** – VT College of Agriculture and Life Sciences Internal Seed Grants – Va State Needs Assessment

i. **Received** – Virginia Cooperative Extension – Controlled Environment Agriculture Certificate Program
j. **Received** - Tobacco Region Revitalization Commission (TRRC) grant titled "Building a Regional Food System Through the Creation of a Value Chain Coordinator" ($104,452 request + $100,000 external match)
k. **Received** - Tobacco Region Revitalization Commission grant in partnership with Virginia Tech titled "Supporting Controlled Environment Agriculture (CEA) Growth in Southern Virginia", ($145,841 request + $150,000 external match)
l. **Received** – USDA Specialty Crop Block Grant "Biostimulants to Improve Indoor Strawberry Production" ($54,000)
m. **Received** – USDA Specialty Crop Block Grant "Biotechnology to Improve Indoor Strawberry Production and Disease Control"
n. **Received** - Agrospheres is funding a new employee for 2 years ($110,000)
o. **Received** – The applied research team along with Virginia Tech and Cornell University submitted a grant titled "Empowering Greenhouse Resiliency with an Optimized Workforce (E-GROW)" focused on introducing controlled environment agriculture to K-12. ($149,119 subaward)
p. **Received** - A grant partnership with Virginia Western Community College focused on AgTech robotics and vegetable production resulted in an NSF grant award to develop an in-depth program for workforce training in community colleges. Dr. Lowman will serve on the advisory board.

Economic / Business Development – Companies Utilizing Space at IALR

a. MicroEndo has agreed to locate at IALR later this spring

b. Lester Polymer Insights (added two employees)

c. Scale Holdings

d. Canon

e. Mosaic

f. Axxor

g. Ferment Systems (New)

h. Plantedits (New)

MASTER SERVICES AGREEMENT

This MASTER SERVICES AGREEMENT ("Agreement") is made and effective August _____, 2018 (the "**Effective Date**") by and between _____, a _____ _____ with offices located at _____ ("COMPANY") and the Institute for Advanced Learning and Research, a political subdivision of the Commonwealth of Virginia with offices located at 150 Slayton Avenue, Danville, Virginia 24541 ("CONTRACTOR"). COMPANY and CONTRACTOR are referred to individually as a "**Party**" and collectively they are referred to as the "**Parties**."

WHEREAS, COMPANY desires to engage CONTRACTOR to perform certain services for COMPANY on a non-exclusive basis from time to time following the Effective Date (the "**Services**"), and CONTRACTOR is interested in providing certain services to COMPANY, and

WHEREAS, COMPANY and CONTRACTOR desire that the foregoing be accomplished pursuant to the terms and conditions set forth herein.

NOW, THEREFORE, the Parties hereby agree as follows:

1. Services.

(a) General. COMPANY hereby engages CONTRACTOR to perform services that may hereafter be described in Work Orders agreed to by the Parties in writing and in the form of the Work Order attached as Exhibit B hereto (the "Services"). CONTRACTOR will use commercially reasonable efforts in performing the Services agreed to in any such Work Order.

(b) Contact Person. Each Party will designate in Exhibit A hereto (the "Contacts"), individuals to serve as primary contact persons with respect to administrative, technical and financial aspects of this Agreement. The designated individuals will meet at times and places mutually agreed upon to discuss the status, progress, and results of the Services rendered and to be rendered hereunder as well as the plans and any changes in plans for the Services.

(c) Services. COMPANY will order Services using written work orders, each one of which, if accepted in writing by CONTRACTOR, will be signed by the Parties, numbered, and attached hereto as Exhibit B (each such executed work order, a "Work Order"). Each Work Order will consist of (i) a statement of work (including, without limitation, project description, requirements, time table, deliverables and any other applicable terms), (ii) a budget and (iii) a payment schedule. CONTRACTOR will provide COMPANY with an invoice for the Services rendered. Each invoice for Services will set forth: (i) the period of time covered by the invoice, (ii) the nature and extent of Services rendered during such period, and (iii) the fees due and payable for Services. The compensation set forth in a Work Order will be the maximum compensation payable for the corresponding Services, including, without limitation, all time, equipment, materials, personnel, facilities and overhead charges. CONTRACTOR shall not have any obligation to perform Services under any Work Order that exceed the amount budgeted for the Work Order. In the event of a conflict between the terms of this Agreement and a Work Order, the terms of the Work Order will govern unless the Work Order specifically states otherwise. Each Work Order is hereby incorporated herein by reference and made a part of this Agreement. A Work Order can only be amended by a written amendment signed by an authorized representative of each Party.

Return to Agenda

2. Performance and Delivery Obligations; Subcontractors.

(a) CONTRACTOR will complete the Services and provide COMPANY with a final report and any other deliverables as specified in the applicable Work Order within the time frame set forth in such Work Order. CONTRACTOR will carry out the Services using at all times its reasonable professional knowledge, ability, skill, judgment and efforts, in a manner consistent with generally accepted industry standards, in a workman-like manner, and in accordance with all applicable laws and regulations.

(b) CONTRACTOR may not subcontract all or any part of the Services to any of its affiliates or third parties unless: (i) COMPANY provides its prior written consent, and (ii) such subcontracted Services are performed in accordance with this Agreement and the relevant Work Order(s).

3. Payment Terms.

(a) Upon execution of each applicable Work Order, an authorized purchase order will be issued along with invoicing instructions. CONTRACTOR will invoice COMPANY in accordance with the terms set forth in the applicable Work Order.

(b) COMPANY will pay CONTRACTOR's invoices for the Services within thirty (30) days of COMPANY's receipt of the applicable invoice. Payments will be sent to the CONTRACTOR address identified in Exhibit A.

4. COMPANY Materials.

(a) As used herein, "Materials" means, without limitation, all plant extracts, reference standards, formulations, samples, reagents, equipment, supplies, manuals and other materials provided by or on behalf COMPANY in connection with the Services, as well as modifications, derivatives, analogs and/or products, as specified in the Work Order.

(b) COMPANY may provide CONTRACTOR with any Materials required by CONTRACTOR to perform Services hereunder (together with any modifications, derivatives, analogs and products thereof). CONTRACTOR will provide reagents and other supplies and materials necessary for the Services, unless otherwise stated in the Work Order. COMPANY will reimburse CONTRACTOR for the costs of all such reagents, supplies and materials.

(c) COMPANY will retain at all times all right, title and interest, and all intellectual property rights in and to the Materials. Upon completion of the Services or otherwise upon COMPANY's request, CONTRACTOR will promptly destroy or return (at COMPANY's direction or as specified in each Work Order) all unused COMPANY Materials, all other COMPANY Materials and any copies thereof (subject to CONTRACTOR's rights under section 6(c)).

(d) CONTRACTOR shall use Materials solely for the purposes identified in the applicable Work Order and not for any other purpose. Under no circumstances will CONTRACTOR engineer, re-engineer, formulate, re-formulate, modify, deconstruct, synthesize, reverse engineer, analyze,

Return to Agenda

or derivatize any of the Materials provided by COMPANY under this Agreement, unless such work is set forth in a Work Order signed by COMPANY.

(e) CONTRACTOR agrees that it will not transfer or otherwise provide any of the COMPANY Materials to any other party without the prior written permission of COMPANY.

(f) CONTRACTOR agrees to keep all samples of COMPANY Materials in a reasonably safe place and restrict access to the COMPANY Materials to persons involved in the conduct of the Services.

5. Confidential Information.

(a) Definition of Confidential Information. For the purposes of this Agreement, "Confidential Information" will mean: (i) the COMPANY Materials; (ii) the Results; (iii) the terms and conditions of this Agreement; and (iv) any and all confidential and proprietary information of COMPANY that COMPANY expressly marks or otherwise identifies in writing as being Confidential Information and that COMPANY discloses to CONTRACTOR for use under this Agreement or a related Work Order..

(b) Nonuse and Nondisclosure. During the term of this Agreement and for a period of five (5) years thereafter, CONTRACTOR will maintain all Confidential Information in confidence and will use Confidential Information only for the purposes contemplated in this Agreement. During such period, CONTRACTOR will not disclose any Confidential Information to any third party or person except for persons involved in the conduct of the Services who have agreed, in writing, to treat the COMPANY Materials and Confidential Information in accordance with the requirements of this Agreement.

(c) Maintenance of Confidentiality. CONTRACTOR agrees to take reasonable measures to protect the secrecy of and avoid disclosure and unauthorized use of the Confidential Information. Without limiting the foregoing, the CONTRACTOR will use at least that degree of care that it takes to protect its own confidential information of a similar nature, but in no event less than reasonable care.

(d) Exclusions. The obligations of confidentiality set forth above will not apply to the extent that CONTRACTOR can demonstrate that Confidential Information: (i) was in the public domain or otherwise known to CONTRACTOR prior to this Agreement or becomes part of the public domain or otherwise known to CONTRACTOR through no fault of CONTRACTOR (ii) was independently developed or discovered by CONTRACTOR without the use of any Confidential Information as evidenced by written documentation (iii) is or was disclosed to CONTRACTOR at any time by a third party having no obligation of confidentiality with respect to such Confidential Information or (iv) is required to be disclosed to comply with applicable laws or regulations, or with a court or administrative order, including without limitation in a filing with the United States Securities and Exchange Commission, provided that CONTRACTOR gives notice to COMPANY prior to making such disclosure, uses its best efforts to limit disclosure and to obtain confidential treatment or a protective order and has allowed COMPANY to participate in the proceeding.

6. Ownership; Intellectual Property Rights; License.

Return to Agenda

(a) Ownership of Results and Intellectual Property. Upon completion of the Services, the CONTRACTOR will provide COMPANY with a written report containing the data and results of the Services (the "Results"), which COMPANY will be free to use in the course of its business. COMPANY will own all Results and any Intellectual Property generated based to the Results. (As used herein, "**Intellectual Property**" means: (i) any and all information, data, Results, inventions and discoveries, whether or not patentable or copyrightable, made by CONTRACTOR individually or in conjunction with others in connection with the Services or based on any Confidential Information, including, without limitation, all reports and other deliverables; (ii) all modifications and/or improvements to the Materials and any and all analogs, progeny, derivatives and/or reproducible and/or functional portions thereof made by CONTRACTOR individually or in conjunction with others, whether or not patentable; and (iii) all intellectual property rights in and to all items described in clauses (i) and (ii) above.) CONTRACTOR shall not file or cause to be filed any patent applications or any other form of intellectual property protection based on the Results or the COMPANY Materials. CONTRACTOR agrees to assign and hereby assigns to COMPANY all rights to Intellectual Property, arising from the performance of the Services, including the Results and all other work product (the "Deliverables"). All work products resulting from the Services that are "Works Made for Hire" as defined in the U.S. Copyright Act and other copyrightable works will be deemed, upon creation, to be assigned to COMPANY. COMPANY will be free to use Deliverables for any and all purposes. CONTRACTOR shall promptly disclose to COMPANY any and all known Intellectual Property. At COMPANY's request and expense, CONTRACTOR shall undertake all further actions required to perfect COMPANY's title to, and enjoyment of, such Intellectual Property.

(b) Limitation of Rights. Nothing contained in this Agreement will be construed to grant CONTRACTOR any ownership, license or rights to any of the COMPANY Materials, Confidential Information or to any COMPANY patents, trademarks or other intellectual property rights.

(c) COMPANY Property Rights. All COMPANY Materials and Confidential Information will remain the property of COMPANY and, upon completion of the Services or otherwise upon COMPANY's request, CONTRACTOR will promptly destroy all unused COMPANY Materials and written Confidential Information, and any copies, notes, summaries or extracts thereof. CONTRACTOR will certify completion of the destruction in a certificate of destruction that must be sent to COMPANY. Notwithstanding the above, CONTRACTOR may retain one copy for legal purposes as a record of its obligations under this Agreement. In addition, the destruction obligation does not apply to copies of Confidential Information stored in backup systems, provided that such media are not readily accessible to users.

7. Representations and Warranties; Covenants.

(a) CONTRACTOR represents and warrants that CONTRACTOR has the legal authority to enter into this Agreement.

(b) COMPANY represents and warrants that it has the legal authority to enter into this Agreement and, to the best of its knowledge, it owns all right, title, and interest in and to the Materials and other information that will be transferred to CONTRACTOR under this Agreement or any Work Order, that no other person or entity has any rights in such Materials and other information, that

Return to Agenda

it has the right to transfer such Materials and other information to CONTRACTOR for the Services, and that it is not aware of any pending or threatened litigation alleging that COMPANY does not have the rights stated in this subsection.

8. Warranty Disclaimer.

EXCEPT AS STATED IN SECTION 7(B), THE COMPANY MATERIALS AND INFORMATION ARE PROVIDED "AS IS" WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, AND SPECIFICALLY WITHOUT WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. CONTRACTOR SHALL NOT BE RESPONSIBLE FOR ANY LIMITATION ON ITS ABILITY TO PERFORM SERVICES OR PROVIDE RESULTS ARISING FROM OR RELATED TO DEFICIENCIES, INADEQUACIES, OR IMPERFECTIONS WITH THE COMPANY MATERIALS AND INFORMATION. CONTRACTOR MAKES NO WARRANTY AS TO THE USEFULNESS OF ANY RESULTS FROM THE SERVICES. COMPANY WILL BE RESPONSIBLE FOR WHATEVER IT DESIRES TO MAKE OF THE RESULTS.

9. Limitations on Liability and Remedies.

(a) NEITHER COMPANY NOR CONTRACTOR SHALL BE LIABLE TO THE OTHER FOR ANY PUNITIVE, CONSEQUENTIAL, INCIDENTAL, INDIRECT, EXEMPLARY OR SPECIAL DAMAGES (INCLUDING LOST REVENUES OR LOST PROFITS) IN CONNECTION WITH ANY CAUSE OF ACTION FOR BREACH OF THIS AGREEMENT.

(b) IN ALL CASES, CONTRACTOR'S LIABILITY FOR ANY ERROR, ACT, OR OMISSION OR FOR ANY BREACHES OF THIS AGREEMENT SHALL BE LIMITED TO THE LESSER OF: (I) ACTUAL, DIRECT DAMAGES SUFFERED BY COMPANY AS A RESULT OF SUCH BREACHES OR (II) THE TOTAL AMOUNT PAID BY COMPANY TO CONTRACTOR AS ROYALTIES UNDER THIS AGREEMENT.

10. Term and Termination; Survival.

(a) General. The term of this Agreement shall commence on the Effective Date and shall continue thereafter, until: (i) final completion of the Services; or (ii) until December 31, 2022, whichever is later, unless terminated by one of the Parties in accordance with Section 10(b) of this Agreement.

(b) Termination.

(i) COMPANY will have the right to terminate this Agreement, any Work Order, or any portion of ordered Services or deliverables contained within any Work Order, without cause upon thirty (30) days' prior written notice to CONTRACTOR. CONTRACTOR may terminate this Agreement, without cause, upon thirty (30) days' prior written notice to COMPANY; provided, however, CONTRACTOR will complete any Work Order then in effect (unless directed otherwise by COMPANY) but will not accept any Work Order after providing notice of termination.

Return to Agenda

(ii) In the event that either Party remains in material breach of any of the provisions of this Agreement or a Work Order (such breaching Party, the "**Defaulting Party**") without cure for a period of thirty (30) days after receiving written notice of such material breach from the non-breaching Party (the "**Non-Defaulting Party**"), the Non-Defaulting Party may terminate this Agreement or the Work Order forthwith by written notice to the Defaulting Party.

(c) Effect of Termination.

(i) Upon any termination of a Work Order or termination of this Agreement pursuant to Section 10(b) above, CONTRACTOR shall immediately cease and desist from incurring any further costs or expenses in connection with the affected Services, and COMPANY shall be responsible solely for those non-cancelable and non-refundable costs and expenses incurred by CONTRACTOR in connection with the affected Services on or before the effective date of cancellation or termination.

(ii) CONTRACTOR shall provide to COMPANY a summary of costs and expenses incurred through the effective date of cancellation or termination, together with original receipts, within fifteen (15) days of such effective date of cancellation or termination.

(iii) Reconciliation of the Parties' accounts required by the costs and expenses accounting mechanism set forth in Section 10(c)(ii) shall be done as follows:

(1) in the event COMPANY has not paid any amount owed to CONTRACTOR under such accounting mechanism, within thirty (30) days of the effective date of cancellation or termination COMPANY shall pay to CONTRACTOR the amount of the underpayment; or

(2) in the event COMPANY has advanced funds to CONTRACTOR in excess of the amount owed to CONTRACTOR by COMPANY under such accounting mechanism, within thirty (30) days of the effective date of cancellation or termination CONTRACTOR shall refund to COMPANY the amount of the overpayment, as the case may be.

(d) Survival. Sections 1(c), 2, 3(b), 4(c)-(f), 5, 6, 7, 8, 9, 10(c), 10(d), 11, 12, and 14(b)-(l) will survive any termination of this Agreement. Termination of this Agreement will not relieve either Party of any liability which accrued hereunder prior to the effective date of such termination, nor preclude either Party from pursuing all rights and remedies it may have hereunder or at law or in equity with respect to any breach of this Agreement, nor prejudice either Party's right to obtain performance of any obligation.

11. **Communications and Notices.**

(a) CONTRACTOR will direct all communications and reports relating to a Work Order to the Technical Contact at COMPANY identified in Exhibit A, any contact at COMPANY identified in such Work Order, or such other person as COMPANY may later designate. CONTRACTOR will direct all communications relating to an invoice or a payment to the Financial Contact at COMPANY identified in Exhibit A or such other person as COMPANY may later designate COMPANY will direct all communications and reports relating to a Work Order to the

Return to Agenda

Technical Contact at CONTRACTOR identified in Exhibit A, any contact at CONTRACTOR identified in such Work Order, or such other person as CONTRACTOR may later designate. COMPANY will direct all communications relating to an invoice or a payment to the Financial Contact at CONTRACTOR identified in Exhibit A or such other person as CONTRACTOR may later designate

(b) Any notice or other communication required or permitted by this Agreement to be given to a Party shall be in writing in English and shall be deemed given if delivered personally or by commercial messenger or courier service, or mailed by U.S. registered or certified mail (return receipt requested) or its foreign equivalent, to the Party at the Party's "Legal Contact" address set forth in Exhibit A. If by mail, delivery will be deemed effective five (5) business days after mailing in accordance with this Section 11(b).

Each Party may change its address and/or contact person for such notices and communications by written notice to the other Party in accordance with this Section 11(b).

12. <u>Indemnification and Insurance</u>.

(a) COMPANY will indemnify, defend, and hold harmless CONTRACTOR and its employees, officers, independent CONTRACTORs, consultants, or agents, and their respective successors, heirs and assigns and representatives (the "CONTRACTOR Indemnitees"), from and against any and all third-party claims, threatened claims, damages, losses, suits, proceedings, liabilities, costs (including without limitation reasonable legal expenses, costs of litigation, and reasonable attorney's fees) or judgments, whether for money or equitable relief, of any kind ("Losses and Claims"), to the extent arising out of or relating to, directly or indirectly: (a) the negligence, recklessness, or wrongful intentional acts or omissions of COMPANY, its affiliates, and their respective employees, officers, independent CONTRACTORs, consultants, or agents, in connection with COMPANY's performance of its obligations or exercise of its rights under this Agreement; (b) any breach by COMPANY of any representation, warranty, covenant, or obligation set forth in this Agreement.

(b) CONTRACTOR is a political subdivision of the Commonwealth of Virginia. Therefore, with respect to tort or other liability, CONTRACTOR may be immune (or partially immune) from suit, judgment, or liability, as determined by applicable Virginia law. No provision, covenant or agreement contained in this Agreement shall be deemed to be a waiver or limitation of CONTRACTOR's sovereign immunity from tort or other liability. Subject to the foregoing and to the extent permitted by applicable law, CONTRACTOR will be responsible for the intentional, reckless, or negligent errors, acts, or omissions of its employees.

(c) <u>Insurance</u>.

(i) During the term of this Agreement, CONTRACTOR shall each obtain, pay for, and keep in full force and effect policies of Commercial General Liability and/or Professional Liability Insurance, which policies shall, by virtue of either the limit of a single policy or the combined limits of a plurality of policies, have minimum per occurrence/per claim limits of at least one (1) million dollars ($1,000,000), and which policies shall be carried by one or more insurance carriers with an AM Best Rating of at least A-, VII or its equivalent. In the event that any such insurance policy is written on a claims-made basis, then the policy shall be maintained during the entire period of this Agreement and for a

Return to Agenda

period of not less than three (3) years following the termination or expiration of this Agreement.

(ii) During the term of this Agreement, COMPANY shall each obtain, pay for, and keep in full force and effect policies of Commercial General Liability and/or Professional Liability Insurance, which policies shall, by virtue of either the limit of a single policy or the combined limits of a plurality of policies, have minimum per occurrence/per claim limits of at least one (1) million dollars ($1,000,000), and which policies shall be carried by one or more insurance carriers with an AM Best Rating of at least A-, VII or its equivalent. In the event that any such insurance policy is written on a claims-made basis, then the policy shall be maintained during the entire period of this Agreement and for a period of not less than three (3) years following the termination or expiration of this Agreement.

(iii) The Parties may request proof of all insurance coverage and/or certificates thereof at their discretion anytime.

13. Export Control

The CONTRACTOR agrees that the technology subject to this Agreement is subject to the export control laws and regulations of the United States, including but not limited to the Export Administration Regulations ("EAR") and undertakes to comply with these laws and regulations. Without limiting the foregoing, the CONTRACTOR will not, without a U.S. Bureau of Industry and Security license or license exception, export, re-export, or transfer any technology subject to this Agreement, either directly or indirectly, to any national of any country in breach of such laws and regulations.

14. Miscellaneous.

(a) Further Obligation. Nothing in this Agreement will be construed as an obligation of either Party to enter into any further agreement with the other Party.

(b) Governing Law. This Agreement will be governed and interpreted in accordance with the laws of the Commonwealth of Virginia, without regard to the conflicts of law provisions thereof. Any claim or controversy arising out of or related to this Agreement or any breach hereof shall be submitted to a court of applicable jurisdiction in the City of Danville, Virginia, and each party hereby consents to the jurisdiction and venue of such court.

(c) Entire Agreement. This Agreement constitutes the entire agreement between the Parties with respect to the subject matter hereof and supersedes all prior agreements or understandings between the Parties relating to the subject matter hereof.

(d) Independent Parties. The Parties understand that both Parties hereto are independent CONTRACTORs and are engaged in the conduct of their own respective businesses. Neither Party is to be considered the agent of the other Party for any purpose, and neither Party has the right or authority to enter into any contracts or assume any obligations for the other or to give any warranty to or make any representation on the other's behalf, except where and to the extent authorized specifically in writing to do so.

Return to Agenda

(e) Assignment. Without the other Party's prior written consent, no Party may assign or delegate or encumber any right or obligation hereunder, except that COMPANY may assign its rights or transfer its obligations to its affiliates or in connection with the sale or transfer of the majority of its stock or all or substantially all of its assets to which this Agreement relates, whether as part of a merger, acquisition, or asset sale. Any transfer or assignment in contravention of this Agreement shall be null and void.

(f) Modification; Waivers. This Agreement may not be altered, amended or modified in any way except in writing signed by both Parties. Waiver of any term or provision of this Agreement or forbearance to enforce any term or provision by either Party shall not constitute a waiver as to any subsequent breach or failure of the same term or provision or a waiver of any other term or provision of this Agreement.

(g) Severability. If any term or condition hereof is found to be invalid or unenforceable by any competent court, such term or condition will be ineffective only to the extent that it is in contravention of applicable law, without invalidating the remaining terms and conditions hereof.

(h) Voluntary Nature of Agreement. Each Party acknowledges and agrees that it is executing this Agreement voluntarily and without any duress or undue influence by the other Party or anyone else. Each Party further acknowledges and agrees that it has been provided an opportunity to seek the advice of an attorney of its choice before signing this Agreement.

(i) Construction. Headings included herein are for convenience only, and shall not be used to construe this Agreement. Ambiguities, if any, in this Agreement shall not be construed against any Party, irrespective of which Party may be deemed to have drafted the Agreement or authorized the ambiguous provision.

(j) Publicity/Advertising. Neither Party hereto shall originate any publicity, news release, or other announcement, written or oral, whether to the public press, the trade, customers or otherwise, relating to this Agreement, or to the performance hereunder or the existence of an arrangement between the Parties, without the prior written approval of the other Party hereto, except where such publicity, news release or other public announcement is required by law.

(k) Force Majeure. Except as otherwise herein provided, neither Party shall be liable or deemed in default for failure to perform any duty or obligation that such Party may have under this Agreement (other than a failure to make payment that is due and owing) where such failure has been occasioned by any act of terror, God, fire, inevitable accidents, war, civil unrest or any other cause outside the reasonable control of that party and occurring without its fault or negligence. The Party whose performance has so been interrupted shall give the other Party notice of the interruption and cause and shall use every reasonable means to resume full performance of this Agreement as soon as possible. In the event the period of non-performance exceeds sixty (60) days, the other Party to this Agreement may terminate this Agreement or the applicable Work Order without penalty immediately upon written notice of termination to the non-performing Party.

(l) Counterpart Signatures. This Agreement may be executed in two or more counterparts, each of which will be deemed an original, but all of which together will constitute one and the same instrument. The Parties agree that this Agreement may be executed and delivered by facsimile,

Return to Agenda

electronic mail, internet, or any other suitable electronic means, and the Parties agree that signatures delivered by any of the aforementioned means shall be deemed to be original, valid, and binding upon the Parties.

Return to Agenda

The Parties hereto have entered into this Agreement by their duly authorized representatives as of the Effective Date.

Institute for Advanced Learning and Research

Signature

Printed Name

Title

Date

COMPANY

Signature

Printed Name

Title

Date

Return to Agenda

Exhibit A

Contact Information

Company Name	**Institute for Advanced Learning and Research**
Mailing Address	Mailing Address 150 Slayton Avenue Danville, Virginia 24540
Shipping & Express Mail Address	Shipping & Express Mail Address 150 Slayton Avenue Danville, Virginia 24540 Telephone: 434-766-6700
Legal Contact Address	**Legal Contact Address** IALR 150 Slayton Avenue Danville, Virginia 24540 Attn: Grants and Contracts

Technical Contact	**Technical Contact**
Name:	Name: Yimeng "Jack" He
Telephone:	Telephone: 434-766-6629
E-mail:	E-mail: Yimeng.He@ialr.org

Financial Contact	**Financial Contact**
Name:	Name: Robin Barker
Telephone:	Telephone: 434-766- 6730
E-mail:	E-mail: robin.barker@ialr.org

Return to Agenda

Exhibit B

WORK ORDER NO. ___

This Work Order No. _____, including Appendix 1 (the "Work Order") is entered into pursuant to the Master Services Agreement between _____ ("COMPANY") and the Institute for Advanced Learning and Research, ("CONTRACTOR") dated _____, 20____ (the "Agreement"). This Work Order is effective as of the date of the last signature herein (the "Work Order Effective Date"). Capitalized terms used in this Work Order and not otherwise defined will have the same meaning as set forth in the Agreement. This Work Order and any appendix hereto shall be incorporated into the Agreement. However, if there is a conflict between the terms and conditions of the Agreement and this Work Order (including any appendix hereto), the Work Order shall govern.

The Parties hereby agree as follows:

1. Work Order. This document constitutes a Work Order as defined in the Agreement, and the Services to be provided hereunder are subject to the terms and conditions of the Agreement. COMPANY will provide the Materials listed in Annex 1 of this Work Order in connection with the Services, in addition to any other Materials that COMPANY may provide to CONTRACTOR in connection with the Services.

2. Statement of Work; Scope of Services; Deliverables.
Describe Services and any protocols or practices that are to be applied in providing the Services.

3. Budget; Payment Schedule. The maximum amount due under this Work Order shall not exceed _____Dollars ($_____). Invoices shall be e-mailed to _____. Payments will be made within thirty (30) days of COMPANY's receipt of invoice from CONTRACTOR.

4. Term. The term of this Work Order will commence on the Work Order Effective Date set forth above, and will continue for _____ or until the Services described are complete or this Work Order is terminated in accordance with the Agreement.

5. Approved Subcontractors. CONTRACTOR will notify COMPANY in writing when they intend to use subcontractors, in part or in full, for any project. COMPANY, at its own discretion, shall have the right to refuse the use of a particular subcontractor.

6. Amendments. Any change in the details of this Work Order or the assumptions upon which this Work Order is based (including, but not limited to, changes in the starting date for the project or a delay or suspension of the project by COMPANY, changes in the project budget and/or timelines) will require an amendment. No amendment of this Work Order will be effective unless in writing and signed by authorized representative of each Party.

Return to Agenda

ACCEPTED AND AGREED by their duly authorized representatives.

Institute for Advanced Learning and Research

Signature

Printed Name

Title

Date

Company

Signature

Printed Name

Title

Date

Return to Agenda

APPENDIX 1
TO WORK ORDER

MATERIALS PROVIDED BY COMPANY

Return to Agenda

MUTUAL CONFIDENTIALITY AND NONDISCLOSURE AGREEMENT

This Mutual Confidentiality and Nondisclosure Agreement (the "Agreement"), effective the 12th day of April, 2024 ("Effective Date"), is made by and between the Institute for Advanced Learning and Research, a political subdivision of the Commonwealth of Virginia with its principal place of business at 150 Slayton Drive, Danville, Virginia 24540 (hereinafter the "IALR") and (Company name) a (Company type) with its principal place of business (Company address), ("Company").

IALR and Company (hereinafter referred collectively as the "Parties" and individually as a "Party") may exchange through correspondence (including without limitation electronic correspondence), documents, and discussions technical, business, and financial information concerning each other's efforts. Each Party agrees to receive said information on the following terms and conditions:

1. PURPOSE OF THIS AGREEMENT

The purpose of this Agreement is to allow the Parties to engage in a business relationship whereby Company provide advisory services to IALR, and to protect the confidential nature of certain information that may be provided by Company to the IALR or by the IALR to Company as part of such relationship. ("Purpose"). In order to facilitate the discussions contemplated hereunder, the Parties agree that each may receive (the "Recipient") from the other (the "Disclosing Party") certain information that is proprietary, secret, and confidential, and that such information will be disclosed by the Disclosing Party to the Recipient only on the terms and conditions contained herein. Nothing in this Agreement shall be construed or interpreted as requiring either Party to disclose any Confidential Information to the other Party. Nothing contained in this Agreement shall be construed as an obligation to enter into any further agreement concerning the Confidential Information, or as a grant of license to the Recipient to use the Confidential Information other than for the Purpose. Nothing in this Agreement shall obligate either Party to proceed with any transaction between them, and each Party reserves the right, in its sole discretion, to terminate the discussions concerning the Purpose.

2. CONFIDENTIAL INFORMATION

"Confidential Information" means any and all nonpublic information and materials that Disclosing Party designates as being confidential or which, under the circumstances surrounding disclosure the Recipient should know is treated as confidential by Disclosing Party, regardless of whether such information is disclosed in writing or verbally and regardless of the form of transmission of such information, provided that nonpublic information disclosed verbally shall be described in a writing delivered by Disclosing Party to Recipient within thirty (30) days of the date of disclosure. Confidential Information includes, without limitation, the following: (a) intellectual property positions and analyses, scientific data, technical information, business operations, business strategies, business plans, and strategic plans; (b) existing or proposed products, research, development efforts, or lines of business; (c) biological material, chemistries, or formulas; (d) ideas, samples, techniques, sketches, drawings, works of authorship, models, inventions, trade secrets, know-how, processes, apparatuses, equipment, algorithms, designs, data, analysis, software programs, and software source documents, and formulas; (e) trial or experimental data, business models and contracting strategies; (f) specifications, engineering, financial information,

Return to Agenda

financing plans, procurement requirements, purchasing, manufacturing, customer lists, investors, employees, business and contractual relationships, business forecasts, sales and merchandising, marketing plans; and (g) any similar information the Disclosing Party provides regarding, or disclosed to it by, third parties.

Confidential Information does not include any information that: (i) is or subsequently becomes publicly available without Recipient's breach of this Agreement; (ii) became known to Recipient prior to Disclosing Party's disclosure of such information to Recipient, which Recipient can show by competent written proof; (iii) became known to Recipient from a source other than Disclosing Party without breach by such source of any obligation of confidentiality owed to Disclosing Party; or (iv) is independently discovered or developed by Recipient without reliance on, use of, or guidance from the Disclosing Party's Confidential Information. The burden of proving the applicability of any of these exceptions to "Confidential Information" resides with the Recipient.

3. LIMITATION ON USE; OBLIGATION OF NON DISCLOSURE

The Parties may use Confidential Information only for the Purpose. Recipient shall not use the Confidential Information for any other purpose, or publish or disclose any Confidential Information to third parties or persons, including Patent Offices in any country, for five (5) years following the date of termination or expiration of this Agreement, except as expressly set forth herein, as required by law, statute or regulation, or in accordance with judicial, administrative, or other governmental order (provided Recipient shall give Disclosing Party reasonable notice to the extent legally permitted prior to such compelled disclosure and shall comply with any applicable protective order or equivalent). Recipient shall safeguard the Confidential Information with no less care than the Recipient takes to protect its own confidential information. Recipient may disclose Confidential Information only to Recipient's (including the Recipient's affiliates') employees or consultants on a need-to-know basis in connection with the Purpose. Recipient will have executed appropriate written agreements, or maintain policies with such employees and consultants sufficient to require them to comply with all the provisions of this Agreement. To the extent permitted by law, Recipient shall be responsible for any breach of this Agreement by such employees and consultants. Recipient may not reverse engineer, decompile or disassemble any software, device or other composition of matter disclosed to Recipient.

4. OWNERSHIP OF CONFIDENTIAL INFORMATION

Except for the right to use the Disclosing Party's Confidential Information for the Purpose, no right, title or interest is granted or conferred by the Disclosing Party to the Recipient in the Disclosing Party's Confidential Information, by license or otherwise. Recipient recognizes and agrees that nothing contained in this Agreement shall be construed as granting any property rights, by license or otherwise, to any Confidential Information disclosed pursuant to this Agreement, or to any invention or any patent, copyright, trademark, or other intellectual property right that has issued or that may issue, based on such Confidential Information. Recipient shall not make, have made, use or sell for any purpose any product or other item using, incorporating or derived from any Confidential Information.

5. TERM AND TERMINATION

Return to Agenda

This Agreement shall remain in force for a period of three (3) years from the date of last signature hereon ("Termination Date"). This Agreement can be terminated prior to the Termination Date by either Party by giving thirty (30) day's prior written notice to the other Party. Recipient's obligations under this Agreement shall survive any such expiration or termination.

6. NOTICE OF DISCLOSURE

Recipient shall notify Disclosing Party immediately upon discovery of any unauthorized use or disclosure of the Confidential Information or any other breach of this Agreement by Recipient, and will cooperate with Disclosing Party in every reasonable way to help Disclosing Party regain possession of the Confidential Information and prevent its further unauthorized use.

7. RETURN OF INFORMATION

Upon termination or expiration of the Agreement, or upon written request of the Disclosing Party, Recipient shall within thirty (30) days return to the Disclosing Party all documents, notes and other tangible materials representing the Confidential Information and all copies thereof, provided that Recipient may retain one (1) copy of Confidential Information in its confidential, restricted access files for use only to prove compliance with the terms of this Agreement. Confidential Information shall not be reproduced in any form except as required to accomplish the Purpose of this Agreement. Any reproduction of any Confidential Information shall remain the property of the Disclosing Party and shall contain any and all confidential or proprietary notices or legends which appear on the original, unless otherwise authorized in writing by the Disclosing Party.

8. INJUNCTIVE RELIEF

The Parties acknowledge that monetary damages may not be a sufficient remedy for unauthorized disclosure or use of Confidential Information and that Disclosing Party shall be entitled, without waiving any other rights or remedies, to such injunctive and other equitable relief (without posting of any bond or surety, and without the necessity of showing actual monetary damages) as may be deemed proper by a court of competent jurisdiction.

9. EXPORT LAWS

Recipient shall not export, directly or indirectly, any technical data acquired pursuant to this Agreement or any product utilizing any such data to any country for which the U.S. Government or any agency thereof at the time of export requires an export license or other governmental approval without first obtaining such license or approval. Recipient also shall not, under any circumstances disclose Confidential Information to any foreign national if such disclosure would violate export control laws or regulations of the United States.

10. MISCELLANEOUS

(a) This Agreement constitutes the entire understanding between the Parties with respect to its subject matter. It may not be modified except by a written agreement signed by authorized representatives of both Parties. None of the provisions of this Agreement will be deemed to have been waived by any act or acquiescence on the part of Disclosing Party, its agents, or employees, but only by an instrument in writing signed by an authorized officer of Disclosing Party. No waiver

Return to Agenda

of any provision of this Agreement constitutes a waiver of any other provision(s) or of the same provision on another occasion.

(b) This Agreement shall not be assigned by either Party without the prior written consent of the other Party, which consent may be withheld in such other Party's sole discretion. Any purported assignment in violation of this paragraph shall be void. This Agreement shall be binding upon and shall inure to the benefit of the Parties and their permitted successors and assigns.

(c) This Agreement shall be construed and controlled by the laws of the Commonwealth of Virginia (without regard to such state's choice of law rules). Further, the Parties agree that any disputes arising out of or relating to this Agreement shall be brought in the state and federal courts sitting in the City of Danville, Virginia, and the Parties hereby consent to the personal jurisdiction and venue of these courts. No litigation arising out of or relating to this Agreement shall be brought in any other court. Without limiting the foregoing, the parties may agree to submit any dispute between them to a mutually agreeable form of alternative dispute resolution.

(d) If any provisions of this Agreement are held by a court of competent jurisdiction to be illegal, invalid or unenforceable, such provisions shall be limited or eliminated to the minimum extent necessary so that this Agreement shall otherwise remain in full force and effect.

(e) All notices under this Agreement shall be delivered personally or sent by first class post or by fax or electronic mail, to the Party due to receive the notice or communication at its address set out in this Agreement or such other address as either Party may specify by notice in writing to the other. In the absence of evidence of earlier receipt, any notice or other communication shall be deemed to have been duly given: (i) if delivered personally, when left with a competent adult at the address referred to above and a receipt acknowledging delivery is received; (ii) if sent by mail five (5) days after posting it; (iii) if sent by fax or electronic mail, when electronic confirmation of receipt is received.

(f) If either Party is required, by controlling law or statue or in any civil or criminal legal proceeding or any regulatory proceeding or any similar process, to disclose any part of the Confidential Information, such Party shall, prior to the disclosure and to the extent legally permitted, give the other Party notice as soon as practicable of such request.

(g) This Agreement does not create any agency, partnership, joint venture, employment, or independent contractor relationship between the Parties

(h) ALL INFORMATION DELIVERED UNDER THIS AGREEMENT IS GIVEN "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTY REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION, OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Return to Agenda

(i) The Parties represent and warrant that they have the right to enter into this Agreement. The Parties further represent and warrant that the terms of this Agreement are not inconsistent with other contractual obligations, express or implied that they may have.

(j) This Agreement may be executed in any number of counterparts, each of which, when executed and delivered, is an original, but all counterparts taken together shall constitute one document. This Agreement will not take effect until both Parties have executed it.

IN WITNESS WHEREOF, this Agreement has been executed by the duly authorized representatives of the Parties on the dates indicated below:

INSTITUTE FOR ADVANCED LEARNING AND RESEARCH

By:_____

Telly Tucker

President

Date:_____

(COMPANY NAME)

By:_____

Name: _____

Title:_____

Date:_____

Return to Agenda