99 High Street
Boston, MA 02110

Main: 617-330-2000
Fax: 617-330-2001

massdevelopment.com

March 1, 2023

The Honorable Joanne M. Comerford
Joint Committee on Higher Education Senate Chair
24 Beacon Street
Room 410 – State House
Boston, MA 02133

The Honorable David M. Rogers
Joint Committee on Higher Education House Chair
24 Beacon Street
Room 473B – State House
Boston, MA 02133

Mr. Michael D. Hurley
Senate Clerk
24 Beacon Street
Room 335 – State House
Boston, MA 02133

Mr. Steven T. James
House Clerk
24 Beacon Street
Room 145 – State House
Boston, MA 02133

RE: Innovation Voucher Program Fund Annual Report

Dear Madam Chairwoman, Mr. Chairman, and Sirs:

Massachusetts Development Finance Agency (MassDevelopment) is pleased to submit this fifth annual report of the Innovation Voucher Program Fund (Fund) as required by M.G.L. Chapter 75, s.45C. The Fund was established as of July 1, 2017, and regulations were promulgated on November 16, 2018. The Commonwealth has allocated $10 million to capitalize the Fund.

Across the five campuses of the University of Massachusetts (UMass), 90 Core Facilities enable faculty, students, and industry collaborators to access a broad array of equipment to enhance their R&D capabilities, address both basic and translational questions, deliver technologies and product candidates more rapidly, and become more competitive in obtaining state, federal, foundation, and private funding. UMass may award vouchers to allow companies to use these Core Facilities for work that includes, but is not limited to, the construction of prototypes, testing, and market research, so long as this work furthers the goals of job creation, innovation, and economic development.

The Innovation Voucher Program Fund is held and administered by MassDevelopment and its moneys shall be deployed to:

> (A) reimburse UMass for vouchers that it may issue to eligible small corporations and startup companies for a portion of the cost of either or both of (1) their use of Core Facilities, or (2) their contract for work to be performed by UMass using the Core Facilities; and
>
> (B) reimburse MassDevelopment for its direct costs of administering the Fund.

UMass submitted its first invoice under the program in January 2019, which, as reported in the Program's first annual report dated March 1, 2019, covered disbursements of $419,217.91 against 43 voucher requests made from Fund inception to February 28, 2019.

The second annual report submitted on March 1, 2020, demonstrated that from March 1, 2019 through February 29, 2020, four UMass campuses submitted 214 reimbursement requests against the vouchers issued to 109 companies for which total reimbursement of $1,254,593.19 was approved.

The third annual report submitted on March 1, 2021, demonstrated that from March 1, 2020 through February 28, 2021, four UMass campuses submitted 234 reimbursement requests against the vouchers issued to 129 companies for which total reimbursement of $1,683,480.81 was approved.

The fourth annual report submitted on March 1, 2022, demonstrated that from March 1, 2021 through February 28, 2022, four UMass campuses submitted 293 reimbursement requests against the vouchers issued to 140 companies for which total reimbursement of $2,265,562.85 was approved.

The attached annual report summarizes the progress that MassDevelopment has made with respect to the Fund from March 1, 2022 to February 28, 2023. During this period, four UMass campuses submitted 317 reimbursement requests against the vouchers issued to 150 companies for which total reimbursement of $2,172,091.87 was approved. UMass has reported the following details summarizing the vouchers against which disbursements were made during the past year.

Sincerely,

Daniel Rivera
President and CEO

University of Massachusetts, Amherst

The University of Massachusetts, Amherst awarded 134 vouchers to 63 companies totaling $1,294,823.15. Requested reimbursements against these vouchers during this reporting period totaled $731,653.03.

1. **3Daughters, Inc.** was awarded $3,750. The Fund allowed 3Daughters, a Concord startup company focused on evolutionary health care for women, to develop its first technology - a revolutionary approach to long-acting reversible contraception.

2. **42 Design Fab Studio Inc.** was awarded $7,500. The Fund allowed 42 Design Fab Studio, an Indian Orchard exhibit design and fabrication studio specializing in museum casework, scenic dioramas, and sculptures, to fulfill a special order for one of its clients.

3. **ACTnano, Inc.** was awarded $900. The Fund allowed ACTnano, a Cambridge-based global leader in protective nanocoating for automotive and consumer electronics, to develop and test products with technical rigor. It also provided an opportunity for the company's engineers to acquire skills in operating multiple analytical instruments.

4. **AI Proteins, Inc.** was awarded $7,500. The Fund allowed AI Proteins, an Andover biotechnology company reimagining the possibilities of protein therapeutics by synthetically designing new proteins to carry out specific therapeutic functions, to accelerate its most critical operations, including protein quality control.

5. **Asymmetrex, LLC** was awarded two vouchers totaling $15,000. The Fund allowed Asymmetrex, a Boston company with a mission of advancing innovative adult tissue stem cell technologies to applications in medicine and drug development, to conduct cell culture analyses that are essential for the development of a first-in-kind technology for determining the specific dosage of therapeutic stem cells.

6. **BrainStem Biometrics Inc.** was awarded $712.50. The Fund allowed BrainStem Biometrics, a Lincoln company that has developed a unique sedation monitoring system, to redesign its wearable neurosensor. The redesign is expected to result in a lower-cost, higher-performance sensor that is optimized for additive manufacturing processes.

7. **Catch the Sun Design (Olive Barber)** was awarded four vouchers totaling $13,500. The Fund allowed Catch the Sun Design, a Pelham small business making whimsical sun catchers inspired by nature, to access and use a laser cutter to create the base for the company's product.

8. **Civetta Therapeutics, LLC** was awarded two vouchers totaling $8,800. The Fund allowed Civetta Therapeutics, a Cambridge biotechnology company focused on developing a pipeline of therapies that target beta-propeller proteins, to use an entirely

new screening approach and library for its company, accelerating its research and development.

9. **Clean Crop Technologies, Inc.** was awarded two vouchers totaling $21,250. The Fund allowed Clean Crop Technologies, a Holyoke company using cold plasma chemistry to ionize a food-safe gas to destroy pathogens without harming food quality, to leverage affordable rapid prototyping services for several core product components.

10. **Cofab Design LLC** was awarded $3,750. The Fund allowed Cofab Design, a Holyoke small design and engineering consultancy, to access flexible, technically sophisticated local partners and vendors, quickly turn around projects, and add considerable technical value to its work that it would be unable to sustain in-house.

11. **Cyvl, Inc.** was awarded two vouchers totaling $11,250. The Fund allowed the Somerville startup with a mission to streamline infrastructure inspections for civil engineers while producing better, safer deliverables, to develop affordable solutions for municipalities to manage infrastructure assets more effectively and efficiently.

12. **Dap Management** was awarded $3,750. The Fund allowed Dap Management, a Manchester small business, to access technical resources that made it possible to collaborate with a multinational medical technology customer to develop necessary components using 3D-printed parts in support of a new product.

13. **DeepCharge, Inc.** was awarded three vouchers totaling $26,250. The Fund allowed DeepCharge, a Needham company building functionally superior wireless charging devices, to successfully launch its phase I and II pilot demonstrations by using 3D-printed parts.

14. **Diemat, Inc.** was awarded $5,625. The Fund allowed Diemat, a Byfield company that specializes in the development and manufacturing of innovative adhesive and sealing materials serving the electronic packaging industry, to research polymer and nano materials for the semiconductor and energy storage industries.

15. **Elateq, Inc.** was awarded four vouchers totaling $8,681.25. The Fund allowed Elateq, an Amherst water treatment company started by the Pioneer Valley Coral and Natural Sciences Institute, to accelerate its product development, provide high-quality service to its clients, and support its educational programming projects.

16. **Electro-Term, Inc.** was awarded $2,500. The Fund allowed Electro-Term/Hollingsworth, a Springfield manufacturer of solderless terminals, wire harnesses, cable assemblies, and tools to produce correct-crimp applications, to cost-effectively and rapidly source parts for its tools and machines using 3D-printing.

17. **Epicore Biosystems, Inc.** was awarded three vouchers totaling $110,559. The Fund allowed Epicore Biosystems, a small Series A startup company in Cambridge developing a wearable device to assess local sweat production and composition while subjects perform industrial work in hot and humid environments, to learn new techniques, engage in a broader range of scientific exploration, and return its findings to the greater industry towards solving problems.

18. **Ernest Pharmaceuticals, LLC** was awarded four vouchers totaling $8,490. The Fund allowed Ernest Pharmaceuticals, a Hadley company developing a microbial anti-cancer pipeline, to generate a critical mass of data and secure additional funding support rapidly and cost effectively.

19. **Etesian Technologies, LLC** was awarded $7,500. The Fund allowed Etesian Technologies, a small company headquartered in Amherst that specializes in the development of wireless, self-powered anemometers, to 3D-print parts and sell its products at competitive prices.

20. **Folia Materials, Inc.** was awarded two vouchers totaling $10,125. The Fund allowed Folia Materials, a Woburn materials science company that uses paper as a super material to make everyday life sustainable, to characterize metallic nanoparticles coating for the development of antiviral masks.

21. **FTL Labs Corporation** was awarded two vouchers totaling $5,000. The Fund allowed FTL Labs, a research, development, and management firm in Amherst, to develop more prototypes in the aerospace, medical, and VR/AR/Touch Computing fields to meet critical project goals.

22. **Galy Co**. was awarded seven vouchers totaling $27,654.37. The Fund allowed Galy, a Boston company using biotechnology and synthetic biology to create lab-grown cotton, to cost-effectively perform numerous experiments. This work, and the results obtained, has allowed Galy to successfully complete Series A financing.

23. **GenH Inc.** was awarded two vouchers totaling $22,500. The Fund allowed GenH, a next-generation clean energy technology company in Somerville, to cost-effectively buildout its Adaptive Hydro pre-commercial prototypes.

24. **Handbrew Frameworks Inc.** was awarded two vouchers totaling $11,250. The Fund allowed Handbrew Frameworks, an East Longmeadow company that builds custom, sustainably focused titanium all-road and gravel dream bikes, to implement solutions and deliver 3D-printed parts quickly and efficiently.

25. **Hyalex Orthopaedics, Inc.** was awarded two vouchers totaling $12,500. The Fund allowed Hyalex Orthopaedics, a Lexington company developing transformational

synthetic cartilage technology and implant systems for diseased and damaged joints, to rapidly develop a unique test that has provided critical insight to the development of its product and to accelerate its R&D efforts.

26. **Ichosia Biotechnology, Inc.** was awarded three vouchers totaling $9,187.50. The Fund allowed Ichosia Biotechnology, a Worcester company developing a cost-effective method of mass producing a naturally derived red blood cell, to accelerate its research and further develop its technology.

27. **Innovative Wellness Systems Inc.** was awarded four vouchers totaling $89,726.53. The Fund allowed Innovative Wellness Systems, a Dover smart insole and data analytics startup looking to solve biomechanical problems, to extend its non-dilutive funding toward the development of medical health technology.

28. **Instaversal MFG Corporation** was awarded two vouchers totaling $22,500. The Fund allowed Instaversal, a Newton company focusing on high-volume part production processes for plastic injection molding using proprietary predictive modeling, design, and additive manufacturing techniques to bring conforming cooling technology to scale, to iterate quickly through its R&D cycles by trying new materials alongside unique conforming cooling designs and enabling first-time pilot programs with new customers.

29. **J E Robison Service Co., Inc.** was awarded two vouchers totaling $15,000. The Fund Robison Service, a Springfield automobile service shop specializing in the repair of luxury imports, to take advantage of cost-effective solutions like 3D-printing.

30. **Knight Machine & Tool Company, Inc**. was awarded $2,500. The Fund allowed Knight Machine, a South Hadley machine shop with a niche in the precision grinding and lapping field, to implement solutions and deliver 3D-printed parts quickly and efficiently.

31. **Kuva Systems (MultiSensor Scientific, Inc.)** was awarded three vouchers totaling $40,000. The Fund allowed Kuva Systems, a Cambridge small business specializing in methane monitoring and leak detection with actionable images for oil and gas companies, to cost-effectively prototype and pilot a new leak detection camera.

32. **Latde Diagnostics Corp.** was awarded three vouchers totaling $1,312.50. The Fund allowed Latde Diagnostics, a Northampton startup life sciences company, to develop a rapid, low-cost test to determine antibiotic susceptibility for bloodborne pathogens.

33. **Load Controls, Incorporated** was awarded $44,799.75. The Fund allowed Load Controls, a Sturbridge manufacturer of motor power sensors for the process manufacturing world, to develop a high-level case to help the company penetrate a new market sector and demonstrate its technology at scale.

34. **Metalmark Innovations, Inc.** was awarded $10,050. The Fund allowed Metalmark Innovations, a Boston startup developing and manufacturing the first self-cleaning commercial air purifier, to develop and optimize a critical coating process for its carbon sequestration product development.

35. **Millimeter Wave Systems, LLC** was awarded two vouchers totaling $1,380. The Fund allowed Millimeter Wave Systems, an Amherst company that provides solutions for quantum computing, security sensors, environmental sensors, wireless communications, and defense and space applications, to leverage its own resources in the trial of a new technique to improve its services.

36. **Mitchell Machine Incorporated** was awarded $5,000. The Fund allowed Mitchell Machine, a Springfield manufacturer of special custom machinery, to access additive manufacturing resources and metal printing technologies, which would otherwise be beyond its reach, to create better parts with greater value for its customers.

37. **Nano-C, Inc.** was awarded $2,152.50. The Fund allowed Nano-C, a Westwood manufacturing company that is a leading innovator in the chemistry of nanostructured carbon, including fullerenes and nanotubes for high-value applications in the electronics and energy markets, to conduct an initial evaluation of ink on small-scale printing setups, which will be required before moving to the large scale R2R printing.

38. **Nested Therapeutics, Inc.** was awarded two vouchers totaling $42,500. The Fund allowed Nested Therapeutics, a Cambridge company seeking to advance precision oncology medicine by finding new driver mutations to reach a broader group of patients, to perform microscopic measurements.

39. **Nido Biosciences, Inc.** was awarded $5,400, The Fund allowed Nido Biosciences, a Cambridge biotechnology research company developing a new wave of therapies to transform the lives of patients with devastating neurological diseases, to understand how a specific protein interacts with a small molecule.

40. **Nyobolt Inc.** was awarded $5,205. The Fund allowed Nyobolt, a Waltham company offering high-performance battery and charging technologies, to explore previously unavailable coating conditions for its electrode components that will enable ultra-fast charge capabilities within Li-ion battery systems.

41. **Obaggo Recycling, LLC** was awarded $3,750. The Fund allowed Obaggo Recycling, a Melrose early-stage startup working on recycling innovations, to move toward

commercialization of a plastic bag and packaging film recycling appliance that converts the plastic materials into compressed discs.

42. **Olaris, Inc.** was awarded two vouchers totaling $42,052.50. The Fund allowed Olaris, a Framingham startup that uses high field Nuclear Magnetic Resonance spectroscopy to perform metabolite profiling in the discovery of biomarkers for precision diagnostics, to expand the reach of its science by offsetting the high costs associated with industry use of equipment, allowing the company to run nearly 500 samples which were critical for reaching the company's next milestone.

43. **Onvector LLC** was awarded two vouchers totaling $7,500. The Fund allowed Onvector, a Somerville company that develops non-chemical water treatment technologies, to cost-effectively prototype ideas, several of which have led to significant improvements in the performance of its technology.

44. **Optical Waters LLC** was awarded two vouchers totaling $15,000. The fund allowed Optical Waters, an Amherst woman-owned, seed-stage business offering custom ultraviolet optical fiber solutions for disinfecting small channels and complex geometries, to perfect its product while keeping its technology in-house.

45. **Optodot Corporation** was awarded three vouchers totaling $19,800. The Fund allowed Optodot, a Devens company innovating in the commercialization of next-generation products based on nano porous membranes and infrared organic coatings, to quickly pivot after its contract coater closed, leaving the company without a pilot manufacturing partner. The company transitioned its development activities seamlessly to UMass to meet its project objectives and timelines, running five different coating trials with an average of four different designs at each trial.

46. **Organicin Scientific, LLC** was awarded four vouchers totaling $1,500. The Fund allowed Organicin Scientific, an Amherst and Northborough venture-backed biotech company that has pioneered a proprietary bacteriocin discovery platform that overcomes major obstacles in antibacterial drug discovery, to quickly and cost-effectively access labs and equipment, allowing the company to allocate a greater share of capital into its R&D activities.

47. **Polestar Technologies, Inc.** was awarded $2,460. The Fund allowed Polestar Technologies, a Needham Heights company that is a recognized leader in the development of sensing technologies including optical monitoring, sensing, and probes

for technologies, to complete a prototype run of new sensing film for optical measurement of air-borne CO2.

48. **RevBio Inc.** was awarded three vouchers totaling $23,625. The Fund allowed RevBio, a Lowell medical device company engaged in the development and commercialization of a patented, synthetic, injectable, self-setting bone adhesive biomaterial called TETRANITE, to make significant advances in its research and prototyping. The company now intends to file an application with the FDA to seek approval to start a human clinical trial.

49. **Rx3DPrint Inc.** was awarded two vouchers totaling $11,250. The Fund allowed Rx3DPrint, a Chicopee health care additive manufacturer, to design and manufacture 3D-printed products without huge initial start-up costs associated with starting a new business.

50. **Soliyarn, LLC** was awarded four vouchers totaling $37,500. The Fund allowed Soliyarn, a Belmont company developing novel conductive, waterproof, and antimicrobial textiles, to cost-effectively perform more R&D and hire more people to advance its technology.

51. **Spectrus LLC** was awarded three vouchers totaling $10,050. The Fund allowed Spectrus, a Beverly bioanalytical chemistry service provider supporting the biotech and pharmaceutical sectors with the characterization of complex molecules by mass spectrometry, to gain access to the state-of-the-art instrumentation which in turn allows the company to offer top-level research to its clients and accelerate the discovery process.

52. **Sudoc, LLC** was awarded two vouchers totaling $149,440.50. The Fund allowed Sudoc, a Boston chemical industry company committed to environmental sustainability, to expand the development of its NewTAML® chemistry, a platform technology which has remarkable oxidation capabilities. TAML® catalysts replace and eliminate toxic chemicals in a wide range of cleaning and environmental treatment applications.

53. **Tatum Robotics, LLC** was awarded $3,750. The Fund allowed Tatum Robotics, a Hudson company developing a robotic system to sign tactile sign language (the primary and often only communication method of the 150 million Deafblind individuals worldwide), to create prototypes far beyond its current means. With the prohibitive startup and operational costs of high-quality 3D-printers, the voucher program gave the company the opportunity to test its designs using materials and techniques otherwise inaccessible at its early stage.

54. **Terminus Bio LLC** was awarded two vouchers totaling $4,293.75. The Fund allowed Terminus Bio, a Southbridge biotech company committed to the development of biotechnology tools that are directly impactful to commercial crop producers, to access

instrumentation that will allow it to develop a method of ploidy analysis using flow cytometry on hemp plant tissue.

55. **The New Dalton Group, LLC** was awarded $5,587.50. The Fund allowed The New Dalton Group, a Dalton consulting firm that specializes in business development and technology commercialization, to access the UMass Roll to Roll Core facility to advance prototyping concepts supporting the development of paper-based flexible electronics.

56. **Thriving.ai** was awarded three vouchers totaling $108,086.25. The Fund allowed Thrivng.ai, a Boston company that has developed an app to enable smart technology to support marginalized or older individuals in the home, to design the architecture to monitor and aggregate smart device data to assist in monitoring daily activities.

57. **TinyPilot, LLC** was awarded four vouchers totaling $82,500. The Fund allowed TinyPilot, a South Hadley company that provides affordable and accessible remote management solutions for servers via a kernel-based virtual machine over IP device, to access expertise and resources in 3D-printing.

58. **Versatope Therapeutics, Inc.** was awarded five vouchers totaling $27,555. The Fund allowed Versatope Therapeutics, a Lowell biotechnology company developing vaccines and immunotherapies, to achieve critical milestones in the development of a multi-strain influenza vaccine.

59. **Volta Labs, Inc.** was awarded $650. The Fund allowed Volta Labs, a Cambridge biotechnology company interested in developing accessible gene sequencing technologies relying on low-cost alternatives for consumables, to characterize silicone-coated films via Atomic Force Microscopy.

60. **Xheme Inc.** was awarded three vouchers totaling $6,000. The Fund allowed Xheme, a Newton nanotechnology company developing a next-generation nanocomposite blood bag and tubing system that is free from toxic plasticizers, to conduct nanoparticle leaching studies to prove that the product is ready for commercialization.

61. **Xogen Mass Inc.** was awarded two vouchers totaling $77,271.75. The Fund allowed Xogen, a Boston company developing an advanced technology that treats wastewater using an electrolytic process that also produces a mixture of hydrogen and oxygen gas, to gather baseline data on the treatment of municipal wastewater which has enhanced the technology's marketability and development.

62. **YOUBIQ, Inc.** was awarded $750. The Fund allowed YOUBIQ, a Northampton company developing technology to support automated capture processing and publishing of professional-quality 360-degree panoramas with a smartphone, to cost-effectively run

through a number of prototyping and product iterations to accelerate its development timeline as it embarks on a crowdfunding campaign.

63. **ZwitterCo, Inc.** was awarded $1,440. The Fund allowed ZwitterCo, a Woburn startup developing membrane technology and products for filtration applications, to perform custom coating processes and testing to deliver prototypes to customers to assist in the evaluation of performance and costs of implementation.

University of Massachusetts, Boston

The University of Massachusetts, Boston awarded 27 vouchers to 11 companies totaling $374,786.38. Requested reimbursements against these vouchers during this reporting period totaled $168,106.68.

1. **ACTnano, Inc.** was awarded $100. The Fund allowed ACTnano, a Cambridge-based global leader in protective nanocoating for automotive and consumer electronics, to scan a sample of its product over a 1600 nanometer (nm) wavelength using fluorescence microscopy.

2. **Glympse Bio, Inc.** was awarded two vouchers totaling $31,875. The Fund allowed Glympse Bio, a Cambridge biotechnology company developing revolutionary technology to diagnose and monitor disease, to analyze samples of peptide mixtures by liquid chromatography-tandem mass spectrometry (LC-MS-MS) using collision-induced dissociation (CID) and electron-transfer/higher-energy collision dissociation (EThCD) using 120-minute gradients.

3. **Hopewell Therapeutics, Inc.** was awarded $16,875. The Fund allowed Hopewell Therapeutics, a Lexington biotechnology company specializing in synthesizing and developing targeted, efficient, and safe lipid nanoparticles to address unmet medical needs and advance the field of genomic medicine, to use LC-MS to identify and assess the purity of lipid amino derivatives.

4. **Innovo Bio, Inc.** was awarded two vouchers totaling $49,331.25. The Fund allowed Innovo Bio, a Boston biotechnology company that develops breakthrough diagnostic and therapeutic tools for animal and human diseases including kidney diseases, diabetes, and cancers, to analyze biological samples for biomarker concentration.

5. **Irradiant Technologies Inc.** was awarded $5,925. The Fund allowed Irradiant Technologies, a Cambridge nanotechnology research company creating novel optical/photonic components made possible by its 3D-nanofabrication platform to create solutions for sensing, imaging, telecommunications computation, and display, to use a confocal microscope to characterize patterning efficiency and resolution using single-

photon microscopy of deposited chromophores, and to characterize the absorption and fluorescence of different chromophores under a wide variety of solution conditions.

6. **Jura Bio, Inc**. was awarded four vouchers totaling $57,899.89. The Fund allowed Jura Bio, a Worcester company developing autoimmune therapies, to profile autoimmune patient T and B cell receptor sequences and to study full transcriptomics data to interrogate the immunological identities of pathogenic lymphocytes by using genomic services.

7. **Kano Therapeutics, Inc.** was awarded $22,500. The Fund allowed Kano Therapeutics, a Somerville biotechnology company expanding the reach of genetic medicine through the development of transformational biomaterials, to use the Artificial Intelligence Core which provided infrastructure and algorithms for machine learning on massive data samples.

8. **Phuc Labs, Inc.** was awarded $1,764.84. The Fund allowed Phuc Labs, a Boston company that intelligently sorts limitless variations of particle-based industrial waste streams using hydrobotics, to use high-resolution inductively coupled plasma mass spectrometry to analyze samples for copper concentration and any impurities and nitrate, sulfate, and phosphate content.

9. **Pinetree Therapeutics, Inc.** was awarded two vouchers totaling $20,026.25. The Fund allowed PineTree Therapeutics, a Cambridge pre-clinical stage biotechnology company, to access the Proteomic Core to discover and develop a bispecific or multispecific antibody which potentially treats "so-called difficult-to-treat" solid cancers due to high mutation burden including undruggable genetic mutants.

10. **Unravel Biosciences, Inc.** was awarded three vouchers totaling $112,067.25. The Fund allowed Unravel Biosciences, a Boston therapeutics company seeking to redefine diseases using patient transcriptomics data to uncover hidden drug targets, to access RNA isolation and sequencing services to evaluate the transcriptome impact of small molecules on disease models generated using Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) editing of tadpoles.

11. **Window Therapeutics, Inc.** was awarded nine vouchers totaling $56,421.90. The Fund allowed Window Therapeutics, a Boston therapeutics company seeking to develop next-generation immunotherapies and molecularly targeted therapies that overcome problems of limited efficacy and low tolerability of leading oncology treatments, to use the Vivarium facility, including mice housing/husbandry, experimentation, and monitoring by in vivo imaging solutions.

University of Massachusetts, Lowell

The University of Massachusetts, Lowell awarded 112 vouchers to 51 companies totaling $1,632,248.09. Requested reimbursements against these vouchers during this reporting period totaled $722,953.96.

1. **2Witech Solutions LLC** was awarded $1,504.50. The Fund allowed 2Witech Solutions, a Chelmsford company that specializes in commercializing nano-enabled solutions through understanding customer needs, conceiving innovative ideas, developing technology, and bringing it to market, to process and metalize graphene/silicon devices with gold using a CHA e-beam evaporator.

2. **ACTnano, Inc.** was awarded three vouchers totaling $34,481.50. The Fund allowed ACTnano, a Cambridge based global leader in protective nanocoating for automotive and consumer electronics, to characterize coatings, and develop and test products with technical rigor. It also provided an opportunity for the company's engineers to acquire skills in operating multiple analytical instruments.

3. **Adaptive Surface Technologies, Inc.** was awarded $26,422.50. The Fund allowed Adaptive Surface Technologies, a Hopkinton industrial technology company that produces additives and coatings that repel fluids, contaminants, and ice for a wide range of consumer, industrial, marine, and medical applications, to use many advanced characterizations tools at a highly discounted rate.

4. **Advanced Silicon Group, Inc.** was awarded four vouchers totaling $92,876.57. The Fund allowed Advanced Silicon Group, a Lowell nanotechnology company developing the next-generation biosensor, to raise its SEED round funding, hire additional employees, and move its R&D forward in a cost-effective manner.

5. **Akita Innovations LLC** was awarded three vouchers totaling $23,471.25. The Fund allowed Akita Innovations, a Billerica materials development company that uses synthetic chemistry and advanced materials techniques to develop antifog and anticontamination coatings and coating fluids for optics and other materials, to cost-effectively access state-of-the-art equipment to advance research, develop sophisticated prototypes, and build its commercial services.

6. **AltrixBio, Inc.** was awarded $17,192.03. The Fund allowed AltrixBio, a Lowell biotechnology company developing a therapeutic pill to treat obesity, diabetes, and fatty liver disease, to characterize, image, and analyze the parameters of its product.

7. **AmberWave, Inc.** was awarded four vouchers totaling $97,467. The Fund allowed AmberWave, a Lowell semiconductor company developing thin, lightweight, flexible, high-efficiency solar cell technology for use in commercial building rooftop solar energy

applications and military individual soldier portable power generation, to use the Nanofabrication Laboratory and the Materials Characterization Laboratory at UMass-Lowell in support of its product development.

8. **APorous, Inc.** was awarded two vouchers totaling $18,115. The Fund allowed APorous, a Tyngsboro R&D company specializing in porous film development and compounding of specialty resins for use in food packaging and battery components, to cost-effectively test a series of products and their corresponding process variables, leading to product improvements and accelerated commercialization.

9. **Arborjet, Inc.** was awarded $3,531. The Fund allowed Arborjet, a Woburn company on the leading edge of tree and plant health through an innovative injection technology, to access advanced equipment and facilities research and develop advanced sustainable products.

10. **Cellino Biotech, Inc.** was awarded four vouchers totaling $97,467. The Fund allowed Cellino Biotech, a Cambridge biotechnology company building a precision platform that personalizes human cells through stem-cell derived regenerative medicines designed to cure Parkinson's, diabetes, and heart disease, to expand the development and research of its consumable prototype.

11. **Circe Bioscience Inc.** was awarded $7,695.56. The Fund allowed Circe Bioscience, a Somerville biotechnology company seeking to decarbonize food production by using carbon dioxide to produce fats from microbes through a fermentation process, to cost-effectively use a variety of analytical and materials characterization tools for evaluating the products that its microbes produce.

12. **DialyFlux, LLC** was awarded two vouchers totaling $54,696. The Fund allowed DialyFlux, a Medfield biotechnology company designing, fabricating, and testing a microstructured surface on a silicon wafer for the rapid separation of plasma from human blood without centrifugation, to fabricate and characterize novel microstructures to company specifications. The company's technology platform also includes a new microfluidic-based medical adhesive that is now in final prototype development.

13. **Dogodan Therapeutics, Inc.** was awarded $43,621.50. The Fund allowed Dogodan Therapeutics, a Westford therapeutic company developing treatments for a broad range of indications in the lung, to accelerate its research programs for developing genomic medicine nanoparticles for treating cancer and fibrotic disease.

14. **Electrified Thermal Solutions, Inc.** was awarded two vouchers totaling $21,135. The Fund allowed Electrified Therma Solutions, a Medford technology company seeking to decarbonize industry with renewable heat, to cost-effectively access instruments and materials for accelerated and more comprehensive testing.

15. **Elektrofi, Inc.** was awarded two vouchers totaling $6,760. The Fund allowed Elektrofi, a Boston biologics company focused on the development and delivery of "ultra-high" concentration biologics, to utilize otherwise unavailable equipment to create a better product and demonstrate the robustness of its approach to commercial partners.

16. **Erbi Biosystems, Inc.** was awarded two vouchers totaling $16,662.50. The Fund allowed Erbi Biosystems, a Stoneham company that supports therapeutic drug manufacturers with tools to accelerate the development of their processes and therapies, to cost-effectively use the gamma facility to efficiently and cost-effectively run more experiments, enhancing its R&D efforts and accelerating commercialization.

17. **Evolve Diamonds LLC** was awarded three vouchers totaling $17,972.25. The Fund allowed Evolve Diamonds, a Harvard supplier of diamonds, diamond processing, metrology, and application engineering for laboratory-grown diamonds, to offer processes that it could not offer on its own, which enhanced its business profile and expanded its product offerings.

18. **Factorial Inc.** was awarded $3.945.50. The Fund allowed Factorial, a Woburn company developing safer solid-state battery technology offering greater driving range than current lithium-ion technology, to advance its research by using a wide range of equipment to advance this frontier of battery research.

19. **Flexomics LLC** was awarded $15,690. The Fund allowed Flexomics, a Boston biotech startup developing an innovative high-throughput screening platform capable of simultaneously phenotyping and genotyping more than 500,000 individual cells, to accelerate the development of its core technology and generate key proof-of-concept data.

20. **Folia Materials, Inc.** was awarded $3,704.25. The Fund allowed Folia Materials, a Woburn materials science company that uses paper as a super material by marrying it with a coating for use in the packaging, filtration, and water industries, to advance its research by determining the air permeability and tensile properties of the raw materials and products and to expand its product lines.

21. **Global Materials, Inc.** was awarded $1,616.95. The Fund allowed Global Materials, Inc. doing business as Specialty Materials, a Lowell manufacturer of boron and silicon carbide fiber products, advanced composite materials, and boron nanopowder used in superconductors and wire technology used in aircraft, aerospace, sporting goods and industrial applications, to cost-effectively characterize a resin's tolerance to heat and compare the properties from multiple batches to ensure that key performance indicators did not change.

22. **Glycologix, Inc.** was awarded four vouchers totaling $30,158.25. The Fund allowed Glycologix, a Beverly biotechnology company targeting locally delivered therapeutics for the protection and repair of soft tissues, to use the Nuclear Magnetic Resonance and Thermal Analysis and Mechanical Properties Labs to cost-effectively run several product samples to advance its research.

23. **Glyscend, Inc.** was awarded two vouchers totaling $8,251.50. The Fund allowed Glyscend, a Lowell company pursuing ongoing synthesis, testing, and scale-up work for a therapeutic polymer to be used in the treatment of metabolic diseases, to access advanced analytic capabilities to accelerate its research and attract private investment.

24. **Honeycomb Biotechnologies, Inc.** was awarded two vouchers totaling $67,965.50. The Fund allowed Honeycomb Biotechnologies, a Waltham biotech company that develops solutions to remove barriers and expand the opportunities for single-cell analytics to basic, translational pre-clinical and clinical researchers throughout the world, to access sequencing services to support R&D and product development.

25. **i2O Therapeutics, Inc.** was awarded $7,556.25. The Fund allowed i2O Therapeutics, a Cambridge biotech company, to cost-effectively generate high-quality data at a rapid pace using Nuclear Magnetic Resonance (NMR) Spectroscopy, which has enabled the company to accelerate the development of its lead programs.

26. **Integral BioSystems, LLC** was awarded three vouchers totaling $33,623.40. The Fund allowed Integral BioSystems, a Bedford company specializing in the development of innovative, micro- and nano-particulate sustained-release drug formulations, to cost-effectively use scanning electron microscopy analysis to confirm its structures.

27. **KnipBio, Inc.** was awarded $34,386.75. The Fund allowed KnipBio, a Lowell company evaluating the impact of a dietary ingredient on the gut microbiota of fish, to initiate the molecular research needed to better understand how the ingredient interacts with the biology of the fish.

28. **Mioe Inc.** was awarded four vouchers totaling $71,692.50. The Fund allowed Mioe Inc., an Andover technology company that makes high-speed vertical-cavity surface emitting linear (VCSEL) arrays for data center application and 2D arrays for smartphone facial recognition and driverless car applications, to accelerate its prototype demonstration and accelerate its commercialization.

29. **Nanite Inc.** was awarded $11,846.25. The Fund allowed Nanite, a Boston gene therapy and drug delivery company, to expand its research capabilities of high-throughput material characterization in support of its polymer nanoparticle design platform Sayer!, a non-viral delivery of gene therapies for tissue specific targeting.

30. **NanoLab, Inc.** was awarded four vouchers totaling $25,623. The Fund allowed NanoLab, a Waltham company developing a nanotube-based friction pad for robotic handling of silicon wafers, to cost-effectively and rapidly develop and test products in a clean room environment.

31. **Nth Cycle, Inc.** was awarded two vouchers totaling $24,817.50. The Fund allowed Nth Cycle, a Beverly metals processing technology company developing a state-of-the-art electrochemical filter to decarbonize the critical mineral supply chain for lithium batteries and permanent magnets, to hire interns from local universities and gain cost-effective access to top-quality instrumentation that it otherwise wouldn't be able to afford.

32. **OPT Industries, Inc.** was awarded $5,052. The Fund allowed OPT Industries, a Malden company combining computational design, automation engineering, and material science to manufacture materials with micro-scale precision, to use chromatographic and other analytic tools to perform a materials-screening project to understand the composition, stabilities, and thermal properties of a product.

33. **Palomaki Consulting, LLC** was awarded $7,933.50. The Fund allowed Palomaki Consulting, a Billerica company with expertise in quantum dots and nanomaterials for optical applications, to use scanning electron microscopy with energy dispersive X-Ray spectroscopy (SEM/EDX) identification of an unknown contaminant.

34. **Power for Humanity, Inc.** was awarded $16,752.75. The Fund allowed Power for Humanity, an Amherst technology company seeking to improve the performance of existing battery systems, to fabricate prototypes of film devices using material deposition.

35. **Privo Technologies, Inc.** was awarded three vouchers totaling $88,125. The Fund allowed Privo Technologies, a Peabody biotechnology company seeking to improve the standard of care for cancer patients, to use gamma irradiation to sterilize its cancer treatment, and gain data to define radiation parameters and certificates indicating the quality and consistency of the process.

36. **Pulsar Bio Inc.** was awarded three vouchers totaling $19,141.50. The Fund allowed Pulsar Bio, a Watertown company developing an early-stage pharmaceutical screening platform, to develop a proof of concept more quickly by rapidly iterating through more design trials.

37. **Pykus Therapeutics, Inc.** was awarded three vouchers totaling $23,742.75. The Fund allowed Pykus Therapeutics, a Cambridge biotech company developing hydrogels for ocular surgery, to synthesize and characterize polymeric materials to make hydrogels, and to explore drug delivery with the hydrogels.

38. **Radical Plastics, Inc.** was awarded two vouchers totaling $9,984. The Fund allowed Radical Plastics, a Beverly company developing biodegradable plastics, to test materials-related properties, such as thermal properties, and metals in the mineral used in the catalyst formulation of its product.

39. **Rapha Robotics Inc.** was awarded $5,169. The Fund allowed Rapha Robotics, a Lowell medical equipment manufacturer seeking to change the standard of care for onychomycosis (nail fungus), to cost-effectively access essential equipment for prototype development.

40. **RevBio Inc.** was awarded two vouchers totaling $37,964. The Fund allowed RevBio, a Lowell medical device company engaged in the development and commercialization of a patented, synthetic, injectable, self-setting bone adhesive biomaterial called TETRANITE, to complete bench top, animal, and biocompatibility studies per FDA regulations, in support of human clinical use.

41. **Riparian Pharmaceuticals, Inc.** was awarded $37,500. The Fund allowed Riparian Pharmaceuticals, a Watertown pharmaceutical company discovering therapeutics to reverse endothelial dysfunction and provide a new approach to vascular health, to perform key preclinical research that is accelerating the development of its therapeutic candidates leading to safer medicines for patients.

42. **SilarTek LLC** was awarded $9,202.50. The Fund allowed SilarTek, a Leominster company developing solar silicon technology, to advance research, expand product lines, and develop prototypes.

43. **Verdox, Inc.** was awarded four vouchers totaling $40,328. The Fund allowed Verdox, a Woburn company commercializing its electro swing adsorption platform technology that removes carbon dioxide from industrial emissions and the air, to perform molecular weight characterization of novel polymer/oligomer materials using SEM.

44. **Versatope Therapeutics, Inc.** was awarded four vouchers totaling $31,443. The Fund allowed Versatope Therapeutics, a Lowell biotechnology company developing vaccines and immuno-therapeutics and customized therapeutic delivery vehicles with broad applications, to reach proof-of-concept milestones sooner by providing access to state-of-the-art facilities and equipment.

45. **Volta Labs, Inc.** was awarded two vouchers totaling $7,163.90. The Fund allowed Volta Labs, a Cambridge biotech company building a sequencer agnostic front-end digital fluids platform, to cost-effectively access tools to advance its testing and research.

46. **VPT Rad** was awarded five vouchers totaling $94,500. The Fund allowed VPT Rad, a Chelmsford Defense Logistics Agency-approved radiation and test services laboratory, to

use the Radiation Laboratory Fast Neutron Irradiator to qualify electronic components for space application.

47. **Vuronyx Technologies LLC** was awarded two vouchers totaling $19,868.55. The Fund allowed Vuronyx Technologies, a Woburn company focused on commercialization of novel material science-based technologies and products, to characterize bio-based epoxy, elastomeric material and water samples with various analytical techniques, and to continue developing proof-of-concept prototypes for potential new products.

48. **Warner Babcock Institute for Green Chemistry LLC** was awarded three vouchers totaling $43,295.25. The Fund allowed Warner Babcock Institute for Green Chemistry, a Lowell company focused on the development and optimization of sustainable chemistry, to facilitate both the execution of paid research and development contracts with clients, and internally funded development and commercialization programs.

49. **Weddell Technologies, LLC** was awarded four vouchers totaling $72,930.75. The Fund allowed Weddell Technologies, a Lowell company developing multiplexed photonic integrated circuit solutions for cancer immunotherapy, to create more prototypes at a lower expense.

50. **Young Biopharma, LLC** was awarded $1,452. The Fund allowed Young Biopharma, a Lowell biopharmaceutical company focused on developing revolutionary therapies that restore functions and improve the lives of people living with pain, to analyze and determine the purity of organic compounds from its synthetic effort.

51. **Z-Polymers, LLC** was awarded three vouchers totaling $143,883.38. The Fund allowed Z-Polymers, an Andover startup company working on innovative fiber applications, to cost-effectively access more expensive analytical techniques, enabling the company to perform more experiments and accelerate development of its thin super-fiber prototype which is thinner than a human hair and six times stronger than steel.

University of Massachusetts Medical School, Worcester

The University of Massachusetts Medical School, Worcester awarded 44 vouchers to 25 companies totaling $702,885.43. Requested reimbursements against these vouchers during this reporting period totaled $549,378.20.

1. **Apic Bio, Inc.** was awarded $3,137.50. The Fund allowed Apic Bio, a Cambridge biotech company committed to finding cures for patients with genetic diseases, to cost-effectively access sophisticated equipment and techniques to expand its therapeutic research.

2. **ARIScience** was awarded two vouchers totaling $35,379.52. The Fund allowed ARIScience, a Wayland biotechnology company offering state-of-the-art molecular

discovery and design service pursuing chemical entities to interrupt disease progression for dengue infection, Alzheimer's disease, and resistant staph aureus infection, to use its novel in silico algorithms through supercomputing centers.

3. **Cedilla Therapeutics, Inc.** was awarded $37,800. The Fund allowed Cedilla Therapeutics, a Cambridge biotechnology company committed to bringing a new dimension to precision oncology, to access the latest cutting-edge structural biology tools and techniques that can significantly boost its drug discovery process.

4. **D2M Biotherapeutics, Inc.** was awarded two vouchers totaling $16,050. The Fund allowed D2M Biotherapeutics, a Natick biotechnology company specializing in human-genetics-driven immune-oncology and inflammatory diseases therapeutics discovery, to access state-of-the-art core facilities to triple its research ability and capacity.

5. **FireCyte Therapeutics, Inc.** was awarded $22,994.12. The Fund allowed FireCyte Therapeutics, a Beverly biotechnology company developing novel treatment strategies focused on the role of microglia and neuroinflammation in progressive neurodegenerative diseases of the eye, to cost-effectively access state-of-the-art imaging and analytics that will help guide its drug discovery and translational ophthalmology programs and significantly contribute to the development of first-in-class therapeutics that preserve vision in patients with glaucoma.

6. **Fornax Biotech LLC** was awarded $27,157.50. The Fund allowed Fornax Biotech, a Worcester biotechnology company providing next-generation sequencing, bioinformatics, and molecular biology services, to use cutting-edge technology in its current research to facilitate the discovery of therapeutics.

7. **Frontera Therapeutics, Inc.** was awarded two vouchers totaling $13,893. The Fund allowed Frontera Therapeutics, a Bedford clinical-stage biotechnology company that seeks to develop the gene therapy medicines across multiple disease areas, to generate critical materials for gene therapy research and development using state-of-the-art facilities and equipment.

8. **Gel4Med, Inc.** was awarded $11,875.20. The Fund allowed Gel4Med, a Newton biotechnology company specializing in regenerative medicine and wound healing, to expand and meet its research goals by preparing and staining slides of samples from the company's in vivo studies and undertaking a large-scale in vivo study of subcutaneous implants with its Hydrogel products.

9. **Glyscend, Inc.** was awarded two vouchers totaling $51,409.50. The Fund allowed Glyscend, a Lowell biopharmaceutical company developing oral, first in-class polymer therapies, to undertake a study to enable a deeper understanding of the mechanism of its therapeutic and aid in the development of next-generation therapeutics.

10. **Ichosia Biotechnology, Inc.** was awarded $2,415. The Fund allowed Ichosia Biotechnology, a Worcester biotechnology company developing a cost-effective method of mass producing a naturally derived red blood cell called Erythrosyn, to bring new capabilities to its research, enabling the company to create clear illustrations of its work through scanning electron microscopy (SEM) imaging.

11. **Inozyme Pharma, Inc.** was awarded two vouchers totaling $17,536.63. The Fund allowed Inozyme Pharma, a Boston biotechnology company developing novel therapeutics for rare bone mineralization diseases, to perform additional research activities supportive of its internal therapeutic programs.

12. **Leveragen, Inc.** was awarded $6,585. The Fund allowed Leveragen, a Worcester biotechnology company developing and providing comprehensive solutions to genetic modeling, to embark on internal R&D activities to develop novel genetic models for antibody discovery, such as antibodies against SARS-CoV-2 and cancer targets through the use of sequencing platforms for characterization.

13. **Microbiotix, Inc.** was awarded $17,185. The Fund allowed Microbiotix, a Worcester clinical stage biopharmaceutical company committed to the discovery and development of novel antibacterials to combat the rise in multidrug resistant bacterial infections, to cost-effectively perform an essential experiment to determine the mechanism of action of its antibiotic candidate.

14. **New Equilibrium BioSciences, Inc.** was awarded two vouchers totaling $55,980. The Fund allowed New Equilibrium BioSciences, a Boston company dedicated to developing new medicines through cutting-edge science and cross-disciplinary collaborations, to access resources and training in a variety of experimental and computational domains, allowing the company to generate exciting new data under startup-friendly terms to accelerate its mission of developing new precision medicines for life-threatening diseases.

15. **Nira BioSciences, Inc.** was awarded $42,646.50. The Fund allowed Nira BioSciences, a Burlington biotechnology company focusing on developing photo-immunotherapy for the treatment of inflammatory skin diseases, to accelerate development and establish preliminary demonstration of its skin disease therapy.

16. **ProDeg LLC** was awarded three vouchers totaling $6,425.29. The Fund allowed ProDeg LLC, a Belmont therapeutics company pursuing a novel therapeutic strategy for the treatment of cancers, to synthesize and research new compounds with higher potency.

17. **Rectify Pharmaceuticals, Inc.** was awarded three vouchers totaling $72,930.75. The Fund allowed Rectify Pharmaceuticals, a Cambridge company developing disease-

modifying precision therapeutics for patients with serious genetic diseases, to cost-effectively access the state-of-the-art cryo-electron microscopes to advance drug discovery research.

18. **RegenX LLC** was awarded $27,714.71. The Fund allowed RegenX, a Burlington biotechnology company investigating the use of telocollagen for the repair of tendon defects and dermal aesthetics, to move forward with promising studies using new analytical techniques to determine whether telocollagen injectables are promising avenues for future development.

19. **Riparian Pharmaceuticals, Inc.** was awarded $33,307.95. The Fund allowed Riparian Pharmaceuticals, a Watertown company discovering therapeutics to reverse endothelial dysfunction and provide a new approach to vascular health, to perform key preclinical research that is accelerating the development of its therapeutic candidates leading to safer medicines for patients.

20. **SignaBlok, Inc.** was awarded $50,162.25. The Fund allowed SignaBlok, a Shrewsbury biopharmaceutical company whose pioneering research efforts focus on therapeutics for cancer, atherosclerosis, inflammatory and immune diseases, to advance the development of novel anticancer therapeutic combinations that could substantially improve treatment of pancreatic cancer using the histology and immunochemistry services at the University of Massachusetts Medical School Morphology Core.

21. **Skylark Bio, Inc.** was awarded $75,000. The Fund allowed Skylark Bio, a Cambridge venture-backed discovery-stage biotech company dedicated to creating novel therapeutics to treat hearing loss disorders with gene therapy, to conduct proof-of-concept efficacy studies to select drug candidates for its programs, while continuing to build its platform and expand its pipeline.

22. **SpadXTech LLC** was awarded five vouchers totaling $14,560.50. The Fund allowed SpadXTech, a Worcester company employing the power of microbes and synthetic biology to ameliorate climate change, reduce air and water pollution, and address the problem of plastic waste, to run more samples, unequivocally validate its hypothesis, translate the research to the world, and bring green and sustainable product to the marketplace.

23. **Tiba Biotech LLC** was awarded $8,062.50. The Fund allowed Tiba Biotech, a Cambridge company advancing the ribonucleic acid (RNA) medicine field through vaccines and therapeutics, to characterize nanoparticle formulations in furtherance of its research.

24. **Versatope Therapeutics, Inc.** was awarded three vouchers totaling $7,437. The Fund allowed Versatope Therapeutics, a Lowell immuno-therapeutic company that harnesses a

customized biotechnology platform to deliver immunity, to advance its research and analyze important data to advance the development of universal influenza vaccines and immuno-therapeutic applications.

25. **Yurogen Biosystems LLC** was awarded four vouchers totaling $45,240. The Fund allowed Yurogen Biosystems, a Worcester biotechnology and biopharmaceutical company dedicated to producing premium antibodies and antibody-based products, to cost-effectively perform single B cell-based sorting and culture for monoclonal antibody discovery.