

ANNUAL REPORT 2020-21



NI^{MBL}® The National Institute for
Innovation in Manufacturing
Biopharmaceuticals

THIS ANNUAL REPORT COVERS NIIMBL'S ACCOMPLISHMENTS FROM MARCH 1, 2020 – FEBRUARY 28, 2021.



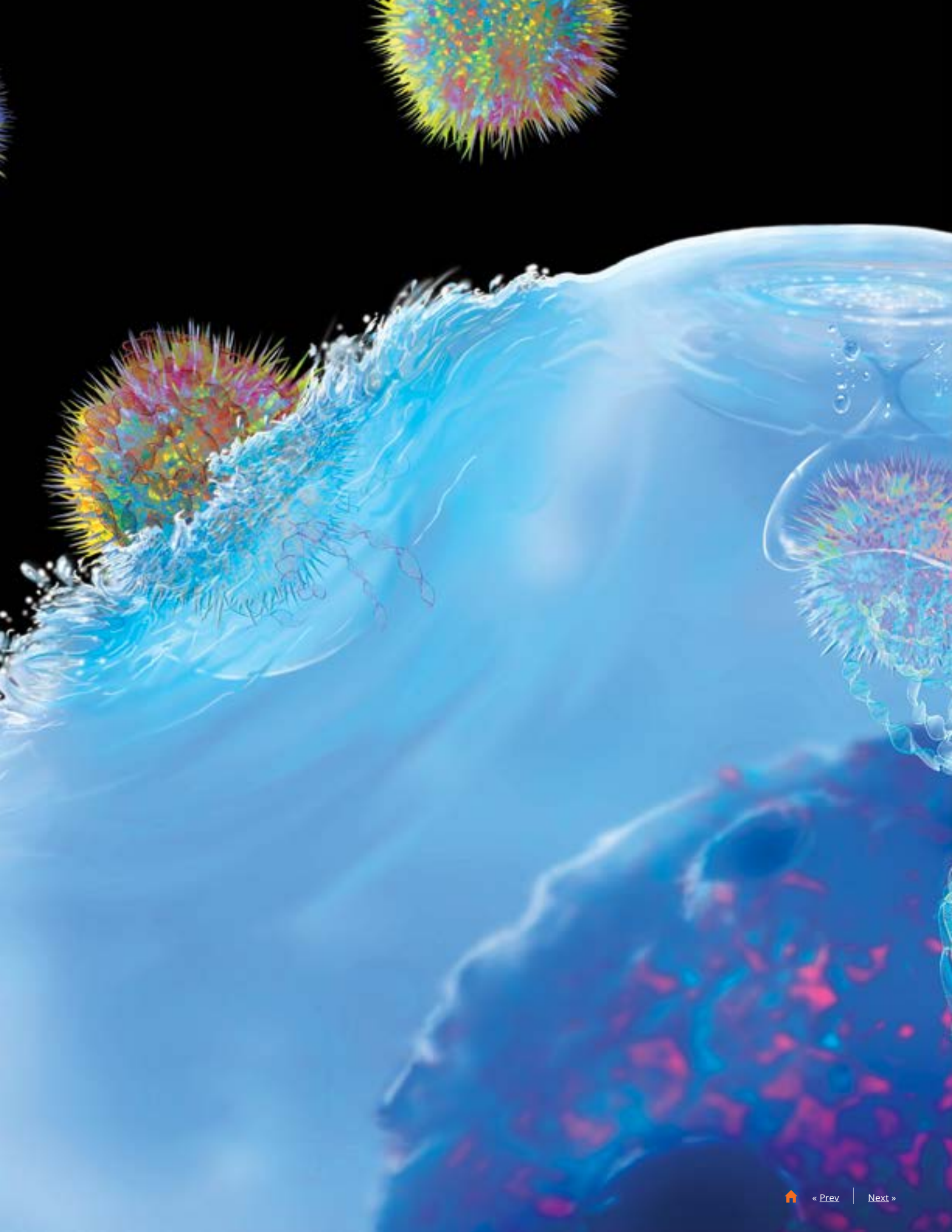
OUR MISSION

The NIIMBL mission is to accelerate biopharmaceutical manufacturing innovation, support the development of standards that enable more efficient and rapid manufacturing capabilities, and educate and train a world-leading biopharmaceutical manufacturing workforce, fundamentally advancing U.S. competitiveness in this industry.



OUR VISION

NIIMBL will lead and transform the development and adoption of next-generation biopharmaceutical manufacturing technologies that contribute to patient well-being. As a public-private partnership, NIIMBL will forge and catalyze advancements that are vital to the acceleration of innovative technologies and a skilled workforce, and these strategic efforts and investments will be undertaken to secure U.S. biopharmaceutical manufacturing leadership.



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ACCOMPLISHMENTS



Dear Colleagues,

It is with great pleasure that we share with you our 2020–21 Annual Report. To consider 2020 as a difficult year would be an understatement. However, our industry has persevered and stepped up to the challenges before them.

This reports presents significant advancements in the work and momentum of projects and programs that NIIMBL delivered last year. To highlight a few examples, NIIMBL distributed over \$11.4M in funding across 14 projects through our Project Call process and an additional \$8.9M in funding for COVID-19 related projects. We also moved into our new headquarters and are establishing a shared laboratory infrastructure for our work.

With over 185 members, our community and partners continued to convene large industry with some of the most talented technology specialty companies and researchers around the world. We have made significant progress in our NIIMBL-led programs and projects including the demonstration of the buffer stock blending skid. The Global Health Fund broadened with another commitment of \$1.8M to support projects in addition to the \$3M already invested through our partnership with the Bill & Melinda Gates Foundation.

As we look ahead, we are well positioned for continued growth and look forward to working across the ecosystem to achieve new outcomes. If there is one thing we learned from this last year, it is that we can go much further and succeed much faster when we work together.

Sincerely,
The NIIMBL team

2020-21 NIIMBL PROJECTS

14 TOTAL

TECHNOLOGY, WORKFORCE, AND
GLOBAL HEALTH FUND PROJECTS

\$11.4M

TOTAL VALUE

TECHNOLOGY
\$6.5M

WORKFORCE
\$1.9M

GLOBAL HEALTH
FUND
\$3M

TOTALS SINCE NIIMBL'S LAUNCH IN 2017

70 TOTAL

TECHNOLOGY, WORKFORCE, AND
GLOBAL HEALTH FUND PROJECTS

93 TOTAL

COLLABORATING ORGANIZATIONS

58 TECHNOLOGY

52 WORKFORCE

07 GLOBAL HEALTH FUND

\$65.2M

TOTAL VALUE

TECHNOLOGY
\$47.3M

WORKFORCE
\$14.9M

GLOBAL HEALTH
FUND
\$3M





NIIMBL ACTIVITIES



NIIMBL-LED PROGRAMS

Our NIIMBL-led programs and projects bring together the thought leaders from our community to tackle biomanufacturing challenges and optimize processes for the future. From end-to-end intensification to big data integration, we are pushing the limits of what is currently possible to bring safe therapies to patients faster.

As of February 28, 2021, we have authorized funding for 21 NIIMBL-led projects with a total value of \$8.9M. The projects involve 40 organizations.

End-to-end collaboration to transform biopharmaceutical development and manufacturing

An ambitious 10-year program, our process intensification program will transform biopharmaceutical manufacturing by 2029. Through six distinct workstreams, thought leaders from within the NIIMBL community are collaborating on an integrated approach to create flexibility, improve control and security of the supply chain, foster sustainability and reduce costs. These technologies will be demonstrated in a test bed at the NIIMBL headquarters.

Big Data Analysis for Biomanufacturing

The analysis and interpretation of data can take biomanufacturing processes to the next level. Our big

data analytics program will enable biomanufacturers to harness the power of data to make informed decisions in real-time. Fueled by the collaboration of our community, this highly-integrated, synergistic program focuses on five key areas: standardization and contextualization, end-to-end automated control of critical quality attributes (CQAs), multivariate sensors and analytics, advanced control strategies, and bioprocess modeling and simulation.

NIIMBL-BioPhorum Buffer Stock Blending System

The NIIMBL-BioPhorum Buffer Stock Blending System is ready for action. Located at NIIMBL headquarters in Newark, DE, this open-sourced system is set for testing by the biopharmaceutical manufacturing community. This portable, flexible system blends highly concentrated single component stock solutions to make buffers, saving manufacturers time and labor.

NIIMBL-LED PROJECTS

21 TOTAL

NIIMBL-LED PROJECTS

40 ORGANIZATIONS INVOLVED

\$8.9M

TOTAL VALUE

GLOBAL HEALTH FUND

When public health emergencies hit, it is crucial that our industry is able to move quickly to ensure the best possible outcomes for all people, including those in underserved areas or developing nations. In 2018, we launched the Global Health Fund (GHF) with an award from the Bill & Melinda Gates Foundation. The Global Health Fund supports new technologies that accelerate development, reduce costs, and secure the supply of vaccines and biopharmaceutical products.

Through our Project Call 3.1 in April 2020, we authorized project funding as part of the Global Health Fund initiative. These projects explore cutting-edge technologies that will reduce animal-based testing and improve vaccine manufacturing processes.

Our commitment to these emerging technologies will extend beyond these initial projects. In December 2020, the Bill & Melinda Gates Foundation committed an additional \$1.8M to fund more innovation projects.

Improving potency assays for whole-cell pertussis vaccine

The Developing Countries Vaccine Manufacturers Network (DCVMN) is working to reduce mice-based testing by maturing a new assay to determine the potency of the whole-cell pertussis vaccine. Current potency tests cause distress to a large number of

mice and the results are highly variable. DCVMN is partnering with 11 labs around the world to test a plate-based assay that would greatly reduce the use of mice and provide faster results.

Replacing animal models for tetanus toxin detection

The University of Massachusetts Medical School is partnering with the Wadsworth Center to develop an in vitro assay to replace animal-based toxicity tests for the tetanus vaccine. Animal-based assays are now used to measure the key mechanisms of the toxins that trigger the disease. This project focuses on one of those key mechanisms, the transport of the toxin in the cell. The new in vitro assay allows manufacturers to determine the safety of the vaccine while eliminating the use of animals.

2020 – 21 GLOBAL HEALTH FUND PROJECTS

3 TOTAL
NEW PROJECTS

\$3M
TOTAL VALUE

\$1.8M IN ADDITIONAL
FUNDING COMMITTED
FOR FUTURE PROJECTS

NIIMBL EXPERIENCE

At a time when the world focused on the biopharmaceutical industry, a talented group of 13 college students gained an even deeper understanding of its impact on human health.

In summer of 2020, NIIMBL held its second eXperience program. The program connects African American/ Black, Latinx, and Native American students at Historically Black Colleges and Universities (HBCUs) and NIIMBL member institutions with thought leaders and experts from the biopharmaceutical industry. It aims to foster diversity within the industry and open the students' eyes to career possibilities in the life sciences.

Due to the COVID-19 pandemic, the 2020 NIIMBL eXperience shifted to a virtual format, which allowed more organizations to participate. Participating organizations included Merck & Co., Inc., AstraZeneca, Genentech, Sartorius, Keck Graduate Institute, BioBAT, AABB, Vericel, Solano Community College, and United States Pharmacopeia, among others. The program was developed with support from the National Society of Black Engineers (NSBE).

"I loved the wealth of opportunities that were available. I literally didn't know much about biopharmaceuticals, but knowing that this is such a vast industry, now it's like 'where has this been all along,'" said Tiala Gabrielle Scott, a student at Lincoln University.

The eXperience program made a huge impression on Tiala. She went on to secure a Project Management internship at Genentech for the summer of 2021.

Alani Perkin, a student at Harris-Stowe State University, expressed this sentiment during her final presentation, *"I also want to stay connected, not only with the NIIMBL team, but with all of the people I have connected with during this experience and more because I know you are willing to be there and mentor me in the future."*

In addition to helping students forge a career path, the program also helps companies build talent pipelines.

"The eXperience program was a fantastic opportunity to have meaningful interactions with students, beyond what we may normally get to do during a traditional job fair. Not only do we get to talk about our industry, but we also learn from the insightful questions the students asked, what their interests are and where their concerns lie; both are vital feedback as we look to enhance our talent acquisition efforts." said Rita Wong Director, Head of Manufacturing Science and Technology at Genentech.

The 2021 NIIMBL eXperience took place from June 14 - 25, 2021.

2020 NIIMBL EXPERIENCE FELLOWS



This industry is the reason that lives are saved on a daily basis.

KAMARA ALLEN
Alcorn State University



After seeing the different aspects of the biopharmaceutical industry, I now understand how engineering can be applied in different situations.

SHERGAUN ROSERIE
Howard University



From the industry presentations, I loved the wealth of opportunities that were available.

TIALA GABRIELLE SCOTT
Lincoln University



COMING TOGETHER IN A TIME OF CRISIS

With the U.S. and the world gripped by a pandemic, the NIIMBL community quickly stepped up in the fight against COVID-19.

In April 2020, NIIMBL received an \$8.9M award from NIST through the Coronavirus Aid, Relief, and Economic Security (CARES) Act to fund innovation projects that supported the U.S. response to the COVID-19 pandemic. Despite only 72 hours to respond due to the rapidly evolving situation, members submitted more than 200 concepts, tapping into expertise within and outside of NIIMBL's traditional scope. The concepts resulted in the selection of nine projects.

The funded projects included: advancing serological testing by making recombinant virus proteins; rapid development of diagnostic testing capabilities to assist regional hospital systems; enhancing domestic supply chains related to testing and personal protective equipment manufacturing; testing of approaches for rapid sanitization; and to establish testbeds to accelerate agile manufacturing of medical countermeasures and rapid release testing of biopharmaceuticals and vaccines.

High Throughput PCR Testing

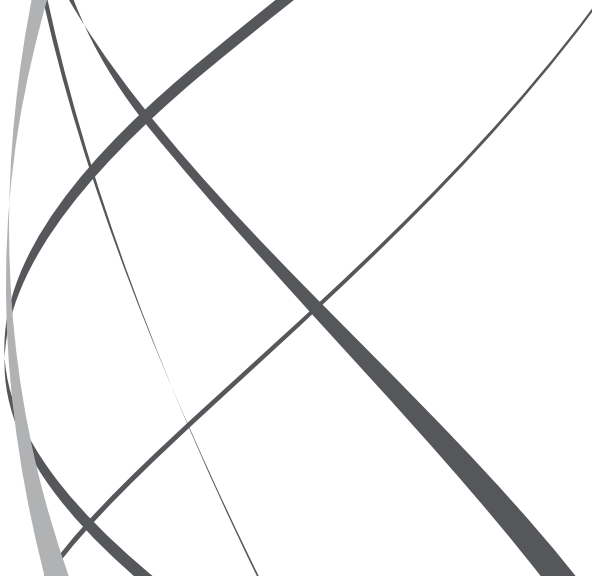
In the early days of the pandemic, Polymerase Chain Reaction (PCR) testing was a challenge with long

turnaround times due to limited supply chains. The University of Delaware, Roche Diagnostics, Incyte, and Christiana Care Health System teamed to develop an alternate PCR-based assay to diagnose COVID-19. The new assay allowed Christiana Care, a large Delaware-based health system, to test for COVID-19 in-house rather than sending patient samples to third parties. The team published the methods so other organizations may implement similar procedures

Alleviating PPE Shortage for Healthcare Workers

A lack of Personal Protective Equipment (PPE) hampered the Nation's ability to fight the pandemic. However, the Nonwovens Institute (NWI) at North Carolina State University was able to step up in a big way by developing and manufacturing a novel filter media that is suitable for the production of surgical masks and N95 respirators. The team has provided 4.5 million square meters of the filter media to its partners, which has resulted in the production of more than 100 million masks since March 2020 for front-line healthcare workers.





PROJECT HIGHLIGHTS



BRIDGING THE GAP: A BIOPHARMACEUTICAL PROCESSING WORKFORCE DEVELOPMENT CONTINUUM

Providing an education pathway for a successful biopharmaceutical career



JEFFERSON INSTITUTE FOR BIOPROCESSING

Philadelphia, PA

Type:

Academic Research Institution

Participating Organizations:

Bucks County Community College, Montgomery County Community College, Merck & Co., Inc.

NIIMBL certainly helped us jumpstart this project. We share with everyone how much value there is to be a part of NIIMBL and what a terrific opportunity it is to advance the industry. From a participant perspective, it was an overwhelming success with students finding employment and two continuing their education in the field. One student even called it the best educational experience they ever had.

LYN KUGEL

Jefferson Institute for Bioprocessing

INDUSTRY NEED

The global biopharmaceutical industry is growing at approximately 13-14% annually.¹ As a result of this growth, the industry needs entry-level candidates who possess the skills and competencies for technician roles on the manufacturing floor. While community colleges have been supplying the industry with biopharmaceutical manufacturing and biotechnology technicians for over 20 years, many entry-level candidates don't get hands-on experience with industry-scale equipment until they enter the workforce. Providing such experience to community college students is critical to ensuring the industry can continue to grow and entry-level technicians can hit the ground running.



SOLUTION

This project has developed a program to provide community college students with critical hands-on experience with industry-scale equipment to jumpstart a successful bioprocessing career. Developed with input from Merck & Co. Inc. and an industry task force, a 5-week hands-on course at Jefferson Institute for Bioprocessing (JIB) addresses this need in a state-of-the-art GMP (good manufacturing process) facility. The course covers components such as upstream and downstream operations, analytical methods and quality control, as well as professional skills development. The program enables students to jump directly from community college to industry careers and provides a roadmap for career advancement.

OUTCOME

In August 2020, a pilot course was completed by 10 students from Montgomery County Community College and Buck County Community College. All of the students who completed the course were able to find employment, transition into related roles with existing employers, or pursue advanced education in the biopharmaceutical field. The course created a solid framework for the scale up of a high-value industry-focused training program that can quickly meet the demand for skilled candidates in today's growing biopharmaceutical manufacturing market.

¹Morrow, K. John & Langer, Eric S. A Biopharma Year In Review — And A Look Ahead To 2020. Biosimilar Development. December 16, 2019.

LOW-COST PRODUCTION AND PURIFICATION OF CYTOKINES AND GROWTH FACTORS FOR CELL THERAPY PRODUCTS

Reducing costs for critical cell growth components



POTOMAC AFFINITY PROTEINS

North Potomac, MD

Type:

Small-Med Size Company

Participating Organizations:

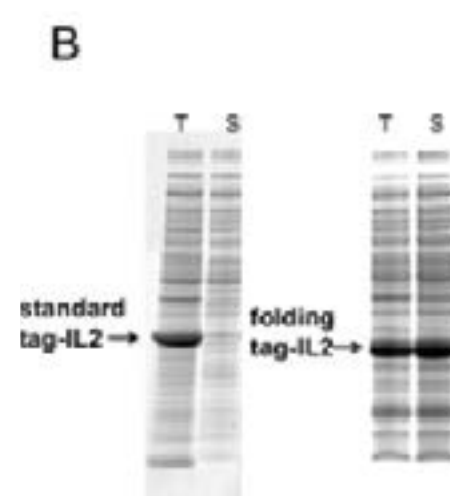
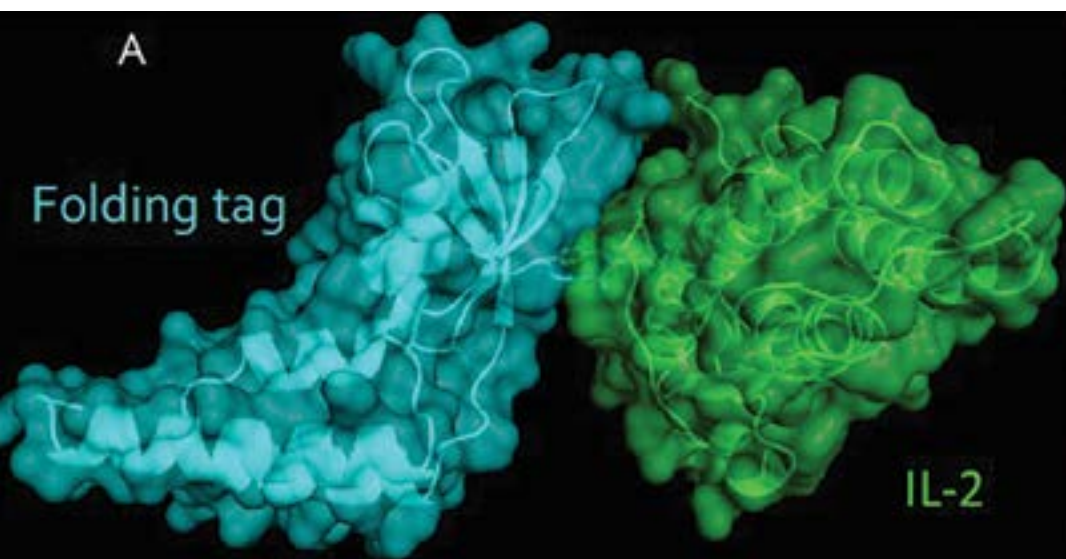
University of Maryland College Park

Before the NIIMBL project, our business model has been to license technology. Post-NIIMBL project, we may become a manufacturer. Being involved with a group of people who live, eat, and breathe manufacturing, it has been transformative to be involved in a project like this.

PHIL BRYAN
Potomac Affinity Proteins

INDUSTRY NEED

Cytokines are proteins used in cell culture to support cell growth, survival and differentiation. While they are a vital component of cell therapy manufacturing, they are also the most expensive with costs ranging from \$1K to \$50K for a single milligram per cytokine. The industry would greatly benefit from a new approach to manufacture cytokines for cell growth that is more cost effective.



2,000%

INCREASED PRODUCTION

>90%

REDUCTION IN COST

SOLUTION

Focusing on IL-2 and FGF2 cytokines, Potomac Affinity Proteins teamed with the University of Maryland to scale cytokine production reliably and at a fraction of the cost. The team aimed to use Potomac Affinity Proteins' *E. coli* expression system to create a platform process for cytokine production and purification that integrates molecular machinery into traditional manufacturing technologies. The process would allow for greater scale up potential at a reduced cost, while expanding flexibility for the industry to adopt the novel purification process for other critical cytokines or proteins.

OUTCOME

The results of this project exceeded expectations. Initial projections were ≥ 50 mg per run. Impressively the team was able to produce and validate 1 gram of IL-2 and FGF2 cytokines respectively from 5 Liters of cell culture. In addition to the nearly 2,000% increase over expected production, the team achieved a significant cost reduction of 90% - 99.8%, from \$1k - \$50k per mg to less than \$100 per mg. This basic methodology can be applied across additional cytokines beyond IL-2 and FGF2. However, the real game-changer for the industry is that it can be scaled-up to manufacture significantly higher quantities reducing cost to only dollars per mg, potentially resulting in significant manufacturing cost savings.

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This project was developed with an award from the National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL) and financial assistance from the U.S. Department of Commerce, National Institute of Standards and Technology (70NANB17H002).

SOFTWARE AND HARDWARE TOOLS FOR LYOPHILIZATION SCALE-UP

Improving product stability through new lyophilization tools



When companies come to me asking if they can implement this broadly through their organization, that is one of the biggest validations that our project was a success.

BILL KESSLER
Physical Sciences, Inc.

PHYSICAL SCIENCES, INC.

Andover, Massachusetts

Type:

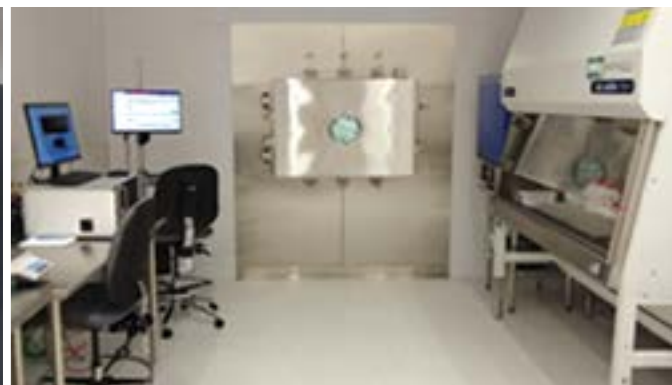
Small-Med Size Company

Participating Organizations:

University of Massachusetts Lowell, National Institute for Pharmaceutical Technology and Education, Inc. (NIPTE) (Uconn), Massachusetts Life Sciences Center, Purdue University, Merck & Co., Inc., Genentech

INDUSTRY NEED

Lyophilization, commonly known as freeze drying, is used in biopharmaceutical manufacturing to stabilize products and maximize shelf life. The share of approved lyophilized injectable/infusable drugs has grown tremendously in recent years from 11.8% between 1990 – 98 to approximately 50% between 2013-15.¹ However, lyophilization is a complicated process that currently lacks predictive modeling. Further, despite its growing prevalence in the industry, there is generally a lack of expertise on the freeze drying process. This knowledge gap puts the industry at risk for disruptions that may lead to wasted products or supply shortages.



SOLUTION

This project built universally accepted software and hardware tools to help manufacturers better understand their lyophilization process to reduce the risk of errors and lost product. These tools will not only increase expertise but also ease companies through scale-up. The project creates modeling tools that helps manufacturers understand the impact of process errors and addresses heterogeneity to ensure consistency across the batch.

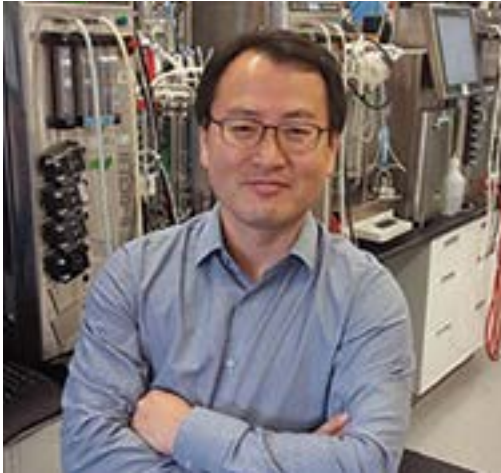
OUTCOME

The team successfully built the new software and hardware tools that provide companies with a complete understanding of the lyophilization process. The tools were then tested by large industry partners Merck & Co., Inc. and Genentech. The project led to the opening of the new Lyophilization Lab at the University of Massachusetts Lowell, which is available to the biopharmaceutical community for research and development. This pilot-scale, non-GMP facility can be used to further R&D to support advancements in freeze drying technology.

¹LyoHub. Lyophilization Technology Roadmap (2017).

AT-BIOREACTOR TRACE METAL QUANTIFICATION AND STATISTICAL PROCESS CONTROL IN CHO CELL-CULTURE PRODUCTION

Improving trace metal measurement for better process control



CLEMSON UNIVERSITY

Clemson, South Carolina

Type:

Academic Research Institution

Participating Organizations:

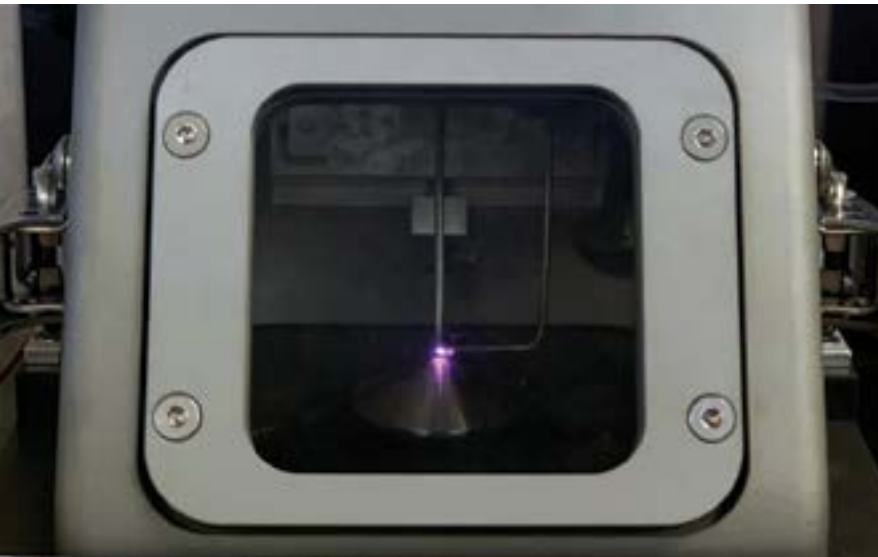
University of Massachusetts Lowell, Massachusetts Life Sciences Center, FDA, Merck & Co., Inc.

Our collaboration and the partnerships we have built through NIIMBL have allowed us to develop a new instrument that measures trace metals quickly without sacrificing accuracy.

SEONGKYU YOON
Umass Lowell

INDUSTRY NEED

Ongoing research suggests the level of trace metals (zinc, copper, manganese, and selenium) found in cell cultures may impact the health, growth rate, and productivity of cells used to manufacture therapeutic products. The gold standard method, Inductively Coupled Plasma Mass Spectrometry (ICP-MS) requires a large footprint and measurements must be taken offline at a separate location. In addition to the space requirements, long run times and variability between sites limit the quantitation of trace metals that can affect health and productivity of cell cultures.



96% TIME SAVINGS

REDUCED MEASUREMENT TIME FROM 4 HOURS TO 10 MINUTES.

SOLUTION

This project advanced the testing of trace metals by 1) demonstrating the transfer of an ICP-MS assay between FDA and UMass Lowell and 2) design and testing of a small-scale mass spectrometer for rapid trace metal quantification in cell culture using liquid sampling-atmospheric pressure glow discharge (LSAPGD) microplasma as an ion source at Clemson. The instrument is small enough to use at the bioreactor for real-time monitoring, which can alleviate the need for off-site testing and save significant time. With enhanced measurement tools in place on-site, manufacturers will be able to monitor trace metal levels and make decisions in near real-time.

OUTCOME

The project resulted in the development of a compact mass spectrometer which reduced measurement time from approximately four hours per sample to only 10 minutes, a 96% time savings. The approach and time-savings will allow manufacturers to measure trace metals more frequently for better process control. In addition, the instrument cuts the cost of measurement by nearly 50% compared to off-line methods.

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MEMBERSHIP



MEMBERS AND PARTNERS 2020–21

Industry

4th Phase Water Technologies*
908 Devices, Inc.
ABL*
Accugenomics Inc
Adjutant Solutions Group*
Aerosol Therapeutics
Akron Biotechnology, LLC
Amgen Inc.*
Applied Biosensors
Applied Control Engineering, Inc.
Applied Materials, Inc.
Artemis Biosystems Inc.
Asimov
AstraZeneca
Automated Control Concepts Inc
Bill & Melinda Gates Foundation
Bristol-Myers Squibb
Catalent Pharma Solutions, LLC*
CellFE, Inc.
Centivax Inc*
Chromatan Corporation
Commissioning Agents Inc.
CompassRed, Inc.
Cygnus Technologies*
Denali Therapeutics
Dyadic International Inc*
Eli Lilly and Company
Extrave Bioscience, LLC
Fisher Rosemount Systems Inc
Genentech
GlaxoSmithKline, LLC
iBio, Inc.*
ILC Dover LP
IMA Life North America Inc.*
InDevR Inc*
Intabio
Isolere*
Janis Research Company
Janssen Research & Development, LLC
Just - Evotec Biologics*
LigaTrap Technologies, LLC.
Lindy Biosciences, Inc.
LumaCyte, LLC

M Davis & Sons Inc
MacroGenics, Inc.
Mango Inc.*
MedInstill
Merck
Metalytics
MilliporeSigma/EMD Serono
MOBILion Systems Inc
MockV Solutions, Inc
MTI BioScience, LLC*
National Resilience, Inc.
PAK Biosolutions
Pfizer, Inc.
Physical Sciences Inc
PMT (USA) LLC
Potomac Affinity Proteins
ProMechSys-RLP, LLC
Protein Metrics Inc
Redbud Labs Inc
RedShift BioAnalytics*
Repligen Corporation
RoosterBio Inc
Sanofi*
Sartorius Stedim
Scarab Genomics, LLC / DNASTAR
Scientific Bioprocessing*
Sepax Technologies Inc
Sepragen Corporation*
SP Industries
Spark Therapeutics, Inc.
Sudhin Biopharma Co
Sutro Biopharma
Synthego Corporation*
Takeda Pharmaceuticals*
Univercells Technologies, S.A.
Unum Therapeutics Inc.
Uvax Bio LLC*
Vericel Corporation
Vir Biotechnology, Inc.*
Werum IT Solutions America Inc. |
Körber Group*
Whirlcell LLC.
Xcellerate Biotech Inc.

Academic Institutions and Non-profits

AABB Center for Cellular Therapies
AICHE
Alamance Community College
Albany College of Pharmacy and Health Sciences
Alliance for Regenerative Medicine
Austin Community College*
Automation Anywhere, Inc., Life Science Division
BioBAT, Inc.
BioKansas
Biotility*
Brunswick Community College
Bucks County Community College
California Polytechnic State University*
Cape Fear Community College
Caring Cross, Inc.*
Carnegie Mellon University
Cecil College
Center for Entrepreneurial Innovation
Maricopa CCCD
Central Carolina Community College
Clemson University
Delaware BioScience Association
Delaware Prosperity Partnership*
Delaware State University
Delaware Technical Community College
Delaware Valley Industrial Resource Center*
Developing Countries Vaccine Manufacturers Network
Durham Technical Community College
Forsyth Technical Community College
Fraunhofer USA
Frederick Community College
Gaston College
Georgia Tech Research Corporation
Gustavus Adolphus College
Hagerstown Community College
International Academy of Automation Engineering
Johns Hopkins University
Keck Graduate Institute*
Life Science Washington

Massachusetts Institute of Technology
Massachusetts Life Sciences Center
MassBio Education Foundation*
MiraCosta College
Missouri Biotechnology Association
Missouri University of Science and Technology
Montgomery College
Montgomery County Community College
National Institute for Pharmaceutical Technology and Education, Inc (NIPTE)
New Jersey Economic Development Authority*
New Jersey Innovation Institute
New York State Department of Health (Wadsworth Center)
North Carolina Biosciences Organization
North Carolina Biotechnology Center
North Carolina Central University
North Carolina Community Colleges Systems BioNetwork
North Carolina State University
Northeastern University
Open Applications Group, Inc.*
Oregon Bioscience Association*
PATH Center for Vaccines Innovation & Access
Purdue University
Quincy College
Regents of the University of Colorado (Boulder)
Regents of University of Minnesota
Rensselaer Polytechnic Institute
Research Corporation Technologies Inc
Santa Clara University
Shoreline Community College
Skilled KC Technical Institute
Sloan Kettering Institute for Cancer Research
Solano College
Southwest Research Institute
Standards Coordinating Body
Texas A&M University System
The American Society of Mechanical Engineers (ASME)
The Pennsylvania State University
The Research Foundation for the State

MEMBERSHIP ENGAGEMENT

186 TOTAL

NIIMBL MEMBERS

- 40 ACADEMIC RESEARCH INSTITUTIONS
- 24 COMMUNITY COLLEGES
- 14 INDUSTRY (LARGE)
- 70 INDUSTRY (SMM)
- 05 MEP
- 31 NON-PROFIT RESEARCH ORGANIZATIONS
- 02 STATE GOVERNMENT

39 TOTAL

NEW MEMBERS

YEAR-OVER-YEAR
MEMBERSHIP GROWTH
20%

MEMBERS ENGAGED
IN ACTIVITIES
90%

169

MEMBERS ENGAGED IN
NIIMBL ACTIVITIES

University of New York, on behalf of State
University of New York
Polytechnic Institute
Thomas Jefferson University
Tulane University
United States Pharmacopeial Convention
University City Science Center
University of California, Los Angeles
University of Delaware
University of Georgia
Research Foundation
University of Maryland*
University of Maryland,
Baltimore County

University of Massachusetts System
University of North Carolina
at Wilmington
University of North Carolina,
Chapel Hill
University of Pennsylvania
Vance-Granville Community College
Villanova University
Wake Technical Community College
Washington State University*
Worcester Polytechnic Institute
Xavier University of Louisiana

Manufacturing Extension Partnerships

New Jersey Manufacturing
Extension Partnership
Massachusetts Manufacturing
Extension Partnership
North Carolina Manufacturing
Extension Partnership
Delaware Manufacturing
Extension Partnership

Other Partners

National Institute of Standards
and Technology
Food and Drug Administration
National Institutes of Health

*NIIMBL interacts with
several other federal
agencies and institutes.*

* New members

Genentech
A Member of the Roche Group

MERCK

MILLIPORE
SIGMA

EMD
SERONO

Janssen
A Johnson & Johnson Company

gsk

Pfizer

SARTORIUS

4th Phase Water Technology, LLC

BIOKANSAS

DELAWARE
TECHNICAL COLLEGE

JANIS

908devices

BRUNSWICK
COMMUNITY COLLEGE

JENALI

Jefferson

Center for
CELLULAR THERAPIES

UTCS

DNASTAR

JONES HOPKINS
UNIVERSITY

AccuGenomics

CAL POLY

DURHAM
TECH

KU

AT

CaringCross

DYADIC

KGI

AICHE

Carnegie Mellon University

extrave

KÖRBER

AKRON

CARE FEAR
COMMUNITY COLLEGE

FDA

LIFE SCIENCE

Albion
Community College

GENSLER

ResylTech
community college

LigoTrap

AMERICAN
INSTITUTE OF PHARMACEUTICALS

CEI

Fraunhofer

Lindy Biosciences

Alliance for
Regenerative
Medicine

CelliFE

Central Community College

LumaCyte

ASME

centivax

Caston College
Castonville, OH

MacroGenics

APPLIED
BIOSYSTEMS

CHROMATAN

Chrysalis
Pharmaceuticals

MANGO

APPLIED CONTROL
ENGINEERING

CLEMSON
UNIVERSITY

GUSTAVUS
MAGNANUS

MASSACHUSETTS
INSTITUTE OF TECHNOLOGY

APPLIED
MATERIALS

CBQI

DEWOLF

MASSACHUSETTS
INSTITUTE OF TECHNOLOGY

ASAP

CompassRed

ILC DOVER

MassBioPharma

ASIMOV

CYGNUS

Just
CIVIC BUSINESS

MIT

AUSTIN
COMMUNITY COLLEGE

dcvm

iBio

MDAVIS

lab
owl

DelawareBio

IAA

INTACT Solutions

ALUMINATION
ANYWHERE

DEMPE

Intabio

METATICS

AMERICAN
MILITARY

Delaware State University

IAAE

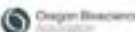
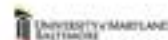
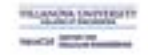
INTEGRATED
SOLUTIONS

BioBAT

DELAWARE
PROSPERITY
PARTNERSHIP

Isolere Bio

MOBIO

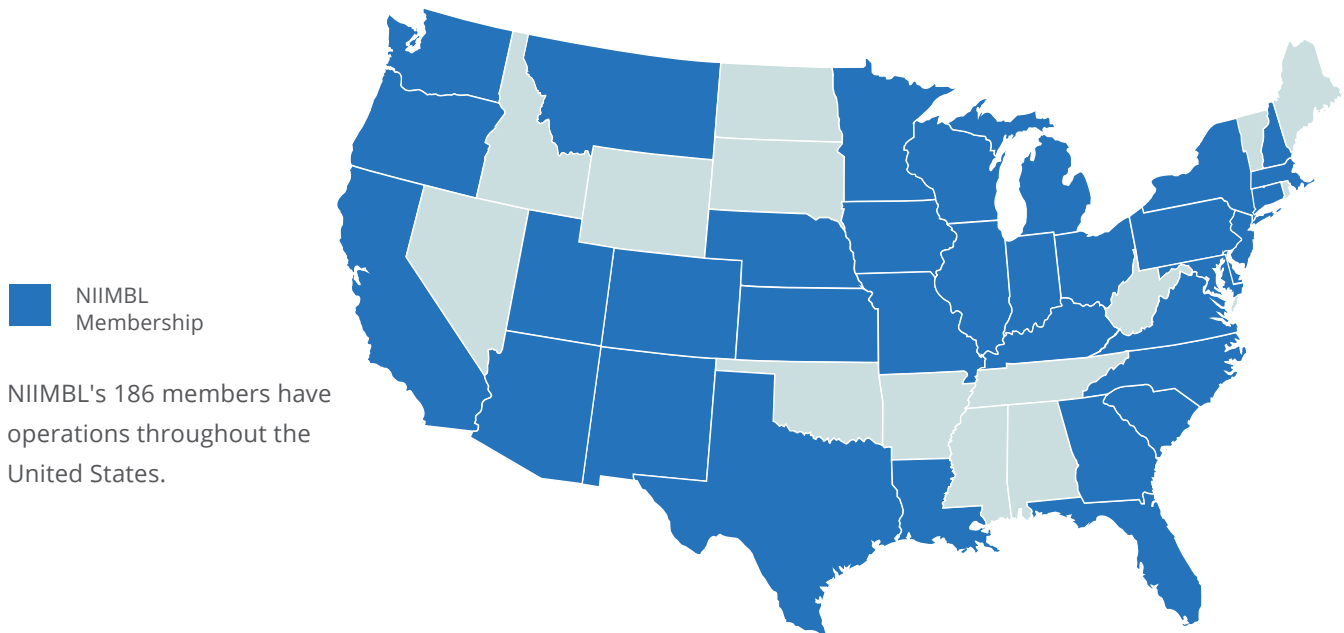


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