LETTER FROM THE PRESIDENT

BioGenerator strives to address a complex set of goals: building strong companies; investing in diverse life science sectors and business models, from high reward technologies that generate strong returns to investors, to others that achieve revenue more quickly or create sustainable jobs; expanding the St. Louis talent pool; educating first-time entrepreneurs; and assisting regional partners.

In 2016 BioGenerator deployed $2.6M in investment capital, from pre-seed financings to venture rounds, and added five new companies to our portfolio. We continue to address the capital gap between seed and venture financings. The scope of innovation in our portfolio is broad, e.g., engineering natural rubber biosynthesis in sunflowers; medical devices to treat cardiac arrhythmias and stroke; and development of novel therapies for fibrosis and cancer. BioGenerator helps build early-stage companies, exemplified by the substantial time and efforts from our staff and entrepreneurs in residence (EIRs) to build a cutting-edge research tools company. We are committed to assisting companies in diverse ways such as identification of talent, access to our unique wet labs, board of directors engagement, and assistance in capital raises. In 2016 our portfolio companies raised $149M in additional capital, highlighted by an expansion of Tioma Therapeutics’ Series A round to $86M; an additional $20M into Galera Therapeutics’ B round; and a $10M Series B round for Pulse Therapeutics. APT Therapeutics entered into an agreement with AstraZeneca for development of its novel antithrombotics. In the medical device sector, two companies completed initial clinical proof of concept while another received approval for European clinical studies.

BioGenerator has a robust set of complementary programs designed to support not only our investment portfolio, but also other St. Louis startups and entrepreneurs. These include the BioGenerator Labs, unique space home to 200 users and over 50 client companies, with state-of-the-art laboratory instrumentation accessible to firsttime entrepreneurs, research institution partners, and industry veterans; hands-on support to identify potential co-investors; our EIR program, a pre-investment grant program designed to support early validation of commercial readiness, which funded 24 opportunities in 2016; BioSTL Fundamentals, a coaching program for firsttime founders and entrepreneurs; and hands-on coaching and submission support services for commercial grant applicants, which provided critical support to 90 client groups in 2016.

This report would not be complete without our thanks to the organizations and individuals that generously support BioGenerator and our parent organization, BioSTL. Major 2016 funders of BioSTL and, by extension, of BioGenerator include Washington University; BJC HealthCare, St. Louis Life Sciences Project, Monsanto, Boeing, Crawford-Taylor Foundation, Mallinckrodt Pharmaceuticals, the JPMorgan Chase Foundation, and The Ewing Marion Kauffman Foundation. We also received funding for specific activities from public sector entities: Missouri Technology Corporation, the Helix Fund of St. Louis County, the Economic Development Administration of the US Department of Commerce, and the US Small Business Administration. In addition, we are indebted to the BioSTL Board and to BioGenerator’s seed stage Investment Advisory Committee whose members generously donate their time and expertise.

I’m truly blessed to work with a committed and highly talented group of colleagues, energized by opportunities to improve the human condition while helping to transform the St. Louis economy in 2017 and beyond.

Eric Gulve
President, BioGenerator
OUR APPROACH

We position our portfolio companies to raise syndicated and follow-on investments and to navigate the unique challenges of company development. With the goal of removing barriers to entrepreneurial success, we collaborate with our portfolio companies in three primary ways:

- Access to capital by making investments across multiple stages and developing strategic relationships with qualified investors
- Strategic advisory services to innovators and entrepreneurs, focused on company building and identifying strong talent
- Collaborative lab space and state-of-the-art equipment to create capital efficiency for portfolio companies

INVESTMENT ACTIVITY

<table>
<thead>
<tr>
<th>STAGE</th>
<th>SOURCE/CREATE</th>
<th>DE-RISK</th>
<th>BUILD</th>
<th>DEVELOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOGENERATOR INVESTMENT FUND</td>
<td>Deal Sources</td>
<td>Pre-Seed Fund</td>
<td>Seed Fund**</td>
<td>Post-Seed Fund</td>
</tr>
<tr>
<td>TYPICAL BG TRANSACTIONS PER YEAR &amp; PER FUND</td>
<td>300–400</td>
<td>4–8</td>
<td>3–5</td>
<td>4–6</td>
</tr>
<tr>
<td>MAX BG CUMULATIVE CAPITAL PER DEAL &amp; PER FUND</td>
<td>≤ $100k</td>
<td>≤ $750k</td>
<td>≤ $1.25M</td>
<td></td>
</tr>
<tr>
<td>TYPICAL NON-BG CUMULATIVE CAPITAL PER COMPANY</td>
<td>$50k–$1M</td>
<td>$500k–$3M</td>
<td>$2–$10M</td>
<td></td>
</tr>
<tr>
<td>TYPICAL BG % OF CUMULATIVE CAPITAL PER COMPANY</td>
<td>10–100%</td>
<td>10–35%</td>
<td>10–20%</td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
* BioGenerator seeks to syndicate deals with other investors at the Seed and Post-Seed fund stages.
** Seed Fund deals are presented before the BioGenerator Investment Advisory Committee.

ALIGNMENT OF CAPITAL AND QUALITY

The BioGenerator investment philosophy emphasizes making the largest investments in companies who prove, over time and based on accomplishment of milestones, that they are the most likely to achieve success and return capital to investors.
BioGenerator Led a $2M Financing to Create New St. Louis Company

Canopy BioSciences is commercializing technologies used by academic and industry scientists in human health and agriculture. The new company will build a portfolio of kits and other products used in gene editing, cell biology, and molecular biology. Canopy was founded by the leadership team that previously led startup company SAGE Labs from formation to successful exit by acquisition.

“We look forward to several successful product launches in 2017 and to expanding the business from there,” said Edward Weinstein, co-founder and CEO. “We’ve built Canopy BioSciences working side-by-side with BioGenerator.”

With BioGenerator Investment, Edison Agrosciences Relocated to St. Louis

Edison Agrosciences is an agtech company developing and commercializing innovative solutions for the production of plant-based industrial materials, with a primary focus on the development of alternative rubber crops. BioGenerator investment relocated the company from North Carolina to the agtech corridor in St. Louis County.

“Edison’s technology offers unique advantages over other methods of rubber production,” said Tom Christensen, CEO. “Our system uses established agronomic practices familiar to growers and for which a robust infrastructure is in place today.”
2016 INVESTMENTS

EXAMPLE BIOGENERATOR GRANTS PROJECTS*

ANTHROBIO
CANOPY BIOSCIENCES
CARDIAFORM
CELLATRIX
GEMINI
GENEOSCOPY
HOPE MRI
KALOCYTE
LUPEUP
SENTIAR
NEPHROZIP
PRECISION VIROLOGICS
PRO-ARC DIAGNOSTICS
SARM-1
SPECTRUM PERCEPTION
TUNR

PRE-SEED FUND

ACCURONIX
CANOPY BIOSCIENCES
COURIER THERAPEUTICS
EDISON AGROSCIENCES
MEDAWARE
NITROGENICS
UNLEASH IO
VIBA THERAPEUTICS

SEED FUND

S4 AGTECH
EDISON AGROSCIENCES**
YOURBEVCO

POST-SEED FUND

ADARZA BIOSYSTEMS
APSE
BACTERIOSCAN
CONFLUENCE LIFE SCIENCES
EUCLISES PHARMACEUTICALS
INDALO THERAPEUTICS
NEUROLUTIONS

“USVP looks for compelling science and top management talent. I have been impressed with the portfolio of medical device and therapeutic companies that BioGenerator is building.”

—John Root, M.D.
General Partner, USVP

* Representative examples of pre-investment projects; includes pre-company and other activities such as i6 Proof of Concept Center

** Companies received multiple investments in 2016
INVESTMENT PORTFOLIO

$15.2M CUMULATIVE BIOGENERATOR INVESTMENT

$462M ADDITIONAL FUNDING ATTRACTED BY BIOGENERATOR COMPANIES

49 ACTIVE BIOGENERATOR COMPANIES

PRE-SEED FUND

ACCURONIX Therapeutics
ARCH INNOTEK Nutrition
ARRAY BRIDGE Research Tools
CANOPY BIOSCIENCES Research Tools
COFACTOR GENOMICS CRO & Diagnostics
COURIER THERAPEUTICS Therapeutics
EDIS Health IT
EDISON AGROSCIENCES Agriculture
ELIRA THERAPEUTICS Medical Device
EPHARMIX Health IT
IMMUNOPHOTONICS Therapeutics
KATALYST SURGICAL Medical Device
MEDAWARE Health IT
MEDSOCKET Health IT
MOBIUS ABX Therapeutics
NANOPORE DIAGNOSTICS Medical Device
NITROGENICS Agriculture
PMDI Diagnostics
TANSNA THERAPEUTICS Therapeutics
TRAXXSON Diagnostics
UNLEASH IO Therapeutics
VIBA THERAPEUTICS Therapeutics
**SEED FUND**

<table>
<thead>
<tr>
<th>Company</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arvegenix</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Graematter</td>
<td>Health IT</td>
</tr>
<tr>
<td>Indalo Therapeutics</td>
<td>Therapeutics</td>
</tr>
<tr>
<td>Kogent Surgical</td>
<td>Medical Device</td>
</tr>
<tr>
<td>S4 Agtech</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Yourbevco</td>
<td>CPG</td>
</tr>
</tbody>
</table>

**GRADUATES & EXITS**

<table>
<thead>
<tr>
<th>Company</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>APERTUS Pharma CRO</td>
<td></td>
</tr>
<tr>
<td>APT Therapeutics</td>
<td>Therapeutics</td>
</tr>
<tr>
<td>Benson Hill Biosystems</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Confluence DT CRO</td>
<td></td>
</tr>
<tr>
<td>Electrochaea</td>
<td>Clean Tech</td>
</tr>
<tr>
<td>Galera Therapeutics</td>
<td>Therapeutics</td>
</tr>
<tr>
<td>Kypha</td>
<td>Diagnostics</td>
</tr>
<tr>
<td>Medibeacon</td>
<td>Medical Device</td>
</tr>
<tr>
<td>Mobius Therapeutics</td>
<td>Therapeutics</td>
</tr>
<tr>
<td>Piixelexx</td>
<td>Research Tools</td>
</tr>
<tr>
<td>Pulse Therapeutics</td>
<td>Medical Device</td>
</tr>
<tr>
<td>Sarmont</td>
<td>CRO</td>
</tr>
<tr>
<td>Synerz Medical</td>
<td>Medical Device</td>
</tr>
</tbody>
</table>

**POST-SEED FUND**

<table>
<thead>
<tr>
<th>Company</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adarza Biosystems</td>
<td>Research tools</td>
</tr>
<tr>
<td>Apse</td>
<td>Agriculture</td>
</tr>
<tr>
<td>Bacterioscan</td>
<td>Diagnostics</td>
</tr>
<tr>
<td>CardiaLEN</td>
<td>Medical Device</td>
</tr>
<tr>
<td>Confluence Life Sciences</td>
<td>Therapeutics</td>
</tr>
<tr>
<td>Euclises Pharmaceuticals</td>
<td>Therapeutics</td>
</tr>
<tr>
<td>Generico Pharma</td>
<td>Therapeutics</td>
</tr>
<tr>
<td>Neurolutions</td>
<td>Medical Device</td>
</tr>
</tbody>
</table>

"The deal flow coming from BioGenerator has matured significantly and I’ve been impressed by the companies being developed in St. Louis."

—George Arida
Managing Director, Venture Investors
COMPANY HIGHLIGHTS

**INDALO THERAPEUTICS**

Indalo is developing novel therapeutics to treat fibrotic diseases impacting organs such as lung, kidney, and liver. The company was founded to exploit the therapeutic potential of RGD-binding integrin antagonists by leveraging groundbreaking discoveries on the role of these proteins in the pathogenesis of fibrosis. Indalo was founded by former Pfizer researchers working at Saint Louis University’s Center for World Health and Medicine.

BioGenerator was the first investor in Indalo, creating the company at the BioGenerator Labs alongside the founders. Subsequently, BioGenerator led two additional rounds of financing as the company has expanded its team and demonstrated compelling pharmacology data for its lead compounds.

“Indalo’s integrin antagonists show robust efficacy in multiple disease models. The team of seasoned drug hunters has made significant progress during the seed phase.”

—Charlie Bolten

**NEUROLUTIONS**

Neurolutions is a medical device company developing stroke rehab therapies leveraging brain-computer interface technology. The company’s founders include Drs. Eric Leuthardt & Dan Moran of Washington University. Its first product, the IspiHand, is an external device for upper extremity rehab in chronic stroke patients using proprietary software to translate brain signals (EEG) into action via smart integration with a consumer-friendly interface.

BioGenerator invested at the founding of Neurolutions and made an additional investment as the company progressed from concept to clinical data, expanded its team, and iterated design of its device. Neurolutions completed initial clinical proof-of-concept in patients that had plateaued in response to standard therapy.

“Neurolutions’ approach enables patients to tap into signals from uninjured brain regions and drive restoration of motor function by rewiring of neural circuits.”

—Eric Gulve
Galera Therapeutics is a clinical stage company developing novel therapeutics that are highly selective small molecules that mimic the enzymatic activity of human superoxide dismutase enzymes. The initial indications for these compounds are for the prevention of radiation-induced toxicity, such as oral mucositis, that occur during cancer treatment. Galera’s lead compound has advanced to a randomized, placebo-controlled Phase 2b clinical trial in head and neck cancer patients.

BioGenerator led the seed financing of Galera, backing an experienced team that repurposed leads with prior clinical exposure for clinical indications directly connected to the molecular mechanism of the lead compounds. Subsequently the company raised multiple venture rounds to finance clinical development.

“Early clinical studies suggest that Galera’s dismutase mimetics reduce the incidence of severe oral mucositis without compromising anti-tumor efficacy.”

—Eric Gulve

APT Therapeutics is pursuing innovative approaches for the treatment of thrombotic diseases. Their lead molecule, an engineered variant of human apyrase, rapidly inhibits platelet activation and aggregation. Its mechanism of action is unique amongst antithrombotic therapies. Clot formation in models of heart attack and stroke is attenuated without causing bleeding. Furthermore, when given concurrently APT’s lead molecule reduces bleeding complications associated with current antithrombotics.

BioGenerator was an early investor in APT Therapeutics and identified industry experts to assist the company in reaching out to potential strategic partners.

“APT’s technology offers the potential for rapid onset of antithrombotic effects without the bleeding complications associated with current agents.”

—Eric Gulve
Bacterioscan is a commercial stage diagnostic company with a device to rapidly detect bacterial growth. Bacterioscan’s first product detects and measures bacterial growth from clinical urine samples quickly, precisely, and with minimal labor. Earlier detection supports faster, more appropriate determination of treatment and better patient care, while reducing costs for detection of infected and uninfected samples.

BioGenerator invested in Bacterioscan’s Series A financing and assisted the company in raising follow-on capital. BioGenerator has made three investments in Bacterioscan, providing critical capital as the company has moved from proof-of-concept stage to regulatory review and initial product launch.

“Bacterioscan’s technology is a fast and accurate solution for bacterial detection. It should reduce healthcare spend and unnecessary antibiotic usage.”

—Dan Broderick

Tioma is an immuno-oncology company developing anti-CD47 antibodies for the treatment of solid and hematologic cancers. The company’s functionally diverse antibodies represent a new class of checkpoint inhibitors that harness both the adaptive and innate immune responses. The company was co-founded by William Frazier, professor at Washington University.

As the first investor in Tioma, BioGenerator provided capital and support to expand the company’s team, develop a panel of clinical candidates, demonstrate pharmacology in oncology models, further understand mechanism of action, and raise follow-on capital. BioGenerator has made four investments in Tioma from seed to Series A.

“CD47 is an opportune target in immuno-oncology. Tioma leverages outstanding research and pharma expertise to provide unique insight into the target.”

—Charlie Bolten
Cardialen is revolutionizing atrial fibrillation (AF) treatment through a low-energy, implantable device. The therapy has the potential to detect and terminate arrhythmias, slow disease progression, and greatly reduce AF’s substantial financial burden. Cardialen was founded by Igor Efimov based on technology invented at Washington University.

BioGenerator was the lead investor in Cardialen’s founding round of financing, providing capital to demonstrate preclinical proof of concept, develop prototypes, initiate clinical testing, add management talent, and raise follow-on capital. BioGenerator has made four investments in Cardialen, enabling generation of important clinical data supporting the technology.

“Cardialen is developing potentially game-changing technology for treatment of AF, an area of unmet clinical need with a significant market opportunity.”

—Eric Gulve

Benson Hill Biosystems is an agricultural company seeking to increase crop productivity, principally by improving the efficiency of photosynthesis. Benson Hill benefits from leading academic founders at Donald Danforth Plant Science Center, management composed of experienced agbiotech executives, and strategic partnerships with agricultural companies for multiple crops.

Benson Hill’s first financing and move to St. Louis were led by BioGenerator, which subsequently invested two additional times to fuel the company’s growth. Since BioGenerator’s initial financing, Benson Hill has established strategic partnerships, built a robust R&D team and research facility, validated its technology with field trials, and raised significant capital.

“Increased yield adds great economic and societal value. Benson Hill’s technology enhances the mechanisms by which plants extract energy from the Sun.”

—Dan Broderick
MediBeacon is a clinical stage company developing technology to measure kidney function in real time. Today, standard methods provide indirect estimates reflective of the status of renal function several days prior. MediBeacon’s Optical Renal Function Monitor measures, rather than estimates, kidney function, and does so in real-time.

Having assisted MediBeacon in securing key technology assets, BioGenerator led the company’s first financing. As MediBeacon progressed, BioGenerator invested three times to help catalyze the company’s early funding rounds. MediBeacon made significant progress toward a commercial product with additional clinical data and an institutional financing.

“Through strategic acquisition of a mature asset, MediBeacon has quickly advanced a product concept with a large unmet medical need and market opportunity.”

—Charlie Bolten

Adarza BioSystems produces a platform enabling next-generation, label-free, multiplex protein assays. The company’s platform has high sensitivity, broad dynamic range, and significant workflow advantages. The versatility of the Adarza platform means that it can serve as a central tool for evaluating a broad range of important biological problems.

BioGenerator recruited Adarza to St. Louis, was the company’s first regional investor, and subsequently led a seed financing. BioGenerator has invested three times in Adarza as the company progressed. Adarza has made significant progress toward a commercial product, established a St. Louis manufacturing facility, and expanded its strategic partnerships.

“Understanding biological pathways requires analysis of multiple endpoints. Adarza allows this to be done at the protein level with simple workflow.”

—Charlie Bolten
YourBevCo is a beverage device company developing a pipeline of innovative, disruptive consumer devices that safely and effectively remove problematic ingredients from beverages that are known to cause allergic or sensitivity reactions. Its first product removes problematic sulfites from wine and fruit juices, allowing consumers to enjoy these beverages sulfate-free.

YourBevCo was created within the BioGenerator Entrepreneur in Residence program, received pre-company proof of concept funding from BioGenerator, and has subsequently received three investments from BioGenerator. YourBevCo has advanced its first product from concept to commercial launch, with multiple additional products in development.

“Consumers are increasingly looking for healthier choices in their foods. YourBevCo’s products quickly and conveniently reduce unwanted allergens.”

—Edward Hamati

Arvegenix is the leader in the development of Field Pennycress as a significant new crop for the corn-soy growing regions of the world. Pennycress will grow over winter between the corn-soy rotation thereby providing growers with another revenue crop, as well as the environmental benefits of cover crops.

BioGenerator facilitated the creation of Arvegenix with pre-company funding and Entrepreneur in Residence support, and then led the initial round of financing. BioGenerator has invested twice in Arvegenix as the company has matured. Arvegenix has progressed from concept to a sophisticated R&D company led by highly experienced industry executives and benefiting from a strong syndicate of agtech-focused venture investors.

“Arvegenix has the potential to leverage a dormant asset to produce profits for farmers while providing the soil and environmental benefits of cover crops.”

—Charlie Bolten
MANAGEMENT HIGHLIGHTS

STEVE HANLEY
MEDIBEACON

Steve is an experienced global business leader who has managed complex pharmaceutical and medical device operations with annual global revenue exceeding $1 billion. As the President of Covidien’s Imaging Solutions business unit, he led a multi-functional organization that included sales, marketing, logistics, and manufacturing, as well as R&D. His track record includes numerous new drug and device product introductions and sales force expansion in Eastern Europe, China, and Latin America. Steve is experienced working in different cultures and successfully navigating dynamic regulatory environments. As co-founder and CEO of MediBeacon, Steve has led the company through several rounds of clinical validation.

JOHN TALLEY
EUCLISES

John is one of the world’s most successful medicinal chemists, best known as the co-inventor of the blockbuster COX-2 inhibitor celecoxib (Celebrex®) and follow-on coxibs Bextra® and Dynastat®. In addition, John played a major role in the discovery of the HIV protease inhibitors Agenerase®, Lexiva®, and Prezista®. In all, he is a co-inventor of seven marketed drugs, with several more still in development, is named inventor on more than 215 issued U.S. drug patents, has authored over 50 peer-reviewed publications, and was honored with the prestigious PhRMA Discoverers Award in 2002. John is the founder of Euclises and serves as CSO, and has driven the scientific program from concept to late pre-clinical development.

PAULA SKJEFTE
CARDIALEN

Paula brings over 30 years of healthcare experience to CardiaLEN, a clinical stage medical device company. Her experience includes roles as VP of Marketing in Cardiac Rhythm Management and VP of Consumer Business with Medtronic, Inc., and as President and CEO of Waterford Consulting, a company focused on driving strategic growth in medical technology through innovation, disruptive market approaches, and creative commercialization. As CEO, Paula has guided CardiaLEN through multiple financings, expansion of the IP portfolio, completion of preclinical studies, and initial human evaluation.

JERRY STEINER
ARVEGENIX

Jerry has 33 years of agricultural and life science experience. Prior to Arvegenix, Jerry spent most of his career with Monsanto in a variety of roles including crops marketing/sales, animal ag, strategy, global commercialization, public policy, public acceptance for biotechnology; and governmental and industry affairs. He was Executive VP reporting to the Monsanto CEO and a member of the Executive Team. In 2000-01 he worked for Celera Genomics as Executive VP Genomic Services. As CEO of Arvegenix, Jerry has built a strong leadership team, raised Series A financing, and led the company through multiple field trials.
Beginning with his first business startup in 1986, Gregg has founded multiple companies. Following a successful sale of this first company, Gregg founded his second ophthalmology products company in his garage. Gregg led the startup to $55 million in annual revenues as a NASDAQ-listed company. Gregg is an inventor on approximately 50 US Patents and previously served at the University of Missouri as the Director of Entrepreneurship and Industry Partnerships and Co-Director of the MU Biodesign and Innovation Program. Gregg founded and is the current CEO of Katalyst Surgical, serving the Ophthalmology marketplace once again, as well as Kogent Surgical, where he has developed a catalog of neurosurgical products.

Bill brings over 25 years of experience in clinical research, including 19 years in the biopharma industry in executive, development, and medical affairs roles. Bill was Senior Vice President of Clinical Development at InterMune, where he was the architect of the Esbriet® clinical program and approvals for idiopathic pulmonary fibrosis. He has also held positions at IntraBiotics Pharmaceuticals and Genentech. Bill trained in internal medicine and infectious diseases and practiced academic medicine at the University of California, San Francisco. Prior to Indalo, Bill was co-founder of Cascadia Therapeutics, acquired by Indalo in 2016. At Indalo, Bill serves as Chief Medical Officer and is a member of the company’s board.

Kern has over 20 years of executive management experience in both start-ups and large corporations. He previously founded Tibion Bionic Technologies, a leader in neurological rehabilitation that was recently acquired, and served as Chairman and CEO for seven years leading the company from concept through venture financing, clinical trials, and regulatory hurdles to achieve market entry and sales. Kern’s career began at IBM with responsibilities ranging from medical imaging systems to senior management in global technology operations. As CEO of Neurolutions, Kern is re-shaping the overall strategy and moving the company to next-stage clinical trials.

Formerly an Executive Director in the Pfizer Inflammation Research Unit, Joe brings over 30 years of biochemical pharmacology and drug discovery experience. He has held many management and leadership positions and has directed several drug discovery programs into Phase 1 and 2 stages of clinical development. As a demonstrated scientific leader he has over 75 peer reviewed publications. Joe is co-founder and President of Confluence Discovery Technologies, a nationally recognized drug discovery contract research organization that offers expertise in complex assay development, target prosecution, enzymology, and cell biology.
The BioGenerator Labs provides access to collaborative lab and office space and state-of-the-art equipment for portfolio and pre-investment technologies. The BioGenerator Labs is a critical asset to increase efficiency of early stage technology development by:

- Increasing capital efficiency for client companies via access to cutting-edge and otherwise unaffordable scientific equipment
- Concentrating world-class talent in a single facility adjacent to Washington University’s medical school campus
- Fostering an innovative and collaborative environment

The BioGenerator Labs is an 18,000 square-foot facility equipped for bioscience research, located in St. Louis’ Cortex startup district. Access to facilities is provided to promising companies and pre-investment technologies, reducing startup costs for clients, while focusing investment capital on technology de-risking and value creation.

BIOGENERATOR LABS

>200 USERS

>50 CLIENT COMPANIES

AND MANY MORE PRE-COMPANY PROJECTS
Since the program was launched in 2012, EIRs supported by BioGenerator have influenced the success of many startup companies.

EIR IMPACT

ADARZA
Board of Directors
APSE
Board of Directors
ARVEGENIX
Founding CEO
CANOPY BIOSCIENCES
Founding CEO and Founding Chairman
EUCLISES
Series A CEO and key strategic pivot
GENERICO PHARMA
Founding CEO
INDALO THERAPEUTICS
Chairman of the Board
YOURBEVCO
Founding CEO

ENTREPRENEURS IN RESIDENCE

BioGenerator Entrepreneurs in Residence (EIRs) are experienced professionals with diverse expertise including investing, fundraising, management, operations, and industry R&D. EIRs focus on supporting BioGenerator portfolio companies and creating new ventures.

THE 2016 EIR TEAM

ALAN MACINNES
CPG, THERAPEUTICS

DAVID CHRISTENSON
HEALTHCARE IT

PAUL OLIVO, M.D., PH.D.
DIAGNOSTICS, THERAPEUTICS

DAVID SMOLLER, PH.D.
RESEARCH TOOLS

EDWARD WEINSTEIN, PH.D.
RESEARCH TOOLS

JIM MCCARTER, M.D., PH.D.
NUTRITION, AGTECH
Capital Formation efforts focus on business development and relationship building on behalf of St. Louis and our portfolio companies. Interest from national investors in BioGenerator portfolio companies has increased significantly in the past several years. Recent cumulative financings secured by companies initially seed-funded by BioGenerator are listed below. In all examples, BioGenerator was the lead investor at the initial financing of the companies.

**Arvegenix** raised over $3M with key investors Monsanto Growth Ventures, Prelude Ventures, and Cultivation Capital. The company is commercializing a cover crop for use in the corn-soy rotation. In 2016, Arvegenix completed field testing.

**Pulse Therapeutics** completed a $10M round led by Silicon Valley fund Nanodimension. Pulse is developing novel magnet-based technology for the treatment of stroke and other vascular diseases, and is in clinical testing.

**MediBeacon** closed over $27M in multiple rounds of financing with key investors Pansend/HC2 Holdings and Jump Capital. MediBeacon is advancing a real-time renal function monitor through clinical testing.

**Benson Hill Biosystems** closed a Series A of $7.3M with participation from Middleland, Mercury Fund, Prelude Ventures, and Cultivation Capital. Benson Hill is improving yield in important food crops.

**Galera Therapeutics** has raised $80M with key investors Novo Ventures, NEA, Novartis Ventures, Enso, and Correlation. Galera is in clinical trials for cancer and other indications.

**Tioma Therapeutics** closed a Series A round reported at $86M, with key investors RiverVest, Roche Ventures, Novo, and SR One. Tioma is developing a new class of checkpoint inhibitors.

“We were impressed with the BioGenerator companies, and identified a strong opportunity for Jump Capital to add to our portfolio.”

—Garrett Vygantas, M.D.
Partner
Jump Capital

$462M

**CUMULATIVE FUNDING ATTRACTED FOLLOWING BIOGENERATOR INVESTMENT**
BioGenerator provides grants of up to $50K to promising companies and pre-company concepts. Awards are milestone-based, made available on a continuous basis during the year, and address the most important business or scientific risks associated with commercialization. BioGenerator Grants may be used for laboratory proof-of-concept, prototype development, intellectual property review and strategy, market assessments, business plan development, independent technical or business assessment, and many other key steps in new company development. BioGenerator Grants are often combined with mentoring through Fundamentals and EIRs, pursuit of non-dilutive SBIR/STTR funding through Grants2Business, and use of the BioGenerator Labs. Primarily through the i6 Proof of Concept Center, in 2016 BioGenerator provided grants to more than 25 opportunities. Example BioGenerator Grants recipients include:

**AnthroBio** is developing novel therapeutics. BioGenerator Grants were used to conduct proof-of-concept experiments at the BioGenerator Labs, to develop an intellectual property strategy, and to fund an external CRO to conduct screening.

**Precision Virologics** licensed technology for biologically targeted vaccines. BioGenerator Grants helped with laboratory proof-of-concept, formation of the new company, license strategy and negotiation, and corporate costs associated with partnering.

**GeneoScopy** is developing a noninvasive screening test to improve colorectal cancer screening compliance. BioGenerator Grants helped with proof-of-concept at the BioGenerator Labs, along with expert consulting.

**Pro-Arc Diagnostics** is advancing a new diagnostic test. The company used BioGenerator Grants to conduct proof-of-concept experiments at the BioGenerator Labs, and to support intellectual property due diligence, licensing, and corporate costs.

**Spectrum Perception** is a research instrument company developing hand-held analytical devices. BioGenerator Grants were used for intellectual property, creation of prototypes, market research, and proof-of-concept at the BioGenerator Labs.

**SentiAR** is developing an augmented reality platform to allow 3D holographic visualization of a patient’s cardiac anatomy. BioGenerator Grants helped with prototypes, commercialization plan, regulatory, intellectual property, and corporate startup expenses.

> “BioGenerator provided critical pre-company proof of concept funding, advice, and connections as we launched our new company. Their relationships with venture capital and experience structuring deals were invaluable in this process.”

—Jeff Milbrandt, M.D., Ph.D.
Professor and Head of Genetics
Washington University in St. Louis
ENTREPRENEUR SUPPORT

Outside of investments, BioGenerator supports individuals considering new business ideas through several programs, including BioGenerator Grants, access to the BioGenerator Labs, and mentoring from Entrepreneurs in Residence. In 2016 we launched two new support programs that work hand-in-glove with each other: coaching clients often need SBIR/STTR funding to “de-risk” their technologies; SBIR/STTR grant applicants need business-coaching to meet the commercialization standards demanded by granting agencies.

BIOSTL FUNDAMENTALS is a start-up business coaching and resource program that provides one-on-one business support aimed mainly at technically trained company founders. Unlike fixed-schedule, classroom-based programs, Fundamentals is tailored to the needs of each client. By successfully meeting business-coaching goals, through the BioGenerator Grants program, founders can earn valuable development resources including patent diligence, market/customer research, proof-of-concept grants and introductions to business mentors.

BIOSTL G2B - GRANTS TO BUSINESS is a training and support program that helps clients craft competitive grant applications targeting SBIR/STTR and other Federal, State, Municipal and Private Foundation funding sources. The program uses an “incentive driven calendar,” offering three cycles per year timed to coincide with major Federal grant deadlines. In each cycle, participants may earn resources (grant development training; technical and business consulting; expert evaluation; administrative support) by achieving specific grant development milestones by specific target dates. For promising applicants that may compete for larger awards (e.g., Phase II and Fast Track), G2B may provide significant “hands on” resources through the BioGenerator Grants program.

“BioGenerator successfully coached me and my team through IP challenges, forming a new company, acquiring lab space, preparing STTR and DOD applications, securing a leadership team and our first technical hires, and much more. Their support has been critical to our early success.”

—Allan Doctor, M.D.
Professor of Pediatrics, Washington University and Co-Founder, Kalocyte, Inc
“The input from the mock panel was extremely valuable. The format also allowed us to advance our planning in a way that was beneficial. This is a useful aid for start-ups and we will certainly use it again.”

—David Curiel, M.D., Ph.D.
Professor, Washington University

“Through our participation in Fundamentals and G2B, we received essential business coaching and technical assistance with our Phase II SBIR application that proved critical for its success.”

—Tom Hannan, Ph.D., D.V.M.
VP of Research, Fimbrion Therapeutics
“BioGenerator is a significant value-add investor, while also being a great source of life science deal flow. The quality of the investment opportunity combined with the professionalism they brought to due diligence and the deal process allowed us to move very quickly.”

—Sach Chitnis
Managing Partner, Jump Capital
“BioGenerator was the lead investor for our seed financing and has remained actively engaged in Cardialen. Their respect and connections in the industry have been invaluable to us. And we knew we could count on them for follow-on funding as we progressed and grew the company. They have been a true partner.”

—Paula Skjefte
CEO, Cardialen

BIOGENERATOR’S TOTAL CUMULATIVE INVESTMENT OF $15.2M HAS BEEN LEVERAGED 30 TO 1

INVESTMENT ADVISORY COMMITTEE

NATHAN LAKEY
CEO, ORION GENOMICS

BRIAN CLEVINGER, PH.D.
YIELD LAB

PETER FINLEY
PROSPER ACCELERATOR

MARY JO GORMAN, M.D.
FOUNDER, ADVANCED ICU CARE

MICHAEL KINCH, PH.D.
WASHINGTON UNIVERSITY in ST. LOUIS

STEVE HANLEY
CEO, MEDIBEACON

JOHN MCKEARN, PH.D.
RIVERVEST VENTURE PARTNERS

RAUL PEREZ, M.D.
OAKWOOD MEDICAL VENTURES

RICK RYAN, PH.D.
CULTIVATION CAPITAL

WALTER SMITH
CEO, CONFLUENCE LIFE SCIENCES

DAVID SMOLLER, PH.D.
CULTIVATION CAPITAL
ABOUT BIOGENERATOR

BioGenerator is an evergreen investor that creates, grows, and funds promising companies and talented entrepreneurs in the St. Louis region. BioGenerator identifies and de-risks commercially promising innovations and services; advises innovators and entrepreneurs; recruits and supports entrepreneurial talent; makes staged investments grounded in rigorous due diligence; and offers access to lab space and capital equipment. We position companies to navigate the unique challenges of early-stage bioscience company development. BioGenerator’s work spans the early stage startup lifecycle of companies within the health and plant sciences, including therapeutics, diagnostics, medical devices, research tools, agriculture, nutrition, and health IT.

BioGenerator is a nonprofit subsidiary of BioSTL, working together to advance the economic vitality of St. Louis by cultivating a thriving bioscience sector and innovation economy. BioSTL organizes business, university, and philanthropic leaders around a set of deliberate strategies that capitalize on St. Louis’ strengths in medical and plant sciences. Focus areas include: building and investing in startups through our venture development arm, BioGenerator; improving access to investment capital; ensuring appropriate physical infrastructure; promoting science- and innovation-friendly public policy; fostering a more inclusive entrepreneurial talent pool in the region; attracting the U.S. presence of international companies; and raising global awareness of St. Louis’ strengths. BioGenerator and BioSTL staffs collaborate in the development and implementation of many of these programs.

“BioGenerator has been instrumental in opening up the commercialization of creative life sciences research being performed in the St. Louis region. That sounds easy, but it is a very difficult, long, and expensive process of evaluating, planning, nurturing, funding, redirecting, mentoring, and sometimes shutting down promising ideas. It takes creativity, persistence, patience (but also impatience), and a deep understanding of the business creation process.”

—John McDonnell
Chairman, BioSTL
### 2016 BY THE NUMBERS

<table>
<thead>
<tr>
<th>Metric</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board positions</td>
<td>31</td>
</tr>
<tr>
<td>Investment firm relationships fostered</td>
<td>200</td>
</tr>
<tr>
<td>Investment transactions closed</td>
<td>25</td>
</tr>
<tr>
<td>Investment opportunities evaluated</td>
<td>&gt;300</td>
</tr>
<tr>
<td>Companies financed</td>
<td>17</td>
</tr>
<tr>
<td>Conversations with entrepreneurs</td>
<td>2500</td>
</tr>
<tr>
<td>Additional capital leveraged</td>
<td>$149M</td>
</tr>
<tr>
<td>Commercial grant applicants trained</td>
<td>95</td>
</tr>
<tr>
<td>Pre-investment projects funded</td>
<td>24</td>
</tr>
<tr>
<td>Users of the BioGenerator Labs</td>
<td>&gt;200</td>
</tr>
</tbody>
</table>

---

“BioGenerator’s model has helped grow companies like Benson Hill into quality, highly-attractive investments for venture investors.”

—Scott Horner, Ph.D. Managing Director, Middleland Capital

“The St. Louis startup community is flourishing. We’ve discovered and invested in several of our most promising companies there. I continue to be impressed by the BioGenerator model and the quality of their portfolio.”

—Dan Watkins, Ph.D. Managing Director, Mercury Fund