

**IMPACT 2018**

**PERFORMING  
A MISSION.**

**PURSUING  
A VISION.**



Northeastern University  
*Center for Research Innovation*



A wall covered in vibrant, multi-colored paint splatters and drips in shades of blue, yellow, pink, and purple. The word "TOGETHER" is written across the center in large, bold, white, sans-serif capital letters. To the left, a wooden step ladder is leaning against the wall. The background is a light-colored, possibly white, surface that has been heavily splattered with paint. The overall scene suggests a creative or collaborative activity.

TOGETHER

As Co-directors of the Center for Research Innovation (CRI) we take our responsibility to Protect, Accelerate, and Commercialize Northeastern's cutting-edge research seriously. The gravity with which we approach our mandate is compelled by the fierce commitment of those we serve: the faculty and students of Northeastern. Together, we are united around a single purpose, the purpose to create impactful solutions for the world's pressing challenges. In 2018, we successfully concentrated on refining fundamental practices to ensure a solid foundation for growth, and 2019 is the year of expansion. CRI team members, energized by challenge and steeped in purpose, are poised to steward new technologies, design new programs, discover new partnerships - to catalyze impact. We are proud to lead this enterprising team as we collectively strive to fulfill the Mission and realize the Vision of the Center for Research Innovation.



Jennifer Boyle-Lynch  
CO-DIRECTOR



Andrew Curtin  
CO-DIRECTOR

TO PAIR SOLUTION-ORIENTED  
RESEARCH WITH REAL-WORLD NEEDS  
FOR THE ENRICHMENT OF  
SOCIETY THROUGH THE PROTECTION,  
ACCELERATION, AND COMMERCIALIZATION  
OF NORTHEASTERN INNOVATION.





SAFEGUARDING NORTHEASTERN  
INGENUITY IS OUR MANDATE,  
WHICH WE FULFILL BY JUDICIOUSLY  
FILING ROBUST, STRONG, DEFENSIBLE,  
AND COMMERCIALY VIABLE  
PATENT APPLICATIONS.

“Effective intellectual property protection attracts commercial interest, promotes strong licensing agreements, and positions technologies for maximal public benefit. I give inventors the best advice I can to help facilitate their goals, and nothing makes me happier than seeing an inventor excited about the grant of a patent or a licensee successfully commercialize Northeastern innovation.”

Paige Clapp  
ASSISTANT DIRECTOR OF INTELLECTUAL  
PROPERTY & CONTRACT COUNSEL

## IMPROVING THE PROCESS

INTRODUCING THE INVENTOR PORTAL.  
THIS NEW TOOL STREAMLINES THE  
DISCLOSURE PROCESS, SAVES INVENTORS  
TIME, ENHANCES TRANSPARENCY, AND  
BOOSTS DISCLOSURE STRENGTH.

“By developing the Inventor Portal, not only are we creating an easier method of disclosing via a completely online experience, but we are also empowering inventors by providing an on demand portfolio dashboard.”

Jacqui Mitchell  
FINANCE & TECHNICAL ADMINISTRATOR





**123** INVENTION DISCLOSURES  
13% INCREASE



**168** PATENT  
APPLICATIONS

**32** PATENTS ISSUED  
14% INCREASE

# NORTHEASTERN UNIVERSITY INVENTORS AWARDED PATENTS FY2018

RONALD AARON	ANDREW GOULDSTONE	DAXING LIU	SPIRO PAVLOPOULOS
DEBRA AUGUSTE	ZHANGYU GUAN	ALEXANDROS MAKRIYANNIS	MATTEO RINALDI
BENJAMIN BIRD	VINCENT HARRIS	MICHAEL MALAMAS	CARL SHIFFMAN
AHMED BUSNAINA	STEPHEN HATFIELD	ROMAN MANETSCH	MICHAIL SITKOVSKY
CRISTIAN CASSELLA	YUNG JOON JUNG	NICOL MCGRUER	SIVASUBRAMANIAN SOMU
MAX DIEM	YONG-BIN KIM	TOMMASO MELODIA	KUMARA SUBRAMANIAN
CHARLES DIMARZIO	PUSHKAR KULKARNI	SHASHI MURTHY	GANESH SINGH THAKUR
JOHN ENGEN	TATYANA LEVCHENKO	MARK NIEDRE	VLADIMIR TORCHILIN
SLAVA EPSTEIN	YIANNIS LEVENDIS	MARVIN ONABAJO	MING WANG
			NIKOLAI ZVONOK

**TOP 100 WORLDWIDE UNIVERSITIES  
GRANTED U.S. UTILITY PATENTS**

**2015      2016      2017**







CONNECTIONS DRIVE INNOVATION  
FORWARD. THROUGH INDUSTRY  
ENGAGEMENT AND SIGNATURE PROGRAMS,  
WE CREATE AN EXCHANGE OF IDEAS AND  
RESOURCES LEADING TO SPONSORED  
RESEARCH, COLLABORATIVE  
INNOVATION, EDUCATIONAL INSIGHT,  
AND UNIVERSITY-WIDE OPPORTUNITY.

“Here’s where the two sides of our office meet, the industry facing and the Northeastern facing. It’s a space enlivened by collaboration and brimming with opportunity  
- a space that ignites my enterprising spirit.”

Brice Tennant  
MARKETING AND PROGRAM MANAGER

## INDUSTRY ENGAGEMENT

ACUTE AWARENESS OF INDUSTRY NEEDS IS A CRITICAL COMPONENT OF OUR ACCELERATION PROGRAM. THE NEEDS WE IDENTIFY SEED RESEARCH AND EXPEDITE SOLUTION-ORIENTED INNOVATION.

“Industry engagement provides deep understanding of the process, requirements and operating needs of end users for academic researchers steeped in their work from a scientific perspective, and the CRI is the critical medium for this exchange.”

Colin Sullivan  
COMMERCIALIZATION, RESEARCH AND MARKETING



# CORPORATE RELATIONSHIPS

Genuine Relationships Generating Real Results

EXTERNAL  
LEADS

64

12

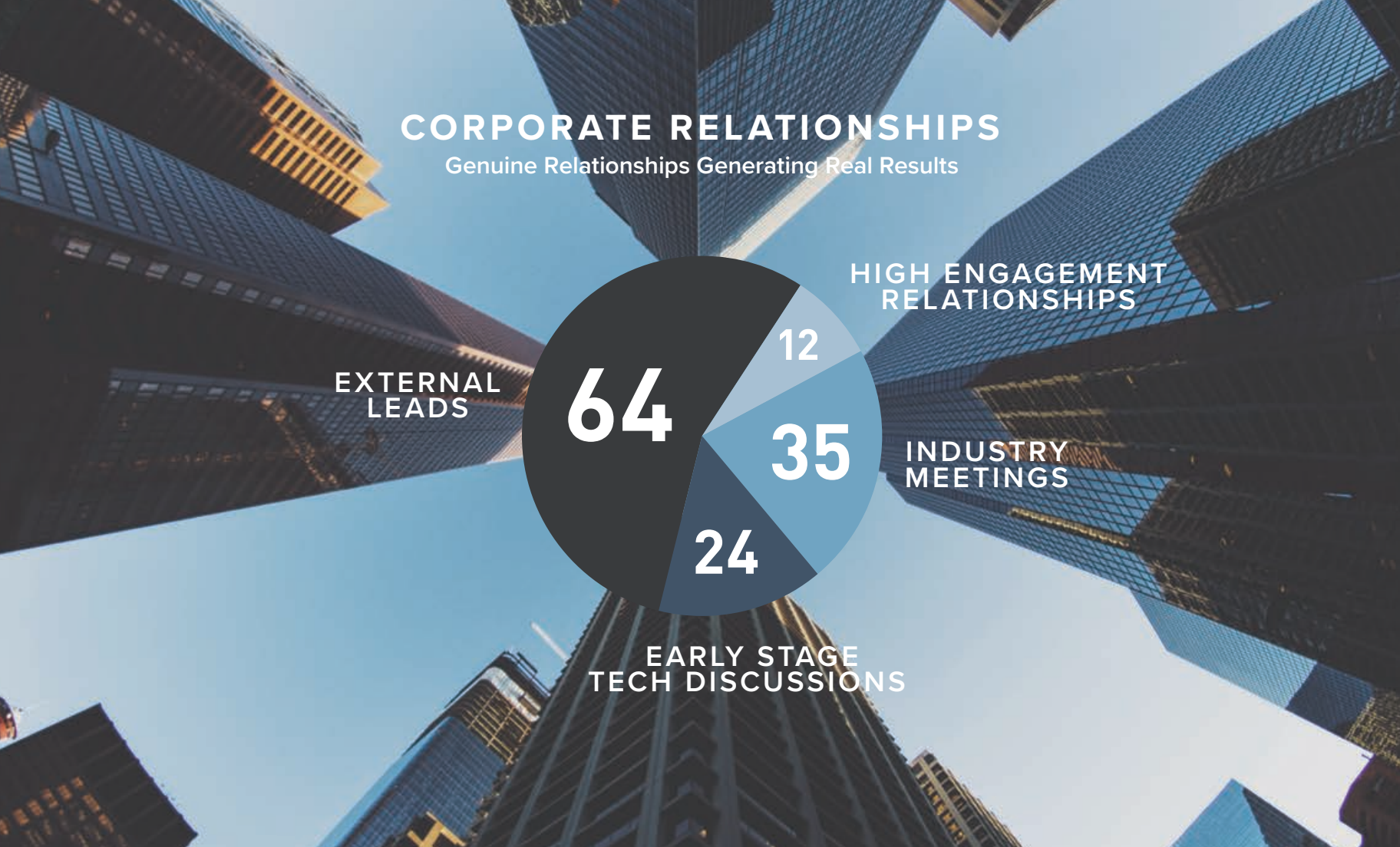
HIGH ENGAGEMENT  
RELATIONSHIPS

35

INDUSTRY  
MEETINGS

24

EARLY STAGE  
TECH DISCUSSIONS





**34** **NON-DISCLOSURE AGREEMENTS**  
FORTIFYING INTEREST THROUGH CONFIDENTIALITY

## NON-DISCLOSURE AGREEMENTS

NON-DISCLOSURE AGREEMENTS ENABLE INDUSTRY LEADERS TO SHARE CHALLENGES AND DISCOVER NORTHEASTERN RESEARCH CAPABILITIES. WE BROUGHT THE EXECUTION OF COMMERCIAL NDAs IN HOUSE TO ENSURE NIMBLENESS AND RAPID TURN AROUND BECAUSE TIMING, RESPONSIVENESS, AND SPEED MATTER.

“Through proactive analysis, we discovered new process efficiencies, making it faster and easier for faculty and industry partners to hold discussions leading to tailored solutions.”

Jennifer Boyle-Lynch  
CO-DIRECTOR

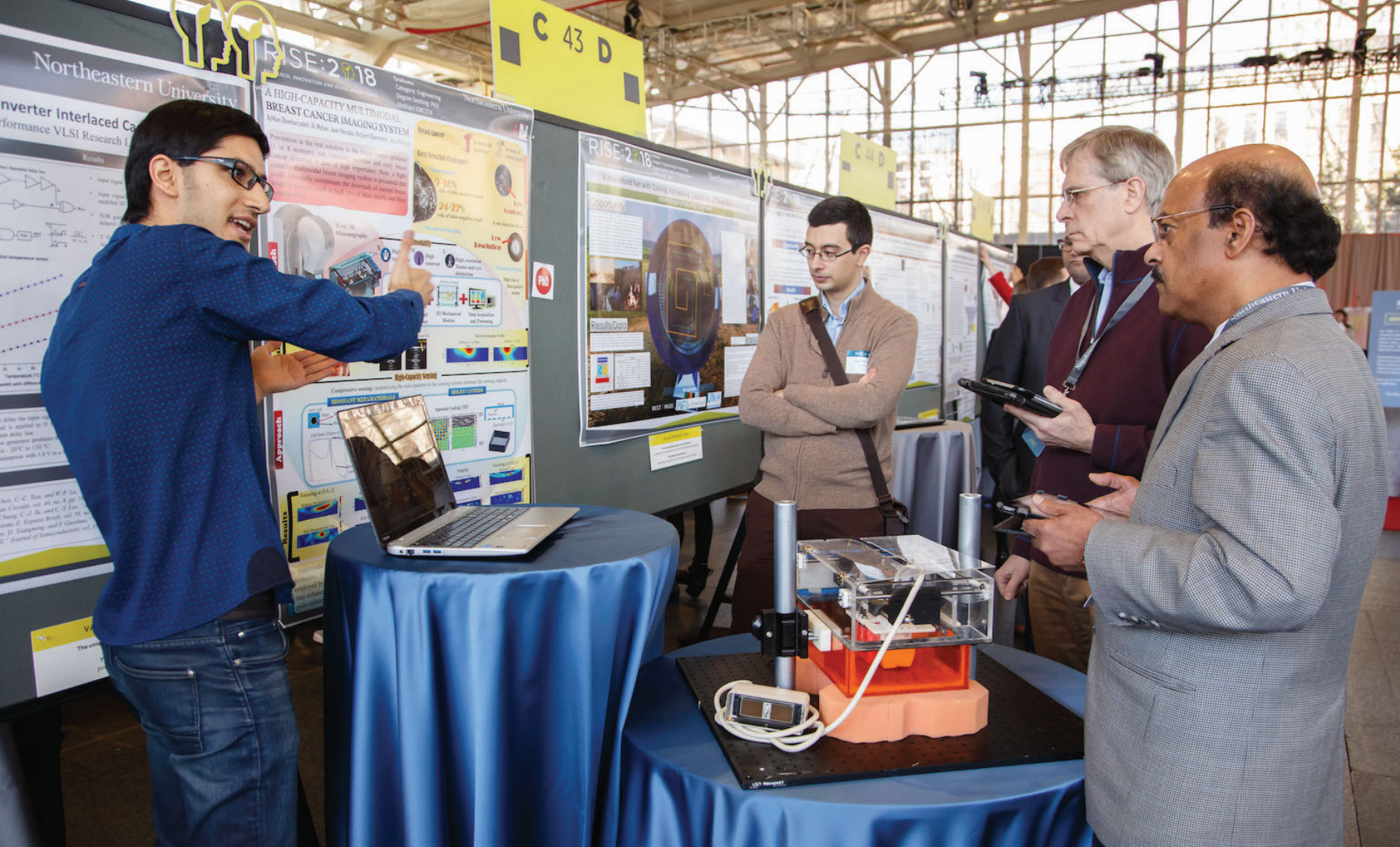
# RISE



RESEARCH  
INNOVATION  
SCHOLARSHIP  
ENTREPRENEURSHIP

THE PREMIER SHOWCASE FOR NORTHEASTERN'S  
VIBRANT RESEARCH COMMUNITY. MEET THE  
MINDS, SEE THE RESEARCH, FEEL THE ENERGY.  
RISE, NORTHEASTERN'S RESEARCH,  
INNOVATION AND SCHOLARSHIP EXPO.

RISE 2018 | 436 Undergraduate, Graduate, and Faculty Submissions



Northeastern University

RISE:2018

C 43 D

Converter Interlaced Ca  
Performance VLSI Research I

A HIGH-CAPACITY MULTIMODAL BREAST CANCER IMAGING SYSTEM

Abstract: This work presents a novel, high-capacity and early breast cancer multimodal breast imaging system in parallel data processing pipeline. The system is composed of a breast base and a high-capacity VLSI system. The system is designed to process the data from the breast base and the VLSI system. The system is designed to process the data from the breast base and the VLSI system. The system is designed to process the data from the breast base and the VLSI system.

Results: The system is designed to process the data from the breast base and the VLSI system. The system is designed to process the data from the breast base and the VLSI system. The system is designed to process the data from the breast base and the VLSI system.

Approach: The system is designed to process the data from the breast base and the VLSI system. The system is designed to process the data from the breast base and the VLSI system. The system is designed to process the data from the breast base and the VLSI system.

Results: The system is designed to process the data from the breast base and the VLSI system. The system is designed to process the data from the breast base and the VLSI system. The system is designed to process the data from the breast base and the VLSI system.



RISE:2018

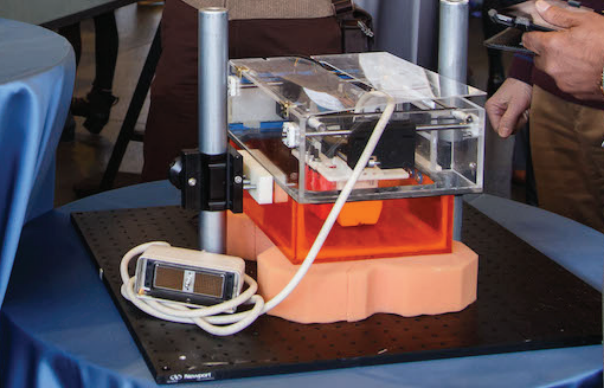
A Novel Field for Cooling and Heating Systems in Data Centers

Abstract: This work presents a novel, high-capacity and early breast cancer multimodal breast imaging system in parallel data processing pipeline. The system is composed of a breast base and a high-capacity VLSI system. The system is designed to process the data from the breast base and the VLSI system. The system is designed to process the data from the breast base and the VLSI system. The system is designed to process the data from the breast base and the VLSI system.

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WHERE INNOVATORS LEARN

WHERE NORTHEASTERN INNOVATORS  
LEARN FROM EXPERTS ABOUT PROTECTING  
INTELLECTUAL PROPERTY, LAUNCHING STARTUPS,  
AND COMMERCIALIZING TECHNOLOGIES.  
EXPERTS LEARNING FROM EXPERTS.

October 2017 | Crafting Invincible Disclosures



# Pathways to Partnership

BY PAIRING CORPORATE R&D NEEDS WITH  
NORTHEASTERN CAPABILITIES, PATHWAYS TO  
PARTNERSHIP EVENTS ARE AN INVITATION TO  
CREATE CUSTOMIZED SOLUTIONS.

September 2017 | Finding Drugs, Foiling Disease









GAPFUND360 HELPS NORTHEASTERN'S RESEARCHERS BRIDGE THE GAP BETWEEN PROMISING LAB RESULTS AND COMMERCIALY VIABLE PROTOTYPES BY OFFERING GRANTS AND PROGRAMS DESIGNED TO CATALYZE STATE-OF-THE-ART TECHNOLOGIES.

"With GapFund360, we are anticipating robust interest and impressive results. Stay tuned!"

Joel Bresler  
TECHNOLOGY PORTFOLIO DIRECTOR

\$550,000 Total Awards for Launch | 5 x \$50,000 Phase I Awards (2019) | 2 x \$150,000 Phase II Awards (2020)

COMMERCIALIZE

MEANINGFUL IMPACT RESULTS WHEN  
REAL-WORLD CHALLENGES ARE PAIRED WITH  
REAL-WORLD SOLUTIONS. BY CONNECTING  
GLOBAL COMPANIES AND ENTERPRISING  
STARTUPS TO NORTHEASTERN'S USE-INSPIRED  
INNOVATION, WE TAKE STEPS TOWARD  
TRANSFORMING THE WORLD.

“Finding ways to move technologies from Northeastern labs to the market is the most exciting part of my job. Every day I see new discoveries made by our researchers which can solve the needs of industry and address critical world problems. Our goal is to help bring these innovations to light, for the benefit of all.”

Mark Saulich  
SENIOR COMMERCIALIZATION MANAGER





**4** UNIVERSITY SPIN OUTS  
100% INCREASE

## **SPINOUTS**

ENTREPRENEURSHIP PERMEATES THE CULTURE OF NORTHEASTERN. RESEARCHERS ARE DRIVEN TO BRING THEIR INNOVATIONS TO MARKET, AND OUR PORTFOLIO OF RESOURCES FACILITATES THE REALIZATION OF THESE AMBITIONS.

AprX Biotech | DeepCharge | Guardion | Imaginostics







## RECENTLY ACQUIRED CRI SPINOUT GOES GLOBAL WITH SHISEIDO

Giaran's AI empowered virtual makeup accessory gives consumers an enhanced try-on experience that eliminates guesswork through its exact color-matching and customized recommendations.

“Raymond Fu and the Giaran team have created truly novel AI technologies for cosmetic applications, and we are thrilled to welcome them to the Shiseido family. ... Giaran will provide Shiseido with immediate expertise and advanced technologies to further expand our digital capabilities, while also allowing for greater consumer intimacy through personalized offerings and enhanced user experiences. We share Giaran's philosophy that digital is a mindset rather than a tool, and we look forward to bringing more disruptive innovation to reinvent the beauty industry business model.”

Marc Rey  
PRESIDENT & CEO OF SHISEIDO AMERICAS

## AGREEMENTS

INKING DEALS, A NOTEWORTHY  
ACHIEVEMENT: YET, OUR RELATIONAL  
PHILOSOPHY COMPELS US TOWARD  
SERIAL COLLABORATION AND  
LASTING COMMITMENTS.

“Our priority is partnerships built upon flexibility, speed,  
decisiveness, and mutual benefit, and I’m proud to say our reputation  
accurately reflects, and rewards, this approach.”

Andrew Curtin  
CO-DIRECTOR



**7** **OPTIONS & LICENSES**  
WHERE INVENTION MEETS IMPACT

**+86%** **INTER-INSTITUTIONAL  
AGREEMENTS**  
13 IIA'S FY 2018

A photograph of a SpaceX Falcon Heavy rocket launching from the Kennedy Space Center. The rocket is ascending vertically, leaving a large plume of white smoke and fire at its base. The launch pad structure is visible on the right side of the frame. The sky is a clear blue with some light clouds. The overall scene is captured during the day, with bright sunlight illuminating the launch.

**\$556,254**

**LICENSING REVENUE**

108% INCREASE

**\$421,768**

**PATENT SAVINGS**

21% INCREASE

**FINANCING THE MISSION.  
CAPITALIZING THE VISION.**

GROWTH DEMONSTRATES THE VALUE OF  
OUR METHODS, AND WE CONSISTENTLY  
ENDEAVOUR TO PIONEER NEW PATHS.

“Creative thinking spurs new growth. By repurposing  
patent savings, we paved the way for GapFund360.”

Jennifer Boyle-Lynch  
CO-DIRECTOR

TO LEAD IN INNOVATION AND ENTREPRENEURSHIP  
BY DRAWING UPON OUR ENTERPRISING FABRIC,  
BEING EMPOWERED TO IMPLEMENT AN AMBITIOUS,  
NOVEL, TRANSPARENT, AND CONSISTENT APPROACH  
TO INTELLECTUAL PROPERTY PROTECTION AND THE  
ACCELERATION AND COMMERCIALIZATION OF  
NORTHEASTERN INNOVATION FOR LOCAL AND  
GLOBAL SOCIETAL IMPACT.





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