FY2024 ANNUAL REPORT

zuckerinnovation.org

From idea to marketplace





Welcome to **Zucker Institute**

The Zucker Institute for Innovation Commercialization has set a higher trajectory for transforming MUSC innovations into commercially viable products and services that address health challenges and improve lives.

From commercial viability assessments to intellectual property support and market research; to funding assistance, business planning, and mentorship; to prototyping resources, regulatory guidance, and post-launch support, we help propel innovations all the way to market.

- In this Annual Report, we're excited to demonstrate how our innovation commercialization institute is known for guiding our inventors who are entrusted to us. At Zucker Institute, success stories happen every day—here, we'll introduce you to just a few of them. Learn more about our accomplishments and see the
- exciting things yet to come.



Our new model is based on:



INNOVATION

what we do to achieve our vision and mission



IMPACT

our actions produce significant positive outcomes



INFLUENCE

positive impact enables us to lead health innovation for the lives we touch

Proof is in the numbers

The Zucker Institute has made remarkable progress in advancing new technologies and transforming them into companies, services and potential medical innovations.

178

819

\$

\$3.1M federal small business

funding in FY23

447

72

number of active

4

startups

85 licenses from FY20-24

\$17.8M

federal small business

funding from FY19-23

Charleston, SC – a National Leader in Innovation Growth

Zucker Institute and MUSC have played a key part in boosting Charleston's rise as one of the nine fastest-growing areas for patent awards in the US.



Partnerships that empower

From MUSC laboratories to business and product development, we're involved with several partners to help researchers and inventors move their work from idea to innovation to market. These partners include:



BLUE SKY LABS

Located in Charleston, SC, Blue Sky Labs is a place for scientists and other experts who want to hone their creations, test new concepts and share space and ideas with fellow innovators. It's a physical demonstration of MUSC's commitment to innovation and entrepreneurship, as well as fostering that culture among its faculty and staff.



INNOVATION DISTRICT

A visionary project designed to stimulate regional growth and academic and clinical excellence and position the area as a nexus of medical and technological advancement. This endeavor extends beyond the construction of buildings and infrastructure; it is about cultivating an ecosystem where innovation thrives and benefits the entire community.



INNOSPHERE VENTURES

Helps provide muchneeded funding and logistical support for a number of companies, including Thendor (fibrosis), Oncoblaze (devices, oncology), Somatoceutics (oncology), PatientSIM AI (digital health, medical education), Loxigen (oncology).



SCBIODRIVE

This accelerator program is designed to advance emerging companies through expert business curricula industry guidance and mentorship. A semiannual program, SCbioDrive will select up to six seed-stage therapeutics companies for an eight-week course, consisting of seven weeks of virtual instruction followed by one week in person at SCbio facilities in Charleston.



CREW



The Coaching and Resources for Entrepreneurial Women (CREW) program addresses the imbalance in the number of women entrepreneurs in biomedical sciences. Using an innovative approach combining mentoring, coaching, and skill-building activities, CREW promotes an entrepreneurial mindset among women in junior faculty and senior post-doctoral fellows.





"Women account for less than 12% of US inventors. The CREW program combines entrepreneurial education with personalized *leadership* coaching to address this gender disparity. *We appreciate the* support of the Zucker Institute in mentoring our participants and *identifying resources* for their success."

- Carol Feghali-Bostwick Kitty Trask Holt Endowed Chair for Scleroderma Research and CREW Director



Innovation leaders guide the Way

Two key leaders are crucial to the Zucker Institute's success.

JESSE GOODWIN

Zucker Institute Board Chair and MUSC **Chief Innovation Officer**

Dr. Goodwin has spent more than a decade engaged in innovation across a broad range of medical therapies, with applications in academia and industry. She has a demonstrated track record for driving improved

outcome metrics. Prior to accepting the role of Chief Innovation Officer at MUSC, Goodwin was Vice President of Development and Deputy Director for the organizations that combined to create the Zucker Institute.

"The Zucker Institute plays a critical role in advancing MUSC generated ideas and discoveries into tangible solutions addressing today's biggest health challenges. It is a key ingredient of what makes MUSC's innovation culture as special as it is."





Dr. Mehta serves as MUSC's Interim Vice President for Research, overseeing all its associated divisions, which include responsibility for accreditation and regulatory affairs, university-wide promotion of research across





ANAND MEHTA

Interim Vice President of Research, MUSC, and Zucker Institute **Board Member**

> all colleges and centers, representing the president and provost on internal and external research matters, and identifying institutional research strategies and benchmarks in relation to the MUSC strategic plan.

"The move from idea in a laboratory to products in the marketplace is often a significant challenge. I'm proud to be part of an institution that has mentored inventors and innovators and helped develop these ideas into realistic products and businesses."

Innovation champions

Scientific discoveries-the seeds of tomorrow's advances-happen every day at the Zucker Institute. The following companies demonstrate how the Zucker Institute, its resources, and researchers and inventors have made dramatic advances in life science technology.

Founded and led by Zucker Institute chief technology officer and MUSC professor Nate Dolloff, Leukogene is harnessing the ability of the immune system to develop an effective cancer vaccine. The technology, based on the immune system's Major Histocompatibility

us make this happen."

Complex II (MHC II) to transport specifically targeted antigens to develop immune cell attacks on cancer cells, raises the promise of new treatments for pancreatic cancer, acute myelogenous leukemia (AML) and other hard-totreat tumors.

LEUK OGENE THERAPEUTICS. INC

"Leukogene is leading a new chapter in cancer immunotherapy by training the body's immune system to attack tumors using innovative cancer

vaccines. We are grateful to the Zucker Institute for their support and helping

- Dr. Nate Dolloff, Leukogene Therapeutics, Inc. founder

Leukogene started at the MUSC laboratory of Nate Dolloff, and-with the help of the Zucker Institute-raised \$3M in private funding and federal and state grants and is a National Cancer Institute and South Carolina Research Authority portfolio company with continuous SBIR/ STTR grant funding since 2013.

> BabyStrong is a Transcutaneous Auricular Vagus Nerve Stimulation (taVNS) technology designed to assist infants with feeding difficulties. TaVNS stimulates the vagus nerve through the skin on the patient's ear and is paired with oral feedings to enhance motor learning and improve feeding. BabyStrong helps infants

BABYSTRONG

"BabyStrong feeding system offers a groundbreaking new approach to assist pre-term and term infants with brain injury in overcoming difficulties in learning to feed. We hope to get infants with feeding delays home faster without invasive gastrostomy tubes for feeding." - Dr. Dorothea Jenkins, BabyStrong device inventor

achieve full oral feeds, avoiding the need for a gastrostomy tube placement. This approach supports the infants' health and development and allows families to go home sooner.

The Zucker Institute team worked closely with the clinical team and inventors to help improve the BabyStrong system

so that it was easy to use. While designing the current version, the Zucker Institute staff and BabyStrong team invented a novel electrode. In addition, Zucker Institute facilitated internal and external funding through SCRA grants as well as the NIH Phase II application.

Innovation champions



VayuClear specializes in developing innovative surgical suction de-clogging technology. Their flagship product, the VORTEX system, quickly and safely clears blockages in surgical suction tubes using pressurized saline and a patented clearing mechanism. These blockages can cause significant delays and increase

the risk of exposure to bodily fluids for surgical staff. VayuClear's technology helps improve surgical efficiency and safety, allowing medical teams to focus more on patient care.

The Zucker Institute was instrumental in the development of the VORTEX system. Engineers at the Zucker

Institute, working closely with the surgeon and inventor of the device, built, iterated and tested early prototypes. The team also sourced manufacturing partners and made necessary changes to the design to assist in manufacturing. In addition, the Zucker Institute managed the IP portfolio and prosecution for the VORTEX device.

"VORTEX frees up our time to focus on the critical parts of surgery, not maintaining the patency of suction lines. VORTEX led to less frustration during surgery. I am also not worried about getting spayed with patient debris (blood, muscle, disk material) while the nurse or scrub tech attempts to force fluid through a clogged sucker!"

- Dr. Stephen Kalhorn, Vortex inventor

"Learning about tech transfer helped me understand how to operate QuickSortRx. I couldn't have done it without the framework at MUSC to guide me. I developed a solution that has had a huge impact on customers, transforming how hospitals manage their pharmacy supply chain, portfolios, and partnerships."

– Jonathan Yantis QuicksortRX co-founder and CEO



Quicksort^Rx

QuicksortRX, a startup created by MUSC pharmacists and technologists, has significantly impacted the healthcare industry by helping health systems optimize pharmacy purchasing. Their realtime pharmacy business intelligence software has saved health systems over \$137 million by consolidating purchase, price, shortage, and compliance data. This

achievement earned QuicksortRX top recognition in the KLAS Pharmacy **Purchasing Analytics** Report. This success underscores the Zucker Institute's commitment to fostering innovation that directly impacts patient care and operational efficiency. QuicksortRX has also recently expanded its headquarters in Charleston, further cementing its ties to MUSC and the local community.

As MUSC celebrates its 200th anniversary, the Zucker Institute also draws its inspiration from "Then, Now, Next." From its beginnings as the 10th oldest medical school in the US, MUSC has been groundbreaking in health care and scientific advances not only in South Carolina, but nationally. The Zucker Institute carries on these traditions and innovations, advancing and supporting life science research and the adoption of new medical technologies.





"At the Zucker Institute, we are dedicated to transforming MUSC's groundbreaking research and innovations into real-world solutions that make a real impact on healthcare. This year, we've achieved remarkable progress, supporting innovators and advancing technologies that will positively impact lives." — Todd Headley, Chief Executive Officer





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