



INNOVATEUPSTATE

A NEWSLETTER FROM THE OFFICE OF INDUSTRY RESEARCH



WINTER 2023

UPSTATE
MEDICAL UNIVERSITY

WELCOME TO INNOVATE UPSTATE

Quarterly, the Office of Industry Research will include updates, highlights, and activities from across the SUNY Upstate Medical University ecosystem. We are particularly focused on reporting on our expanding industry relationships.

Upstate Medical University's Office of Industry Research (typically known as technology transfer) supports Upstate's Research mission; "to create a world-class research enterprise that supports biomedical research innovation, development, and entrepreneurship." We provide personal and hands-on support to industry and Upstate faculty to advance innovation. The resources of the SUNY Research Foundation (RF) help guide Intellectual Property (IP) and commercialization activities.

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A new test could revolutionize how head injuries are treated, preventing further harm

SAFETY IN NUMBERS

Providing the data to help caretakers keep their aging patients safe

PLUS:

AVAILABLE NOW

New and innovative foreign-based products and companies

LATEST IN TECH

Technology created by Upstate researchers available for licensing

FEATURED PHOTO:

Students from Henninger High School test out motorized adaptive devices they built with Dr. James "Cole" Galloway, PhD at the 2022 Fit-In Conference held at SUNY Upstate.



INNOVATE
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HEADS UP:

Working together, researchers and industry are on the verge of revolutionizing how we diagnose and treat concussions and brain injuries

After years of development and study, a patent was recently issued to Quadrant Biosciences, SUNY Research Foundation, and Penn State College of Medicine for a saliva test that can analyze the occurrence of mild traumatic brain injuries and concussion symptoms. This project is just the most recent development in the incredible partnership between SUNY Upstate researchers and Quadrant Biosciences, showing how beneficial these partnerships can be and the revolutionary work they can produce.

"The way things have been assessed for too long has ignored too many things. We've had walking wounded in our midst; the silent pandemic, traumatic brain injuries," explains SUNY Upstate's Frank Middleton, PhD.

This project began as an attempt to find a rapid way to determine when someone has experienced head trauma beyond a certain level of injury. Collaborating with the founder of the Upstate Concussion Center Dr. Brian Rieger, and Drs. Christopher Neville and Paul Johnson, they added saliva profiling to an ongoing project that was studying the blood of mixed martial arts fighters.

"What we were able to do in the first saliva study that we published was identify what are called microRNAs, or small RNAs in the saliva that changed;" Middleton explains. "Not as a function of performance during training, but as a function of getting hit in the head in the fight." Not only were they able to detect these changes, but tests showed they were identifiable in saliva faster than they showed up in the bloodwork.

How will this saliva test be used? Middleton describes its use as two-fold; not only can it detect the occurrence of a traumatic event, but work that his collaborator and SUNY Upstate alumnus

Dr. Steven Hicks has conducted shows that saliva data can also help predict the course of recovery and the delayed onset of post-concussive symptoms.

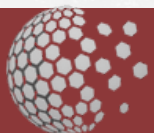
Middleton describes one of the biggest dangers as repeat injuries, which could occur if someone who experiences head trauma is unaware of an injury that may not be fully healed before it happens again.



Frank Middleton, PhD with the patent issued for "Analysis and prediction of traumatic brain injury and concussion symptoms".

"If they're not right, it means their brain is still vulnerable, more vulnerable than it was prior to the first injury. Repetitive injuries occurring in that scenario? That's the real demon that we're trying to do something about."

Administering multiple tests that can detect and measure microRNAs could be a powerful tool used by doctors to help gauge severity of injury and how recovery is progressing, similar to how hemoglobin can be measured to track blood sugar. Right now Quadrant Biosciences and researchers are conducting a multi-site study, collecting thousands of samples taken from a wide cross-section of people who experienced injury



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days to weeks beforehand, and the outcome of their trauma is known. This dataset will be crucial to using these tests to analyze results and predict outcomes.

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Middleton credits the benefits of partnering with a private company like Quadrant with the speed at which they’ve been able to move the saliva test from concept to commercialization. Specifically, these working conditions have allowed both flexibility and speed. He explains while a traditional academic timeline for a project like this can be five years or more, Quadrant recognized the potential of a concussion test, and “in the space of a week funding was set up. The account was spendable. And we were collecting samples.”

“That flexibility doesn’t happen, and that type of instant funding doesn’t happen unless you have a business partner. They’re motivated,” Middleton says. “That’s been my experience in the working relationship I’ve had with Quadrant. Every step of the way they’re very supportive and open to new ideas. Flexible when we needed to change directions slightly or flexible to take the same approach and apply it to a different disorder.”

Middleton points out that It’s not just medical researchers that benefit from this type of partnership.

“It’s easier for the businesses, we’ve known this for decades, to partner with an academic that already has an established program that may have a near market-ready product or has shown promise already.”

Quadrant agrees that partnering with SUNY Upstate has been extremely beneficial in past and current projects.

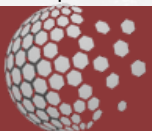
“The collaboration between SUNY Upstate and Quadrant has led to important breakthroughs in the development of saliva-based diagnostic solutions for neurological conditions such as autism spectrum disorder and concussion injuries,” says Ben Perry, CO-CEO of Quadrant. “Early in the SARS-CoV-2 pandemic, we transferred this innovative approach to address the need for COVID-19 testing solutions, further demonstrating the critical importance of working with an academic institution like SUNY Upstate.”

So what are the next steps for this test now that they’ve been granted this patent? Quadrant says they plan to launch it under the name Clarifi mTBI in New York by late 2023, before expanding nationwide in 2024. “Between now and the end of the year, the test is undergoing its final development before being commercially available,” says Perry.

Middleton is quick to point out that the concussion test is only scratching the surface of what these microRNA saliva tests could potentially do in the future.

“There’s this whole class of RNAs that we’ve realized are really pulling the strings. We didn’t know they existed at all until well after the year 2000; they were not in my college textbooks.” Middleton theorizes this technology could be applied to a wide range of autoimmune conditions from multiple sclerosis, lupus, arthritis, and possibly even Parkinson’s disease.

“It’s great when you realize how much you don’t know; you’re sort of entering a field that was undiscovered country and we’re learning things every time we look under a rock or turn over a new leaf.”



CNY STARTUP IMPROVES SAFETY, CREATES PRODUCT TO HELP VULNERABLE ADULTS AVOID INJURY

CNY Biotech Accelerator clients Carapace Analytics took home one of the top prizes at the 2022 FuzeHub Commercialization Competition, recognized for their innovative fall detection device. FuzeHub awarded the team \$50,000 to continue their mission to develop technology to extend the healthy years of one's life and help caretakers keep their loved ones safe.



Chris Sheedy and Grainger Sasso, co-founders of Carapace Analytics after winning a \$50,000 prize at the 2022 FuzeHub Commercialization Competition.

Carapace was founded by two Cornell University students who recognized how detrimental falls can be to older adults, resulting in traumatic injury and loss of independence for millions each year. Chris Sheedy and Grainger Sasso began researching this problem in 2017, using their experience in biomedical engineering and emergency medicine.

"We regularly see fall injuries occur, despite the presence of world-class caretakers," says Sasso. "We discovered that falls often occur when there is a disconnect between safety interventions and one's unique mobility needs. We created the Carapace Clip to bridge this information gap so that caretakers and families can make the best possible decisions based on data."

The Carapace Clip is a wearable device that creates a mobility report documenting the user's behavior and possible risks. It then analyzes the data generated to provide insight for caretakers on mobility with metrics like fall risk, activity, and sleep quality.

"This information is often unavailable and leads to meaningful interventions that improve a user's safety. We are focused on bringing new technology to this space where it can make the biggest impact," explains Sasso.

Since the beginning of 2021 Carapace Analytics has been a client of the CNY Biotech Accelerator; providing office space, research & development, connections to clinical and industrial experts, and more.

"They offer recommendations for legal and consulting services, they alert us to grant and event opportunities, and they curate a lot of great speakers on a range of different topics," Sasso says. "Kathi Durdon, MA, CCRP, the Executive Director, and Stephanie Carbone both provide a ton of support to us, for which we are very grateful. This team has supported us from the beginning."

The team plans to use this award to start up a web service for clients and upgrade their sensor platform. They have launched their Carapace Clip, and are actively seeking partners to try out their new device.

Interested in learning more or trying their technology?
You can reach the team at carapacehealth.com

Sharing Upstate's mission to streamline and optimize Industry Relations



Dr. Chris Neville, Tanisha LaVeck & Kathi Durdon represent SUNY Upstate at the 2023 SCOPE conference in Orlando.

The Summit for Clinical Ops Executives (SCOPE) held its 14th annual conference in February 2023. SCOPE is focused on the important work of the clinical community and the recognition that it requires collaboration and innovation. The programming focused on advances and innovative solutions in all aspects of clinical trial innovation, planning, management, and operations. With more than 3000 in attendance, the InnovateUpstate team promoted the Upstate core facilities, clinical trials office, and biotechnology accelerator. The Industry Research office is focused on expanding industry collaboration to support innovation across the Upstate research enterprise.

Stay updated on the latest from Upstate Research and InnovateUpstate on social media:

 @InnovateUpstate

SUNY Upstate honored for clinical research achievements

SUNY Upstate Medical University was honored for "Distinguished Achievement in Clinical Research" at the 2022 MedTech Association bio/med conference. Head of Clinical Research Mary Lou Watson accepted the award given to an institution whose "contributions to clinical practice have measurably advanced medical research." Watson accepted the award on behalf of every patient that takes part in a clinical trial at Upstate;

"Patients give us their time, when they may not have a lot of time left. Patients participate when they know that the outcome of the clinical trial may not benefit them. What we strive to give them... is hope."



MedTech Executive Director Win Thurlow, Chair of MedTech's Board of Directors Sarah Olikier, and SUNY Upstate's Head of Clinical Research Mary Lou Watson at the 2022 MedTech Bio/Med Conference.

LATEST IN UPSTATE TECH AVAILABLE FOR LICENSING

With world-changing intellectual property such as the most sensitive saliva test for SARS-CoV2, SUNY Upstate Medical University is an outstanding source of biomedical research innovation, development, and entrepreneurship. Congratulations to the following faculty members who have disclosed new inventions and patented novel technologies that offer pioneering solutions to today's problems.

A Nanotrap to Improve Survival in Severe Sepsis by Attenuating Hyperinflammation Through Hemoperfusion

Juntao Luo, Lili Wang, Changying Shi

- For treatment of sepsis caused by virus or bacteria.
- This technology is particularly effective for gram negative bacteria caused sepsis which makes up 50% of most sepsis cases.
- The well-defined linear-dendritic telodendrimer nanoplatform has precise and engineerable chemical structures for customized nanocarrier design in drug delivery.
- Once put back into the body, the TD nanotrap will trigger the release of microphages to fight the rest of the infection, reduce swelling, and treat cytokine storm.

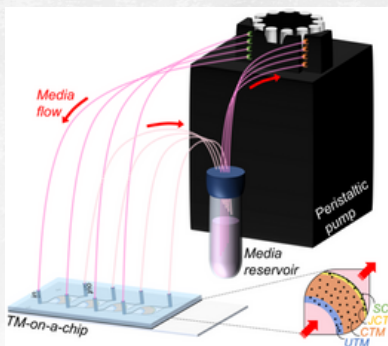
Human Trabecular Organ-on-a-Chip Models

Samuel Herberg, Preethi Ganapathy, Haiyan Li

- 3D biomimetic hydrogel models of the trabecular meshwork of the eye, and a bioengineered system for modelling the conventional outflow tract.

ADVANTAGES:

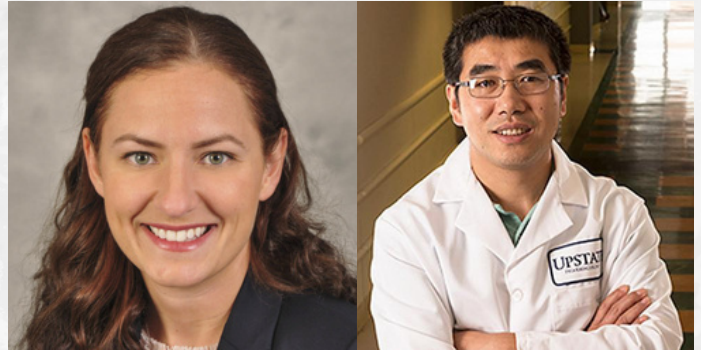
- These two technologies more accurately approximate human 3D tissue anatomy with focus on the cell-ECM interface, and will permit more sophisticated research, clinically relevant drug screening and therapeutic testing, increased accuracy in data-gathering and drug production.



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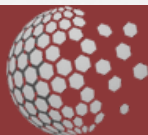
Upstate researchers fast-tracked to create treatment for sepsis patients



Michaela Kollisch-Singule, MD and Juntao Luo, PhD who are leading the Upstate team working with CMTx Biotech to develop a treatment for ARDS.

CMTx Biotech in partnership with SUNY Upstate was awarded a \$2.3 million Fast-Track Small Business Technology Transfer (STTR) award to develop a treatment for sepsis-induced acute respiratory distress syndrome (ARDS). Dr. Michaela Kollisch-Singule, Assistant Professor of Surgery and Pediatrics at SUNY Upstate Medical University, and Dr. Juntao Luo, Associate Professor of Pharmacology and Surgery at SUNY Upstate Medical University, will each serve as a co-Principal Investigator on the project. They are joined by an experienced team of co-investigators and scientific consultants from both CMTx Biotech and SUNY Upstate Medical University to evaluate the safety and efficacy of a proprietary aerosolized nanoformulation of incyclinide for the treatment of ARDS.

At least 1.7 million American adults develop sepsis annually, resulting in nearly 270,000 deaths. There is currently no specific treatment for sepsis-induced ARDS. Published studies have shown that incyclinide prevents the development of ARDS and septic shock, and improves survival in several animal models of ARDS across several species. CMTx Biotech and Upstate researchers are hoping to obtain regulatory approval from the FDA and comparable international regulatory authorities to market aerosolized incyclinide for the treatment and prevention of sepsis-induced ARDS.



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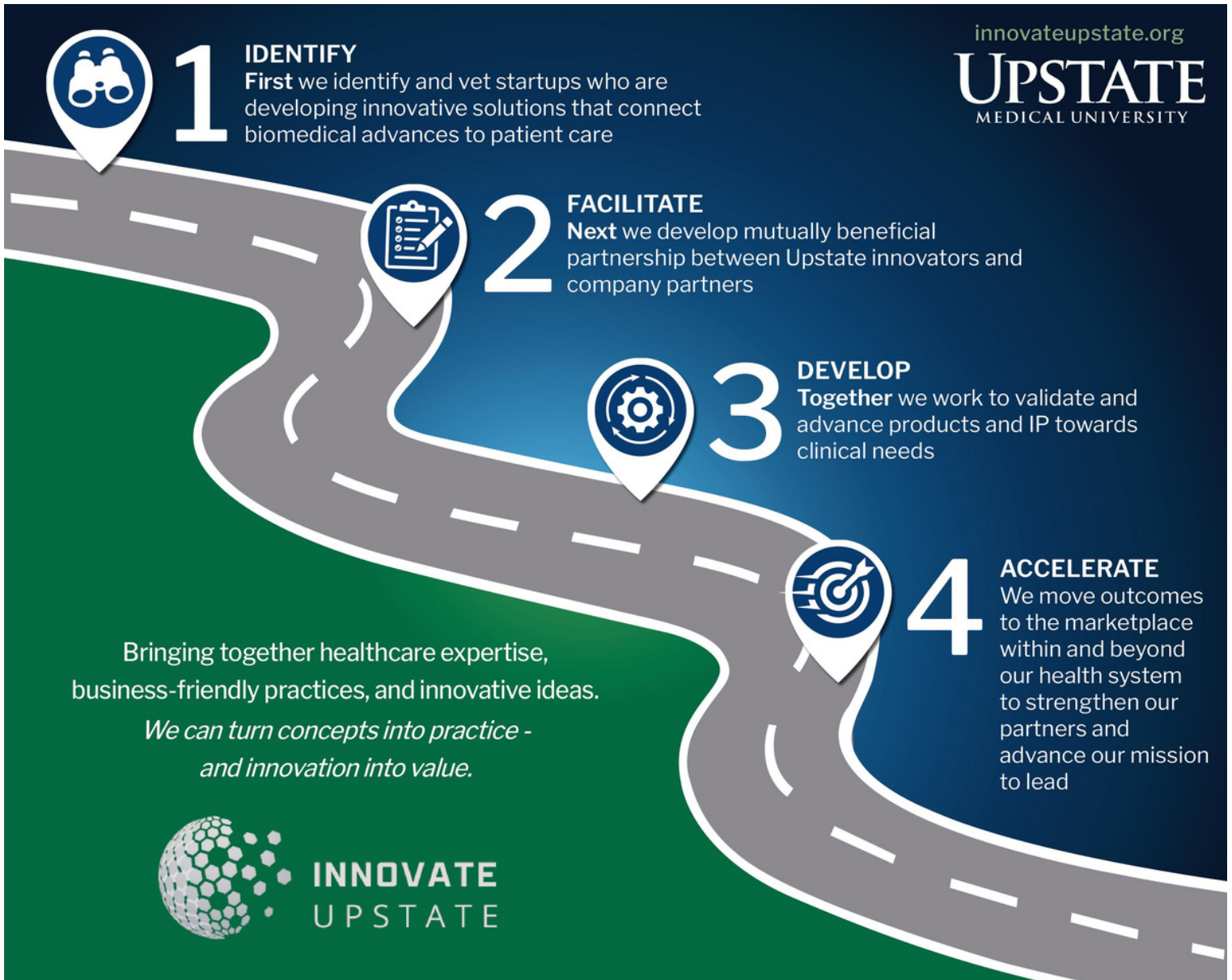
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NEW:

"InnovateUpstate" is the new home of the Upstate Clinical Trials Office, Industry Research Office, & CNY biotech Accelerator!

INNOVATEUPSTATE is a one-stop shop to support moving ideas to solutions.

- *Upstate Clinical Trials Office*: Manages all aspects of clinical trial execution to efficiently move medical innovation toward market.
- *Upstate Industry Research Office (IRO)*: Dedicated to developing long-term growth of innovation on the Upstate campus.
- *CNY Biotechnology Accelerator (CNYBAC)*: The place to grow your start-up business with a focus on mentorship and growth.



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CNYBAC.com

AVAILABLE NOW

NEW AND INNOVATIVE FOREIGN-BASED PRODUCTS AND COMPANIES

Imedos

Imedos offers a suite of products for retinal vessel analysis with the aim of protecting and improving the microvascular health of patients worldwide.

- Systems for Static/Dynamic Vessel Analysis
- Analysis Software VesselMap
- The IOPstim; enables a simple, painless increase of the intraocular pressure
- RCrodent systems; developed for use in scientific laboratories for retinal imaging and analyzing particularly small eyes.



Adjusting the IOPstim System

Hi-D Imaging

Revolutionizing cardiac imaging with AI-powered software

The Hi-D Imaging technology provides the world's first AI-based decision-making support software that predicts blood flow abnormalities directly from the Computed Tomography (CT) examinations and uses this information for the diagnosis, treatment planning, and risk assessment for cardiac operations.

Read more:

www.hidimaging.com

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UPCOMING VIRTUAL EVENTS

HOSTED BY THE CNY BIOTECH
ACCELERATOR

FEB. 28TH, 3PM

THE INTERSECTION OF ETHICAL
PRINCIPLES & SITE OPERATIONS

WITH LAURA HOLTZ, YALE SCHOOL OF
MEDICINE AND CLINICAL INVESTIGATIONS

MAR. 2, 3PM

NY VENTURES -

NEW FUNDING PROGRAMS
CONCEPT TO COMMERCIALIZATION
VIRTUAL SERIES

MAR. 7TH - 9TH

SOCRA PRESENTS:

FDA SPONSOR INVESTIGATOR
VIRTUAL CONFERENCE PROGRAM

MAR. 28TH-29TH

FDA DIGITAL HEALTH
TECHNOLOGIES FOR DRUGS PUBLIC
WORKSHOP

More info on events @
<https://cnybac.com/education>

LOOKING TO EXPLORE PARTNERING WITH US?

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