

RISING TIDE



MAKING WAVES

UCI Team Designs and Produces 20,000 Face Shields for UCI Medical Center

The UCI campus and industry partners answer the call to design, produce and deliver personal protective equipment used in the fight against COVID-19.

2

6

STARTUP

Wing's App Soars Across California

10

FACULTY SPOTLIGHT

UCI Faculty & Researchers Tackle COVID-19 from all Angles

21

OPINION

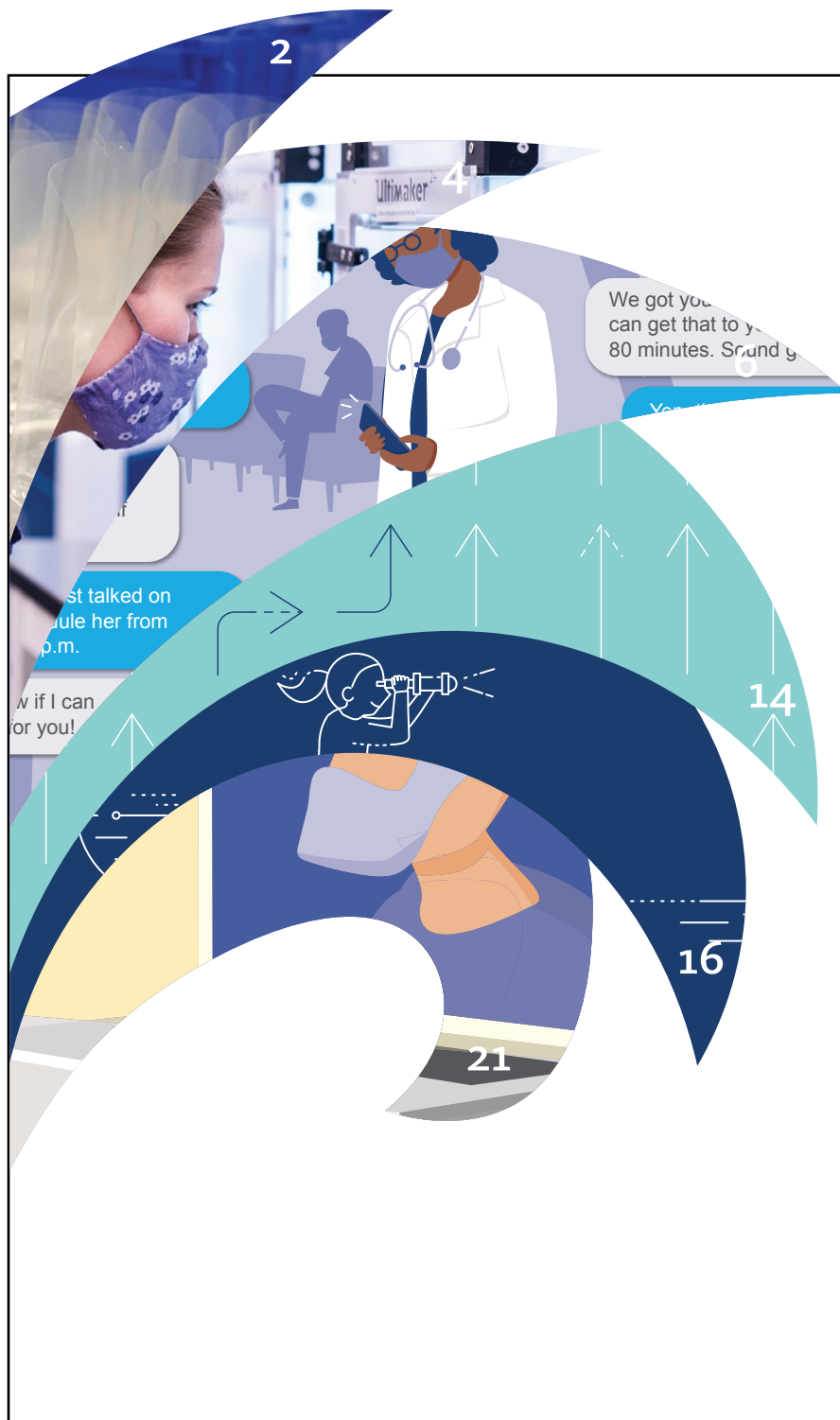
A Vision for Post-Pandemic Investing

“

“WHEN YOU’RE BACKED INTO A CORNER
WITH SEEMINGLY NO WAY OUT...IT’S THE
MOST CREATIVE YOU’LL EVER BE.”

– Dale Crighton, entrepreneur





2 Making Waves
UCI Team Designs and Produces 20,000 Face Shields for UCI Medical Center

4 Resource
Bringing Prototypes to Life at the Cove @ UCI

5 Available Technologies
Coming Down the Pipeline

6 Startup
Wing's App Soars Across California

10 Faculty Spotlight
UCI Faculty & Researchers Tackle COVID-19 from all Angles

14 Deep Dive
Innovation Advisor Lizz Pellet Helps Businesses Adapt to Shifting Cultures

16 Listicle
10 Ways Startups Can Look Up in an Economic Downturn

19 Cove Partners
In the Ecosystem

19 Q&A Employee Feature
Sara Willman

20 UCI Stories
Across Campus
• Henry Samueli School of Engineering
• School of Humanities
• UCI Health
• Donald Bren School of Information and Computer Sciences
• School of Physical Sciences

21 Opinion
A Vision for Post-Pandemic Investing

Rising Tide Editorial

Editor-in-Chief
Jackie Connor

**Senior Writer/
Copy Editor**
Ethan Perez

Writers
Kate Wokowsky
Grace Wood

Design Director
Julie Kennedy

Designers
Elisa Le

Photographers
Rthura Cevallos
Daniel Xu

Stay up to date with news about UCI's innovations and commercially promising technologies. Find this issue of Rising Tide at innovation.uci.edu/news

If you have story ideas, contact the editor-in-chief: connorj@uci.edu

To ensure the safety of our staff and story subjects, we follow all COVID-19 safety guidelines in accordance with the state of California and the UC system.

"...WE NEVER IMAGINED THAT WE WOULD BE FACED WITH A GLOBAL PANDEMIC, BUT THE COLLABORATION THAT WE FOSTER BETWEEN THE UNIVERSITY AND THE BUSINESS COMMUNITY IS EXACTLY WHAT ALLOWED THIS TIME-SENSITIVE PROJECT TO SUCCEED, AND IT IS WHAT WILL HELP THE LOCAL ECONOMY REBUILD IN THE COMING MONTHS."

— Richard Sudek, Ph.D.



MAKING WAVES

UCI TEAM DESIGNS AND PRODUCES

20,000 Face Shields

FOR UCI MEDICAL CENTER

THE UCI CAMPUS AND INDUSTRY PARTNERS ANSWER THE CALL TO DESIGN, PRODUCE AND DELIVER PERSONAL PROTECTIVE EQUIPMENT USED IN THE FIGHT AGAINST COVID-19.

Personal protective equipment such as gloves, medical masks and face shields are in short supply as the medical community deals with the influx of COVID-19 cases. Hospitals and medical centers are working vigilantly to provide medical staff and first responders with the equipment they need to safely treat COVID-19 patients and others.

Everyone from hobbyists and professional seamsters to Nike and Ford are working to create masks and face shields for the nation's healthcare workers.

In mid-March, UC Irvine joined the fight when Carolyn Stephens, managing director of enterprise collaborations at UCI Beall Applied Innovation, received a call from the UCI Medical Center asking for assistance.

Within days, a team was tasked and assembled, including collaborators from the medical center, the business community, Applied Innovation, UCI School of Medicine, the Sue & Bill Gross School of Nursing, the Henry Samueli School of Engineering and the Claire Trevor School of the Arts (CTSA).

With industry partners consulting on the product's design, assembly and packaging constraints to ensure they would arrive uncontaminated and in accordance with the medical center's procurement standards, Jesse Jackson of CTSA and Ben Dolan of UCI's Institute of Design and Manufacturing Innovation, and their team, got to work creating numerous disposable face shield prototypes with laser cutters and 3D printers.

Following feedback on function and desired features from medical professionals, they settled on a design that could be produced by either 3D printing or laser cutting to make it easier for other individuals or institutions to produce, as well as to run both machine types simultaneously to quickly hit their first production goal.

Key to the success of this project were the design leads and their advanced manufacturing facilities on campus. Jackson and Dolan combined the available fabrication resources from UCI facilities, including Applied Innovation, RapidTech, FABWorks and the Speculative Prototyping Lab, to produce the parts, and received help from Cove lab tenants and UCI students, faculty and staff who assembled the 20,000 single-use face shields for the medical center – all while employing safe practices and social distancing – at the Cove @ UCI, Applied Innovation's headquarters.

This interdisciplinary effort from campus, with collaboration from the community and the medical center, is just one of the many ways that Southern California is mobilizing to support one another.

"When UCI Beall Applied Innovation opened its doors five years ago, we never imagined that we would be faced with a global pandemic," said Richard Sudek, executive director at Applied Innovation and chief innovation officer at UCI.

"But the collaboration that we foster between the university and the business community is exactly what allowed this time-sensitive project to succeed, and it is what will help the local economy rebuild in the coming months."

Learn more about how Applied Innovation is taking action:
innovation.uci.edu/covid-19-info ///

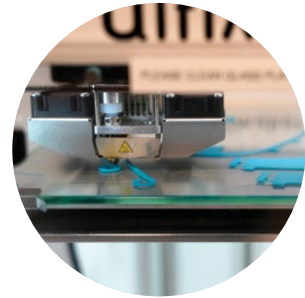
***Resources Mentioned in this Story**

Cove @ UCI
innovation.uci.edu/the-cove

Cove Prototyping Lab
innovation.uci.edu/the-cove/facilities-info

FABWorks
manufacturing.uci.edu/index.php/fabworks-2

RapidTech
manufacturing.uci.edu/index.php/rapidtech



Face shield parts are 3D-printed in the Cove Prototyping Lab.



Volunteers apply padding to the inside of the face shields.



Elastic straps are attached after the transparent shields are added.



Face shields are packed 50 to a box, loaded onto pallets and delivered to UC Irvine Medical Center.



Sara Willman, lab manager at UCI Beall Applied Innovation, utilizes a fused deposition modeling 3D printer, which uses continuous filament of thermoplastic material, to make a sign for Applied Innovation's lobby.

RESOURCE

Bringing Prototypes to Life at the Cove @ UCI

THE COVE PROTOTYPING LAB INSIDE UCI BEALL APPLIED INNOVATION OFFERS HIGH-TECH EQUIPMENT DEDICATED TO FACILITATING PROTOTYPING FOR STARTUPS AND THE COMMUNITY.

Entrepreneurs and startups can stop simply imagining their inventions and start bringing them to life. UCI Beall Applied Innovation has a dedicated space for innovators to explore and develop their ideas.

The Cove Prototyping Lab, residing on the first floor at the Cove @ UCI, offers advanced equipment customized for prototyping. Sara Willman, lab manager at Applied Innovation, is proud of the lab's unique offerings and ability to foster creativity.

"We are a one-stop-shop to get projects done," said Willman. "Having all the equipment [here] is something that's hard to come by all in one space."

The lab includes 3D printers, laser-cutting machines, manual and automatic machining equipment and an extensive electronics station for building circuit boards. Lab users can also perform chemical post-processing, low-hazard prototyping, as well as adhesive and molding tasks in a small chemical area.

Most lab residents construct prototypes for medical device and biotechnology companies. However, UC Irvine's Claire Trevor School of Arts (CTSA) also utilized the Cove

Prototyping Lab, along with partners from the medical center, the business community, Applied Innovation, UCI School of Medicine, the Sue & Bill Gross School of Nursing and the Henry Samueli School of Engineering to help construct thousands of face shields for UCI healthcare workers for the COVID-19 crisis.

"The Cove Prototyping Lab was essential for the face shield project, both for the machines it provided and for the technical expertise of lab manager Sara Willman," said Jesse Jackson, associate professor at CTSA. "Sara was able to immediately implement the required fabrication at scale without delay."

Those affiliated with UCI receive first priority to utilize long-term bench rentals or access equipment for short-term prototyping projects. However, Cove partners, Wayfinder startups and the general public can also utilize the lab's resources.

CenSyn, a Wayfinder startup that uses a quick and efficient medical device to monitor the brain during healthcare emergencies, takes advantage of the lab's 3D printers and laser cutters for building precise prototypes.

"The Cove Prototyping Lab has a selection of components that we can choose from to test different designs," said, Ayushi Patel, co-founder and CEO of CenSyn. "It is perfect for a small startup like ours as most of our prototyping is done in-house at the Cove Prototyping Lab and with minimum expense."

For Cove Prototyping Lab inquiries and questions, contact Sara Willman: swillman@uci.edu ///



THE COVE PROTOTYPING LAB WAS ESSENTIAL FOR THE FACE SHIELD PROJECT, BOTH FOR THE MACHINES IT PROVIDED AND FOR THE TECHNICAL EXPERTISE OF LAB MANAGER SARA WILLMAN."

— Jesse Jackson

*Resources Mentioned in this Story

Cove @ UCI innovation.uci.edu/the-cove

Cove Prototyping Lab innovation.uci.edu/the-cove/facilities-info

Wayfinder Incubator innovation.uci.edu/programs/wayfinder-incubator

TEXT: KATE WOKOWSKY / PHOTOS: RTHURA CEVALLOS & RYAN MAHAR

Coming Down the Pipeline

SOME OF UCI'S TOP AVAILABLE TECHNOLOGIES
CURATED BY UCI BEALL APPLIED INNOVATION'S
RESEARCH TRANSLATION GROUP

The Research Translation Group manages over 1,000 inventions from UCI researchers spanning the areas of engineering, medicine and life sciences, physical sciences, communications and computer sciences. These innovative technologies are available for licensing.

Tech ID #: 31993

CO-ADMINISTRATION THERAPY TO PREVENT NEURODEGENERATION AND ENHANCE NEUROPROTECTION

Neurodegenerative diseases are a broad category of illnesses expected to affect 1 in 4 Americans. As they have a variety of underlying mechanisms and pathologies, there are currently no effective methods to prevent or modify disease progression. UCI researchers have developed a potential treatment utilizing a novel combination of two compounds for the abatement of brain inflammation and degeneration.

Howard J. Federoff, M.D., Ph.D. / UCI Health

Licensing Officer
Casie Kelly, Ph.D.
casie.kelly@uci.edu

Tech ID #: 31992

COMBINATION TREATMENT TO RESCUE AGE-RELATED MACULAR DEGENERATION

Age-related macular degeneration (AMD) is a leading cause of blindness in people over 60 years old. One form, called "dry" AMD is caused by slow cell death of the central retinal pigment epithelial cells (RPE cells), and currently has no treatment. Researchers at UCI have found that by combining a repurposed FDA approved drug in combination with a natural product, they are able to prevent cell death of RPE cells by boosting mitochondria activity.

Howard J. Federoff, M.D., Ph.D. / UCI Health

Licensing Officer
Casie Kelly, Ph.D.
casie.kelly@uci.edu

Tech ID #: 31984

NOVEL PRODRUG FOR ANTI-CANCER THERAPEUTIC APPLICATIONS

Inventors at UCI have developed a modified nutrient transporter inhibitor for use as a cancer therapeutic with minimal side effects.

Young Jik Kwon, Ph.D. / UCI Pharmaceutical Sciences

Licensing Officer
Richard Tun, Ph.D., J.D.
tunr@uci.edu

Research Translation Group

Managing Director
Research Translation
David Tiemeier
david.tiemeier@uci.edu

Senior Director:
Life Sciences
Ronnie Hanecak, Ph.D.
ghanecak@uci.edu

Associate Director:
Physical Sciences & Engineering
Alvin Viray, J.D.
aviray@uci.edu

Assistant Director:
Life Sciences
Casie Kelly, Ph.D.
casie.kelly@uci.edu

Senior Licensing Officer:
Physical Sciences & Engineering
Doug Crawford, MBA
doug.crawford@uci.edu

Senior Licensing Officer:
Physical Sciences & Engineering
Richard Tun, J.D., Ph.D.
tunr@uci.edu

Senior Licensing Officer:
Life Sciences
Steve Huyn, Ph.D.
shuyn@uci.edu

Senior Licensing Officer:
Physical Sciences & Engineering
Benjamin Chu, Ph.D.
ben.chu@uci.edu

Licensing Officer:
Life Sciences
Maria Tkachuk, Ph.D.
mtkachuk@uci.edu

Licensing Officer:
Physical Sciences & Engineering
Michael Harpen, J.D.
mharpen@uci.edu

Industry Sponsored Research

Director of Industry
Sponsored Research
David Gibbons
gibbonsd@uci.edu

Industry Contract Officer:
Biological Sciences,
Physical Sciences &
Beckman Laser Institute
Chris Abernethy
christopher.abernethy@uci.edu

Industry Research &
Material Transfer Officer:
All UCI Departments
Kelly Carlson
kelly.carlson@uci.edu

Industry Contract Officer:
Engineering & Information
and Computer Sciences
Natalie Tedford
natalie.tedford@uci.edu

Industry Contract Officer:
Medicine
James Wang
jamesw9@uci.edu

Find all UCI-available technologies at
innovation.uci.edu/tech

STARTUP

Wing's App

Soars Across California

THE UCI STARTUP HAS NOT ONLY TAKEN OFF AMONG COLLEGE STUDENTS, BUT ALSO NOW ANSWERS THE NATION'S CALL FOR HELP DURING A TIME WHEN RESOURCES ARE NEEDED MOST.

UC Irvine Student Housing uses a questionnaire in their dorm assignment process that specifically pairs students as roommates. Little did the department know two student roommates, complete strangers until UCI, would build a startup company.

UCI students Martin Gomez, an undergrad studying criminology, law and society, and Karan Kanwar, a computer science undergrad, were paired up like birds of a feather. And in 2017, they flocked together to form UCI startup company Wing.



TEXT: JACKIE CONNOR / PHOTO: RTHURA CEVALLOS / ILLUSTRATIONS: JULIE KENNEDY & ELISA LE



WE REALIZED THIS COULD BE A BUSINESS AND WE ALSO REALIZED WE NEEDED MORE HANDS..."

— Karan Kanwar

The two didn't think of the startup until their parents decided to randomly stop by their dorm for a visit. They really needed to clean their dorm, but in between classes and studying, there was no time.

"We were really bad at keeping stuff organized. We were really bad at keeping it tidy and clean," said Martin Gomez, co-founder and chief operating officer. "And we were honestly okay with it, but both our parents were definitely not going to have it if they saw that. So, we started scrambling."

The duo searched high and low for help, ranging from reaching out to fellow students on social media to enlisting several apps, like TaskRabbit, Takl and Handy, which provided expensive personal assistance.

"It's almost like if Netflix charged you per minute – that was their model and it was just not affordable," said Gomez.

Gomez and Kanwar put their heads together and created a product that took flight across UCI, UCLA and University of Southern California.

"We realized this could be a business and we also realized we needed more hands and started recruiting interns," said Kanwar, co-founder and engineering lead at Wing. "We read everything we could about starting a company and eventually hired a stellar artificial intelligence team of UCI students."

Wing is a personal assistant app that uses artificial intelligence technology and real people to take care of everything from the small tasks, like ordering groceries or an

Uber ride, to the more important errands, such as booking a last-minute flight.

The user simply downloads the app and can sign up for a weeklong free trial and, after the trial, can decide if they would like the standard model or the plus model of the app. The standard model, which costs \$9.99 per month, provides the user with the capability to make unlimited requests within the app. The plus version, which costs \$19.99 per month, has all the benefits of the standard version with the addition of a predictive services component.

"Wing is able to learn, like what your anniversary or your mother's birthday is, as well as other important recurring events, and then proactively reminds you," said Roland Polzin, chief marketing officer at Wing. "Basically, the app will not only be there on demand for you to ask questions and have things done, but it will also be proactive and actually reach out to you with things that we can predict through our algorithm."

APPLYING THEIR INNOVATION

The team has grown over the years while incubating at UCI Beall Applied Innovation. In 2018, Wing joined Applied Innovation's Wayfinder program*, a structured incubator that connects UC startups with valuable resources. From there, they utilized program's resources, such as Pitch & Match events, Wayfinder Workshops, networking events*, the Innovation Advisors program* and Applied Innovation's conference rooms*.



Martin Gomez, co-founder and chief operations officer at Wing and Roland Polzin, co-founder and chief marketing officer at Wing let the app take flight across California.

I need Wing to get me a babysitter for tonight.

Sure! We found Catherine, a UCI Chemistry undergraduate who is asking for \$25/hour. She can be there at 5 p.m.

Please send me her details, I want to take a look at her first.

I just emailed you Catherine's resume, Facebook profile, and phone number. Let me know if you'd like to book her.

She is great, we just talked on the phone. Schedule her from 6:30 p.m. to 10 p.m.

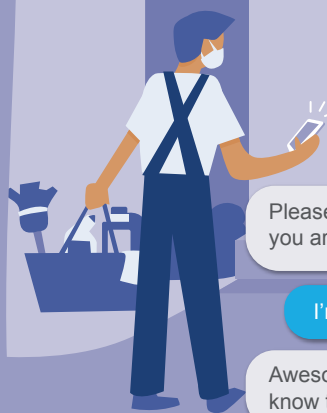
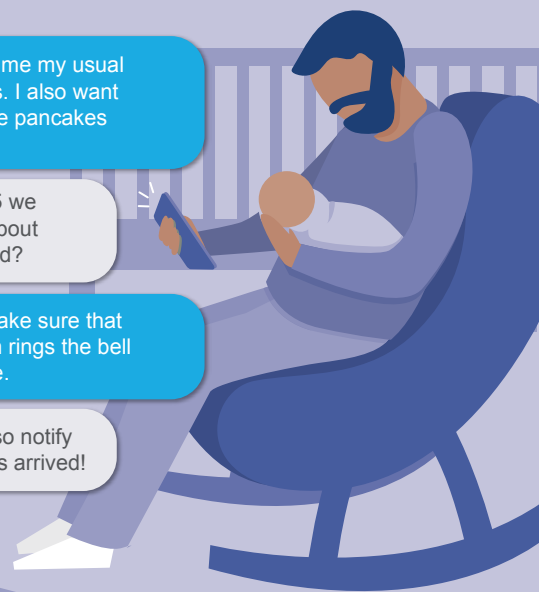
Done. Let me know if I can do anything else for you!

I need Wing to get me my usual groceries from T.J's. I also want ingredients to make pancakes from scratch.

We got you! For \$43.55 we can get that to you in about 80 minutes. Sound good?

Yep, that works. Make sure that the delivery person rings the bell when they get here.

No problem. We will also notify you once your groceries arrived!

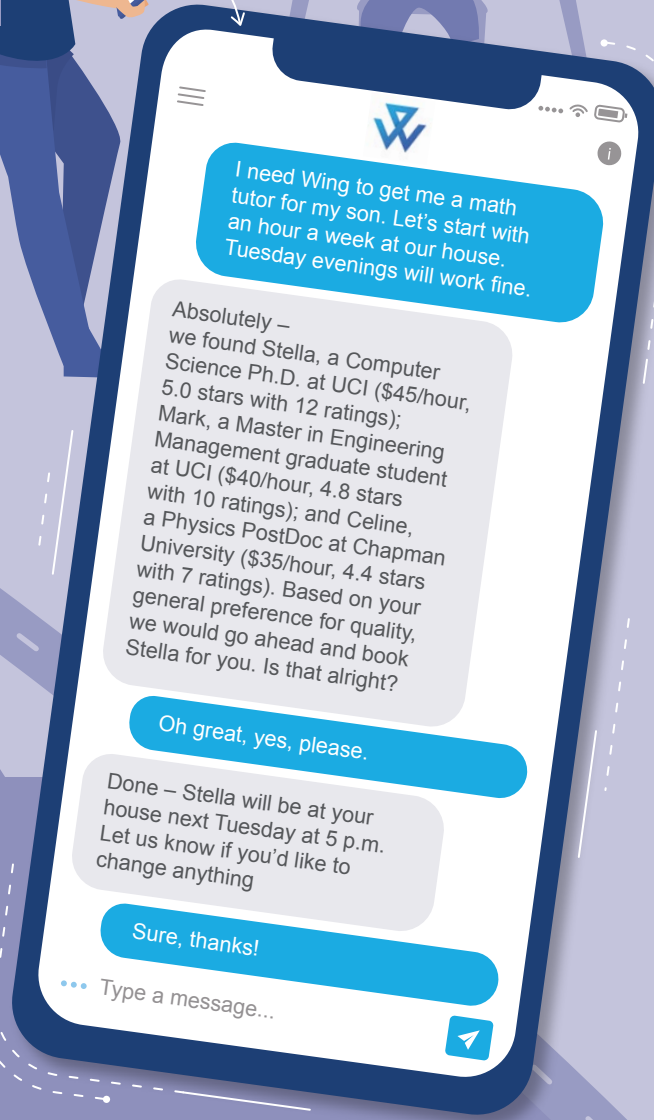


Please let us know when you arrived.

I'm here!

Awesome, we'll let the customer know to open the door for you.

Thank you



I need Wing to book me a flight to San Francisco on July 15, coming back on July 20.

I can set that up with your miles through Southwest. You would depart at 9:10 a.m. on the 15th and be back at 6:30 p.m. on the 20th. Would you like me to book that?

Yeah, that sounds good!

You're all set. You received an email with all travel data



“Applied Innovation was the catalyst that humanized the experience of being an entrepreneur at UCI for me,” said Gomez. “At any point, there was always someone to speak to, as far as challenges and advice goes, and normally you wouldn’t necessarily have that. You’d maybe have a video on YouTube, you’d have a Reddit post, right? But, to have someone or a group of people who are specifically dedicated and, more importantly, committed to promoting startups at this stage, for me that single factor goes a long way.”

In February, the team relaunched their product on Product Hunt, a website that features the latest apps, websites, hardware projects and tech creations. The site ranked the Wing app number one ‘Product Hunt of the Day’ globally and the team realized a new demographic that was most interested in their services: millennial parents.

“They were actually the ones that loved the service. They put in the most requests and stayed with us beyond the free trial,” said Polzin. “That’s what led us to doubling down and going further with this demographic, and it really makes sense because they’re a family and they have children, so they’re busy.”

HELP HAS LANDED

As the COVID-19 pandemic swept the nation and the world, the Wing team saw an opportunity to help busy and drained medical professionals. The team worked with John Muir Health Group, located in the Bay area, and Kaiser Permanente offices based in the mid-Atlantic region to offer

medical professionals 30 days of free service, which included popular requests like scheduling appointments, grocery shopping and finding childcare.

“People still use Wing and people still like Wing to do research and find activities to do, but it’s different from before,” said Polzin. “And right now, nurses and doctors and hospitals are working overtime because they have a lot of very, very difficult work on their hands. And we thought, ‘maybe we can step in and be a little bit of help.’”

The team also launched a free web-based platform that allows the user to let the network know of their needs and the app matches the user’s needs with local businesses that can offer help or products, such as personal protective equipment or any needs related to the pandemic, such as grocery shopping. Wing has also teamed up with NeighborING, a Wayfinder startup that connects students to people in the community who need help completing chores, to expand their network reach.

STRETCHING THEIR WINGS

Wing has designed the blueprints for their company with the help of pre-seed funding, hoping to complete the round by fall 2020. For their seed round, the team aims to pursue \$1.5 million to \$2 million in funding after their move to SkyDeck at UC Berkeley, a startup accelerator and incubator program located in Silicon Valley. Applied Innovation’s Wayfinder program helps UCI startup teams get accepted into

additional accelerators, which might have specialized expertise or other funding opportunities. This is a prime example of how the UC system works together to invest in startups, like Wing.

As Wing continues to evolve into their service-based platform, they aim to grow their user base, which is now approximately 150 users, to 1,200 users by fall 2020 and from there, millions of users. The mobile assistant app serves as the jumping-off point into much larger technological horizons. The team would like to expand their app into not only a concierge service, but also an app that functions much like Siri or Alexa, connecting it to cars and the home to provide people with more free time.

“We’re building much more than an assistant,” said Gomez. “I think it’s a lifestyle that’s powered by technology for the purpose of simplifying day-to-day interactions. Honestly, the greatest thing is for people to be able to focus on things that actually matter ... it is the next generation of living.”

Find out more about Wing:
getwingapp.com ///



HONESTLY, THE GREATEST THING IS FOR PEOPLE TO BE ABLE TO FOCUS ON THINGS THAT ACTUALLY MATTER ... IT IS THE NEXT GENERATION OF LIVING.”

– Martin Gomez

*Resources Mentioned in this Story

Events @ the Cove
innovation.uci.edu/events

Innovation Advisors
innovation.uci.edu/programs/innovation-advisors

Wayfinder Incubator
innovation.uci.edu/programs/wayfinder-incubator

Workspace @ the Cove
innovation.uci.edu/the-cove/facilities-info

FACULTY SPOTLIGHT

UCI Faculty & Researchers Tackle COVID-19 from all Angles

ANTEATERS ASSEMBLE TO FIND ANSWERS AND DEVELOP SOLUTIONS TO THE GLOBAL PANDEMIC, FROM PERSONAL PROTECTIVE EQUIPMENT AND VENTILATORS TO TEST KITS AND VACCINES.

UC Irvine is one of the nation's premier research universities, so when it became clear that COVID-19 was becoming a global threat, its faculty and researchers took action without skipping a beat.

Much work is needed in the fight against the coronavirus, from diagnostics and ventilators to personal protective equipment and vaccines, and UCI's brightest will stop at nothing to make Southern California and the world a safer place. Read on to learn about a few of the projects developed by the hardworking men and women who make UCI proud.

COVID-19 CORONAVIRUS ANTIGEN MICROARRAY AIMS TO SPEED UP TESTING

Director of the Vaccine R&D Center **Phil Felgner**, and his Protein Microarray Laboratory team at UCI's School of Medicine's Institute for Immunology, developed a microarray test to determine if a person has been exposed to COVID-19. With a simple finger stick blood test, results are available in 10 minutes. Felgner, along with clinical research faculty members **Dr. Saahir Khan** and **Dr. Sebastian Schubl**, will conduct a six-month study involving UCI healthcare workers to understand the COVID-19 immune response.

Chancellor's Professor of Mechanical Engineering **Marc Madou** is also collaborating on this effort to integrate the microarrays onto compact disc-based fluidic platforms, which can speed up the process.

AWARD FUNDS RESEARCH ON CELL-FREE, CELLULAR COVID-19 VACCINE

Professor of Pharmaceutical Sciences, Chemical and Biomolecular Engineering, Biomedical Engineering, and Molecular Biology and Biochemistry **Young Jik Kwon** received COVID-19 Research awards from UCI to create a novel extracellular vesicle-based vaccine that effectively and comprehensively boost the immune systems against SARS-CoV-2 virus

GENOME-WIDE PAN-CORONAVIRUS VACCINE IN DEVELOPMENT

Professor of Cellular and Molecular Immunology **Lbachir BenMohamed** has submitted a grant proposal to develop a safe and efficient Pan-Coronavirus Vaccine. The vaccine would ideally stop and reduce the present SARS-CoV-2 virus infection and transmissions as well as reduce the severity of COVID-19 disease. In addition, this "preemptive" Pan-Coronavirus Vaccine is designed to stop or modify any upcoming future Coronavirus outbreaks that may be caused by yet another transmission of SARS-like Coronaviruses (SL-CoVs) from bats to humans.

PROFESSOR AWARDED TO STUDY DIAGNOSTICS & THERAPEUTICS FOR VIRUS

Professor of Pharmaceutical Sciences **John Chaput** received a COVID-19 Research award from UCI to develop therapeutic aptamers – or single-stranded DNA or RNA molecules that selectively bind to a specific target – to treat COVID-19 patients. These reagents represent a new drug class that would prevent the virus from negatively interacting with lung cells.

CAMPUS LABS PRODUCE FLUID REQUIRED FOR COVID-19 TEST KITS

Test kits for COVID-19 require a liquid called viral transport medium (VTM) that preserves samples so that they can be analyzed in a lab. When the UCI Medical Center asked the UCI campus for assistance in procuring more VTM, many labs across campus stepped up. The Sue & Bill Gross Stem Cell Research Center created a task force and began production in Gross Hall.

VENTILATORS CREATED FROM REPURPOSED CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) MACHINES

Dr. Matt Brenner, professor of medicine, pulmonologist and interim director of the Beckman Laser Institute & Medical Clinic (BLIMC) proposed the idea of repurposing CPAP machines to be used as ventilators for COVID-19 patients. **Elliot Botvinick** and **Bernard Choi**, professors of Biomedical Engineering and Surgery and core faculty members of the BLIMC, have led the effort to create ventilators based on the machines, commonly used by those who suffer from obstructive sleep apnea.

PROFESSOR DEVELOPS MOLECULES THAT CAN PREVENT VIRUS SPREAD


Professor of Pharmaceutical Sciences, Chemistry, and Molecular Biology and Biochemistry **Andrej Luptak** received COVID-19 Research awards from UCI to develop molecules that can block the virus from spreading within the lung tissue of a patient, in addition to a diagnostic tool that would detect the virus in patient samples in minutes.

TEAM DESIGNS LOW-COST MECHANICAL VENTILATOR

With the guidance of medical doctors, Professor of Mechanical and Aerospace Engineering **Haithem Taha** and his doctoral student **Moatasem Fouda** have developed a low-cost medical ventilator. In particular, they developed a novel respiratory regulation unit (RRU), which forms the heart of a mechanical ventilator. The RRU operates without the use of electronics and provides greater control compared to the simple, low-cost ventilators recently developed for the COVID-19 crisis.

BRIDGE VENTILATOR CONSORTIUM CONNECTS INDUSTRY EXPERTS

The Bridge Ventilator Consortium (BVC) is a group of physicians, engineers and biomedical device experts from across the country that collaborate virtually to design and build low-cost ventilators. **Dr. Brian Wong** of the School of Medicine, the Henry Samueli School of Engineering and the Beckman Laser Institute & Medical Clinic (BLIMC) is spearheading the consortium with **Dr. Govind Rajan**, the director of clinical affairs at UCI's Medical Center, and **Thomas Milner**, director of the BLIMC. The BVC is collaborating with a number of institutions and organizations, including Virgin Orbit, the University of Texas at Austin, UCI faculty and the University of Southern California. The BVC has now moved beyond ventilator devices and is focused on other projects involving noninvasive ventilation, microwave inactivation, light-based therapies and other technology-based solutions to address COVID-related problems.



Student worker Myia Dickens works on laser cutting plastic parts for face shields in the Cove Prototyping Lab.

FACE SHIELDS DESIGNED AND ASSEMBLED FOR UCI MEDICAL CENTER

Collaborators from the medical center, the business community, UCI Beall Applied Innovation, UCI School of Medicine, the Sue & Bill Gross School of Nursing, the Henry Samueli School of Engineering and the Claire Trevor School of the Arts (CTSA) worked together to quickly design, test, evaluate, assemble and deliver thousands of face shields. Design leads **Jesse Jackson** and **Ben Dolan** utilized advanced manufacturing facilities on campus to produce the parts in record time.

TEAM DEVELOPS WINDSHIELD WIPER MOTOR-INSPIRED VENTILATOR DESIGN

Biomedical Engineering Associate Professor **Elliot Hui**, along with graduate students **Vincent Zaballa** and **Erik Werner**, have developed a low-cost ventilator prototype that utilizes a windshield wiper motor based on a design pioneered by **Thomas Milner's** lab at the University of Texas at Austin. The adjustable motor speed allows the ventilator to be adapted to each patient's specific needs. Parts for this ventilator are being 3D-printed by **Luis Ramirez**, an undergraduate in Hui's group, from home.

STUDY REVEALS VIRUS TRANSMISSION RISKS

Professor and Chair of Civil and Environmental Engineering **Sunny Jiang**, and team, conducted a quantitative microbial risk assessment to investigate the risks of SARS-CoV-2 virus exposure through contaminated aerosols in bathrooms.

NEW PNEUMATIC VENTILATOR DESIGN DEVELOPED

Marc Madou and his bioMEMS team have developed a ventilator that uses a pressurized chamber. The ventilator – created using low-cost electronics – sends compressed air into and out of a patient’s lungs through inhalation and exhalation valves.

UCI RESEARCHERS TEAM UP TO DEVELOP COVID-19 SELF-SCREENING TEST

A team of UCI researchers is developing a self-screening test that uses a patient’s saliva to deliver rapid results. The test strips would match with a HIPAA-compliant smartphone app to instruct anonymized patients on next steps as well provide researchers with a heat map of infection zones. Collaborators include **Elliot Botvinick**; **Michelle Khine**, professor of biomedical engineering; Chancellor’s Professor **Plamen Atanassov**; **Sean Young**, associate professor of emergency medicine and informatics; and **Dr. Shahram Lotfipour**, professor of emergency medicine and public health.

NEW SYSTEM AIMS TO UNDERSTAND VIRUS MUTATION

Associate Professor of Biomedical Engineering, Chemistry, and Molecular Biology and Biochemistry **Chang Liu** and his lab are using an accelerated protein evolution system they developed to mimic how natural immune systems develop antibodies, but at a faster pace. This rapid evolution system allows Liu and team to better understand SARS-CoV-2 and other coronaviruses and to develop ways to detect and neutralize the virus.

PROFESSOR EXPLORES INEXPENSIVE POINT-OF-CARE COVID-19 IMMUNITY TEST

Professor of Electrical Engineering and Computer Science, Biomedical Engineering, and Materials Science and Engineering **Peter Burke** is investigating a less expensive way to detect antibodies by using short DNA sequences. If successful, easy-to-produce at-home tests could allow patients to determine if they have antibodies to COVID-19, which may in the future indicate immunity. It will be as easy as an at-home pregnancy test.

TASK FORCE CREATED TO PLAN STUDENTS EVENTUAL RETURN TO SCHOOLS

Dr. Dan Cooper, professor of pediatrics and founding director of the Institute for Clinical Translational Science, is working with a team of educators, policymakers, scientists, clinicians, students and parents to determine how, when and under what conditions public schools should reopen. The task force is called Pediatric Research Organized and Targeted to Eliminate the COVID-19 Threat (PROTECT).

Innovative solutions to understand and combat COVID-19 are still in high demand. Find out more information about UCI Beall Applied Innovation’s call-to-action and resources during the pandemic and how to get involved: innovation.uci.edu/covid-19-info ///

Lizz Pellet, innovation advisor at UCI Beall Applied Innovation, works virtually coaching startups and hosting webinars during the pandemic.

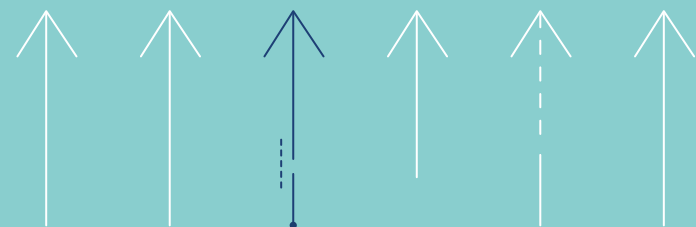
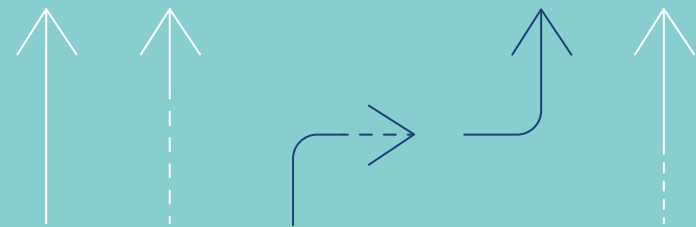
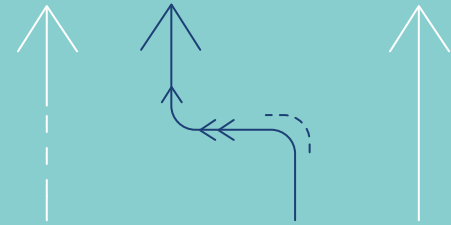
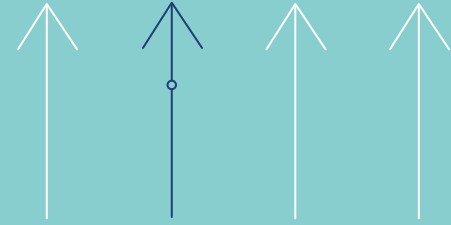
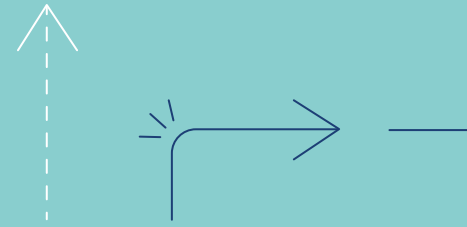
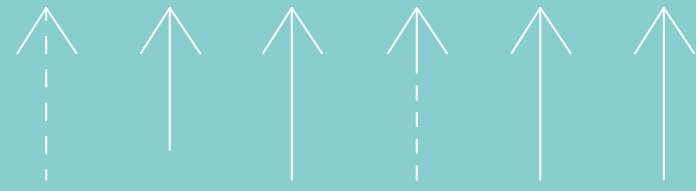


DEEP DIVE

Innovation Advisor
Lizz Pellet Helps
Businesses Adapt to

Shifting Cultures

PELLET USES HER 20 YEARS OF EXPERTISE IN COMPANY CULTURE TO HELP BUSINESSES AND INDIVIDUALS NAVIGATE THE PANDEMIC.



TEXT: GRACE WOOD / PHOTO & ILLUSTRATION: JULIE KENNEDY

You can cook up the perfect startup, sprinkling in funding, employees and a great product, but the key ingredient to any business is culture. Lizz Pellet, innovation advisor at UCI Beall Applied Innovation and chief culture officer at The Inside Solution, emphasizes the importance of company culture in generating productivity and empathy in business, especially with stay-at-home orders.

Company culture encompasses the beliefs and behaviors that determine how a business operates.

“We’re seeing that cultures have to shift right now,” said Pellet. “You’re going to have to pivot that change and it’s going to have a trickle-down effect on how people work and collaborate.”

Despite the pandemic’s effect on company practices and cultures, Pellet’s goal remains the same: build a company culture that works for employees and leaders alike. Pellet emphasizes three tenets of building culture: mission, vision and values, which should guide company decisions. She recommends that companies adapt these tenets to the pandemic as well.

At The Inside Solution, Pellet’s company, she meets with individuals and companies to help assess their cultures, value alignment and employee engagement. Currently, she focuses on businesses that rely on in-person interactions, which must completely pivot during the pandemic.

In her work, Pellet determines the health of company culture through detailed evaluations that become action plans to mend any issues. She also helps individuals leverage their LinkedIn profiles, advising them to populate their profile to follow the website’s algorithm.

In her role as an innovation advisor, Pellet is part of a network of industry experts that offer their knowledge to Wayfinder* startups. Since Pellet cannot meet in person with startups during stay-at-home orders, she conducts virtual webinars and workshops for the Cove @ UCI*. In one titled, “The Ultimate Guide to Working Virtually,” Pellet discussed best practices for remote work.

“If I can share a piece of knowledge with a startup innovation team, which, by the way, is going to teach me something, too, I’m giving back,” said Pellet.

Pellet is also a member of Executive Next Practices Institute’s advisory board. There, she hosts webinars for C-Suite executives about pivoting their cultures in the pandemic.

Additionally, along with her current company, Pellet’s expertise in culture building shows in her three published books and a consulting company she sold in 2011.

“When you get 20 years under your belt, especially in the area that you could say is human resources but is really about talent development, you want to share that knowledge because there’s really no point not to,” said Pellet.

Pellet is available at lizzpellet@gmail.com and through her website: globalcultureguru.com

Learn more about Applied Innovation’s Innovation Advisor program: innovation.uci.edu/programs/innovation-advisors ///



IF I CAN SHARE A PIECE OF KNOWLEDGE WITH A STARTUP INNOVATION TEAM, WHICH, BY THE WAY, IS GOING TO TEACH ME SOMETHING, TOO, I’M GIVING BACK.”

– Lizz Pellet

***Resources Mentioned in this Story**

Wayfinder Incubator
innovation.uci.edu/programs/wayfinder-incubator

Cove @ UCI
innovation.uci.edu/the-cove

10 Ways Startups Can Look Up in an Economic Downturn

ORANGE COUNTY BUSINESS PROFESSIONALS, EXECUTIVES AND INVESTORS SHARE SOME ADVICE TO STARTUPS LOOKING NAVIGATE A TRICKY ECONOMY.

With an uncertain economic future, the business world can be an unpredictable place as companies change their strategies or pivot their models while navigating virtual platforms. Fortunately, entrepreneurs are familiar with adaption. From tailoring their pitches to a particular audience to finding a new target demographic through market research, entrepreneurs can often find ways to adapt their businesses to the current economic atmosphere. Here, UCI Beall Applied Innovation ecosystem partners and Orange County community experts provide advice for startups on ways to maneuver through this difficult economic time.

TEXT: GRACE WOOD / PHOTOS: PROVIDED BY THOSE FEATURED / ILLUSTRATION: JULIE KENNEDY



Jeff Shaw

Senior Leasing Director
Irvine Company Office Properties

Be flexible.

One of the biggest drivers we found important to startups is flexibility with their workplace. Startups should choose a real estate partner that can help scale a company and provide flexibility as that company evolves. There continues to be a growing trend for these companies to find on-demand office space, which offers their own fully furnished and technology enabled workspace under flexible lease terms. These types of offerings can provide startups with hassle-free access to new space without the expense of spending their own capital.



John Yoon

Vice President
Mercato Partners

Use this time to improve your marketing. During times of crisis, your company should focus on conserving cash and protecting revenues. From a marketing perspective, the slow down can provide an opportunity to improve your marketing logistics. This includes measuring the new normal (e.g., funnel stage conversions, web metrics, call-to-action results) and gathering situational intelligence (e.g., customer surveys, advisory councils). Also, use this time to analyze your website's performance, search performance and update your sales metrics.





Julie Cranston

Director
Small Business Development
Center @ UCI Beall
Applied Innovation

Prepare for the worst by making changes for the better. With revenues and investment potentially declining, startups need to make changes now in order to survive. Trim your runway, evaluate operational or product changes, explore federal grants, debt funding options and other financial tools to give your business a greater chance to survive, recover, and hopefully thrive post-COVID-19. Make use of the many no-cost resources available to you: advisors, board members, strategic partners, affiliates, and Small Business Administration- and state-funded business management consulting, such as SCORE and the SBDC @ UCI Beall Applied Innovation.



Dan Rosen

Chairman
Alliance of Angels

Cash is king.
Startups don't die because they run out of ideas. They die because they run out of cash. Therefore, they need to figure out how to make their cash last through the next period of time needed to get to their next milestone. Talk to your advisors, figure out that period of time and have an honest plan of how you can make it through that critical period.

Be realistic.
Is your business going to survive? You have to figure out if the plan you had is realistic enough to continue through this downturn. We are now entering a period where you are going to need to achieve real milestones. Use the money you currently have wisely in order to raise more cash, if needed. Not all good businesses survive this kind of upheaval.



Anurag Bist

Founder & CEO
Monet Networks

Don't stop innovating.
Use your product/platform to adapt to the changing world in the best possible way you can. Startups and entrepreneurship are always about pivoting and responding to changes in marketplace, economic environment, and customer's budgets. Many times, as is very true post-COVID, it becomes important to see if you are able to fine tune your startup's technology to verticals and use cases, which have become more relevant today. For us at MONET, it meant using our core sentiment tracking methodology to environments and use cases where usage is growing rapidly, and repositioning our product messaging to emphasize that it can be used remotely to track consumer behavior. Every brand has a need to know how they should position themselves in front of their consumers.





Larry Kutcher

Innovation Advisor
UCI Beall Applied Innovation
President
theAdvantage

Is it a pain pill or a vitamin?
In a world of limited investment capital and customer resources, “need-to-have” outweighs “nice-to-have.” Your product should address a significant pain point that makes it indispensable and not discretionary. As we move toward a new normal, core needs, such as remote working, distance learning, personal health, security, as well as so many new areas will draw attention and garner investment resources. Be the solution.



Carey Ransom

Co-founder & President
OC4 Venture Studio

Stand out.
When you’re fully committed to your startup, you can stand out in a downturn. Investors understand that many of the best companies are started during a downturn, and they find a way to survive through it and thrive on the other side. Look for ways to demonstrate your commitment, scrappiness and survival instincts. Also, look how you’ll disrupt a big market and make a big difference, and you may just stand out from the crowd.



Scott Hamilton

President & CEO
Executive Next Practices Institute

Use low-risk concept testing. Given the ambiguity of the current environment, challenge your team to come up with low-cost, simple ideas you can quickly test with minimal exposure that might expand your value proposition. These ideas could expand on your current product/service offerings or even take you into new fields/industries where you can leverage your current expertise, talent or partnerships.

Maintain a nonlinear mindset. In an environment of mass disruption, changes in your industry or field will not necessarily be linear. Instead, consider the implications of changes across other sectors and how those “collisions” will change your target markets. We often suggest using an “implications diagram” to forecast multiple options and the impacts your decisions may have.

Learn more about Applied Innovation’s programs that supports startups: innovation.uci.edu/programs ///

COVE PARTNERS

In the Ecosystem

RESIDENTS OF THE
COVE @ UCI AT A GLANCE.

COVE PARTNERS

- AiViva Biopharma
- AJK Pharmaceuticals, LLC
- Anthem
- Auctus Global Capital
- Audact Health Business, Inc.
- Base 11
- BDP Technologies, LLC
- Cellular Nanomed
- Cove Fund II
- DH Diagnostics
- Docbot
- Elyda Pharmaceuticals
- EMVcon, Inc.
- Executive Next Practices
- Gate 5 Energy Partners
- JeniVision
- Laser Associated Sciences
- Learning Ovations
- Mark IV Capital
- Monet Networks
- Pacific Planning Group
- RebeccaTech
- RTConfidence
- Rally Cry
- SBDC @ UCI Beall Applied Innovation
- School of Medicine - Sanger Group
- School of Medicine - Li Group
- Sustain SoCal
- Tech Coast Angels
- TrakPoint Solutions
- Vertical Venture Partners

For more information on community partners, visit: innovation.uci.edu/the-cove/ecosystem



UCI BEALL APPLIED INNOVATION
EMPLOYEE FEATURE

with Sara Willman

SARA WILLMAN DISCUSSES HER LOVE OF SCIENCE AND THE ARTS ALONG WITH A DARING TRIP TO THE TOP OF MOUNT BALDY.

TEXT: GRACE WOOD / PHOTO: RTHURA CEVALLOS

Sara Willman, lab manager at the Cove @ UCI, inhabits many roles. You might find her answering emails, troubleshooting finicky machinery or researching a company's novel technology. When she is not in the lab, Willman pursues her love of the arts and outdoors – perhaps writing the next great American novel or scaling a mountaintop. Learn more about Willman below.

Q Do you have any surprising hobbies?

I like to write about personal things – poetry and sometimes, creative short stories. Throughout my youth, I started many books. None of them ever got much past three chapters. Maybe later in life, when I have more time and I'm not as focused on my career, I can sit down and write a book of some sort, maybe fiction or a memoir. If not published or for the world, then just for me.

Q Did you have any other hobbies growing up?

I love theater. I like being able to take on a character and develop that. I really wish I had an outlet for it somewhere. I watch and read plays – at least it's something. I think in an alternate universe, I went to drama school and pursued that path.

Q What's the most daring thing you've ever done?

I hiked to the top of Mount Baldy in a thunderstorm. We had to stop multiple times and take shelter when the lightning was a high risk. We had to go back down the mountain to escape a sudden rain surge. Much slipping ensued, but we all made it down safely without injury.

Q What job did you want as a kid and how does that compare to your current role?

I wanted to be an obstetrician. I didn't really understand what that meant; I just wanted to deliver babies. As I got older, I realized I didn't have the stomach for medical school. I switched to physical sciences and that's where my love for engineering developed. I work with medical device and biotechnology companies. If I do decide to keep going with this industry for the rest of my career, I've come full circle.

Q What's a food you have always wanted to try?

Anybody who has ever been to Italy tells me that the pizza there is not even pizza. I think that would go for any other foods that are staple American kinds of food and are completely different in its country of origin or in other countries. So, something with a different take, or original take, of foods that we're accustomed to here in the U.S. ///

Across Campus

SOME OF THE LATEST STORIES
FROM THE UCI CAMPUS



HENRY SAMUELI SCHOOL OF ENGINEERING

SPIE, the international society for optics and photonics, awarded a 2020 Optics and Photonics Education scholarship of \$3,000 to graduate student researcher Jason Chen for his potential contributions.

engineering.uci.edu



SCHOOL OF HUMANITIES

Annalisa Coliva, Chancellor's Fellow and chair of the Department of Philosophy, and Duncan Pritchard, Distinguished Professor of Philosophy, share five tips on discerning information during COVID-19. Their advice includes being conscientious and inquisitive about new information.

humanities.uci.edu



UCI HEALTH

UCI Health is one of three sites participating in clinical trials to test Aviptadil's effect on COVID-19 patients in critical condition. If successful, Aviptadil will be a last line of defense where significant complications appear.

ucihealth.org



DONALD BREN SCHOOL OF INFORMATION AND COMPUTER SCIENCES

The National Institute of Standards and Technology awarded \$20 million in renewed funding to the Center for Statistics and Applications in Forensic Evidence, an interdisciplinary group that includes 60 UCI participants. Of the \$20 million, UCI received about \$4 million.

ics.uci.edu



SCHOOL OF PHYSICAL SCIENCES

Steve Davis, associate professor of Earth system science, is part of an international cohort measuring reduced CO2 emissions during COVID-19. So far, in 2020, they have noted a global drop in CO2 emissions of roughly nine percent, compared to 2019.

ps.uci.edu

OPINION

A Vision for Post-Pandemic Investing

RICHARD SUDEK, PH.D., EXECUTIVE DIRECTOR AT UCI BEALL APPLIED INNOVATION AND CHIEF INNOVATION OFFICER AT UCI, SHARES HIS THOUGHTS ON HOW TO MAKE THE INVESTMENT LANDSCAPE BETTER FOR INVESTORS AND ENTREPRENEURS.



THIS DECISION TO ADAPT RATHER THAN WITHDRAW... IS A FRESH REMINDER THAT THE INVESTMENT AND ENTREPRENEURIAL COMMUNITY INNOVATES THROUGH ADVERSITY."

– Richard Sudek, Ph.D.

Never in my life have I thought that I would be faced with a global pandemic. I have lived through a number of economic downturns as both a bootstrap entrepreneur and an angel investor, and witnessed fellow entrepreneurs find fortune and misfortune as a direct result of those forces beyond their control. Because of the momentous impacts of COVID-19, industries must adopt new ideas and mindsets to ensure survival.

After many states issued stay-at-home orders, I was pleased to learn that many investment groups — including Tech Coast Angels — were quick to continue to screen entrepreneurs and view startup pitches virtually. This decision to adapt rather than withdraw, despite the long-held belief by many that an investment deal cannot take place without an in-person meeting, is a fresh reminder that the investment and entrepreneurial community innovates through adversity.

Many of us, myself included, got our start as tenacious entrepreneurs before becoming investors. So we, of all people, should know that continuing to innovate, despite a pandemic, is our only option. After all, do we invest in startups based on the physical location of the entrepreneur or based on the quality of their idea and their passion for bringing that idea to life?



The pandemic has not slowed investor screenings as they continue to occur on a virtual basis

Whether angel groups or venture capital firms are using Zoom or other video conference tools, initial feedback seems to suggest they are an effective alternative to in-person pitches. That said, I do not see virtual screenings as a temporary fix to the problem at hand, but rather a shift toward a more inclusive, forward-thinking and flexible new investing landscape. This is not to say that physical meetings will not be important, as a hybrid format is likely to be the new standard.

The industry's adoption of a hybrid format may be the nudge that angel investors need to move to a more connected and syndicated approach that will allow entrepreneurs to raise larger rounds faster. Although there has been some syndication in a regional sense, the angel investment community has not adopted it in a significant way, with angel investors slow to invest outside their geographical area.

I created the Angel Syndication Network, which includes over 40 angel groups, through Tech Coast Angels to solve this problem. As a result of the pandemic, we have seen online attendance double and more angel investors see deal flow from outside their area. The Angel Capital Association — an industry alliance of angel groups across North America — has escalated an effort to move syndication to the forefront. I believe we are at an inflection point in our industry; our circumstances have provided us the opportunity to move past old habits. I propose that virtual pitches and screenings become not just an option during the pandemic but a key component of all angel groups now and beyond the pandemic.

I ask of you, fellow investors, when the world begins to transition back to a familiar level of normalcy, to move to a more syndicated model to help entrepreneurs raise larger rounds and help angel investors diversify their investments outside of their geographic area. ///

TEXT: RICHARD SUDEK, PH.D. / PHOTO: KATE WOKOWSKY / ILLUSTRATION: JULIE KENNEDY



Printed on recycled paper







UCI Beall Applied Innovation is a dynamic, innovative central platform for the UCI campus, entrepreneurs, inventors, the business community and investors to collaborate and move UCI research from lab to market.

UCI Beall
Applied Innovation

5270 CALIFORNIA AVENUE
IRVINE, CA 92697-7700
949-824-COVE (2683)

email: cove@uci.edu
website: innovation.uci.edu
news: innovation.uci.edu/news
tech: innovation.uci.edu/tech



-  @UCICove
-  @UCICove
-  @UCICove
-  UCI Beall Applied Innovation @ the Cove
-  UCI Beall Applied Innovation @ the Cove
-  UCI Beall Applied Innovation at the Cove

SUPPORT INNOVATION AT UCI

innovation.uci.edu/support-innovation

WAYS TO GET INVOLVED

innovation.uci.edu/get-involved