



LIFT OFF



THE BUSINESS PARTNER
FOR YOUR IDEAS



ANNUAL REPORT 2018

“The true sign of
intelligence
is not knowledge
but imagination.”

.....

Albert Einstein

ANNUAL REPORT 2018



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FOR YOUR IDEAS





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Message from the President

At the University of Utah, we celebrate a strong culture of collaboration, innovation and discovery. Our faculty are at the forefront of ground-breaking scholarship that addresses urgent societal concerns—work that often leads to new products and processes. Our scholars are achieving recognition nationally and globally for their transformative endeavors.

We are rare among our peers in the co-location of a comprehensive research university and a vibrant academic medical center. This allows collaboration between the health sciences and the rest of the university in scholarship, education, community partnerships, and knowledge transfer.

The Center for Technology & Venture Commercialization is at the nexus of these efforts as the catalyst for all aspects of invention management, patents and licensing, startup formation, equity management and early-stage funding. It is dedicated to transforming great ideas into life-changing applications that improve the quality of life in our state, the nation and the world.

Through TVC, the University of Utah plays a key role in the state's economy by creating jobs and companies. TVC's success in taking ideas from lab to market led the Milken Institute to rank the University of Utah

as No. 1 in the United States for Best Universities for Technology Transfer. Our track record in attracting millions in research funding—a new high of \$515 million in FY2018—is excellent.

The University of Utah is a leader in turning innovation and entrepreneurship into products and businesses. TVC is at the center of these efforts.

In this annual report, you'll find examples of how TVC is transforming the ideas and entrepreneurial innovations of our remarkable faculty into products and businesses that improve our lives.



— President Ruth V. Watkins

Message from the Executive Director

The past year has been an exciting one for us here at TVC. We've implemented new services, recruited new expertise, and expanded a global network of opportunities for our inventors. We've increased our focus on helping our University of Utah innovators have positive and powerful impacts on the world beyond our campus boundaries.

The University of Utah is a hub of innovation. Every day at the U, faculty, staff, and students are working on new technologies and ideas, raising the bar of knowledge ever higher. But walk into any lab and you'll discover that we are not content with simply researching and inventing. We care deeply about seeing inventions make an impact on the world.

Here at the Center for Technology Venture & Commercialization (TVC), our job is to help move an innovation from concept to market. Our support for University innovators starts even before they bring us their idea. We provide the support each innovation requires and partner with faculty to advance their innovation out of the University setting and into a beneficial and successful product or service.

TVC has begun providing even greater support through a new program we launched this past year: StartUp 360. From the earliest phase of filing patent applications through the growth stages of a startup recruiting management and raising capital, TVC surrounds the company and entrepreneur with 360 degrees of support,

catalyzing pivotal introductions and relationships, offering expert guidance, mentorship, and support.

Our team is managing more than a thousand technologies through various stages of the commercialization process. As we continue to scale up, it is critical to integrate experienced entrepreneurs into the process. That's why TVC has expanded our network of experienced entrepreneurs. Our new Executive-in-Residence (XIR) and Entrepreneur-in-Residence (EIR) programs are another way we've begun providing expert mentorship and leadership to our startups. The XIRs are serial entrepreneurs and corporate executives who work closely with faculty innovators and TVC teams to ensure that each company is positioned to thrive. The EIRs are serial entrepreneurs who are actively seeking their next opportunity.

We are also seeing exciting results from our new University Seed Fund. Sometimes an inventor's biggest hurdle is the need for early funding to achieve a proof of concept. The University Seed Fund provides grants for researchers to complete that next critical experiment or discovery. By reinvesting in ongoing research and



continuing to provide resources to our innovators, the University is helping ensure future commercial successes.

Of course, “commercial success” has different meanings for different innovators. As we look forward, TVC is heightening our focus on impact. That means we’re less focused on the metric of how many companies we start and more focused on how many innovations successfully move from the University and into the marketplace. Impact is not simply measured in dollars and cents. It’s measured by the lives we positively impact.

The traditional way of thinking about commercialization is linear. But speak with any entrepreneur, and they will tell you their journey has been anything but linear. In

the coming year we’ll be continuing to structure TVC to support the non-linear reality of commercialization. I invite you to meet a few of our innovators on the following pages and see how their journeys are progressing with the help of TVC.

Success to you in all your ventures,

A handwritten signature in black ink, appearing to read 'Keith Marmer', with a stylized, flowing script.

— Keith Marmer, Executive Director

TVC's International Influence

TVC is catalyzing our relationships on a global scale. In 2018 we hosted scholars from 46 different countries and established business ties with a host of others.

- | | | | |
|----------------|------------------------|---------------|----------------|
| 1. Afghanistan | 7. Costa Rica | 13. Germany | 19. Ireland |
| 2. Argentina | 8. Czech Republic | 14. Hong Kong | 20. Jamaica |
| 3. Armenia | 9. Denmark | 15. Hungary | 21. Jordan |
| 4. Australia | 10. Dominican Republic | 16. Iceland | 22. Kyrgyzstan |
| 5. Belarus | 11. Ecuador | 17. India | 23. Laos |
| 6. Colombia | 12. Egypt | 18. Indonesia | 24. Luxembourg |



Pakistan

In collaboration with the Office of the Vice President for Research, TVC hosted a postdoctoral fellow from Mehran University of Engineering and Technology in Jamshoro, Pakistan. Under the guidance of TVC, she developed a tool that helps bridge knowledge gaps between faculty inventors and the staffs of university technology transfer offices.

Russia

In early 2018 TVC hosted a visiting fellow from Tomsk Polytechnic University in Tomsk, Russia. While in Utah, he studied ways to foster innovation ecosystems with universities at their center. He returned to Tomsk and is currently applying best practices from the University of Utah to the regional innovation ecosystem.

South Korea

The University of Utah's Asia Campus in Incheon is providing a home base for TVC as we strengthen our presence in Asia.

25. Mexico
26. Mozambique
27. Myanmar
28. New Zealand
29. Nigeria
30. Norway

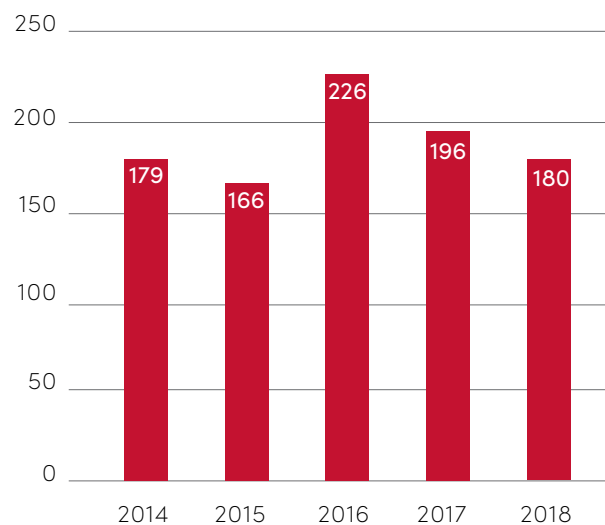
31. Pakistan
32. Panama
33. Peru
34. Philippines
35. Portugal
36. Republic of the Congo

37. Romania
38. Russia
39. Slovenia
40. South Africa
41. South Korea
42. Spain

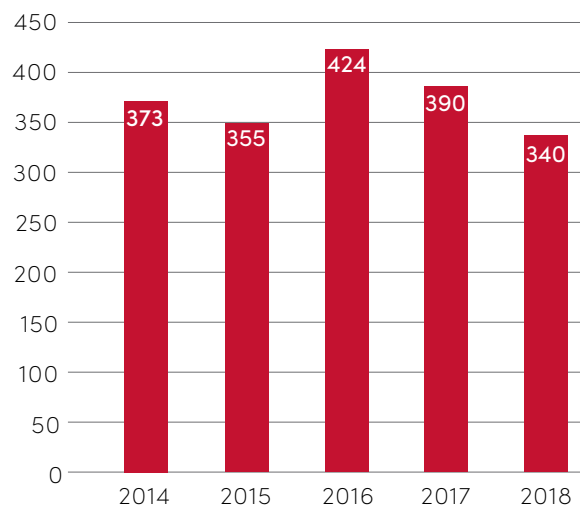
43. Trinidad and Tobago
44. Tunisia
45. Turkey
46. Ukraine
47. Venezuela

2018 By the Numbers

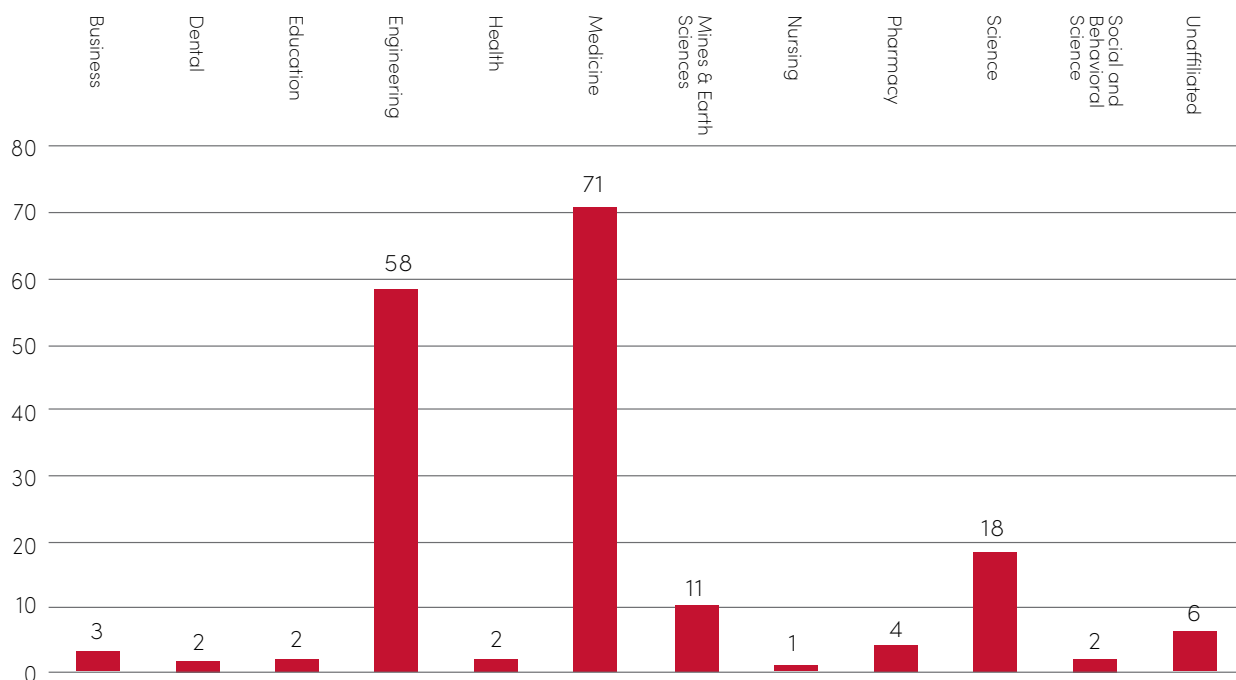
INVENTION DISCLOSURES



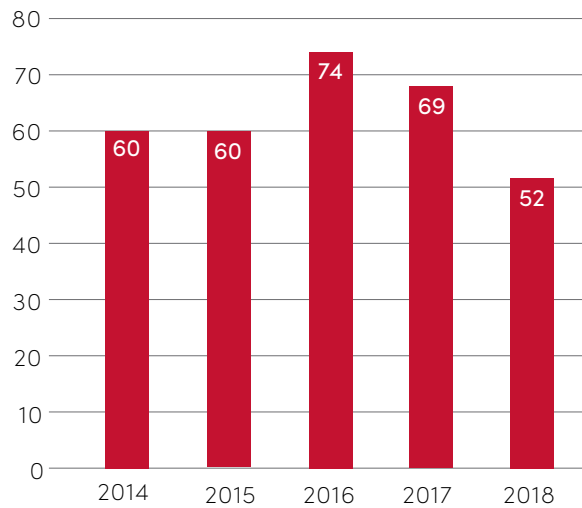
INVENTORS



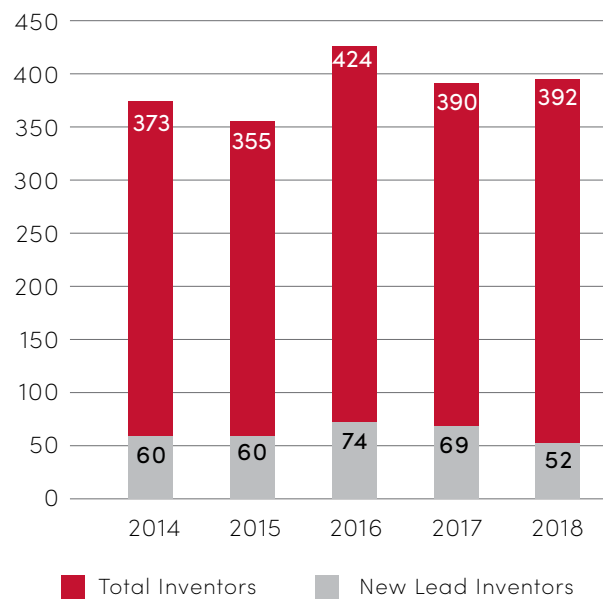
NUMBER OF INVENTION DISCLOSURES BY COLLEGE



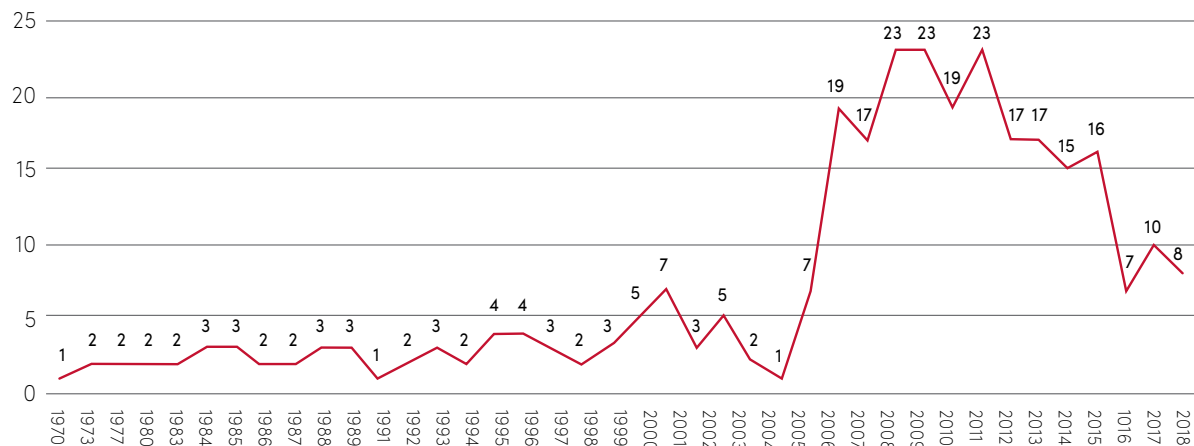
NEW LEAD INVENTORS



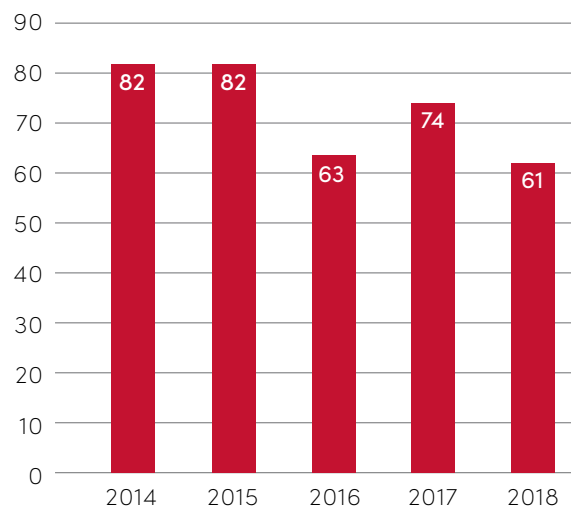
TOTAL INVENTORS AND NEW LEAD INVENTORS



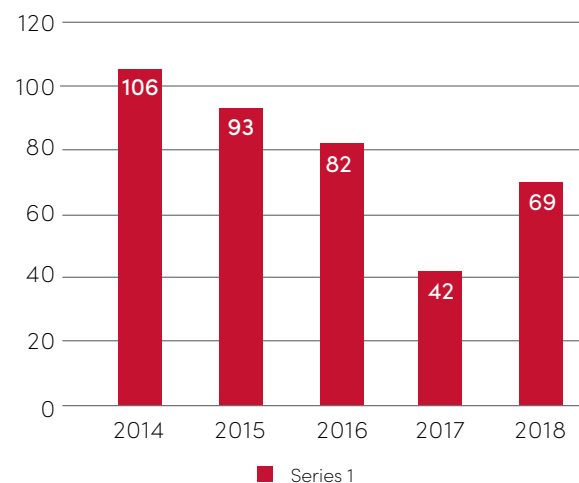
STARTUPS



ISSUED U.S. PATENTS



LICENSES







Holographic Technology: Tiny Lenses, Big Future

Rajesh Menon, an electrical and computer engineering associate professor at the University of Utah and director of the Laboratory for Optical Nanotechnologies, was doing what professors everywhere do. He was pursuing an academic idea because it posed an interesting problem: Could he create a better hologram?

He wasn't expecting companies that print money to start calling him.

Even though holograms still have the intrigue of science fiction, they've been around for decades. You're probably carrying at least one in your wallet right now on a credit card or driver's license.

Whether it's a strip of holographic film on a hundred-dollar bill or a projected 3D image in an art gallery, most holograms are created in essentially the same fashion. First, a laser beam is split in two. Half of the beam hits the object you want to create an image of, and the other half doesn't. Then both beams are reunited. Where the first half of the laser beam hit the object, it will create interference when recombined with the other half, and that interference pattern is recorded on film. Then, when a light source (often the same type of laser used to create the film) shines on or through the film, the interference pattern recreates the 3D image of the object.



Menon, a University of Utah professor with a background in nanofabrication and optical engineering, wasn't content with this process. It's expensive, it uses complicated equipment and lasers, and the end result is usually monochromatic images. "I'm a photonics person," he explains. "What that means is basically using very small structures to do interesting things with light." Finding a cheaper way to create better-quality holograms was a problem tailor-made for Menon.

Two years ago, he began producing holographic films using nanostructures generated by computers instead of lasers. Rather than making a reflective image like those on the back of credit cards, he wanted to project an image through the film onto a surface. But most projected images use a curved lens to bend light to form the image. "We are trying to make optics which can do the same thing, but with lenses that are completely flat and are ten to a hundred times thinner than a human hair," says Menon.

With approximately 4 billion nanostructures within a film about the width of a pencil eraser, his holographic lens is not only flat and incredibly thin, it's also flexible. It can be embedded between layers of plastic, rather than being applied to a surface like a sticker. What's more, you can shine a regular light source, such as sunlight or a cellphone flashlight, through the film and project a clear, full-color image.

Last spring, he and three researchers in his department published their first paper on the technology in *Scientific Reports*. "Then there was an article about it in *The Economist*, and many other publications picked it up," says Menon. That's when companies that manufacture currency for countries around the globe started calling him, because his technology would likely be cheaper to make, yet be far more secure than existing holographic security features.

"This is something I had no idea about eight months ago," says Menon. He had instead envisioned other roles for his new holographic lens, such as making full holographic videos, or developing a GoPro*-like camera the size and shape of a Band-Aid*.

But now that money manufacturers have come knocking, Menon has shifted gears, at least temporarily, to optimize his tech for currency. Although the U.S. still uses paper money, other countries have moved to polymers. Menon sees embedding a tiny holographic image of the bank note's value, such as "100," in a transparent window in the note itself. "Let's say you're in a market and someone hands you a high-value denomination," he says. "You can check it very easily by just using your cellphone flashlight to project the image."

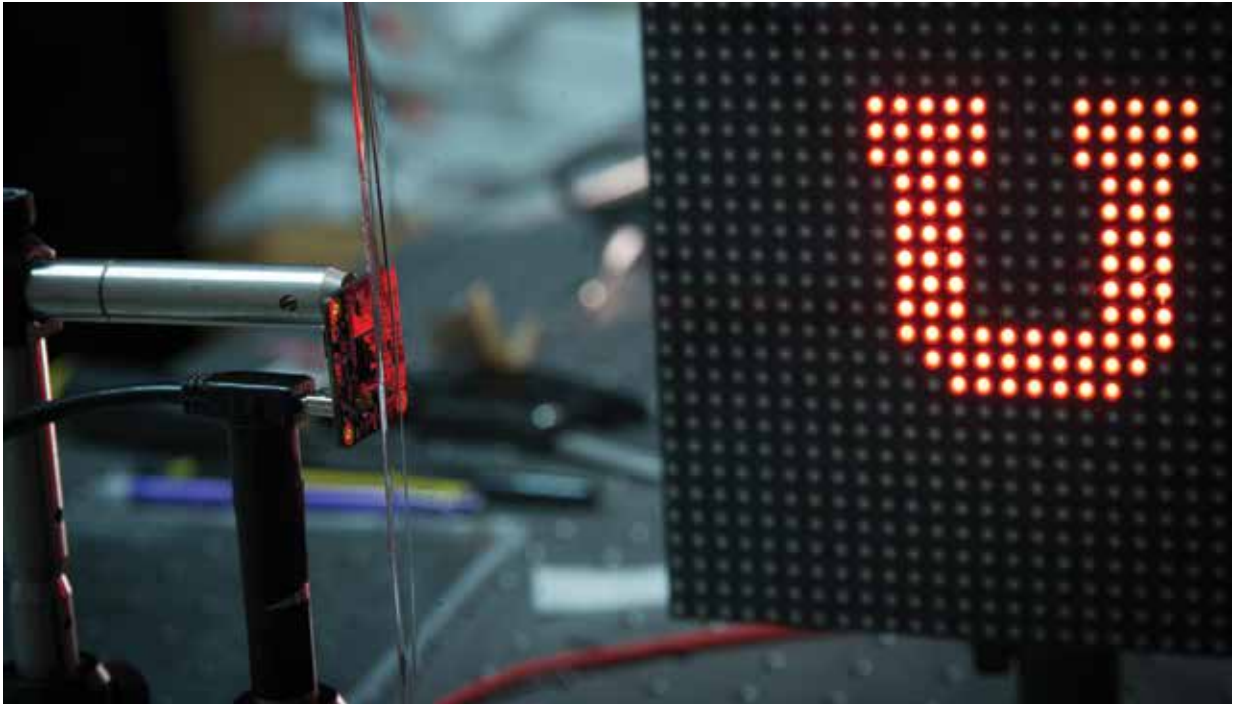
Bank notes are only one application. "You could do this for driver's licenses, passports, visas, tax stamps," and other security documents, says Menon. Another example might be expensive tickets, such as season passes or Super Bowl tickets, and high-end retail products. Menon's holograms could even be used in pharmaceutical packaging to curtail drug counterfeiting. Menon foresees his technology eventually playing energy-efficient and inexpensive roles in eyeglasses and contact lenses, cameras, lighting, 3D animation, and perhaps even phone or TV screens.

But before any of that can happen, Menon's invention must get out of the lab and into the real world. So he took his ideas to the Center for Technology & Venture Commercialization (TVC). "TVC is a fantastic resource that we have at the University," he says. In addition to helping him file for patents and start up his company, Oblate Optics, he says he most appreciates TVC's ongoing business strategy guidance. "This is one of those technologies where you can do a hundred different things, and I'm interested in doing a hundred different

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The most important thing, once you graduate if you want to be successful, you have to innovate.”

Rajesh Menon



things, but it's probably not a good idea to do that," he explains, laughing. "So they help me really focus on what is the right thing. There's a lot of expertise in the TVC to help."

Menon credits TVC's flexibility with their ability to help so many U faculty members successfully navigate the lab-to-marketplace maze. "Every technology is different, every faculty member is different, every technology has a different evolution. It's not like there's one program that fits everything, right? Unfortunately, that's how these things generally work," he says. "But having flexibility and open-mindedness is something the TVC does very well."

Menon believes TVC's expert advice and mentorship is so valuable, he invites TVC members to present to students in his course, Optics for Energy. In this class, student teams often build prototypes and create business plans for their innovations. TVC members teach students "How the patenting process works, how you actually start a company—the nuts and bolts," says Menon. "The way of thinking from an entrepreneurial mindset is very much lacking in most engineering schools. But this is ultimately the most

important thing once you graduate, even if you are working for a large company, because if you want to be successful, you have to innovate."

For Menon, research and innovation are vital elements of students' education at the U and an important part of the University's commitment to Utah and the world. "It's important to understand that a lot of the investment is not only creating interesting new technologies, but it's also educating students in how to think about creating new technologies and how to bring them into the world," he says.

"Sometimes we have to have a long view. We have to try lots of interesting things now, and that takes some investment. But maybe 10 years down the road, we will create something fantastic which makes life much better for everybody." His holographic technology is an example of research that started as a tantalizing academic question, but is rapidly turning into a product with significant commercial appeal.

"We have to take our ideas into the real world to make a difference, improve quality of life," says Menon. "As professors, we are not equipped to do this. So having a fantastic resource at TVC, and particularly the people behind it, is very, very useful and helpful."



A photograph showing a person's lower body and legs in a specialized ski binding, which is mounted on a carpeted floor. The binding is black and red, with yellow ropes attached to it. The person is wearing a black helmet and a white shirt. The background is a plain wall with a door handle visible.

Ski for All: Sports Equipment for People with Tetraplegia that Provides Full Control

Jeff Rosenbluth claims he was a ski bum in the early 1980s. Sure, he was going to college at U.C. San Diego, but his heart was in the mountains. He spent weekends and holidays on the slopes, becoming a ski patrol member. Then, in 1985, Big Bear Ski Resort launched an adaptive ski program for people with disabilities.

Rosenbluth joined the program as a ski instructor, not realizing he had just laid the path for his future. “I was introduced at that time to folks with spinal cord injuries, and to people who were paralyzed but could still do all these cool things, like skiing,” says Rosenbluth. “There are lots of other things that people with disabilities can do sports-wise and activity-wise, but there’s a certain grace that’s still there with skiing. It seemed like a really important part of people’s recovery, knowing that they could do the same things they could do before.”

Three decades later, Rosenbluth, M.D., is the Medical Director of the Spinal Cord Injury Acute Rehabilitation program at the University of Utah Health Sciences Center. And he’s still focused on getting people with spinal cord injuries onto the mountain. “If you ask a lot of people, ‘Who are you?’ a lot of them respond with ‘I’m a skier, I’m a hiker, I’m a climber. That’s who I am.’ The thing about spinal cord injury that happens immediately is that you lose your identity,” says Rosenbluth.



As soon as you restore someone's identity, you've really made the biggest difference you can in their lives."

Jeff Rosenbluth, Tetra Ski

Most adaptive recreational equipment is for persons with paraplegia—generally people who have lost the use of their legs. Ski devices for people with tetraplegia (also known as quadriplegia), where all four limbs are affected, are passive, with the patient being lowered down the mountain by an instructor using ropes to steer the patient's sled. "We had patients with no arm function at all who challenged us. I had one patient who, when I would tell him about the things we were doing in our adaptive rec program, would say, 'Yeah, but what are you doing for me?'" says Rosenbluth. "There are a lot of skis and equipment that are really great if you have good use of your trunk, upper body, and arms. I felt like there was a lot of potential to take people with even more paralysis and have them perform at a higher level."

That's when he discovered a French skiing device resembling a wheelchair on skis, with handles rising from the bindings so that patients can steer the device with their hands. What it needed was a way for someone with little or no arm function to control it. Fortunately, Rosenbluth's rehab department was already familiar with a variety of control devices, such as easy-to-manipulate switches and mouth controllers that use "sip and puff" technology to drive motorized wheelchairs. "When I looked at the French device, I instantly thought, why can't we just power the movement of the skis, and then use a power-wheelchair control scheme to operate it?"

Because he was designing a high-tech/low-volume product, it was unlikely that a commercial business would be interested. So Rosenbluth approached the Craig H. Neilsen Foundation. "We proposed a pipeline project, where we would work within the University, using students in different colleges and programs,

to have this really low-overhead, low-cost model of developing technology." The Foundation liked what they heard, and the Tetra Ski was born.

Rosenbluth brought on lead engineer Ross Imburgia and brought in patients to help identify needs. They recruited students from different areas across campus, such as Mechanical Engineering and Computer Science, for research and development of the features necessary to develop a powered ski system that could be controlled by people with tetraplegia.

To the basic framework, Imburgia added actuators, electronics, and software to power the movement of the skis. He designed two different control systems: a joystick for people with some arm control, and a mouth control system. Most people can use one or the other, but Imburgia and Rosenbluth continue to explore additional systems, such as eye control, voice control, or even switches that capture minute electrical impulses ("twitches") from anyplace on the body that the patient can still control. "Our motto is 'Control everything with anything,'" says Rosenbluth.

Rosenbluth and Imburgia knew there would be a learning curve for operating the Tetra Ski, so they also enlisted help from Entertainment Arts and Engineering (EAE) students and the GApp (Therapeutic Games and Apps) Lab in the U's School of Computing. Those students designed simulators to help patients master the joystick or sip-and-puff controls before ever hitting the slopes in a Tetra Ski.

Soon, Rosenbluth knew they had a great product. In fact, they had more than one. Rosenbluth and Imburgia were simultaneously adapting the same technology to a

kayak/sailboat hybrid craft made by Hobie. What they didn't have was the business know-how to get these products to the people who need them. "That's when we went to the TVC," he says. "We're ready to go, we need a business. How do we do this? I needed help at every step: understanding intellectual property, understanding patents and protections and trademarks, understanding the potential of the device, even figuring out leadership." After bringing in mentors and attorneys, the TVC helped Rosenbluth establish a business with three branches under the TetrAdapt Initiative umbrella. TetrAdapt Community is a nonprofit, which will lease Tetra Skis to programs that need them, making Tetra Skis more affordable and easier to upgrade. TetrAdapt Global is a benefit corporation—a for-profit entity that can commercialize technology developed under Rosenbluth's purview and then funnel any profits directly back into the non-profit entity and into the third arm: TetrAdapt Research and Development, Rosenbluth's program at the University of Utah. "Any money that comes into the nonprofit gets poured back into the University to pay for student stipends, work-study students, materials for projects, and new product development," he says.

For Rosenbluth, this arrangement doesn't just fund future development. It also spreads awareness about spinal cord injury and disability to a new generation of University students. Hopefully, whether they're computer science students programming simulators or business students conducting market research, they're thinking about the disabled population within their target market.

Rosenbluth credits the TVC with helping his dream become a reality. "So many people want to spin their projects away from the University, but we want to spin into it. We want to be as tight and as close as we can and still have that separation that allows us to sell a device," says Rosenbluth. "The bottom line is that working with the TVC is really a great experience. When I go to my annual meetings for spinal cord injury programs, I get to see people from every major top-10 rehab center in the country, and there are very few people using this method."

For Rosenbluth, developing the Tetra Ski, Tetra Sailboat, and similar devices isn't about making money. It's about getting adaptive devices out to patients, and letting them once again call themselves a skier or a sailor. "As soon as you restore someone's identity, you've really made the biggest difference you can in their lives."





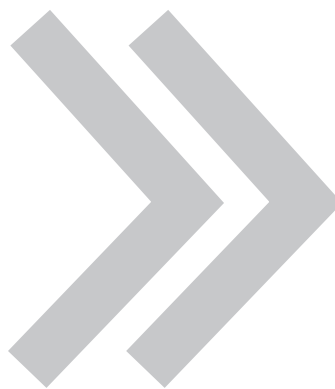


Aqua-Yield's Nanotechnology: The Next Tiny Thing in Agriculture

When you think of farming, you think of nanotechnology, right?

If not, then be grateful that the father-son team of Warren and Clark Bell and their colleagues at Aqua-Yield in Salt Lake City do. They have teamed up with the University of Utah's Nano Institute, and their combined work is likely to revolutionize farming across the globe. Using nanotechnology, Aqua-Yield is focused on making it possible to grow healthier, more productive crops using far less fertilizer, herbicides, and pesticides.

After World War II, U.S. industry was pressed to ramp up food production for rations-weary citizens and returning soldiers. Taking advantage of the wartime buildup of chemical production, the agricultural industry began producing and using chemical fertilizers, which soon outpaced traditional manure-based fertilizers. Chemical fertilizers increase crop production but result in significant unused nutrients and chemical byproducts that remain in the soil, damaging neighboring vegetation and contaminating waterways. In 2017, millions of acres (nearly 65% of U.S. agriculture) were affected when farmers used an herbicide on new crops that were resistant to that product, only to find that neighboring fields of non-resistant crops were being wiped out.



Concerned about the environmental impact of decades of over-fertilization, Clark Bell, CEO and cofounder of Aqua-Yield, says, “One of the big trends in agriculture is what they call the 4 Rs: Right Source, Right Rate, Right Time, and Right Place.” If the right fertilizers can be applied to specific crops in precise amounts, limiting over spraying and reducing contamination of soil, water, air, and neighboring plants, farmers should be able to produce more crops on the same amount of land and drastically reduce detrimental impacts to the environment. What’s more, with the right amount of nutrients, plants’ need for herbicides and fungicides is greatly reduced, meaning farmers save money and reduce even more landscape contamination.

The Bell family has been farming sod grass in Utah since 1979, when Clark’s grandfather, T.H. Bell (Secretary of Education under Ronald Reagan) established BioGrass Sod Farms. Since then, BioGrass—now headed by Warren and Clark—has been a leader in researching and developing sod farming technology. So in 2012, when Warren and Clark came across a “very crude” nanoparticle fertilizer that was supposed to be more readily absorbed by sod grass than traditional fertilizers, they tested it at BioGrass’s farm in Vernon, Tooele County, Utah.

In side-by-side fields, they compared the nanoparticle fertilizer to traditional treatment. “With the addition of the nanotechnology, we were able to reduce one of the fertilizer inputs by 80%, which was very eye-opening for us.” While reducing the amount of fertilizer and associated costs is important, Clark says they also discovered that the nanoparticle-fertilized sod was ready to harvest in only 9 months. The traditionally treated field took a full year. Shrinking production timelines is crucial in Utah’s short growing season. “That’s when the lightbulb came on, and how Aqua-Yield came to be,” says Clark.

Warren, Clark, and their Aqua-Yield partners Fraser and Mike Bullock, knew their nanoparticle fertilizer had promise. Realizing what this new technology could mean for global agriculture and food production, they began sharing their ideas with the international agricultural community. “We had our own system and formulations, and they were good, but we wanted to make sure we stayed ahead of the game, and we wanted an even better nano delivery system,” says Clark. Unsure of their next steps, they first decided to find access to an electron microscope to create images of their nanoparticle. That led them to the University’s Utah Nanofab nano-scale imaging and surface analysis cleanroom, part of



Front Row (L to R) Hamid Ghandehari, Warren Bell, Clark T. Bell, Joann Montesinos, Raziye Mohammadpour, Nick Wilkes, Mostafa Yazdimamaghani Back Row (L to R) Darwin Cheney, Doug Jardine, Martin Jensen, Landon Bunderson, Kyle Isaacson Unable to attend was Seyyed-Pouya Hadipour-Moghaddam

“

With the addition of the nanotechnology, we were able to reduce one of the fertilizer inputs by 80%.”

Clark Bell, CEO and cofounder of Aqua-Yield

the Nano Institute of Utah housed within the USTAR building on campus.

While at the Nano Institute, the Aqua-Yield team chatted with people they ran into in the hallways. According to Hamid Ghandehari, co-director of the Nano Institute and principal investigator, the chance meeting was fortuitous: “These colleagues were looking for a network of nanotechnologists, which already existed on campus in the Nano Institute.” While the Nano Institute explores all aspects of nanotechnology, Ghandehari’s research expertise is in nanotechnology delivery systems, most commonly in medical applications such as cancer drug delivery. Ghandehari and his researchers welcomed the challenge of finding effective ways to deliver nutrients to plants using nanoparticles.

After brainstorming with Aqua-Yield, Ghandehari’s team designed an entirely new nanoparticle for Aqua-Yield. They made their new silica nanoparticle more uniform in size, as well as hollow and porous, enabling the nanoparticle to carry and deliver more nutrients directly to plant cells.

Knowing they had created a unique advancement in agriculture technology, Aqua-Yield and the Nano Institute contacted the Center for Technology & Venture Commercialization (TVC) to patent their nanoparticle and tap into TVC’s business resources.

“Aqua-Yield is kind of a unique case, in that it’s sponsored research and not federally funded,” says Nick Wilkes, technology manager at TVC. U of U faculty are required to disclose new ideas or technology to TVC so that University-related technology can be protected and, if appropriate, licensed and commercialized. In most cases, TVC comes on board early in the innovation process and

helps faculty determine whether their new technology solves a real-world problem and targets a viable market. “In this case, the Aqua-Yield and Nano Institute team had already thought about the market case and it was already vetted by a brilliant team of scientists, business people, and farmers.”

So for Aqua-Yield, TVC’s value has been in the wraparound support and services available after businesses or licensees are established. “We can help in any area of business acumen you might not have, as well as plug in successful business people as mentors,” says Wilkes. “In this case, it was leveraging our own network,” bringing in potential partners, investors, and customers, and seeking ways to expand Aqua-Yield’s message to the world.

“TVC enabled us to take a good partnership and take it all the way to commercialization,” says Clark. Warren adds, “We see these pain points in agriculture. You often don’t solve problems from within. You need to go out and get another point of view. For Aqua-Yield, we get that from the Nano Institute and TVC. They look at things a bit differently than we do.”

By 2050, according to the Food and Agriculture Organization of the U.N., we’ll need to increase food production by 70% to feed the world’s ballooning population. “We have to do a better job than we’re doing,” says Clark. “With this new trend towards environmental stewardship and the 4 Rs, we believe that nano fertilizers, smarter delivery systems, better nutrient uptake—all the wonderful things we’re seeing with our nano fertilizers—will help with what we call in agriculture technology ‘The Race to 2050.’ We believe Aqua-Yield has a big part in that.”





SafeUT: Providing a Safety Net for Utah's Youth

Every day in Utah, two youths (aged 10-17) attempt suicide. According to the Utah Department of Health, the number of suicides and suicide attempts in Utah has been growing steadily since 2011, well above the national rate. Meanwhile, school violence is also rising nationwide as violent situations pull in more young victims and perpetrators.

While the mental health industry tries to address these distressing trends, the University Neuropsychiatric Institute (UNI), under the University of Utah Health Sciences Center, offers a front line of support for Utahns struggling with mental health issues, bullying, or threats of violence. The UNI CrisisLine (the Utah affiliate of the National Suicide Prevention Hotline) averages 6000 incoming calls every month from people across Utah who are in crisis or who need to talk to someone before they reach crisis.

Despite those numbers, folks at the UNI CrisisLine realized they were missing something important: youth.

"Our crisis services were not really reaching younger people," says Barry Rose, UNI Crisis Services Manager. "They don't like to call and talk to strange adults. So we knew for a long time we wanted to start some sort of a text-based crisis service."



In 2013, the Utah Attorney General met with the Attorney General of Colorado, where a tip line managed by law enforcement had been established after the Columbine shooting. Utah, like several other states, was interested in implementing a similar resource for school safety. “This seemed like a great opportunity to potentially partner with the Attorney General’s office and look for funding to create not only a tip line, but also a live-chat texting service, so we could start reaching kids,” says Rose.

Soon, the Utah Legislature passed the School Safety and Crisis Line bill and secured initial funding to create the program. In 2015, the Crisis Center began using a donated phone app, but that app only offered a tip line, where students could text in tips about potentially violent or scary situations. There was no text-based chat capability. As the Crisis Center distributed the SafeUT app to Utah schools, they realized it was inadequate for the volume they were going to experience.

So Rose and his team took their ideas to the University Information Technology (UIT) department at the U. “They were on board; they loved the idea,” says Rose.

“They allocated the resources to start building our own app. Over the last year and a half, they created what you see now—the SafeUT mobile app and the backend of the app.”

The Crisis Center rolled out the new SafeUT app in July 2017. Along with the tip line, the app now includes a live chat feature for text conversations with CrisisLine support members, who are available 24/7. There is also a button to place a phone call to the CrisisLine, but Rose says that is seldom used. “A lot of students feel more comfortable texting about really intimate, really high levels of risky stuff,” he says. “It’s even been a surprise to us, the intensity of some of what’s going on with students.”

Most of Utah’s elementary, middle, and high schools have enrolled in SafeUT. The University of Utah has enrolled, with more Utah higher-education schools to come. As awareness of the program grows, so does usage, with an average of over 600 separate tips and over 1200 text-based chat incidents coming in each month. In March, in the aftermath of the Marjory Stoneman Douglas High School shooting in Florida,

over 3500 tips and text conversations flooded in to the SafeUT app.

“Our focus is school safety,” says Rose. “We have thwarted several potential school attacks and violent situations using the SafeUT app. We also talk, via texting, to young people every day about suicidal thoughts,” he says. “So we’re able to use the texting part of the app in a more preventive way to work with people before things get so bad that they harm themselves or someone else.”

The SafeUT program is working so well that other states are expressing an interest. “There’s nothing like it anywhere in the country that we’re aware of,” says Rose. Other states that have app-based school safety programs only have tip-reporting features, not live-chat texting capability.

An even bigger difference is that the SafeUT text and tips lines are managed by the CrisisLine staff. “All the other states that have tip lines, they’re all managed by law enforcement,” says Rose. All SafeUT tips and texts come directly to the CrisisLine, where every staff member is a licensed mental health professional or licensed social worker. They assess the risk, determining how dangerous the situation is.

Then, the CrisisLine staff can tap their network of relationships with law enforcement, schools, first responders, and medical agencies. “We can immediately dispatch law enforcement or crisis intervention teams if they need it, and then involve the school in a collaborative way,” says Rose. “That gives the school and parents some comfort that they have licensed mental health professionals helping make these decisions and manage risks. We feel like we can provide a better response to a student or young person than a police officer can.”

As the SafeUT program’s success gains attention, Rose’s team has brainstormed a package that they could sell or license to other states interested in implementing or revamping their own programs. But SafeUT is more than just the app developed by the Crisis Center and the UIT department. According to Rose, “It’s really a whole system of care.” It requires a functioning crisis team and an entire infrastructure of services and relationships with everyone from the Board of Education to law enforcement. The SafeUT team quickly realized they needed help turning the system into a product. So they contacted the Center for Technology & Commercialization (TVC).

First, according to Rose, TVC “helped us define who our customer is, and helped us do a series of interviews to get an understanding of what people were looking for, how they would support it, what they would expect from it.”

Next TVC brought in entrepreneurial experts to share their thoughts on packaging and marketing the SafeUT program as a product. From those discussions, the SafeUT team decided they needed to produce a toolkit—a collection of best practices, policies, procedures, and recommendations to go with the app technology. Showing how all the infrastructure pieces fit together might make it easier for other states to adapt the technology to their own situations.

The idea of packaging the SafeUT program for other states is still so new that the team doesn’t know yet whether it will make sense to sell it, license it, or find another way to make it available. That will be the next step where they will turn to TVC for help. “We’re in the healthcare business,” says Rose. “We’re not a startup company or entrepreneurs at all. We’re just trying to provide good health care services.”

“Our crisis services were not really reaching younger people. They don’t like to call and talk to strange adults. So we knew for a long time we wanted to start some sort of a text-based crisis service.”

Barry Rose, UNI Crisis Services Manager







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THE UNIVERSITY OF UTAH

615 Arapeen Dr., Ste. 310 | Salt Lake City, Utah 84108
801-581-7792 | tvc.utah.edu