2014 ANNUAL REPORT

IMPACT

TECHNOLOGY & VENTURE COMMERCIALIZATION

TECHNOLOGY & VENTURE COMMERCIALIZATION
THE UNIVERSITY OF UTAH

ANNUAL REPORT

IMPACT 2014

MESSAGE FROM BRYAN RITCHIE

Last year I compared our efforts at TVC to the construction of the Burj Kalifa, the tallest building in the world. I am happy to report that through the tremendous efforts of faculty, administrators, external partners, and TVC employees, the University of Utah's commercialization efforts achieved their highest returns ever this year in several categories, including royalty income, equity income, and number of agreements concluded. A listing of some of these accomplishments are found below.

Progress: 2014 Accomplishments

Last year we identified a number of areas for improvement. Following is a report on our progress:

- **Continue to improve relationships between TVC and our faculty and students.** We conducted two Boot Camp training sessions, a faculty open house event, and met with numerous chair and department heads to better communicate with faculty. But probably most important, we implemented an improved and standardized 2-and 12-week meeting schedule where TVC meets with faculty to report on the progress of invention disclosures. We then implemented a post-meeting survey to ensure that faculty receive the support they need and desire.

"The University of Utah's commercialization efforts achieved their highest returns ever this year in several categories."

- **Drive value into our startups through additional investments and stronger de-risking.** In 2014 we brought over $4.5 million dollars into our startups from investors. We also launched an accelerator that will allow us to repeatedly apply proven methods and processes to our startups that will, over time, bring better results to the university.
- **Involve outside stakeholders earlier and more intensively in decision-making.** Our outside committee has grown to over 100 active members. We hold meetings every eight weeks to get outside direction.

"The Commercialization Engine is showing signs of success. 45% of all those technologies that received Engine funding from TVC have been licensed."

- **Generate increased resources, especially investment and management.** The accelerator program we launched this year helps new management and founders execute against milestones.
- **Continue to create processes and systems to facilitate data-driven decision-making.** We are improving our new interactive, web-based Inventor Portal, a system that allows inventors to disclose new technologies online. Inventors can now follow the progress of their inventions in real-time and see all of their patents, agreements, and previous invention disclosures.
- **Organize and manage technologies more efficiently.** The Commercialization Engine is showing signs of success. 45% of all those technologies that received Engine funding from TVC have been licensed, compared to 14% that were in a previous program called TCP (Technology Commercialization Project).

Challenges

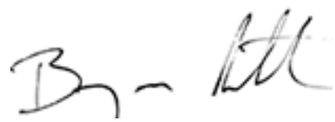
The U, like most universities, relies on a few licenses to produce most of its revenues. Only 0.7% of our technologies have generated more than a million dollars in revenue for the university and only 3% have generated any revenue at all. If we can double these percentages, meaning that if instead of failing 97% of the time we fail 94%, we will dramatically improve our industry-leading performance. To accomplish this, we are working hard to drive value into a wider range of our licensed technologies. Over the last several years we've made great progress in this area: the U now generates revenue from over 100 licenses.

Conclusion

As Dickens famously said, these are the best of times and these are the worst of times. On the one hand, and as mentioned above, TVC and the U recorded its best year ever in several very important categories including number of licenses.

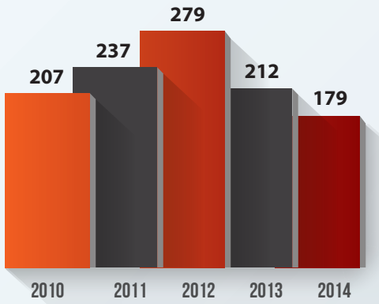
That said, the road ahead could get bumpy. Important patents will be ending while federal funding is diminishing. Even so, we are optimistic about the future of commercialization at the U. We have more equity in startups than ever before. We have more startups that are getting to market than ever before. We have done more licenses than ever before. In all, we are confident that we are expanding our foundation in important ways that will be necessary to support the full productive capacity of commercialization at the U.

Bryan K. Ritchie

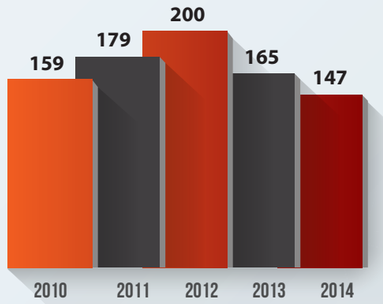


Executive Director, Technology & Venture Commercialization & Associate Vice President for Research—Commercialization

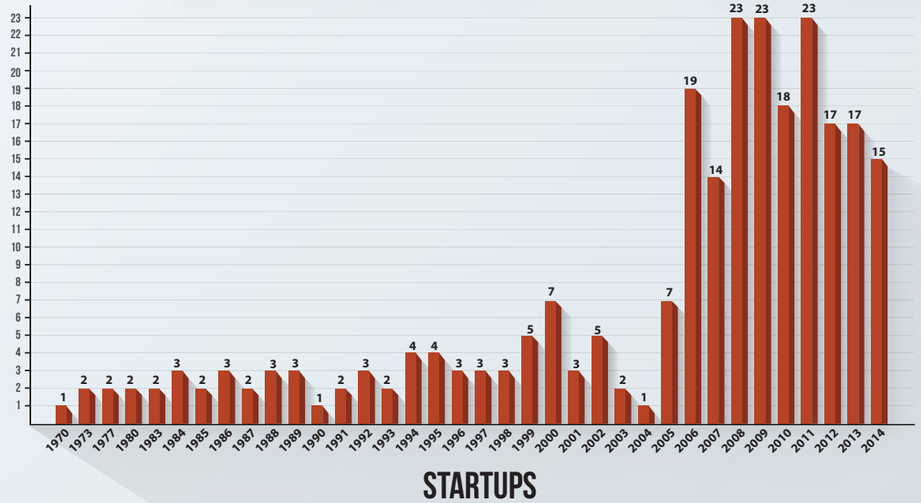
2014 BY THE NUMBERS



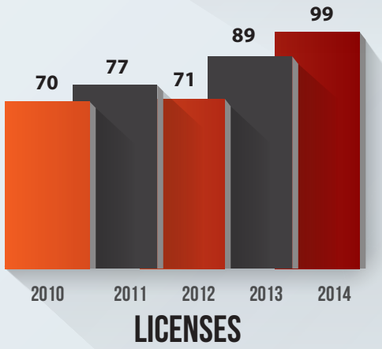
INVENTION DISCLOSURES



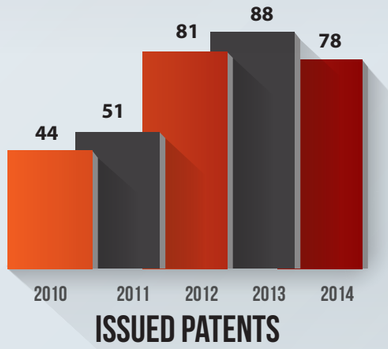
INVENTORS



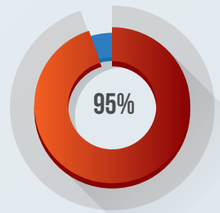
STARTUPS



LICENSES

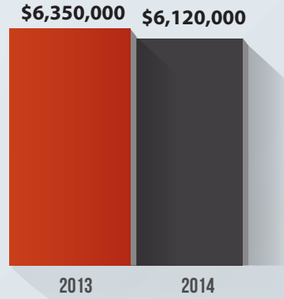


ISSUED PATENTS



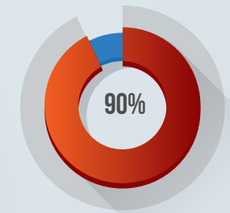
2-WEEK RESPONSE TIME

TVC's business and technology development managers met inventors within two weeks of invention disclosure 95% of the time.



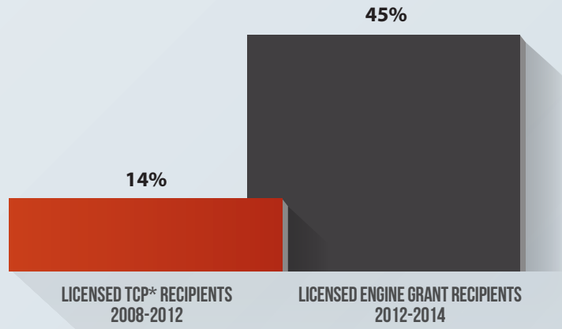
GOVERNMENT GRANTS

Includes federal SBIR and STTR grants as well as State of Utah TCIP grants secured for University of Utah startups and technologies.



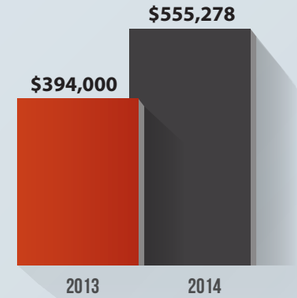
12-WEEK RESPONSE TIME

TVC's business and technology development managers conducted 12-week meetings with inventors to discuss the path forward for their technologies 90% of the time.



COMMERCIALIZATION ENGINE'S PERFORMANCE

*The Commercialization Engine program replaced the Technology Commercialization Project (TCP) in 2012.

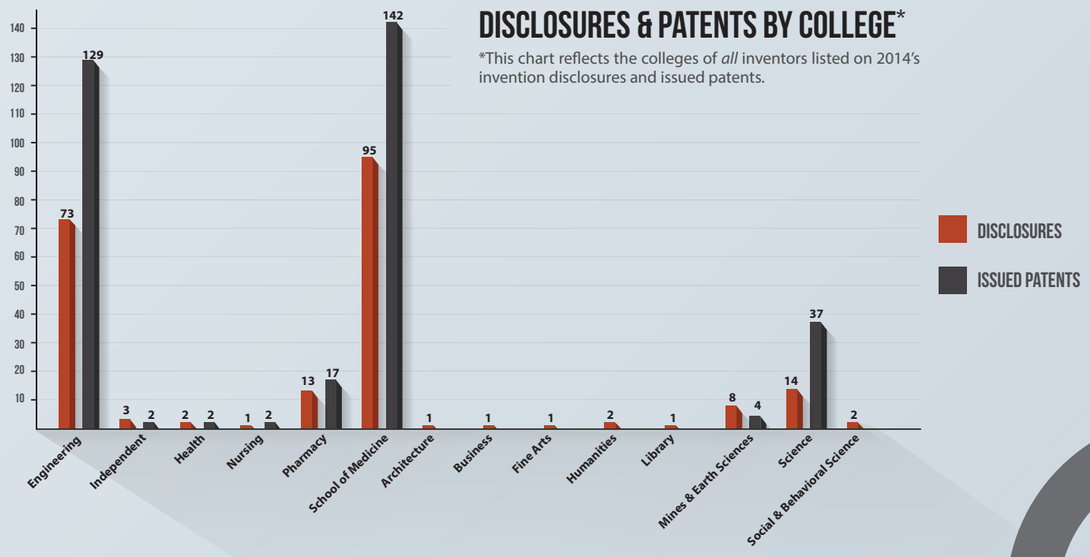


ENGINE INVESTMENTS

Total grant amounts given by TVC to University of Utah technologies for development.

DISCLOSURES & PATENTS BY COLLEGE*

*This chart reflects the colleges of *all* inventors listed on 2014's invention disclosures and issued patents.



DISCOVER. TRANSFORM. APPLY.

ABOUT TVC

Technology & Venture Commercialization

Technology and Venture Commercialization (TVC) at the U is dedicated to commercializing new technologies and inventions from discoveries made and developed at the U. It accomplishes this by applying a stage-gated, milestone-driven process called "The Commercialization Engine" that has as an end-goal of building value for inventors, the university, and the community through licensing intellectual property, starting new ventures, building beneficial commercial partnerships, supporting the community, and educating students.

The Commercialization Engine

The Commercialization Engine is a value-adding process through which all university inventions pass after disclosure to TVC. Its goal is to take early-stage technologies through a process of derisking and transform them into life-changing and productive applications. This is accomplished by thoroughly understanding inventions, finding their value, determining their market fit, acting on feedback from potential customers, protecting IP, creating a strong business model, identifying milestones, and executing an acceleration plan.

Get Involved in The Engine

TVC relies on an active and engaged community. The success of U technology depends on finding quality management, financial backing, and the necessary time and attention to vet these technologies early in their development. To achieve this, we depend on investors, entrepreneurs, and subject matter experts to assist in our technology de-risking process.

As a member of our community, we would like to engage with you.

Below is a URL to an information gathering form. If you are interested in engaging with TVC, please fill out the application below.

www.tvc.utah.edu/tco/engine_form.php

We hope to build a more active and engaged community around U technology and expect increased success in commercialization efforts. Your consideration is appreciated.

TVC LAUNCHES A

STARTUP ACCELERATOR

"Starting companies at TVC is no longer sufficient," said Bryan Ritchie, executive director of TVC. As he explains it, historically the job of a technology commercialization office was complete when a technology was licensed to either an existing company or to a startup. Licensees were responsible for the invention's development and ultimate commercialization.

"While the majority of the U's startups have successfully developed and commercialized U technologies," explains Matt Gardner, business development manager at TVC, "a number of them are not at their highest potential." Explaining further, Ritchie states, "Even though TVC has done very well and is a leading commercialization office, we still rely too much on a handful of licenses. Our goal is to generate more revenue from more technologies." To do this, he says, TVC "must engage with our startups longer and build more value into them."

As part of its efforts to accomplish this, TVC launched the TVC Accelerator this year. It is a 12-week program that is an integral part of the Commercialization Engine process. The Accelerator is designed to advance 6-10 U startups from an early-stage to having a scalable and repeatable business model. It creates value by connecting companies to seasoned and successful mentors, product development professionals, and the necessary equipment and resources for effective testing and refining of assumptions. Throughout the process, the startup's value proposition, market opportunity, intellectual property protection, competitive landscape analysis, and technology overview are thoroughly determined.

"The Accelerator is basically a method that allows us to put more focus on the most promising U technologies," said Taylor Bench, director of Economic Development Services at TVC. "The time, energy, and resources we invest in the technologies in the Accelerator greatly increase their valuation."

The first startup to go through the Accelerator was U-spinoff Navillum. Formed in early 2012 as a quantum dots manufacturing company, the company had been the recipient of multiple awards and grants, winner of numerous national business contests, and beneficiary of generous press coverage. Despite these accomplishments, however, Navillum had a problem: it had no customers or sales.

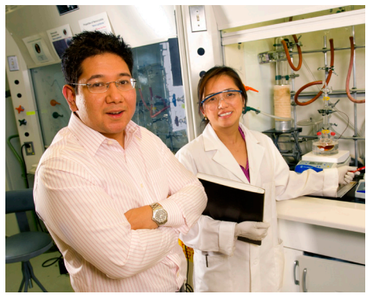
When the company learned it had been chosen to participate in the new startup accelerator TVC was launching, it had a choice: "We could either continue spending the next two years pursuing grants to perfect our core technology, or we could begin commercializing the product," said David Robinson, Navillum's CEO. "Ultimately, we decided that it was time for us to go-to-market. We needed to find a commercial partner and develop a new commercial plan. After discussing the Accelerator's mission with TVC, we knew it was going to be the process that would allow us to accomplish our goals."

When Navillum entered the Accelerator, TVC assembled a team of multidisciplinary students, an accomplished mentor, Navillum employees, and TVC analysts to move the company forward. Weekly team meetings were held to determine the next most critical step it needed to take for that week. The team then acted on that step by communicating and talking to experts, companies, and potential customers in its markets. "Through the amazing and diligent work of the students on our team, we were able to have critical conversations with some extremely big players, including one of the largest companies in the world," Robinson said. "The feedback we received from these calls prompted us to completely change our business model, refocus our technology, obtain customers, and move into more immediate and promising markets," said Robinson.

As a direct result of the Accelerator, Navillum has gained its first six customers, $1.5 million in committed investment funding, critical business partnerships, a new commercialization plan, and a Phase II SBIR grant from the National Science Foundation for $750,000.

"Because of the Accelerator we are now making money, staffing up and delivering samples to customers in expectation of scaling our business," Robinson said.

"The Accelerator," Ritchie explained, "will allow us to repeatedly apply proven methods and processes to U technologies and startups that will bring better results for the university and startups like Navillum."



Top Right: TVC Accelerator Meeting in July 2014
Bottom Right: Navillum co-founders Nikko Ronquillo (L) and Jacqueline Siy-Ronquillo (R)

MORAN'S UNIQUE PARTNERSHIP A VANGUARD FOR FUTURE

COMMERCIALIZATION RESEARCH

Left: Drs. Randall Olson & Gregory Hageman
Right: Dr. Gregory Hageman in his lab

Commercialization research is undergoing a shift and the U is leading the way. In February 2014, the U's John A. Moran Eye Center and Allergan, a large California-based pharmaceutical company, announced a unique partnership quite different from traditional sponsored research. Under the terms of the deal, the two will work together almost seamlessly for the next five years to identify disease-associated pathways and targets for the development of new therapeutic agents to treat ocular disease, particularly age-related macular degeneration (AMD), a leading cause of irreversible vision loss worldwide.

In a typical sponsored research agreement a company provides a lab with a defined budget and a scope of work that is to be conducted by that lab. Most agreements are short-term, project-based, and conducted entirely by the university's lab. By contrast, the Moran-Allergan deal is long-term, the research will be conducted jointly, and payments will be made to Moran as it reaches pre-agreed upon research milestones. The intellectual property surrounding the discoveries made along the way will also be shared between the institutions, including their royalties. According to Randall Olson, CEO of the Moran Eye Center, "As far as I know, there is no other type of collaboration like this in the United States."

"This partnership is more than a collaboration," adds Gregory Hageman, John A. Moran presidential professor. "We are actually combining the strengths of our institutions for better outcomes." Universities and drug companies each have something the other does not, Hageman states. "Industry likes to pretend they can do it all, but they really can't," he said. "They do the drug discovery, target identification and commercialization well. We dig deeply into the science and understand the problem at hand well. We also provide them with patient groups and a large amount of useful data."

A New Model for Research

According to the Association for the Advancement of Science, total federal spending on research and development funding has declined 13.4% since 2005.[1] The Science Coalition does not expect much of an increase to occur in the future, let alone funding to return to pre-2005 levels.[2] As a result, competition for research grants will continue to be tough.

With this erosion of federal research dollars, Olson explains that the Moran-Allergan deal represents a new model for universities to use to fund research: "This is absolutely something we have to do now. These types of deals will be critical for research funding moving forward."

Olson also says that such deals won't just bring universities research funding, they will also bring therapeutics to patients faster. "As a clinician, I'm sick and tired of telling my patients that there's nothing we can do for them because our therapeutics can't get past the lab," he said. "This deal with Allergan will move discoveries along from conception to commercialization more seamlessly." This will be achieved, he said, because all royalties, intellectual property, and licenses were worked out as part of the deal, and because Allergan is investing and collaborating in research at an early stage. As a result, discoveries will have a far easier time getting past the lab and impacting patients' lives.

"This agreement represents the beginning of an innovative academic-industry partnership that we expect to see more of in the future," said Bryan Ritchie, executive director of TVC.

STARTUPS LAUNCHED SINCE 1970

The U has been successful at creating startup companies—especially in recent years. Below are startups by fiscal year with notations for status.

2014

ApopTx	A
Behavioral Health Strategies	A
Episona	A
Javali	A
Medvantage Corporation	A
NeuroCircuit Therapeutics	A
NeuroVersity	A
Orriant	A
Progenitor Life Sciences	A
Recursion Pharmaceuticals	A
Sentius Technology	A
Symptom.ly	A
Tactical Haptics	A
Techcyte	A
Xenocor	A

2013

Active Desk	A
Applied Biosensors	A
Arapeen Medical	A
ASHA Vision	A
CIRJ	A
Curza Global	A
Navigen Endo-Shield	I
Ore to Metal Technologies	A
Resolution Applications	A
SimplicityMD Sharps	I
SimplicityMD Solutions	A
Synoptic	A
University Innovation Services	A
Verus Mobile Security	A
Vettore	A

2012

Add-it	A
Creative Medical Health, Inc.	A
DecipherGenX	I
Falgatter Technologies	A
iBiologics	A
Lazarus Medical	A
Lone Star Thiotherapies	A
MultiFunctional Imaging	A
Navillum Nanotechnologies	A
Salarius Pharmaceuticals	A
Utah Medical Solutions	A
Vaporsens	A
Veristride	A

2012 CONT.

Visus	A
Voyant Biotherapeutics	C

2011

AvanSci Bio	A
Axon Optics	A
Beijing Great Sun Biotech	I
CB Bioenergy	I
CoNextions	A
Domain Surgical	A
e-Sens	A
Elute	A
Espira	A
Granite Mountain Technologies	A
HOT Water Global	I
Innoception Technologies	A
MacCure	I
Perfect Vision	A
Seismic Option Safety (SOS) Systems	I
Telomere Diagnostics	A
TransViragen	A
Xandem	A
XEnd	A

2010

7Revolutions	I
Brickell Biotech	A
Converus, Inc.	A
F2 Solutions	A
Fay Financial Engineering	I
G6	I
iVeena	A
Kayak Biosciences	I
Predictive Medical	A
RedSpan	I
Salt Lake Biosciences	I
Seasonal Energy	I
Sfida Biologic	I
Solan	A
Veritract	A
Versalion Pharmaceuticals	I
Vutara	Q

2009

Blackrock Microsystems	A
Branching Tree	I
Energence Partners	I
Ergonomic Tool Development	I
H20 Tech	I
Headwaters Clean Carbon Services	I
Honde (Wuxi project)	I
Integratech Proteomics, Inc.	I
JSK Therapeutics	A
MeriSight (Formerly MARREK)	Q
Metallosensors	I
Miracotech	I
Nanomedic	A
Optema	I
Oscilla, LLC (formerly HiFunda)	I
Proactive Memory Services Inc. (PAMS)	A
Purple Energy	I
RNA Biosciences	I
Sci-U	I
Sera Prognostics	A
TheraRenal	I
TheraTarget	A
Waste Water Compliance Systems	A

2008

Advanced Signal Detection	I
Akadi, LLC	I
Allegro Diagnostics	A
Baby Jock	I
BioEnergenix	A
Catheter Connections	A
Celux Technologies	I
Epitel, Inc.	A
Geo Mind, LLC	I
GlycoMira Therapeutics	A
HeavyStone Labs	A
I2S Engineering, Inc.	I
Nano-Oxides	A
Nanonc, Inc.	I
PFO Technologies, LLC	Q
Philotek, LLC	I
Riggalya	I
RU Ready	A
Surfagen, Inc.	I
Trapeze Media Solutions	I
ViroPan	A
VisTrails, LLC	A
Wasatch Nanopore Sensors, LLC	I

2007

BioFuels Development Corp	I
Boulder Technology Development Labs	I
Central Logic	A
ContraDyn, Inc.	I
ImageTeck	I
Larada, Inc.	A
LV Partners	Q
Navigen	A
nFocus	I
Osteoseek, Inc.	I
Polevault Media (formerly Angry Duck Productions)	A
RayScale	Q
Rescue Medical Systems	I
Thermimage	I

2006

AlloCure	A
Carbylan Biosurgery	I
Exeven V	I
Fuels Development Group	I
Glycosan Biosystems	Q
Heightened Technologies	I
Intellivis	I
LifeScan	I
Live Wire Test Laboratories	A
Neuroadjuvants	A
Respiris	Q
SentrX Animal Care	A
TechnoImaging	I
Vestan Medical Imaging	A
Visual Share, LLC	A
Wasatch Microfluidics, Inc.	A
Xapio	I
Zicthus	I

2005

Globalmatics, Inc.	I
Goldfinger	I
Lineagen	A
MedAnalytics (Formerly NAPE)	A
Milcin Therapeutics	I
N-ERGY, LLC	I
Sentrx Surgical, Inc.	Q

2003

Applied Medical Visualizations	A
Q Therapeutics	A

2002

Hydra Biosciences	I
Versa Power Systems	Q
Visual Influence	Q
Wyoming Research Innovations	I

2001

Sensicore	I
Tramontane, Inc.	A
Universe Partners	I

2000

Aciont	I
Allvivo Vascular	A
Attensity Corporation	A
ParSiTech	I
Pharmanex	Q
Salus Therapeutics (Genta)	I
Sonic Innovations	I

1999

Fiore Automation	I
MedQuest Products	Q
Mineral Technologies	I
TheraDoc	I
ThermaCom	I

1998

Echelon Biosciences	C
Spectrotek	I
Zars	Q

1997

Cyberkinetics	Q
InfaBloc	I
Signature Immunologics	I

1996

Cimarron Software	C
Cognetix	I
Rosetta Inpharmatics	Q
Viewpoint Manufacturing	I

1995

Diacor	I
ErgoWeb	I
Handtronix Corporation	I
Process Instruments	A

1994

BioCentrx	I
ENECO, Inc.	I
Innovative Caregiving Resources	I

1993

HerediLab	I
PartNet	C

1992

Cardiowest Technologies	I
Myriad Genetics	A

1991

BioFire Diagnostics (formerly Idaho Technologies)	C
Femtoscan	I

1990

MicroMath	I

1989

MacroMed	Q
Parvus Corporation	I

1988

Darbick Instructional Software	I
Tepnel Lifecodes	Q

1987

A.D.A.M.	Q
Evans & Sutherland	Q

1986

Cephalon	Q
DataChem Lab	I
NPS Pharmaceuticals	A

1985

Cephalon	Q
DataChem Lab	I

1984

Engineering Geometry Systems (EGS)	Q
Medtronic Gastro/Uro	I

1983

Datex-Ohmeda	I
Sarcos	Q

1980

Bunnel	I
Ceramatec	A

1977

FFFractionation	Q
Iomed	Q

1973

Metals Manufacturing	I

1970

TerraTek	Q

A Active
I Inactive
Q Acquired
C Acquired but active with name at the time of acquisition

THE UNIVERSITY OF UTAH'S COMMERCIALIZATION IMPACT

Through the trailblazing efforts of faculty, administration, students, and TVC, the University of Utah has created a thriving ecosystem of discovery and innovation that few universities rival. Thousands of U inventions ranging from cancer diagnostics to lice eradication, and from sensors that detect people through walls to animal wound healing products have been invented at the U. This has resulted in tremendous interest in our early-stage commercialization activities and the innovations that gave them life. But after the initial excitement, write-ups and fascination have faded, what happens to these discoveries? Despite enjoying less prominence, many U inventions successfully complete the often long but rewarding path to commercialization. This has resulted in hundreds of lesser-known but no less important medical, human, technological, productivity, job, and business growth impacts. The following stories explore the positive effects of these discoveries. **This is why the U is dedicated to the commercialization of its innovations.**

AN ECONOMIC ENGINE FOR UTAH

Since 1970, the U has created over 230 spin-off companies from technologies developed at the university, most of which were launched over the past ten years. Over 130 of these are still operating as either a business or as part of another company. Companies such as BioFire, Attensity, Blackrock Microsystems, NPS Pharmaceuticals, and Myriad Genetics all originated from U technologies. Moreover, over 30 of the U's spin-offs have been acquired by outside companies. International businesses such as Merck, Xerox, Raytheon, Teva Pharmaceuticals, nVidia, Rockwell Collins, Bruker, Schlumberger, and BioMérieux have all acquired U startups.

A March 2011 study by the Bureau of Economic and Business Research (BEBR) found that U startups have either directly or indirectly generated close to 16,000 jobs. The average wage of these jobs was 59% higher than the statewide 2009 average. The BEBR study also found that in 2009 alone, U spin-offs generated $754.5 million in personal income and $76.6 million in tax revenue.[3] Since 2011, the university's spin-offs have collectively raised over $300 million in investment funding, secured over $70 million in grants and have been involved in acquisitions totaling more than $500 million.

Commercialization at the U is not just a byproduct of research; it is an important and growing economic engine for the State of Utah.

234
spin-offs created since 1970

16,000
jobs created

59%
the percentage that the average U spin-off salary is higher than the statewide average

$300M
in investment funding that the U's spin-offs have secured since 2011

Source: Bureau of Economic and Business Research (BEBR) and Technology & Venture Commercialization

FROM WELDING GOGGLES TO RELIEF: HOW AXON OPTICS OPENED UP THE WORLD FOR A MIGRAINE SUFFERER

Cezanne Bies enjoying Central Park in New York City thanks to her pair of Axon Optics

16-year-old New York City resident Cezanne Bies had never seen the details of a leaf before. Standing outside in Central Park, Bies marveled not only at the leaf's veins, textures and patterns, but how only hours earlier she would have been unable to see even the leaf.

Plagued by extreme photophobia, even the slightest amount of sunshine triggered a severe migraine for Bies. "I basically go blind in sunlight," she said. "I get dizzy and the pain in my eyes is so bad I usually pass out."

"I started to notice that something was wrong with Cezanne when she was very young," Bies' mother Ronnie Woodhouse said. She originally thought her daughter's condition was psychological, but as Bies began to complain more about the sun's effects on her eyes, Woodhouse knew Bies was suffering from something physical. Forced to stop playing tennis at age nine, Bies told her mother: "I just can't do this. I just can't handle the sun anymore."

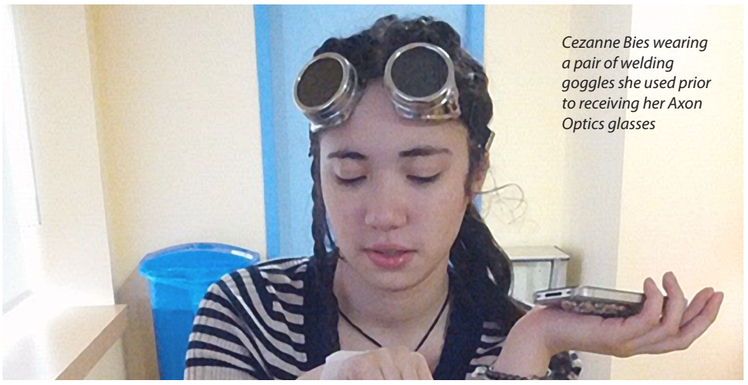
The next seven years were especially hard on Bies and Woodhouse. Bies saw dozens of different doctors, specialists, and ophthalmologists. "She was given all kinds of diagnoses," Woodhouse said. "The amount of research that went into her condition was overwhelming." Despite the help of her doctors, it was to no avail. Bies' condition continued to worsen. The time Bies was required to stay inside continued to increase. As such, she was unable to enjoy a normal childhood like her friends. A pair of welding goggles and a thick umbrella used to shield the sun's glare allowed her to enjoy some time outside, but even that had its limits. "We tried everything on the market," Woodhouse said. "We tried every single kind of eyewear you can think of. We turned to the welding goggles out of exasperation, but they really only helped a little bit."

The use of the dark welding goggles, coupled with Bies' condition, caused her to sprain her ankle and, ironically, run into a blind man, "who I realized after running into him, was really not that different from me," she said.

Not satisfied that her doctors couldn't do anything for Bies, Woodhouse spent years researching her daughter's condition. Finally, she spoke with a researcher in the R&D department of a large pharmaceutical company who thought he could help. He had read a paper by Dr. Bradley Katz, a neural-ophthalmologist at the U, about his studies using lenses that block the light that has been implicated in triggering and exacerbating migraines. That led Woodhouse to discover Axon Optics, a U-spinoff based off of Katz's and Electrical & Computer Engineering Professor Steve Blair's research.

Dr. Katz and Prof. Blair connected in 2010 to collaborate on lens technologies based on the new understanding of the pathophysiology of photophobia and migraines. The pair, along with entrepreneur Ben Rollins, launched Axon Optics in 2011 to make specially-tinted lenses available to the public. The company is currently supporting the development and clinical study of next-generation lenses that promise to be even more effective against photophobia.

A pair of Axon Optics' tinted lenses



Cezanne Bies wearing a pair of welding goggles she used prior to receiving her Axon Optics glasses

When Woodhouse made contact with Axon Optics, an employee recommended that Bies try a few of the company's lenses.

"I didn't get my hopes up," Woodhouse explained. "After all, nothing had worked before." The first pair didn't work for Bies but the next one she tried on was, according to Bies, "magical." "There she stood on the terrace of our home on the 22nd floor. I watched her as she looked at the Brooklyn Bridge, Central Park, and New York City in a way she had never seen it before," Woodhouse said. "She was like a tourist looking at the city in the morning and just embracing it. 'This is what New York looks like Mom', she told me. I just sat down and broke into tears. Axon Optics truly has changed and saved her life."

Since Bies has been using Axon Optics she has embraced life to its fullest. She now sails, bikes, and is finally able to work on her true passion: marine biology. She had always wanted to become a marine biologist, and has taken many courses and worked with researchers in the field, but her migraines and extreme photophobia were always dark clouds over that future. Now, she says, "my dreams can continue and keep going."

A LIFE-SAVING CHOICE HER

MOTHER DID NOT HAVE

"Going into my appointment I had convinced myself that I was not a carrier," said Tara Feiner. "Given the odds, I was fairly certain that I would not test positive for a BRCA mutation. So when I learned that I did actually carry a BRCA mutation, it just didn't process. I had to ask the doctor to repeat herself."

After the initial shock of testing positive had faded, Feiner's doctor informed her that because of her particular BRCA2 mutation and family history, she had a 60-80% chance of developing breast cancer, and a 20-30% chance of developing ovarian cancer.

Feiner's test results also clarified a particularly painful episode from her past. Seventeen years earlier, Feiner's mother had passed away from breast cancer after struggling through seven years of cancer treatments and surgeries. It is rare for someone to know why they have or had cancer, but in Feiner's case, she and her family had received a "gift." Given Feiner's testing positive for a BRCA2 mutation, the family knew that Feiner's mother likely carried the genetic mutation that led to her own cancer. They now had an answer.

Feiner's decision to test herself for a BRCA mutation began when her doctors found tiny floating cysts in her breast during a routine MRI five years ago. Although they told her it was "probably benign", she remembered her mother had been told the same thing twenty-five years prior. Wanting to learn more about what had happened to her mother, and what may be beginning for her, Feiner decided to track down her mother's oncologist. "I had heard about genetic cancer risks before," she said, "but it wasn't until I spoke with my mother's oncologist that I learned I might be carrying a cancer-related genetic mutation and what the implications of that reality were. My knowledge prior to that phone call was purely surface." With the urging of her mother's doctor, Feiner took the BRCAnalysis test, a BRCA mutation diagnostic offered by U-spinoff Myriad Genetics.

BRCAnalysis had its beginnings at the U. In the early 1990s, now-retired U professor Mark Skolnick and his team helped develop a complete genetic sequence for BRCA1. A few years later, Skolnick and U Professor David Goldgar announced a complete sequence for the BRCA2 gene. These discoveries eventually resulted in commercial BRCA1 and BRCA2 diagnostic tests being offered to the general public through Myriad. Since 1996, 1.3 million women have been tested for BRCA mutations. "This discovery," says Vivian Lee, senior vice president for Health Sciences at the U, "has saved thousands of lives and changed how providers and patients treat and prevent breast cancer worldwide."[4]

Tara Feiner, who tested positive for a BRCA2 mutation

Cancer Without the Cancer

A positive BRCA test result is almost always life changing for those so diagnosed. With cancer risks as high as 80% for some women, many choose to have preventive surgeries. Mastectomies, oophorectomies and hysterectomies are all surgical options available to significantly reduce one's chance of developing breast or ovarian cancer.

In 2009, Feiner, like thousands of other BRCA-positive women before her, opted to have preventive surgeries. "Prior to being tested for the BRCA mutations, I told myself that I would not have any prophylactic surgeries. However, I realized after my positive test result that I really couldn't afford not to take action. In the absence of my parents, my husband and I are a center, a stability for my family. I knew I had to be around."

Feiner also knew her decision to have the preventive surgeries wasn't without consequences. These surgeries, while life saving, were described to her by some of her doctors as being "like cancer without the cancer". Feiner underwent a double mastectomy, oophorectomy and a hysterectomy in a nine and a half hour-long surgery at the University of Pennsylvania. It was nine weeks before she could return to work, and that was only on a part-time basis.

Despite the tough recovery, Feiner has no regrets. These surgeries reduced her risk of developing breast or ovarian cancer to between 1-3%. "The BRCA test absolutely saved my life," she said. "It gave me a choice to take preventative actions, a choice my mother did not have." Feiner is ecstatic that she will be present for her family and for her nieces' and nephew's birthdays, graduations, and celebrations for years to come.

HEREDITARY BREAST & OVARIAN CANCER

"Hereditary breast and ovarian cancer syndrome is an inherited condition that causes an increased risk for breast and ovarian cancer (often before age 50)."[5]

55 to 65% of women with cancer-related BRCA1 mutations and 45% of women with cancer-related BRCA2 mutations will develop breast cancer by the age of 70. Compared to the 12% of women in the general population who will develop breast cancer, women with BRCA mutations are approximately five times more likely to develop this cancer. And despite the relatively low number of women with cancer-related BRCA mutations, 5 to 10% of all breast cancers are caused by BRCA mutations.

Similarly, 39% of women with cancer-related BRCA1 mutations and 11 to 17% of women with cancer-related BRCA2 mutations will develop ovarian cancer. Compared to the 1.4% of women in the general population who will develop ovarian cancer, women with BRCA mutations are approximately eight times more likely to develop this cancer. And despite the relatively low number of women with cancer-related BRCA mutations, 10 to 15% of all ovarian cancers are caused by BRCA mutations.[6]

CARMA PUT HER HEART IN RHYTHM

Michele Straube hiking in the Alps following her successful ablation procedure made possible by CARMA

"At the top of a 15,000-foot pass in Peru, I got really mad," said Michele Straube. Diagnosed with atrial fibrillation (AFib), a heart rhythm disorder, more than 30 years ago, the disease's effects were finally becoming too much for her to handle. "I realized that unless something could be done, my trekking and hiking uphill days were essentially over."

Suffering increasing bouts of dizziness and breathlessness while hiking or exercising, Straube, a lifelong outdoors enthusiast, was no longer living the life she wanted. "The longer I had AFib, the more noticeable the symptoms became. In the last few years, it had become difficult to climb a set of stairs without wheezing and getting dizzy."[7] Struggling through her family vacation to Peru, Straube decided then that she was "going to look for something to make my quality of life better."[8]

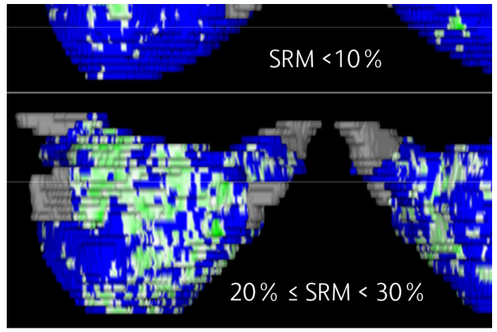
That something ended up being a life-changing and groundbreaking process developed at the U's Comprehensive Arrhythmia Research & Management Center (CARMA). "I was searching for AFib specialists and trying to learn what kind of treatments were available and most successful, especially for folks who were in AFib 24/7. Imagine my surprise to find a specialist right here in Salt Lake City (U professor Dr. Nassir Marrouche), and to learn about his cardiac MRI approach."

At CARMA, Straube had a 3D image of her heart developed using innovative imaging technology invented at the U. This cardiac MRI technology, now licensed and sold by U-spinoff Merisight (now part of Xerox), produces detailed models of patients' hearts, which allow clinicians to quantify the extent of cardiac fibrotic/disease tissue in the left atrium, where AFib occurs. The software then computes the amount of AFib progression into one of four stages based on the amount of tissue injury within the heart, as defined by the Utah Classification System, developed by Marrouche and CARMA.

Despite having AFib for more than 30 years, CARMA did not classify Straube into the higher Utah stages where their research shows that certain treatments will not likely result in a cure or positive outcome. Indeed, Dr. Marrouche informed Straube that based on the amount of fibrosis shown in her cardiac MRI, he estimated a 75-80% chance that an ablation—an AFib treatment where heart tissue is burned to eliminate rogue electoral signals that trigger abnormal heart rhythm—would be successful in eliminating her AFib. "I had been told ever since ablation was 'invented' that I was not a candidate because I had been in AFib for so long, at first 20 years, then even longer, and the assumption was that my heart was too damaged," Straube said.

"Every human heart is unique," said Dr. Marrouche. "We needed a more individualized reading and monitoring of heart tissue behavior in patients diagnosed with arrhythmias." By looking at the extent of cardiac fibrotic tissue in the left atrium for each patient via Merisight's 3D imaging technology, cardiologists are able to tell exactly what type of treatment would be best for each patient. This personalized approach to AFib developed by Marrouche and CARMA was not only new, it allowed Straube to have a procedure her previous doctors thought would not benefit her.

Five years after her ablation, Straube says her AFib is cured. "I feel like a normal person again," she said. "I'm not exhausted at the end of every day just because I had to stand or move around a lot. I can 'walk-and-talk' with my friends while going uphill, instead of asking them a complicated question at the bottom of the hill so they'd talk all the way up. There is no mountain I won't consider hiking up. I can also ride a bike again, after 20 years."



ABOUT Merisight™

U-spinoff Merisight (now owned by Xerox) utilizes high-quality segmentation and quantification algorithms on MRI images to quantify and analyze atrial tissue enhancement. The result, 3D images like the above, provide a close look at the amount of enhancement and the corresponding Utah Classification.

THE UTAH ELECTRODE ARRAY A PLATFORM FOR CUTTING-EDGE

ADVANCES IN BIONICS

"I instantly knew something was wrong," said Ian Burkhart. "I couldn't move." While swimming in the Atlantic Ocean four years ago Burkhart was pushed into a sandbar and broke his neck. "They told me I was paralyzed at the C5 vertebrae."[9]

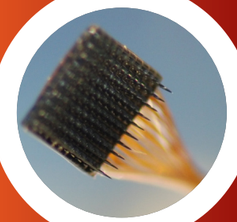
Unable to move from the elbows down, Burkhart went from being an active young man and lacrosse player to having to rely on his family for tasks the majority of us do without thinking. "I'd say that the thing I miss most is just being independent," Burkhart said. "You have to rely on other people so much. It would really be nice to just do something as simple as open up a water bottle myself."[10]

Four years following his accident, sitting in a laboratory at Ohio State, Burkhart moves his hand, grabs a spoon and holds on to it for the first time since becoming paralyzed. "To be able to open and close my hand and do those simple movements that I haven't been able to do in four years was great."[11]

Although still paralyzed, Burkhart was able to make these movements because of Neurobridge, a multi-step process developed by researchers at Battelle. An essential component of Neurobridge involves the Utah Electrode Array, a chip developed by retired U professor Richard Normann and now licensed to U-spinoff Blackrock Microsystems. The Array is about an eighth of the size of a penny and is composed of 96 silicon electrodes that look like small needles. It is inserted 1.5mm into the brain and works by either stimulating or recording the activity of the neurons directly in contact with the electrodes.

Researchers have long known that specific parts of the brain, particularly the primary motor cortex, correspond to certain bodily movements. This knowledge has allowed researchers to place, for example, the Utah Array into the area of the brain associated with the hand and record the signals, or combination of signals, that emanate from that part of the brain when the hand is moved. This, in turn, allows researchers to take these identified signals, and through various other technologies and algorithms, feed them back to the implanted Array via electrical currents to both move the hand and create the sensation of doing so.

This type of stimulation of the hand was precisely the goal Battelle researchers had for Burkhart.



In April 2014, the Array was implanted into Burkhart's brain by surgeons at Ohio State. Two months later, Battelle and Burkhart were ready to test Neurobridge. According to Dr. Chad Bouton, an engineer at Battelle, Neurobridge works by taking brain activity from the Array and translating "that activity to a language that muscles understand and then sends those signals to the muscles" via an electrode sleeve, thus bypassing the broken spinal cord and causing, in Ian's case, him to open and close his hand for the first time in four years. "Physically it was a foreign feeling," he said. "Emotionally it was definitely a sense of hope and excitement to know that it's possible."[12]

Back at the U, Dr. Greg Clark, a professor in Bioengineering, is using the Utah Slanted Electrode Array (USEA) not in the brain, but in the peripheral nerves of hand amputees. Implanting the array in nerves, rather than in the brain, provides for more precise control by subjects. Where Burkhart was only able to open and close his hand in a somewhat fitful manner, Clarke's subjects have been able to move the fingers of a virtual hand in a comparably precise fashion. Clark has also been able to stimulate the biological wires in the arms of monkeys using USEAs in a precise enough way to cause them to perform sequential grasp-and-release movements while sedated. He is planning to eventually replace the virtual hand that his amputee subjects are currently controlling with an actual prosthetic hand.

"I am very pleased that the Utah technology is beginning to move successfully in helping people with nervous system disorders," said Normann. This has grown to include applications for treating blindness, deafness, Parkinson's, and epilepsy. The Array, according to John Donoghue, director of Brown University's Institute for Brain Science, "is an engineering tour de force. [Normann] has had a revolutionary effect on the way people study the brain."[13]

Left: One of U Professor Dr. Greg A. Clark's amputee subjects moving a virtual hand with his thoughts via the USEA
Middle: Ian Burkhart (L) with Dr. Chad Bouton (R) of Battelle as Ian moves his hand for the first time in four years using the Utah Array
Right: The Utah Array

XANDEM STOPPING THEFT WHERE OTHER

SYSTEMS FAILED

Xandem TMD nodes

"We crawled on the ground, underneath shelves and slid along walls," said Michael Katsanevas of Crown Jewelers and Pawn in South Salt Lake City. "We tried everything to beat Xandem TMD but couldn't. It's like James Bond technology."[14]

While no less impressive, unlike many of the gadgets in James Bond films, Xandem's innovative motion detection technology is real and has wide application in the security system industry. Utilizing radio waves to detect movement, Xandem's Tomographic Motion Detection (TMD) system is significantly different from other motion detection systems.

Designed by Professor Neal Patwari of the Department of Electrical and Computer Engineering at the U and Joey Wilson, Ph.D., Xandem, a U-spinoff, works through a powerful network of radio waves that not only communicate with each other, they pass through walls and obstructions. Wireless TMD nodes about the size of a credit card are installed around the perimeter of an area marked for motion detection. These nodes send out radio signals, the same 2.4GHz signals used by Wi-Fi and Bluetooth, which connect to each other. The connections form a tightly woven invisible mesh network. When someone enters that network their presence lowers the network's signal level, indicating motion detection. This disturbance is immediately conveyed to a processing unit connected to any alarm system. Future versions of the product will also locate the exact spot where motion was detected.

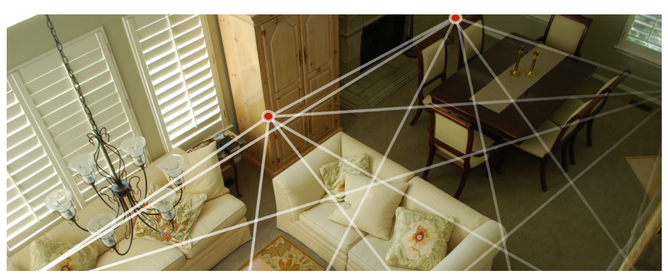
The majority of motion detectors today utilize thermal infrared energy technology. Unlike Xandem's system, these motion detectors have a defined field of view arc, meaning they have blind spots on their sides and back. And because they sense heat, they cannot penetrate walls, let alone large obstructions. The fact that Xandem's radio waves can is exactly what attracted the Brahma Group to the technology.

After losing hundreds of thousands of dollars to theft, the Brahma Group installed Xandem in their warehouse. Once activated, Xandem's system was able to detect movement behind the many boxes, shelves and other objects in Brahma's cluttered warehouse. Prior to installing Xandem, the company used traditional infrared detectors, but even with these active, break-ins occurred. "Since installing Xandem's TMD technology," said Randy Max of the Brahma Group, "all further break-ins have been halted. TMD was the only solution available that gave us reliable and complete coverage with its 'see-through' capabilities."[15]

Because Xandem's system penetrates walls, TMD nodes can be installed inside them. As such, Xandem has the potential to be completely unseen unlike infrared motion detectors and cameras, which must remain in the environment they are detecting. In such a setup, potential intruders cannot scout out the area and locate the position of the sensors. This feature of Xandem is what led Dubai-based Redwood Technical Services to install the system in entrepreneur Philip Charles Gamett's penthouse in Dubai, United Arab Emirates. "The demand came for a completely invisible means to detect presence," says Nathan Williams, director of Redwood. "The project required that even with a very high specification of smart home, very little technology should be on show due to the interior design implications."[16]

Williams says Xandem has worked "very well" for Gammett's home and sees a bright future for the company. "There are so many applications that will benefit from this kind of system," says Williams. "From warehouse security to offices and high-end residential projects, prisons, schools, military and hospitality will all view this development with added benefit over previously utilized solutions."[17]

Xandem is currently developing TMD nodes that can be plugged into power outlets. "The system will be entirely plug-in-play," Wilson says. "The kits will have three easy installation steps and won't require a technician or wiring." In addition, the system will work with a mobile app that Xandem is developing that will allow users to monitor their home, the security system, and turn protection on and off remotely. They expect it to be on the market in 2015.



Bottom Left: An example of the invisible mesh that Xandem's system creates
Top Right: Uncovered Xandem processing units
Bottom Right: Xandem co-founders Joey Wilson (L) and Neal Patwari (R)

EYES DON'T LIE: CONVERUS ESTABLISHING

CULTURES OF TRUST

Subject Taking Converus' EyeDetect Test

For the majority of us, issues of bribery, embezzlement, theft, and other forms of corruption at our workplaces are rare. Indeed, the United States, Canada, and most Western European countries are, according to Transparency International, the least corrupt nations in the world.[18] But for Vilash Poovala, co-founder and CTO of PayClip, a payment company in Mexico, corruption is something his and many other Latin American companies unfortunately deal with on a regular basis. As a result, "we need to make sure the people we hire can be trusted," he said. "We deal with a lot of sensitive information where the potential for risk is very high."[19]

According to Transparency International, the comparative lack of corruption in the United States provides us with significant benefits that more corrupt nations struggle to enjoy. As Nobel laureate Kenneth Arrow has observed, "Virtually every commercial transaction has within itself an element of trust." Adding to this, professors Paola Sapienza of Northwestern University and Luigi Zingales of the University of Chicago state, "Without trust, cooperation breaks down, financing breaks down and investment stops."[20] In other words, trust is a prerequisite of commerce. Its perseverance in the United States, despite public, corporate, and government scandals, acts as a lubricant that eases the movement of the gears of capitalism.

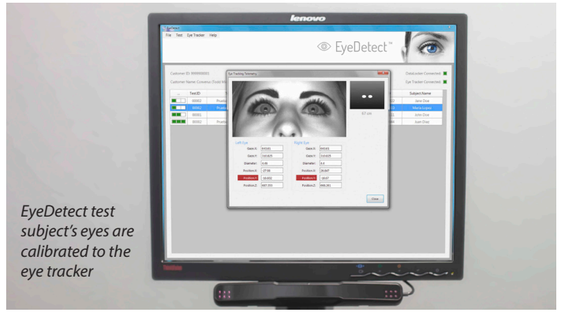
But where corruption is high, so are its costs. The statistics are sobering: corruption worldwide costs society more than 5% of global GDP annually, or $2.6 trillion, with 40% being in the form of bribes alone. Corruption adds approximately 10% to the cost of doing business globally, with the typical organization losing 5% of its revenues to fraud annually.[21] According to a worldwide Ernst & Young survey, close to 20% of surveyed executives believe they have lost business to a competitor who paid bribes.[22]

U-spinoff Converus is on a mission to reduce such corruption, and it believes it has just the tool for it. Converus' product, EyeDetect, is a lie detection system completely different from a traditional polygraph, while also being less invasive and more accurate. EyeDetect was developed by U educational psychologists John Kircher, Anne Cook, Douglas Hacker, and graduate student Andrea Webb. It was further refined by U educational psychologist Dan Woltz and retired U psychology professor David Raskin. EyeDetect uses an infrared eye tracker to measure a number of changes in the eye while the subject responds to a series of questions on a computer. Converus' method measures the stress and effort associated with lying, rather than measuring physiological changes such as heart rate and blood pressure that the traditional polygraph measures.

EyeDetect relies largely on cognitive load. "As it applies to EyeDetect, cognitive load refers to the extra thought and effort we exercise when lying as compared to when we do not," said Todd Mickelsen, Converus' CEO. "When we lie, it takes additional thought effort to ensure we construct the lie correctly and do not contradict ourselves." According to Cook et al., certain bio-cognitive responses take place in our eyes when we lie, such as changes in pupil diameter, eye movements, eye blinks, and fixations.[23]

When a test subject takes an EyeDetect test, they sit in front of a computer with a high-speed eye tracker on it and place their

converus™



EyeDetect test subject's eyes are calibrated to the eye tracker

chin on a chinrest to stabilize the head. After being calibrated to the eye tracker, the test subject answers approximately 300 true and false questions. Questions such as, "I am innocent of stealing money or product from my previous employer," or "I am guilty of accepting bribes at my previous employer," are combined with neutral, benchmarking questions such as "The sky is blue." The eye tracker measures the subtle bio-cognitive response changes to these questions and then combines the measures in a mathematically optimal manner to detect deception.

Across a series of published validation trials, EyeDetect classified truthful and deceptive examinees with 85% accuracy. The polygraph is only capable of achieving this result when administered by an experienced, non-biased examiner. Moreover, whereas a polygraph test can take up to three hours and must be administered by a trained psychologist, an EyeDetect examination is typically completed within 30 to 40 minutes and is administered by an impartial computer.

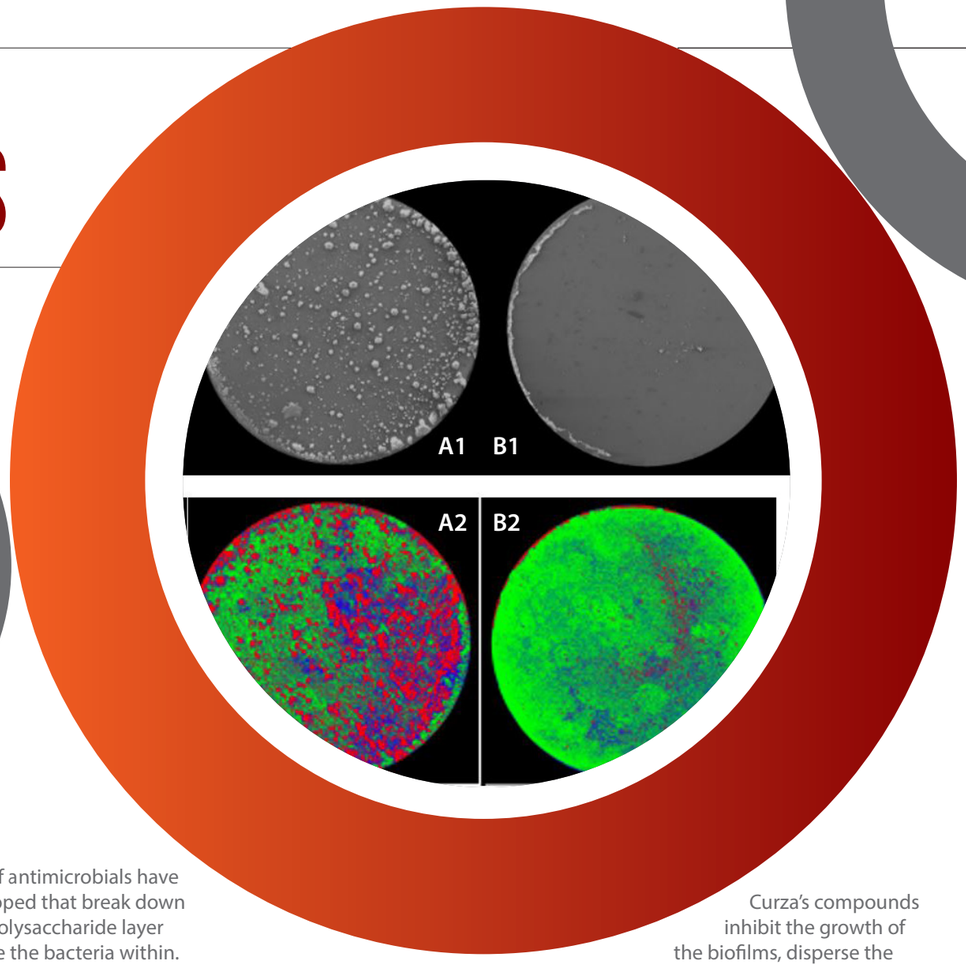
This year Converus optimized its product for the Latin American market and is currently working with a number of companies in Mexico. "Mexico is our beachhead market," said Mickelsen. "EyeDetect will help combat and reduce fraud and crime there, thus making its economy more productive."

Here in the U.S., the Employee Polygraph Protection Act (EPPA) prohibits most employers from administering lie detection tests. There are, however, a few exceptions that Converus expects to target soon: government and law enforcement. In addition to testing government employees in positions of public trust, EyeDetect might also be used to test sex offenders and parolees.

According to Poovala of PayClip, "Technology like EyeDetect that can effectively screen potential employees for previous issues with theft or fraud is long overdue."[24] The goal, said Mickelsen, isn't to punish or frighten potential and current employees. Rather, it's to "create a culture of honesty," he said. "Corruption is the sand in the gears of progress. When a company is full of honest, ethical employees, everyone within that company will be able to function more efficiently and confidently knowing their coworkers can be trusted."

CURZA'S COMPOUNDS

TARGETING SUPERBUGS



U-spinoff Curza's emergence couldn't be more opportune.

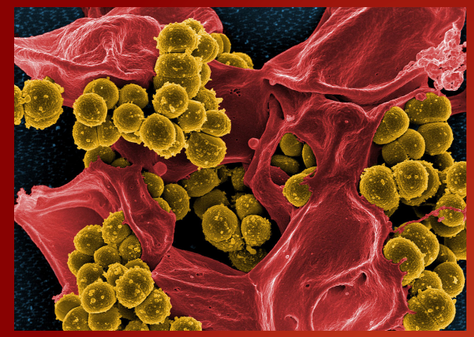
Writing in a recent *Nature* article, editor Vivien Marx states, "Bacteria are continually evolving ways to avoid the effects of antibiotics, and with the pipeline of new drugs drying up, infections are becoming more and more difficult to fight."[25] Indeed, in 2014 the Centers for Disease Control (CDC) listed antibiotic-resistant bacteria as one of its top five threats. According to the agency, "Every year, more than two million people in the U.S. get infections that are resistant to antibiotics and at least 23,000 people die as a result."[26]

Curza is in a race to reverse this trend. Based on technology developed by Dustin Williams, research professor in Orthopaedics and Ryan Looper, associate professor in Chemistry, the company is in the process of commercializing over 100 classes of antimicrobial compounds, called Curza Compounds (CZs), that kill, disperse and inhibit growth of bacterial biofilms, including those that have developed antibiotic resistance. According to Williams, "Bacteria put together a multi-fecta of ways to resist antibiotic treatment. A primary contributing factor for why they are able to develop resistance, even in the presence of antibiotics or biocides, is related to their ability to form biofilms."

Biofilms are communities of bacteria that form on a multitude of solid surfaces. They build a polymer-based enclosure, a sticky polysaccharide, that protects all bacteria within. Because this polysaccharide is so defensive, it can be very difficult for antimicrobials to penetrate and kill the bacteria inside. According to Ryan Davies, Curza's CEO, "When free-floating bacteria, or planktonic bacteria, and bacteria in a biofilm are tested against the same antibiotic, bacteria in the biofilm may be a thousand times more resistant to the antibiotic."

A number of antimicrobials have been developed that break down a biofilm's polysaccharide layer and disperse the bacteria within. Because the majority of the bacteria within biofilms cannot exist outside the polysaccharide layer, they typically die. However, some will remain and these have the potential of actually dispersing the infection as they build more biofilm communities. According to Williams, "in the case of a clinical setting, this could be catastrophic, resulting in an even more difficult-to-treat biofilm-related infection." This is why, as Davies puts it, "our compounds have triple action." This means that Curza's compounds inhibit the growth of the biofilms, disperse the bacteria within by breaking down their polysaccharide layers, and then kill the exposed bacteria.

Curza's compounds are currently pre-clinical but the results have been positive thus far. "CZ compounds have been shown to be between 10 times to 200 times more effective at killing biofilms than traditional antibiotics," said Williams. As a result, the FDA has placed Curza's compounds on its fast track program. Davies expects its compounds to be on the market within three to five years. And because biofilms grow almost everywhere, Curza's compounds will have wide applications in healthcare, industry, marine coatings, agriculture, veterinary care, food production, oil and gas processes, water treatment, and others.



ABOUT SUPERBUGS & ANTIBIOTIC-RESISTANT BACTERIA

On a daily basis, news reports and scientific publications highlight the growing problem of antibiotic resistance. When penicillin was mass-produced and administered to soldiers and patients during World War II, it worked well to treat staph infections. However, scientists recognized early on that resistance could be a problem. Today, more than 90% of S. aureus (a bacterium that may cause skin infections, sinusitis and food poisoning) isolates that infect patients are resistant to the effects of penicillin. S. aureus and other bacteria continue to develop resistance to antibiotics leading to the development of superbugs such as MRSA. This trend of antibiotic resistance constitutes one of the most underappreciated threats to modern society.

In addition to harming individuals and healthcare facilities, bacteria also affect industrial systems, agriculture, water, and food production. Constant vigilance, rigorous testing, and extensive sanitation procedures are necessary to reduce the effects that bacteria may have in these areas.

CŪRZA™

Protecting our World ™

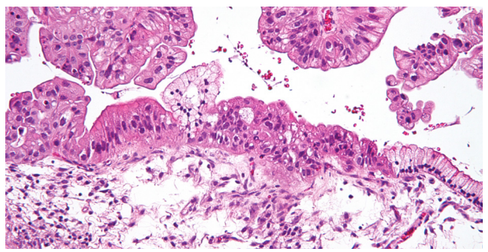
Curza has collaborated with researchers at the U to synthesize and optimize a unique class of antimicrobial compounds referred to as Curza Compounds, or CZs. CZs have been shown to have triple action against bacterial biofilms by inhibiting, dispersing, and killing bacteria within a community.[27]

Left: Curza Compound 110 killing multiple strains of bacteria

Middle: Photos A1 & A2 display MRSA biofilms grown on stainless steel. The biofilms are displayed in red in photo A2. Photos B1 & B2 display the remaining biofilms 24 hours after treatment by Curza Compound 99

Right: MRSA bacteria and white blood cells

2014'S STARTUP COMPANIES



ApopTx

1.

Founded: 2014
Originating Department: Internal Medicine
Industry: Therapeutics
Inventor: Scott Kuwada
Description:

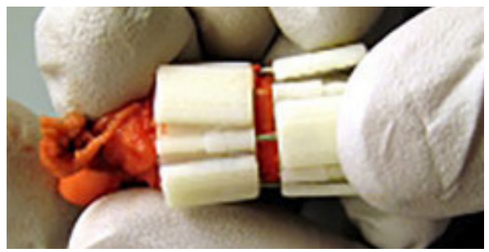
ApopTx was formed with the goal of developing novel cancer therapeutics that target cancer progression in late stage abdominal and ovarian cancers.

Behavioral Health Strategies

2.

Founded: 2014
Originating Department: University Neuropsychiatric Institute (UNI)
Industry: Health and Wellness
Inventor: Ross Van Vranken
Description:

Behavioral Health Strategies provides wellness and mental health services to the Salt Lake Valley.

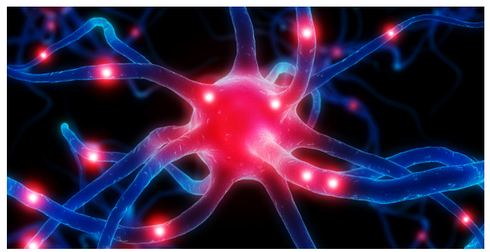


MedVantage Corporation

5.

Founded: 2013
Originating Department: Surgery
Industry: Medical Devices
Inventors: Jayant Agarwal, Bruce Gale
Description:

MedVantage is developing a unique surgical product in the microvascular surgery space. The technology is a vascular coupling system that allows for efficient coupling of arteries and veins in a fraction of a time.



NeuroCircuit Therapeutics

6.

Founded: 2014
Originating Department: Pharmacology & Toxicology
Industry: Therapeutics
Inventor: Julie Korenberg
Description:

Neurocircuits was formed for the purpose of commercializing a class of compounds that show potential for improving brain function and cognition in Down syndrome and related conditions.

Episona

3.

Founded: 2014
Originating Department: General OB/GYN Urology Division
Industry: Diagnostics
Inventors: Douglas Carrell, Bradley Cairns
Description:

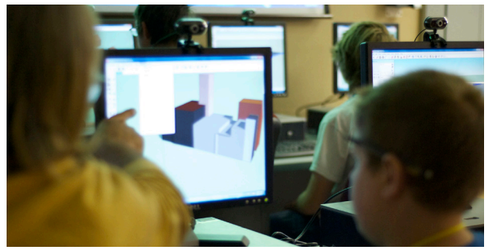
Episona is developing an epigenetic-based diagnostic platform for men's personal health profiles. Episona's first diagnostic panel will focus on male factor infertility (MFI) and in vitro fertilization (IVF) outcome.

Javali

4.

Founded: 2014
Originating Department: Internal Medicine
Industry: Healthcare Information Technology
Inventor: Russell Vinik
Description:

Javali is commercializing a tool for medical chart review.



NeuroVersity

7.

Founded: 2014
Originating Department: College of Nursing/Department of Family and Consumer Studies
Industry: Education
Inventors: Scott Wright, Cheryl Wright
Description:

NeuroVersity provides curricula for training programs that help older children with autism turn their natural strengths into highly sought after abilities and technical skills.

Orriant

8.

Founded: 2014
Originating Department: University Neuropsychiatric Institute (UNI)
Industry: Health and Wellness
Inventor: Ross Van Vranken
Description:

Orriant strives to provide increased wellness for individuals, for businesses, and for the community as a whole. The company provides physical, mental, and fiscal wellness opportunities to the American workforce.

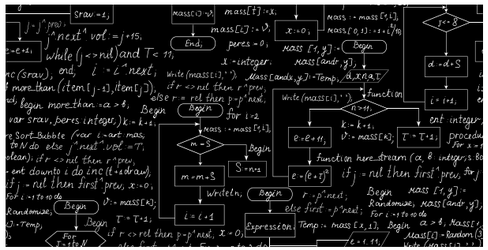
2014'S STARTUP COMPANIES

Progenitor Life Sciences

9.

Founded: 2014
Originating Department: Neurology
Industry: Research Tools/Diagnostics
Inventor: Stefan Pulst
Description:

Progenitor is focused on the development and marketing of research tools and molecular diagnostics for the stem cell market.



Recursion Pharmaceuticals

10.

Founded: 2014
Originating Department: Oncological Sciences
Industry: Healthcare
Inventor: Christopher Gibson
Description:

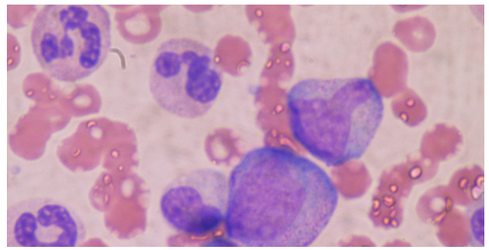
Recursion Pharmaceuticals has developed a unique drug discovery platform using advanced computational algorithms to discover new uses for known therapeutics.

Tactical Haptics

13.

Founded: 2013
Originating Department: Mech. Engineering
Industry: Gaming
Inventor: William Provancher
Description:

Tactical Haptics was founded to commercialize haptic feedback technologies. The initial focus of the company is on commercializing the use of Reactive Grip™ Tactile Shear Feedback in the fields of virtual reality, gaming, and medicine.



Techcyte

14.

Founded: 2013
Originating Department: SCI Institute
Industry: Pathology
Inventor: Nisha Ramesh
Description:

Techcyte provides a digital pathology solution for segmenting hematopoietic cells for more effective and efficient analysis of blood and bone marrow cells via digital image analysis and categorization utilizing machine-learning algorithms.

Sentius Technology

11.

Founded: 2014
Originating Department: Nursing
Industry: Business Intelligence
Inventor: Andrew Wood
Description:

Sentius is engaged in developing a simple to use business analytic tool that acts on gathering relevant data, analyzing the data, and delivering actionable information on that data.

Symptom.ly

12.

Founded: 2013
Originating Department: Pediatrics
Industry: Healthcare
Inventor: Flory Nkoy
Description:

Symptom.ly has developed eAsthma Tracker to address the needs of child asthma patients. The platform includes mobile and internet patient/physician portals, focused care coordination through tracking, and active communication and notification.

Xenocor

15.

Founded: 2014
Originating Department: Surgery
Industry: Medical Devices
Inventor: John Langell
Description:

Xenocor is a surgical medical device start-up developing a low-cost laparoscopic camera system and accessory technology for low-resource settings. This is expected to benefit developing nations, rural areas, and military settings.

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