BIOSPHERE

UTAH'S LIFE SCIENCES INDUSTRY

2023

Change Agent

HOW DAVID BEARSS IS DRIVING LIFE SCIENCES IN UTAH

MEET PEOPLE POWERING THE INDUSTRY

JOHN AND MARCIA PRICE
COLLEGE OF ENGINEERING

THE UNIVERSITY OF UTAH

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RICHARD B. BROWN

For the past 20 years, Richard Brown has led the University of Utah's John and Marcia Price College of Engineering through an era of unprecedent growth and success, including a $100 Million increase in research expenditures. The talented faculty, engineers, and groundbreaking technologies he has helped bring to fruition will leave a lasting impact on our state, country, and world.

With our Gratitude, The Price Family

LETTER FROM THE CHAIR

Welcome to the 2023 Biosphere Magazine - an annual BioUtah publication showcasing Utah's life sciences community. Since the first issue in 2018, we've endeavored to share with readers the many dimensions of this vibrant industry. From innovations in medical technology, laboratory testing and biotech, to companies large and small who have put down roots here, we've covered it. During the COVID-19 pandemic, the magazine focused on the exceptional efforts of our industry to combat the virus and protect public health.

This year, we take a slightly different tack, pulling back the curtain to spotlight some of the names and faces behind the ecosystem that has made the state's life sciences hub among the fastest growing in the nation.

The feature story highlighting Utah native, David Bearss, Ph.D., explores his home-grown journey in drug discovery, as a scientist, entrepreneur and highly acclaimed executive, who is now giving back to the industry in numerous ways. Inside, you'll also have a chance to meet academics, founders, women in leadership, policymakers and partners —all passionately working to improve diagnostics, combat cancer, treat heart disease, Alzheimer's disease and more.

There are far more individuals that deserve recognition than we have pages to print!

Simply put, people with heart and vision are at the core of what we do. In Utah, we're fortunate to have an abundance of talent devoted to the relentless pursuit of advancing health and making a difference for patients' lives. Let me introduce you…

Sincerely,

Andrea Kendell

Chair, Board of Directors, BioUtah
CFO North America/VP Finance Global Manufacturing, bioMérieux

BIOUTAH

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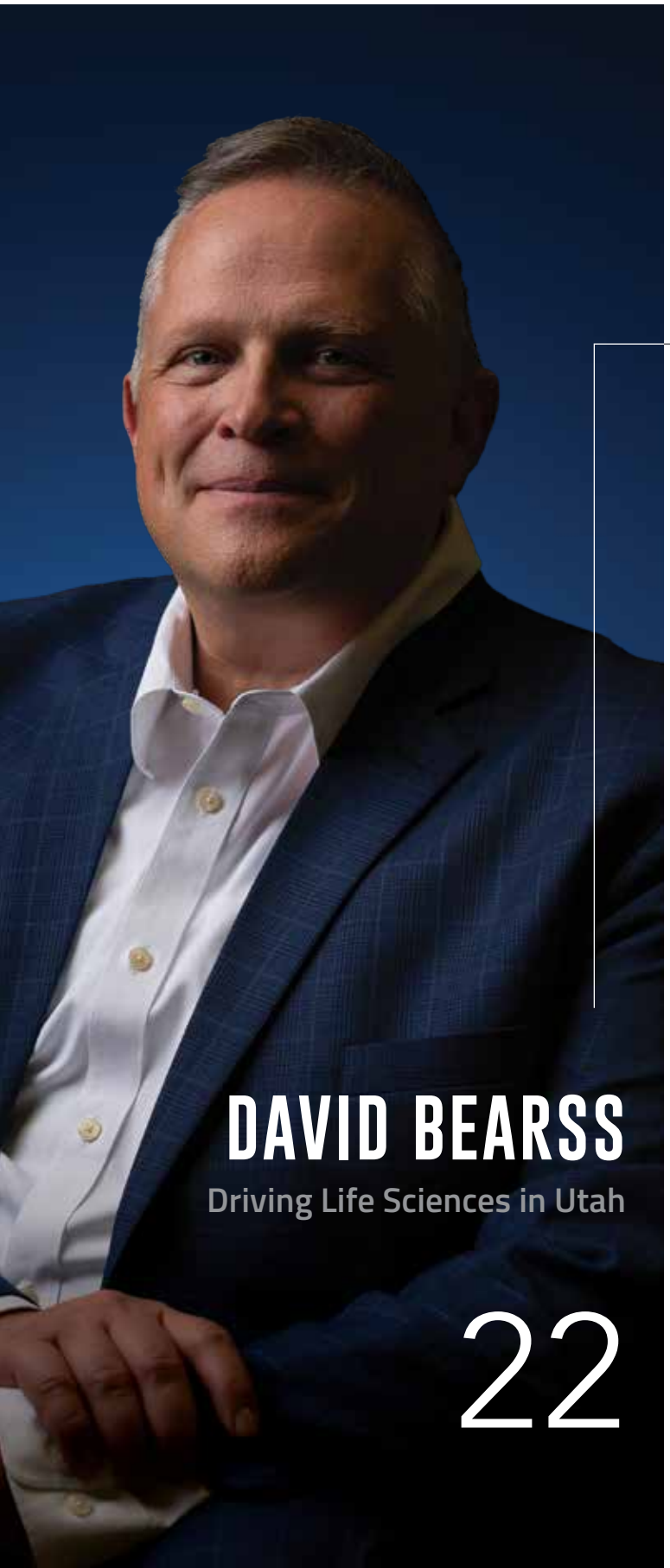

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STATE OF UTAH

SPENCER J. COX
GOVERNOR

OFFICE OF THE GOVERNOR
SALT LAKE CITY, UTAH
84114-2220

DEIDRE M. HENDERSON
LIEUTENANT GOVERNOR

Dear Reader,

Utah is one of the top states in the nation for businesses to grow and thrive, making our economy one of the strongest in the nation. The life sciences — biotech, diagnostics, and medical instrumentation — are key sectors of Utah's vibrant economy. BioUtah continues to play a crucial role in expanding life sciences innovation across the state, and the progress has been impressive.

Life sciences have become a strategic pillar of Utah's economy. The industry drives entrepreneurship and innovation in its work to improve and save lives through advanced testing, novel technologies, and groundbreaking cures. Industry employers in Utah have increased employment by 17% since 2018, outpacing the national growth rate.

Utah is committed to elevating life sciences in our schools, academic research centers, and manufacturing facilities through targeted local and regional initiatives. These initiatives will help the life sciences industry in Utah continue to flourish.

As Utah is among the top in the nation for business development, entrepreneurship, and quality of life, we encourage you to bring your company to the Beehive State!

Sincerely,

Spencer J. Cox
Governor of Utah

WOMEN LEADING
LIFE SCIENCES

Biosphere is proud to showcase four amazing women who are inspiring, shaping and leading Utah's life sciences community. Andrea Kendell of bioMérieux and Tracy George of ARUP Laboratories lead two of the largest life sciences employers in Utah. Andrea Mazzocchi and Katie-Rose Skelly lead Pathos AI, which recently acquired Known Medicine, the company these two entrepreneurs initially founded.

ANDREA KENDELL: BIOMÉRIEUX, CHANGING THE WAY HEALTHCARE IS DELIVERED

bioMérieux, a world leader in the field of in vitro diagnostics, is present in 45 countries and serves customers in more than 160 countries. In 2022, revenues for the French-owned company reached €3.6 billion, with over 90% of sales outside of France. The company's North America headquarters operate out of a new $91 million facility in Salt Lake City with 3,500 employees spread across six sites. The Utah site focuses on developing and manufacturing BIOFIRE® products.

Andrea Kendell, CFO for North America at bioMérieux

The family-owned business is more than a pioneer of developing and manufacturing in vitro diagnostics; it is an innovative healthcare company with a vision for a more equitable and sustainable future. One of the organization's driving goals is to have 40% of the positions reporting to executive leadership be women.

Andrea Kendell is one of those women, as the chief financial officer for North America. In fact, the Salt Lake City leadership team significantly contributes to the company's goal with many leadership roles held by women: Jennifer Zinn, the executive VP, global clinical operations leader, Amy Davis, the molecular biology research and development leader in the U.S. and France, and Meghan Kuehn, leading manufacturing operations in Salt Lake City.

"Beyond those mentioned, the Salt Lake City and other U.S. sites have many incredible women leading teams with broad scope," said Kendell. "The women of bioMérieux are helping change the way healthcare is delivered." They also serve as role models for other women who join the company.

Recently bioMérieux received FDA clearance and launched the new BIOFIRE® SPOTFIRE®, a point-of-care system designed to test

patients onsite. SPOTFIRE® is being manufactured in Salt Lake City, where it was also designed and developed.

Innovation does not stop with cutting-edge technology. Kendell attributes the company's growth to a willingness to change and maintain an employee, customer and patient-first mentality. Leading one of the largest life sciences companies in the state, Kendell is an example of how women are shaping the future of this industry.

Tracy George, M.D., ARUP Chief Scientific Officer & President, Innovation Business Unit

DR. TRACY GEORGE: ARUP ACCELERATES INNOVATIVE DIAGNOSTICS TO IMPROVE PATIENT CARE

Joining ARUP Laboratories in 2018, Tracy George, M.D., now ARUP chief scientific officer and president, Innovation Business Unit, is at the forefront of one of the largest diagnostic laboratories in the nation, with over 4,500 employees and an expansive array of testing services. Her vision: to accelerate innovation and facilitate adoption of new technology to better diagnose disease and guide effective treatment.

On her path to becoming president and chief scientific officer, George distinctly remembers being told by a previous employer that she needed "to stop being such a good citizen" if she wanted to advance.

That advice motivated her, but not in the way the person who delivered it had hoped. "I knew I could be a brilliant scientist and a good, effective leader, and still be true to myself by being a decent human being," she said. "I'm not going to stomp all over people. I'm just not interested in that."

George's approach has served her well. A self-described "consensus builder who listens to people," the hematopathologist and expert in mast cell disease joined ARUP to lead the company's PharmaDx and Clinical Trials groups, attracting new clients and adding services to grow the groups' annual revenue by more than 30%. She quickly advanced to the role of chief medical officer (CMO) in 2020, a position she retained when she became ARUP's president in July 2021.

In May 2022, George traded her CMO title for chief scientific officer while still remaining president. Now, she is expertly directing the formation of a new innovation business unit as its president and overseeing the new ARUP Institute for Research and Innovation in Diagnostic and Precision Medicine to accelerate collaborations with industry partners and academia that will hasten advancements in laboratory medicine - because the advancement of diagnostics is the advancement of patient care.

"Dr. George has served as an exemplary leader in the innovation sphere at ARUP," said Jay Patel, M.D., vice president of PharmaDx and Clinical Trials. "She has deftly navigated entrenched interests and resistance to change to create a new operating structure that will enable ARUP to move more quickly in our cross-industry collaborations as well as internal research, development and innovation initiatives."

"She's a charismatic leader whom people love working with," added CEO Andy Theurer. "Her energy is contagious, and ARUP benefits every day from her intelligence and her vast experience and expertise."

For her part, George believes she's in the ideal position to have a positive impact as a leader and a change-maker in laboratory medicine. "It's challenging, but I can see where we need to be. I can see what the future can be like and what we need to get there."

Andrea Mazzocchi and Katie-Rose Skelly, Co-founders of Known Medicine

ANDREA MAZZOCCHI AND KATIE-ROSE SKELLY: KNOWN MEDICINE, THE BEST DRUG FOR EVERY CANCER PATIENT

Andrea Mazzocchi, Ph.D., and Katie-Rose Skelly were brought together by a deep desire to improve the lives of cancer patients. How can we find what drug works best for each cancer patient, they asked?

It all began in February of 2020. Mazzocchi was finishing her doctorate focused on a new way to predict how patients would respond to drugs by using the patient's own cancer cells. She took portions of a cancer patient's tumor, broke them up into small pieces and formed what are known as organoids from the patient's own cells as a model to test drugs.

Mazzocchi then paired up with Skelly to translate this work from laboratory bench to patient bedside. The two had met via a mutual friend. Skelly's experience as an AI-for-drug-discovery data scientist at Recursion (a Salt Lake City-based biotech company) brought scale and complex analysis to the cutting-edge wet laboratory techniques Mazzocchi had developed. Soon thereafter, the two founded Known Medicine and never looked back.

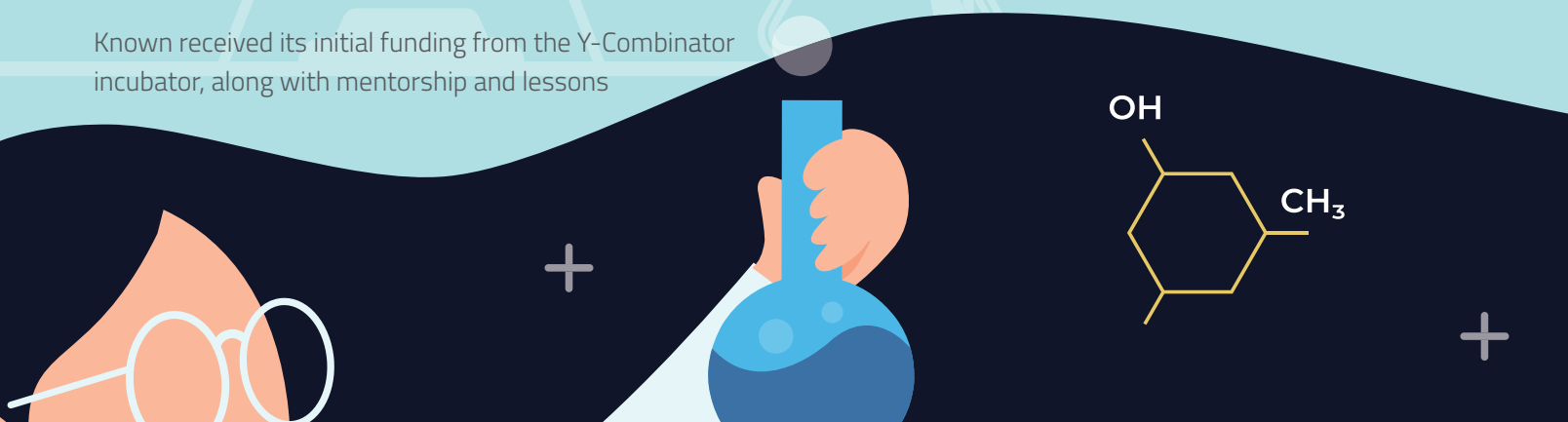
Known received its initial funding from the Y-Combinator incubator, along with mentorship and lessons on starting a company. Startups are risky, but Mazzocchi and Skelly continued to pursue their drug targeting platform by leveraging resources offered by Utah's larger life sciences community.

"Our first angel investment came from Recursion CEO, Chris Gibson," said Mazzocchi. "We then put down roots as the first company at Altitude Lab, a then under-construction, brand new incubator in the University of Utah's Research Park."

"While initial experiments were personally run by the two of us in the Altitude Lab incubator space, experimental demands soon outstripped capacity," said Skelly. In early 2021 the team grew to four and moved into a built-out laboratory space, also in Research Park."

The seed funding and incubator experience were instrumental in proving the technology and attracting investors. So was Mazzocchi's and Skelly's passion and perseverance. After spending several months talking with venture capitalists, with nearly a hundred rejections, the women closed a seed round of $7.2 million from investors in Utah and beyond.

Mazzocchi and Skelly have acquired hundreds of patient samples and added millions of images to the Known dataset. Under their leadership, the company has grown from two entrepreneurs to 15 full time employees across a breadth of disciplines in its own facility in Research Park. They made such significant breakthroughs in developing organoids at scale, that the company was acquired by Pathos AI in April, 2023. Mazzocchi and Skelly, along with their Known team, however, are still very much in the game, transitioning to work for Pathos to continue the mission they began just a few years ago - to find the best treatment for every cancer patient. As Mazzocchi and Skelly like to say, the "Future is Known."



HEALTH CARE IS EXPENSIVE. MAT CAN HELP.

MAT connects patients in need to cost-saving resources for the medicines they depend on.

For patients without insurance or adequate prescription medicine coverage, PhRMA's Medicine Assistance Tool (MAT) is a savings search engine. MAT identifies patient assistance programs and resources that can help those who are eligible get help paying for their prescription medicines, including low-cost clinics and some free or nearly free options.

DELIVERING RESULTS FOR THOSE IN NEED.

mat
medicine assistance tool

PhRMA
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ATL TECHNOLOGY FOUNDER BRAD BROWN

PIONEERING MEDTECH DEVELOPMENT FOR A BETTER FUTURE

Brad Brown, Executive Chairman of ATL Technology

Nearly three decades ago, Brad Brown stepped onto the medical stage and founded ATL Technology. Turns out, he was a visionary in shaping the landscape of medical device development. Today, medical devices for nine of the top ten medical device manufacturers are produced by ATL headquartered in Springville, Utah with operations in the UK, China, and Costa Rica. From his early days as an engineering student at Brigham Young University to leading ATL, Brad's journey is one of creativity, opportunity, innovation and purpose.

Brown began his career in the trenches, working in tool and die shops in Detroit, gaining valuable experience as a tool maker, building molds and progressive dies. After five years in the business, he decided to get a degree in engineering. During this transition, Brad's idea of a company-based engineer-to-engineer approach was sparked.

The business concept became reality in 1993 when Brown and Dan Ellertson founded ATL. Their goal was to establish an engineering-focused company, enabling direct collaboration between their engineers and customers' engineers. This approach bypassed purchasing and prioritized tailored solutions matching customer needs. It was a novel idea in manufacturing.

Brown honed in on the life sciences market after a three-year tenure in China from 2002 to 2005. Observing the shift of manufacturing overseas, he made the decision to support domestic manufacturers upon returning to the U.S. This decision led to a focus on the medical device space. In addition, the company's capabilities aligned with the single use segment of the medical device industry.

"The big thing we decided in 2005, when 90% of our revenue was outside of the U.S., is that we're an American company, and we wanted domestic business," Brown said of ATL's transition into the medical device industry. "We went looking to support domestic manufacturing and found it in the medical device industry."

ATL works with nine of the top 10 medical device OEMs in the world.

ATL's expertise resides in its vertically integrated capabilities, encompassing extrusion, injection molding and precision engineering with tight tolerances. These advanced processes perfectly meet the exacting requirements of medical devices. Years later in 2015, the company transitioned to full-device development—a transition which Brown credits to ATL's highly effective engineer-to-engineer approach.

"Our engineer-to-engineer approach along with a detailed product development process has been a benefit to our customers," said Brown. "We have helped many of the top original equipment manufacturers bring unique and cutting-edge products to the market over the years."

The company has developed special expertise in areas like imaging, high-density interconnect and use control as well as other sensors that meet the needs of their specialized clientele. ATL is now an industry leader in all these areas, including electro surgical instruments. They're also go-getters.

ATL has operations in Utah, the U.K., Costa Rica and China with over 1,400 employees worldwide.

"We do not wait for companies to give us something to quote on, we get in there and figure out what the engineers are working on and then bring them solutions that solve their problems," added Brown.

This approach has set ATL apart from its competition and made the company a trusted partner to top medical device manufacturers. Thanks to Brown's vision, ATL is a Utah success story that is driving the future of medical technology innovation and helping bring life-changing technologies to patients around the world.

Brad Brown, an accomplished pilot, poses with Utah's own Gail Halvorsen, the well-known Candy Bomber from WWII.

> **"...WE'RE AN AMERICAN COMPANY, AND WE WANTED DOMESTIC BUSINESS."**
>
> — Brad Brown, Founder, ATL Technology


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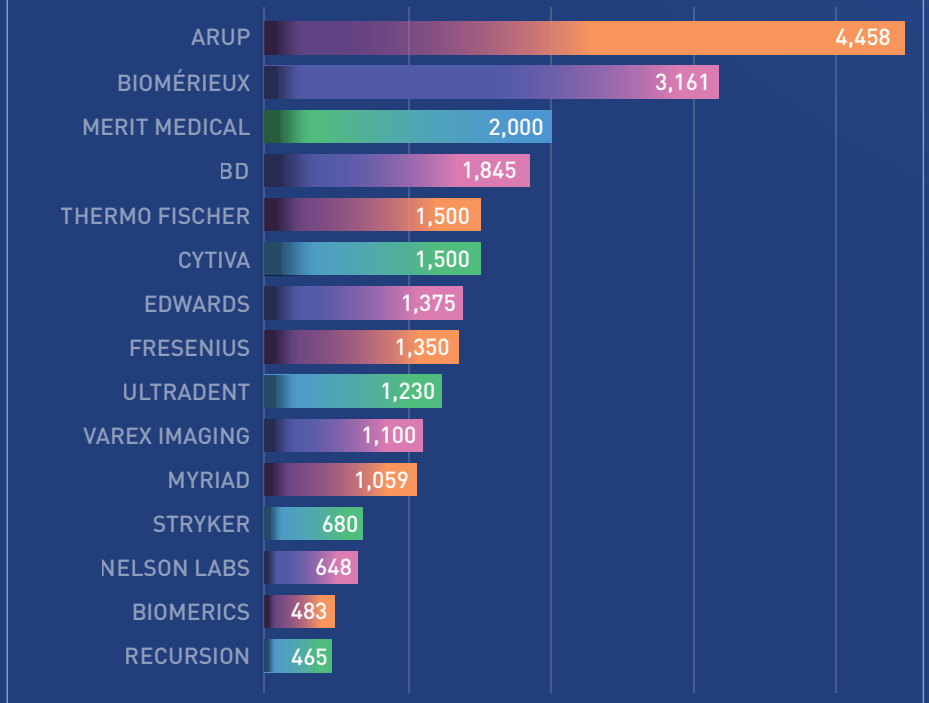
PIONEERING DIAGNOSTICS

THE SCIENCE LIFE

A SNAPSHOT OF UTAH'S LIFE SCIENCES INDUSTRY

TOP 15 LIFE SCIENCES EMPLOYERS
BY EMPLOYEE COUNT



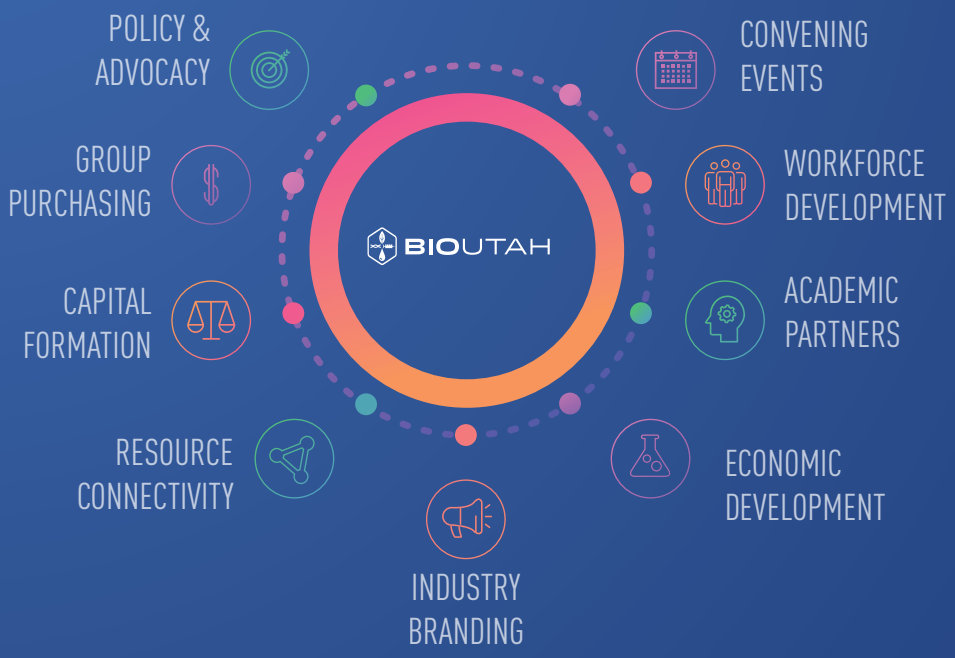
UTAH'S NATIONAL RANKINGS

#1
LIFE SCIENCES JOB GROWTH
2012-2021

#2
TOTAL LIFE SCIENCES EMPLOYMENT CONCENTRATION
2.9%

#3
MEDICAL DEVICE EMPLOYMENT CONCENTRATION

#7
LAB & RESEARCH EMPLOYMENT CONCENTRATION

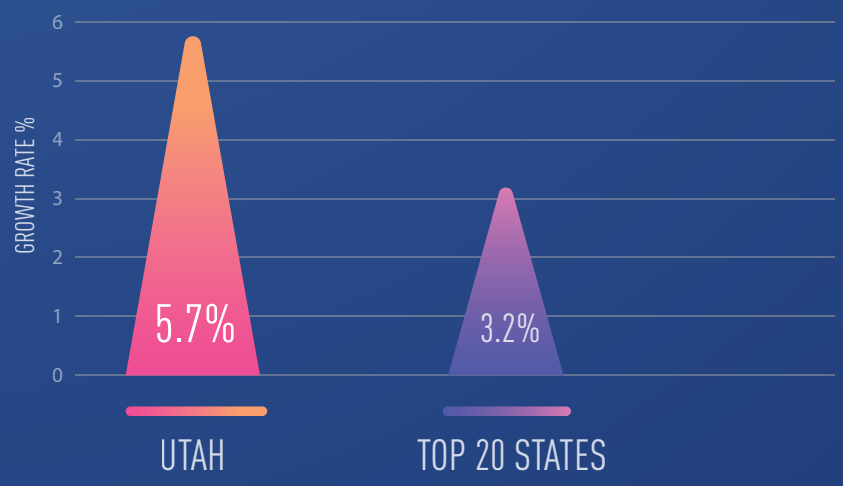


$21.6B
GDP IN UTAH

150K+
DIRECT/INDIRECT JOBS

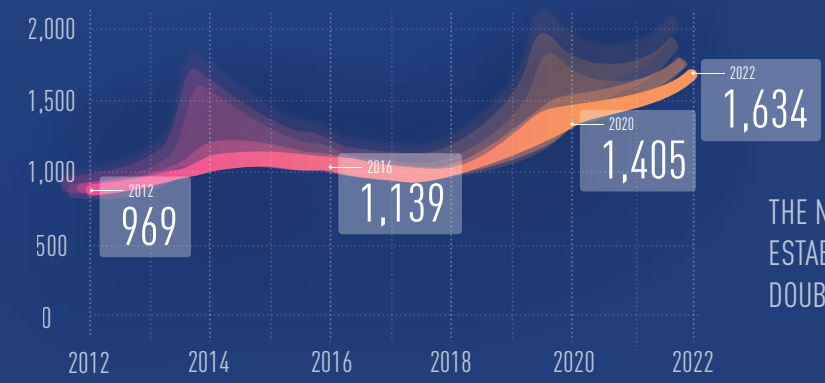
1,600+
LIFE SCIENCES ESTABLISHMENTS

LIFE SCIENCES EMPLOYMENT GROWTH
UTAH VS. THE AVERAGE OF TOP 20 STATES IN LIFE SCIENCES, 2012-2021



#8
TOTAL MEDTECH REVENUES

LIFE SCIENCES ESTABLISHMENTS
2012 - 2022



THE NUMBER OF LIFE SCIENCES ESTABLISHMENTS HAS NEARLY DOUBLED IN THE LAST DECADE.

Sources:
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Utah—The U.S. Bioscience Industry: Fostering Innovation and Driving America's Economy Forward. (2023). Techonomy, Biotechnology Innovation Organization.

The Economic Impact of the Medical Technology Industry: A 2021 Statistical Update on the Contributions of the Industry to National and State Economic Conditions. (2021). Advamed.

UTAH LEGISLATORS STAND UP FOR INNOVATION

ESTABLISHES NEW INVESTMENT FUND

The recipe for successful life sciences companies requires certain ingredients. Visionary scientists conducting basic research at our colleges and universities is one key ingredient - think long hours and years in the laboratory to forge new medical breakthroughs. But to take those breakthroughs from ideation to market requires another key ingredient - funding. As it turns out, a dash of forward-looking lawmakers can be an important leavening agent.

"It's a one, two punch," said Kelvyn Cullimore, president and CEO of BioUtah, the state trade association for the life sciences. "You can't realize the promise of innovative healthcare solutions without capital. This is especially true for our early-stage companies and new discoveries coming from academia."

Fortunately, Utah lawmakers get it, and during the 2023 legislative session, Rep. Jeff Stenquist and Sen. Ann Millner decided it was time for the state to jump in. Together, they sponsored HB42, Technology Commercialization Amendments. The bill established the Utah Innovation Lab (Lab) coupled with an Innovation Fund (Fund) to invest in new technologies at the "pre-seed" and "seed" phase. The Lab is statutorily tasked with administering and managing the Fund with a focus on technologies emerging from Utah's colleges and universities.

Rep. Jefferson Moss was also instrumental in getting the legislation across the finish line. In his role as associate commissioner for Innovation at the Utah System of Higher Education (USHE), he has seen first-hand the value of innovation generated by Utah's academic institutions and how important it is to translate that invention to an investable concept.

"One of the most exciting deliverables from our institutions of higher education is scientific discoveries that can cure disease and improve lives," said Moss.

This is not just another government agency. To the contrary, HB42 mandates the Lab be an independent non-profit, quasi-public corporation while the Fund will be structured as a limited liability company. An initial $15 million will be transferred to the Fund from the Utah Fund of Funds, allowing dollars to begin to flow to startups. Prospects for a return on investments will sustain funding in the future.

> "The Utah Innovation Lab and the funding it provides will play a critical role in helping advance those discoveries beyond the laboratory and further drive the Utah economy."
>
> — Jefferson Moss

The Lab and the Fund will be under the capable management of a seven-member statutorily defined board of directors.

The Lab is creating advisory boards for each of the state's targeted industries, which includes the life sciences. These advisory boards will provide guidance to the Lab relative to innovations in their respective industries. The advisory board for life sciences will be intentionally broad to cover all segments of the industry, including medical device, diagnostics, biotech, biopharmaceuticals and digital health.

"Governor Cox and leaders in our legislature clearly recognize the power of healthcare innovation to both change lives and create jobs in the state," added Cullimore. Bottom line: This new investor in town will strengthen entrepreneurship and further support the expansion of Utah's life sciences sector.

CLARK TURNER
A NEW WAVE OF MEDICAL IMAGING

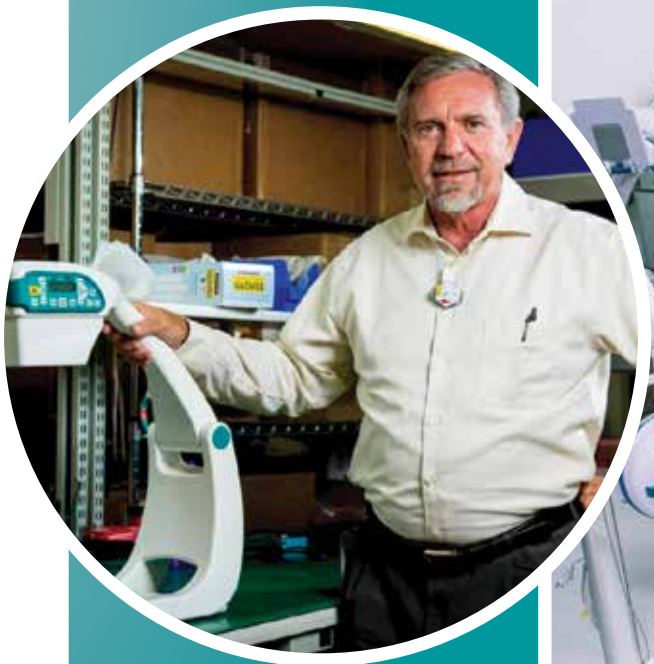
The root of a company's success is often tied to the founder's story. That's certainly true for Turner Innovations started by Clark Turner, who received his B.S. and Ph.D. degrees in analytical chemistry from Brigham Young University. When a colleague doing volunteer work expressed frustration with cumbersome dental imaging equipment in underdeveloped countries, Turner had an idea. The result was the NOMAD handheld dental X-ray system, which helped a friend do humanitarian work and led Turner, the principal inventor, to found Aribex. He was the CEO and chairman of Aribex from 2003 to 2012, as the NOMAD grew to become the predominant device in its class.

When you can bring imaging to the point-of-care, that's transformative. Yet, Turner had even bigger ideas, resulting in multiple U.S. and international patents and a number of commercial successes, including five x-ray devices cleared by the U.S. Food and Drug Administration (FDA). In 2011, he was awarded the Governor's Medal for Science and Technology.

Today, Turner Innovations is a dynamic company established on the principles of that early success.

"Turner Innovations is an incubator for facilitating investment in applied R&D and securing intellectual property for early-stage product development and prototyping," said Turner. With these prototypes, we demonstrate the technical feasibility of the project and can vet the idea with potential customers for market validation. Once we have feasibility and market validation, we spin the technology into a new company for commercialization and outside investment."

Under the umbrella of Turner Innovations sits three companies, Turner Imaging Systems, which markets the first truly portable C-arm x-ray machine for point-of-care applications; 3Dio, Inc., which is developing Lumos 3DX for dental applications; and Turner MedTech, a high-tech contract manufacturing company with expertise in prototyping and finished product manufacturing.



Dr. Turner with Smart C

Smart-C is in the Game

TURNER™ MEDTECH
MANUFACTURING & PROTOTYPING

The Image of Innovation - Team Turner

Turner Imaging Systems, a commercial-stage medical device company has a FDA-cleared portable, lightweight, cordless C-arm x-ray machine called Smart-C. It's ideal for use in hospitals and medical clinics. The company has also engaged with the U.S. military to put Smart C on the front line with its far-forward surgical teams. It's also ideal for the ball field. Turner has sold Smart C devices to roughly half of the National Football League teams and about a third of Major League Baseball teams.

3Dio, Inc. builds upon Turner's success with Aribex and the battery-operated, handheld NOMAD device. 3Dio has developed Lumos 3DX, an intra-oral sensor chairside x-ray machine that constructs a 3D image using multiple 2D x-ray images. The device just received FDA clearance in July 2023. Turner believes this 3D imaging will become the standard-of-care in dentistry over the next decade.

"I realized there is a strong need for a manufacturing partner to produce prototypes and finished products focusing on customer service and quality," said Turner. The contract manufacturing business, Turner MedTech, led by ex-Boeing engineer Charles Jensen, was formed to fill that need.

Turner MedTech is a game-changer for Utah companies looking to innovate. The contract manufacturing company is equipped to service both related and independent companies in the x-ray imaging and medical device industry. The facility is ISO 13485 certified, and currently manufactures Turner Imaging Systems' Smart C and 3Dio's Lumos 3DX.

"We're building out a portfolio of products from design to delivery in a differentiated process that outside investors see as the future of imaging innovation," added Turner.

It's a model built for success. And one that promises to deliver results for Utah companies for generations to come. But in the end, innovation is ultimately cultivated and driven by leaders, like Turner, who won't settle for the status quo.

BIOMERIEUX, ALAIN MERIEUX CENTER FOR MOLECULAR DIAGNOSTICS

BIOMERIEUX, ALAIN MERIEUX CENTER FOR MOLECULAR DIAGNOSTICS

BIOMERIEUX MANUFACTURING

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SCIENCE AND TECHNOLOGY STUDIO

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David Bearss

Driving Life Sciences in Utah

David Bearss' passion for drug discovery has guided his noteworthy career as a dynamic leader who integrates scientific and business interests to deliver new medicines to patients. That passion is still evident today as he gives back to the industry he loves, making a difference with bold initiatives to improve health and change the face of Utah's life sciences ecosystem.

A graduate of Brigham Young University (BYU) with a Ph.D. from the University of Texas Health Science Center, Bearss' successful entrepreneurial track record for drug development spans the last 25 years, in both academic and pharmaceutical industry settings. Under his direction, 16 compounds, many of which he discovered, have entered human clinical trials. Moreover, Bearss has been a founder of eight biotech companies with successful exits and owns more than 75 patents. He was instrumental in establishing the Center for Investigational Therapeutics at the Huntsman Cancer Institute.

He also helped establish the University of Utah therapeutics accelerator, where investigators and researchers receive guided help to move their programs toward clinical studies and licensing opportunities. Bearss has served as an assistant professor at the University of Utah and an associate professor at BYU.

Most notably, he founded Tolero Pharmaceuticals, a drug development company, focused on solutions for blood cancers. The company was sold in 2017 to Sumitomo Dainippon, an international pharmaceutical company, for nearly $1 billion – one of the largest life sciences exits in the history of Utah. That experience has created a point of departure for Bearss to further feed his scientific passion for patient cures and to seed greater development of life sciences in the state. Through it all, he's remained devoted to supporting patients in his local communities and mentoring the next generation of life sciences entrepreneurs.

The Founding of Halia Therapeutics, Inc., and Its Mission to Treat Chronic Inflammation

Not one to rest on his laurels, Bearss latest passion is tackling inflammation as an underlying cause of many diseases. In 2017, he co-founded Halia Therapeutics with his brother, Jared, and Keoni Kauwe, Ph.D., current president of BYU Hawaii, to explore the effects of chronic inflammation. The mission: to develop drugs that tackle chronic inflammation and improve the lives of patients with inflammatory disorders and neurological diseases.

Kauwe provides this perspective. "I had a significant finding in my research, which I thought might be an important drug target in the future. I sat down with Dave and showed him my work. He understood it immediately and agreed that we had a potential therapeutic target. He encouraged me to start a company and was willing to do it with me. Halia was born from that discussion."

HALIA THERAPEUTICS

Inflammation has been typically known as an acute response that causes the redness, swelling and heat accompanying the site of a wound or injury as it heals. However, it is now replaced with an understanding that inflammation can happen chronically in the absence of injury or infection. This everyday inflammation is a driver in most serious lifestyle disorders, including hypertension, heart disease, type 2 diabetes, Alzheimer's disease, fatty liver disease, chronic kidney disease and most cancers.

Now, after months of research, Bearss and Kauwe have discovered a mechanism in a specific cell pathway that results in a decreased capacity to respond to or develop chronic inflammation.

In an ongoing Phase I study in human participants given Halia's lead drug, preliminary results have shown 90% suppression of key inflammatory biomarkers in patients' blood, highlighting the promising therapeutic potential of this innovative medicine in development. Halia will be investigating the efficacy of its treatment in patients with existing chronic inflammatory diseases as well as the potential to treat neurological diseases, such as Parkinson's and Alzheimer's. This exciting technology promises ground-breaking cures for patients with any disease linked to inflammation.

But Bearss' vision and commitment doesn't end there. He is an investor in many early-stage Utah companies and serves on the board of Biolexis Therapeutics, Canary Speech, and Galvan Health, to name a few.

Growing the Life Sciences Ecosystem in Utah

While Utah has been known primarily as a medical device state, Bearss believes the future of pharmaceutical development in Utah is very bright, and he is going all in to nurture entrepreneurship in this arena as well as expand the state's broader life sciences sector. To do this, he is taking on two of the biggest challenges faced by innovators: lack of local capital and lack of adequate lab space and equipment.

In June 2023, Bearss launched UVB Capital, a life sciences-focused venture fund designed to make targeted investments to grow Utah life sciences companies. Bringing together an impressive team that includes Keith Marmer, a past venture capitalist, who recently served as chief innovation and economic engagement officer at the University of Utah, the fund has a goal to raise $60 million for Fund A. The fund will provide significant resources for qualifying companies and promote the cause of life sciences in the state.

When it comes to laboratory infrastructure, Bearss is in the process of opening a Salt Lake County-based incubator to be located at 1800 West, 2100 South. The property is already home to companies such as Paterna, Materna and Scintillant Bioscience with space for several more. In 2024, plans are in the works to open another life sciences incubator in Utah County. These incubators will be seed beds for future growth in Utah's life sciences industry.

If you think that with Halia, UVB, two incubators and numerous board positions Bearss would be running out of bandwidth, you would be wrong. On top of all these endeavors, Neurostar, a private equity fund in which Dr. Bearss is a partner, is acquiring a pharmaceutical manufacturing operation in Florida. He intends to open a site of that operation in Utah, which will complement Utah's growing pharmaceutical presence. The Neurostar facility is expected to do everything from small batch R&D manufacturing and contract manufacturing to proprietary pharmaceutical manufacturing.

Well-Deserved Recognition

In recognition of his many contributions, Bearss received the Utah Governor's Medal of Science in May 2023 and was honored as BioUtah's 2022 Entrepreneur of the Year.

Scientists and life sciences leaders across the globe have also applauded the efforts of Bearss. In fact, when asked about his work, world-renowned cancer researcher, Daniel Von Hoff, M.D., said, "As a medical oncologist, I have worked with Dr. Bearss on multiple projects over the last 20+ years. He is driven by trying to make a positive difference in the health of people. Dave is a devoted husband, father and grandfather. He is a voracious reader and an incredibly inventive man. He has developed multiple new approaches and FDA-approved treatments for patients. And this is just the beginning! Dr. Bearss is a top-notch scientist and a true gentleman and scholar."

With all the success he has enjoyed one might expect Bearss to be impossible to reach and a bit self-absorbed. "To the contrary, he is the antithesis of ego," claims Kelvyn Cullimore, president and CEO of BioUtah. "The truth is you will never meet a nicer guy whose persona belies his incredible accomplishments and leadership role in the industry. He is a pillar of Utah's life sciences community. And he isn't done yet!"

Bearss has a long "to-do" list. He'd say he's just doing his part, but he's doing so much more. He is making a difference in the lives of patients and reshaping the landscape of Utah's life sciences industry.


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DAN FISCHER
ULTRADENT FOUNDER

A HIGH-FIVE FOR LIFETIME ACHIEVEMENT

Last year, BioUtah presented Dan Fischer, M.D., founder of Ultradent, with its prestigious Lifetime Achievement Award, honoring his exceptional contributions to both Utah's life sciences industry and humanitarian causes. Here, in his own words, is his story.

As we get ready to close out our 45th year in the dental industry in South Jordan, Utah, I've enjoyed spending time reflecting on what a wild, fun, incredible, ride these four and a half decades have been.

When I created our first product—our Astringedent™ hemostatic—I had no intention of starting a company. In fact, I offered the patents to several existing dental companies, and at the time, no one could see the value.

That put me at a crossroads—I could set aside the Astringedent hemostatic technology that I knew would enable other dentists besides just myself to make better, more predictable impressions (and continue my work in my busy dental practice), or I could start a company.

With only my family working with me side-by-side, we manufactured and shipped tens of thousands of our little product to every dentist in the country—Ultradent was born.

Looking back, I could never have imagined that today, we'd be selling our products in over 130 countries worldwide with offices all over the globe. If you'd told me that our small, family-only operation would grow to over 2,000 employees, I wouldn't have believed you.

None of this would have happened, however, without a LOT of hard work by family and later, by thousands of other Ultradent "family" members.

Dan Fischer, M.D. at the 2022 BioHive Summit.

As we march toward our next big milestone, Ultradent's 50th anniversary in 2028, I can truly say that I believe our best products haven't been invented yet. I expect we will continue to innovate, grow and come even closer to meeting our vision of "improving oral health globally."

In our journey, we have three foundational commitments that we won't stray from:

First, Ultradent is built on the foundation that we will never sell any product that doesn't aim squarely to preserve the patients' natural tissues including enamel, dentin and supporting tissues. We are driven for solutions that are minimally invasive. This is the first prong of our vision.

Second, our brand and our products must be trustworthy and progressive for the clinician. We are not interested in making "me-too" products. Our products are based on credible research and we will continue to uphold high standards of truth and ethics in advertising.

Third, for humanity at large we will strive toward finding ways to prevent or cure caries and gum disease.

Looking back at photos of myself at some of our very first trade shows where I'd draw blood from my arm to demonstrate how our Astringedent hemostatic and our Metal Dento-Infusor™ Tip worked to arrest bleeding, I marvel at the progress and growth we've experienced as a "little dental company from Utah."

Whether it's our Ultra-Etch™ etchant, the world's gold standard in dental etchants, or our award-winning, top rated VALO™ family of curing lights, or, perhaps, most impactfully, our Opalescence™ Teeth Whitening Systems, the No. 1 professional teeth whitening brand in the world, I feel immense pride for the way Ultradent and our people continue to lead the way in the dental industry. I'm humbled by the recognition as BioUtah's 2022 Lifetime Achievement Award winner. The very success recognized by that award has enabled us to give back through humanitarian causes—perhaps our greatest achievement and still most important to us.

As my grandfather from Denmark taught me about giving back: "Keep your hand open to give and it will be open to receive. You never can receive with a closed fist."

It's been a fun, fulfilling ride. I look to the future with optimism and excitement for the growth and progress that's to come.

DAN LILJENQUIST

CIVICA'S BUSINESS MODEL FOR DOING GOOD

Civica's Petersburg, VA manufacturing facility.

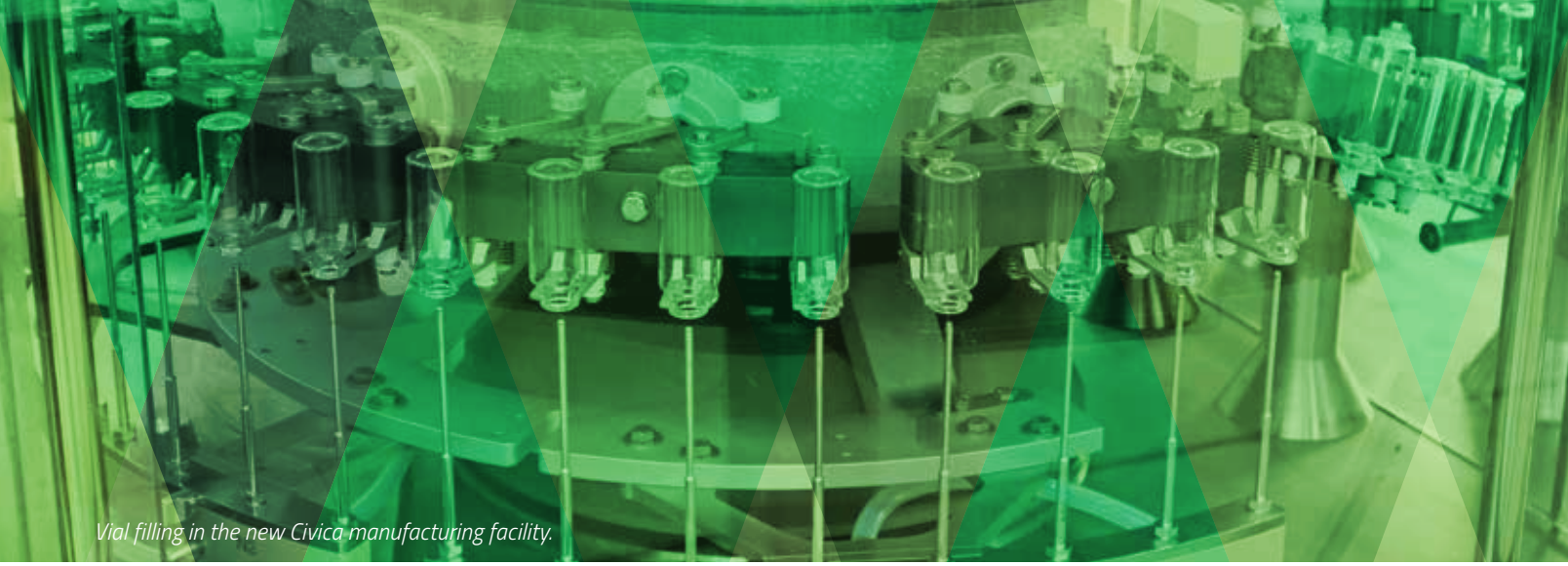
Sometimes it takes the vision of just one big thinker to change course. In disrupting the generic drug market, that big thinker was Dan Liljenquist, chief strategy officer for Intermountain Healthcare.

Liljenquist is the chief architect and current board chair of Civica Rx, an initiative he launched in 2018 to create a not-for-profit generic drug company to ensure that essential generic medications are available and affordable, without paying a penny of profit to anyone. In a nutshell, Liljenquist has been leading the charge to lower drug prices, not with the heavy hand of government, but by leveraging the power of pro-competitive private enterprise.

The dramatic and sudden reduction in insulin prices is just one example of how Civica, headquartered in Lehi, Utah, is revolutionizing the prescription drug market—transforming modern medicine in many ways.

For years, those seeking to get a handle on costs asked "How do you compete in an unmoving and deceptive market for life-saving pharmaceuticals?" But for Liljenquist, this was the wrong question. He decided to ask a different one: "How do you build a functioning market to compete with a broken market?"

Enter Civica to answer that question, first by offering reliable drug supply and fair and sustainably priced drugs to hospitals, and, ultimately, patients directly. Today, more than 55 health systems have joined the effort, including over 1,550 hospitals nationwide. More than 80 generic prescription drug products have been released with nearly 130 million vials distributed so far to over 55 million patients. CivicaScript was subsequently launched to bring lower-priced versions of expensive generic medications directly to consumers at the pharmacy counter.



Vial filling in the new Civica manufacturing facility.

Dan Liljenquist, Chief Strategy Officer at Intermountain Healthcare and Board Chair of Civica

"Still at the forefront of our minds is our desire to tackle the 800-pound gorilla," said Liljenquist. "A year ago, Civica announced that we would begin to manufacture insulin right here in the U.S.—in a brand-new facility built near Richmond, Virginia. Our plan is to sell insulin at a price capped at $30 a vial—a 90% reduction in cost compared to the predatory prices people had to pay at the time. That dream is quickly coming to life."

On March 18, 2023, California governor Gavin Newsom announced the state had entered into a 10-year, $50 million contract with Civica to make more affordable insulin for Americans, joining others in nearly every corner of the diabetes ecosystem who are fueling this effort. In an odd bit of timing, that same month, Eli Lilly, Novo Nordisk, and Sanofi—the leading manufacturers of insulin—announced they would drastically reduce their prices of insulin.

Civica's new facility near Richmond, VA is expected to be operational soon after the Petersburg plant reaches commercial scale in 2024.

CIVICA®

"From the start, Civica's goal in entering the insulin space has been market impact," added Liljenquist. "While we're pleased that the brand insulin makers have indicated they will roll back their predatory high prices, the opportunity now is to continue the momentum of price reductions. We believe Civica's mere existence as a quality insulin supplier will ensure that happens."

Innovators like Liljenquist prove that Utah is fertile ground for new ideas to grow and flourish. Civica is one such outside-the-box idea that is upending barriers to bring lower-cost generic medicines to consumers. This isn't just a case study in business done better; it's a model for business doing good.

Ryan Watts
Denali Therapeutics
Crossing Barriers to Defeat Degeneration

Denali's Salt Lake City team with Ryan Watts on the far right.

The youngest of seven children growing up in Utah, Ryan Watts, Ph.D., co-founder and CEO of Denali Therapeutics, was very close to his mother. He spoke with her by phone almost daily for 15 years when he was a doctoral student at Stanford University and then a scientist at Genentech Inc., in the San Francisco Bay Area. It was in 2014 when Watts noticed that his mother was showing signs of early-stage Alzheimer's disease, the most common form of dementia. A few years earlier, his wife's grandfather had been diagnosed with the disease, and Watts also discovered through genetic testing that he carries a risk factor for developing Alzheimer's.

At the same time, Watts was leading Genentech's re-entry into neuroscience. The Watts laboratory focused on drug discovery for cancer and Alzheimer's, with an emphasis on understanding mechanisms of neurodegeneration guided by human genetics. His laboratory also studied various aspects of blood-brain barrier biology and therapeutic delivery to the brain. The neuroscience field was rapidly evolving. New genetic insights were revealing the underlying biology of neurodegeneration and potential drug targets while enabling better patient selection, similar to how genetic insights transformed the field of oncology.

It was this combination of deeply personal motivations and exciting advances in neuroscience that drove Watts to co-found a company focused on discovery and development of medicines for treating Alzheimer's, Parkinson's disease, ALS, and other neurodegenerative diseases, which present our society with a tremendous challenge to care for and treat people living with these chronic and often devastating diseases.

Watt's Quest Begins

In 2015, Denali was founded in South San Francisco, California, to break through historical barriers in research and development by applying a deep expertise in neuroscience and translating this knowledge and know-how into medical breakthroughs. Watts likens the company's journey to climbing a mountain: "The name Denali captures the formidable challenges in fighting neurodegenerative diseases, but also the unprecedented opportunities enabled by new scientific insights and technologies. With a relentlessly committed team and rigorous effort, we will continue to blaze new trails towards a future where degeneration is finally defeated."

Today, Denali has a number of molecules in clinical development, including four therapeutics in late-stage clinical programs for ALS, Hunter syndrome and Parkinson's. Underlying this progress are Denali's core scientific principles, which are rooted in new insights into the genetics of neurodegeneration, a proprietary technology to deliver protein-based medicines to the brain, and biomarker-driven development. Chief medical officer Carole Ho, M.D., stated, "As we build and grow our capabilities, we believe these core scientific principles

The Denali team spans from South San Francisco to Salt Lake City and Zurich.

will increase our chances of delivering on our mission and realizing our envisioned future as a fully integrated global organization serving patients."

Tapping Into Utah's Talent

Denali's path has led them to Utah, where pioneering, collaboration, and a diverse talent pool are attractive elements of the state's growing life sciences industry. Dana Andersen, Ph.D., chief technical and manufacturing officer, stated, "We are excited to bring our work to the beautiful and vibrant state of Utah with the construction of our new, state-of-the-art biologics clinical manufacturing facility. Building our own manufacturing facility in Utah provides Denali with an opportunity to increase our flexibility and speed in advancing new investigational therapies into clinical trials."

Cindy Dunkle, chief people officer, highlights the importance of diversity and inclusion as Denali expands into Utah: "History has proven that the impossible becomes possible when diverse minds collaborate and face challenges head on. We believe that Utah offers a can-do environment and diverse talent pool that will fortify our efforts to defeat degeneration."

Relentlessly Committed to Serving Patients

All Denalians (as the staff refer to themselves), no matter the location, keep patients at the center of their work. By listening to and involving patients, families and advocates in the drug development process, Denali strives to deliver truly impactful medicines that will address their most urgent and relevant needs.

Watts sums it up this way: "People living with neurodegenerative and lysosomal storage diseases have been waiting far too long for solutions. We believe that breakthroughs are within reach if we continue to invent novel approaches and technologies, follow the data and act with urgency for the people who are waiting for these solutions."

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HEALTH
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Mark Paul: New Executive Director of University of Utah Health's Center for Medical Innovation Shares Vision

This year, on April 1, Mark Paul, a fourth-generation University of Utah graduate, became executive director of University of Utah Health's Center for Medical Innovation.

Paul brings more than three decades of expertise in healthcare innovation to a center that supports student, faculty and staff efforts to develop the next generation of medical devices and find solutions to some of the world's biggest healthcare challenges. Most recently, Paul served as president of Stryker Corporation's Neurovascular Division which has substantial operations in Utah. With a can-do spirit, Paul is focused on fine tuning CMI's vision, and what the center hopes to accomplish.

A More Complete Team

Although CMI has been promoting and facilitating successful healthcare innovation since its inception 13 years ago, the majority of projects have come from a narrow field: medical or engineering students and faculty. In the coming years, under Paul's leadership, CMI plans to change that.

"Medical device ideas can come from a wide variety of innovators and thinkers," said Paul. "Some of our greatest inventions in healthcare came from people who have diverse backgrounds and come from different industries. Going forward, CMI will work more closely with varied departments and students across campus."

Bench to Bedside Competition 2023

Bench to Bedside

Every year, CMI hosts the Bench to Bedside competition, an opportunity for student innovators to present devices they have been working on for the previous year. CMI will continue to grow the program, bringing in more participants from across the nation and the world.

Regulatory and Business Plan Support

CMI will help provide market assessments, along with determining regulatory requirements. Prototypes can then be built and moved forward more efficiently.

PIVOT Center

CMI will increase its collaboration with the PIVOT Center, the university's technology transfer office and industry's gateway to the university. The PIVOT Center not only helps connect inventors, industry, entrepreneurs and investors across the state, but it also positions the university and the State of Utah to take advantage of the growing innovation in our region.

The End Result, Making an Impact

Paul is setting a transformational tone for the future.

"By focusing on these areas in the coming years, we hope to generate new companies and revenue for both the U and the State of Utah," said Paul. "One of my personal ambitions is to help students find really good employment. All of these things fuel the life sciences industry in Utah."

CENTER FOR PRECISION MEDICINE & FUNCTIONAL GENOMICS
UTAH TECH UNIVERSITY

Dr. Howard McLeod: A Utah Superstar for Precision Medicine

Can someone who collects ancient cartography and dabbles in rock music also be leading Utah and the world in realizing the promise of precision medicine? In the case of Howard McLeod, M.D., FASCO, FCCP, the answer is a resounding "yes."

Dr. McLeod and A New Approach to Medicine

McLeod, the new director of Utah Tech University's Center for Precision Medicine and Functional Genomics, is world-renowned in the field of pharmacogenomics (how individuals react differently to medicines). He's the No. 1 pharmacogeneticist in the U.S. and No. 2 globally.

His hobbies around ancient cartography and rock music highlight what precision medicine is all about—individuality. While traditional medicine is often a one-size-fits-all approach based on the average patient, precision medicine looks at the individual, tailoring disease prevention and treatment to specific genetic make-up. According to McLeod, the goal of precision medicine is to target the right treatments to the right patients at the right time.

Growing the Center

Beginning as a cooperative endeavor by Utah Tech University, Culmination Bio and Intermountain Health, the Center has consolidated internationally recognized faculty in areas as diverse as zebrafish functional genomics, evolutionary bioinformatics, population genetics, genomic medicine, biomedical device application and precision health. Initial funding was provided by the Utah legislature's

Deep Tech Initiative and leveraged with federal grant dollars. The center has active visibility across the National Institute of Health, National Science Foundation and professional societies in the field. Key initiatives include the Mental Health PGx consortium, Rural Oncology Care Initiative and Precision Health Certification Collaborative.

Industry Partnerships are Key

McLeod brings an industry-centered perspective for building collaboration between Utah Tech University and Utah's life sciences community. He's building industry partnerships that include the training of undergraduate and graduate students as well as specialty certification for industry employees. Students learn skills in the areas of bioinformatics, functional genomics, variant science, machine learning, protein characterization and molecular biology. Training is also geared to workforce needs, such as developing a viable pipeline of researchers and skilled biotech workers needed in Utah.

McLeod believes that this attention to pragmatic capabilities in areas of biotechnology innovation provides a productive environment for partnerships that will expand the ability of Utah to lead the nation in precision healthcare.

The Future is Now

McLeod likes to put it this way, "I just love the idea that precision medicine is becoming real, and that's the exciting thing about the current time, it's no longer someday, it's now." And for Utah Tech University's Center for Precision Medicine and Functional Genomics, there's no time like the present.

BIOHIVE

A FORCE FOR GOOD

BioHive, a non-profit, public-private partnership is a collective effort of Utah life sciences companies and their employees to build, brand and bring together the state's life sciences and healthcare innovation ecosystem. They advance the mission of healthcare innovation with a focus on actively supporting and giving back to the community.

Founded in 2020, BioHive harnesses the power of community—the more than 1,600 life sciences companies and 150,000 employees in the state—to create greater good at scale. The organization makes a positive difference through volunteerism, social impact and community gatherings.

BioHive is a force for good within Utah's life sciences and healthcare innovation industry and the communities in which we serve," said Aimee Edwards, executive director of BioHive. "Actively engaging our BioHive university student chapters, BioHive women in science and technology, and industry employees among others further advances important industry initiatives, career pathway programs, alliances and partnerships."

One such initiative is BioHive's focus on developing and building the next generation of life sciences leaders in the state with the formation of university student chapters. Chapters have been established at University of Utah, Brigham Young University, Utah State University, and Utah Valley University, with more on the way. BioHive is creating an environment where students can share their passion for improving patient care, connect with peers statewide and engage with industry. They do this through a series of gatherings, seminars, workshops and digital connectivity. The chapters provide a perfect opportunity for medical device, diagnostic, biotech and biopharma companies to help develop and recruit local talent.

Other activities that have been convened under the BioHive banner include a Women "Returnship" Program, women networking events, monthly service projects such as volunteerism at local resource shelters, and a local blood drive in collaboration with ARUP Laboratories.

"Working closely with BioUtah, together we are committed to support the communities in which we live, work and play, while elevating Utah's position as global leader in healthcare innovation," said Jared Bauer, chairman of BioHive's board of directors.

biohive

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