



**BIOUTAH**

**UTAH LIFE SCIENCES INDUSTRY REPORT  
2018**

# Table of Contents

## 03 INTRODUCTION

Letter from the President  
Letter from the Governor  
Executive Summary

## 06 UTAH'S LIFE SCIENCES ECONOMY

Key Economic Driver  
Job Growth

## 08 UTAH'S RICH HISTORY IN MEDICAL INNOVATION

Innovation Timeline

## 09 INDUSTRY LEADERS

Diverse and Vibrant  
Medical Device Manufacturers  
Q&A: Mark Paul, President, Neurovascular Division, Stryker  
Contract Service Providers  
Biotech and Pharmaceuticals  
Genomics, Molecular Diagnostics, and Precision Medicine  
Q&A: Greg Critchfield, MD, MS, President and CEO, Sera Prognostics

## 16 EMERGING GROWTH COMPANIES / A PROMISING FUTURE

Fertile Ecosystem  
Investment, Mergers, and Acquisitions  
Q&A: Chris Gibson, PhD, Co-founder and CEO, Recursion Pharmaceuticals

## 20 EDUCATION AND TALENT DEVELOPMENT

Training the Next Generation  
Educators and Workforce Initiatives  
Q&A: John Langell, MD, PhD, MPH, Executive Director, Center  
for Medical Innovation, University of Utah, Health Sciences

## 23 FOSTERING INNOVATION AND ECONOMIC DEVELOPMENT

Support Systems, Incentives, and Resources  
Q&A: Shawn Fojtik, CEO, Control Medical Technology and Distal Access

## 28 ABOUT BIOUTAH

Mission, Vision, and Goals  
Membership  
Board of Directors

## Letter from the President

As President and CEO of BioUtah, it is my pleasure to share with you BioUtah's report on the life sciences industry in Utah. In a word, this report is about momentum. Employment in Utah's life sciences industry is growing, on average, faster than any other state in the nation. Simply put, the industry is expanding with more room to run.

BioUtah is an independent, non-profit trade association serving Utah's life sciences industry. Utah's life sciences companies are diverse, with strengths in medical device manufacturing and contract services, advanced diagnostics, research, and biotechnology and pharmaceuticals, and health care IT, amongst others. They are committed to finding solutions to some of our greatest health care challenges through the innovation of medical technologies that improve and save lives. Many of these companies are on the front lines of precision medicine with cutting-edge diagnostics and therapies specifically targeted to the genetic make-up of a patient's cancer or other serious illness. These new technologies, diagnostics, and therapies offer hope to patients of all ages across the globe, improve outcomes and advance the efficiency and effectiveness of the overall health care system. For Utah's economy, the industry means good, stable jobs and significant revenues.

The success of the industry, however, does not come without challenges. Access to capital, as well as the regulatory and talent landscape, play an important role in the future of Utah's life sciences industry. BioUtah leads initiatives and actively partners with key stakeholders to address these challenges. We also advocate for public policies that foster innovation and entrepreneurship, helping to make Utah a world-class hub for the life sciences.

Utah already has a strong ecosystem that supports the life sciences industry, from research-focused university systems to public-private partnerships and a talented, hard-working labor force located in one of the most business-friendly states in the country. We are fortunate to have such a solid foundation to build upon.

Again, BioUtah is pleased to present this report. We look forward to continuing to work with the life sciences community to leverage our momentum, drive innovation, and enable success. We would like to thank Little Dog Communications for underwriting this report and for their commitment to supporting Utah's life sciences industry.

Warm regards,



Kelly Slone  
President & CEO  
BioUtah



## Letter from the Governor

Dear Reader,

As governor, I am very pleased with the progress of the life sciences industry in Utah and its impact on our economy. Classified as one of our six strategic industry clusters, life sciences contribute to Utah's diverse economy. The industry accounts for more than 1,000 companies and over 34,000 employees. Average wages are more than 140 percent of the Utah average wage. Most importantly, life sciences companies improve and save the lives of people around the world.

Utah is home to national leaders in medical technologies, advanced diagnostics and biopharma innovation. Our established businesses thrive alongside promising start-ups. The state excels in research and development as well as manufacturing and commercialization. We are at the forefront of some of the world's best medical technologies and groundbreaking therapies.



The industry is supported and well represented by BioUtah, the only trade association in the state exclusively devoted to life sciences. BioUtah produced this report, which provides an excellent summary on the current status of Utah's life sciences ecosystem, including the potential for future innovation and growth in our state.

If your company is already located in Utah, I congratulate you for choosing the best place in the nation to build and grow your enterprise. If not, I encourage you to explore the Beehive State and the opportunities it provides.

Utah's commitment to collaboration has produced unprecedented partnerships between government, industry and education to secure the success of our life sciences industry for years to come. We welcome you to join us.

Sincerely,

A handwritten signature in black ink that reads "Gary R. Herbert". The signature is written in a cursive, flowing style.

Gary R. Herbert  
Governor  
State of Utah



## Executive Summary

.....

The BioUtah Utah Life Sciences Industry Report 2018 provides an overview of the industry's significant presence and economic footprint in the state. The report underscores the industry's strengths in medical technology, advanced diagnostics, contract manufacturing, biotech, and pharmaceuticals.

Importantly, the report provides data on the industry's positive impact on Utah's economy, outlining its contribution to job growth, employee compensation, and state GDP. Interviews with key leaders of Utah's life sciences industry provide real-world insight into the industry's vision, achievements, and commitment to finding cures and helping patients lead longer, healthier lives. The industry benefits from a wealth of programs, resources, and incentives offered through state government, academic institutions, and public-private partnerships. The state's culture of innovation and collaboration is strong.

### Major highlights of the report include:

- Utah leads the nation in job growth in the life sciences industry.
- More than 1,000 life sciences companies in Utah provide 34,352 jobs, paying a combined total of \$2.7 billion in employee compensation.
- Utah life sciences companies achieved \$7.4 billion in total sales in 2016, creating \$4.1 billion in state GDP.
- Utah ranks as the number three genomics market in the nation, based on innovation, talent and growth metrics.
- Many Utah life sciences companies have successfully raised capital to accelerate growth.

This report was developed with guidance and input from the Utah Governor's Office of Economic Development, Economic Development Corporation of Utah, the Kem C. Gardner Policy Institute, and Utah life sciences companies.

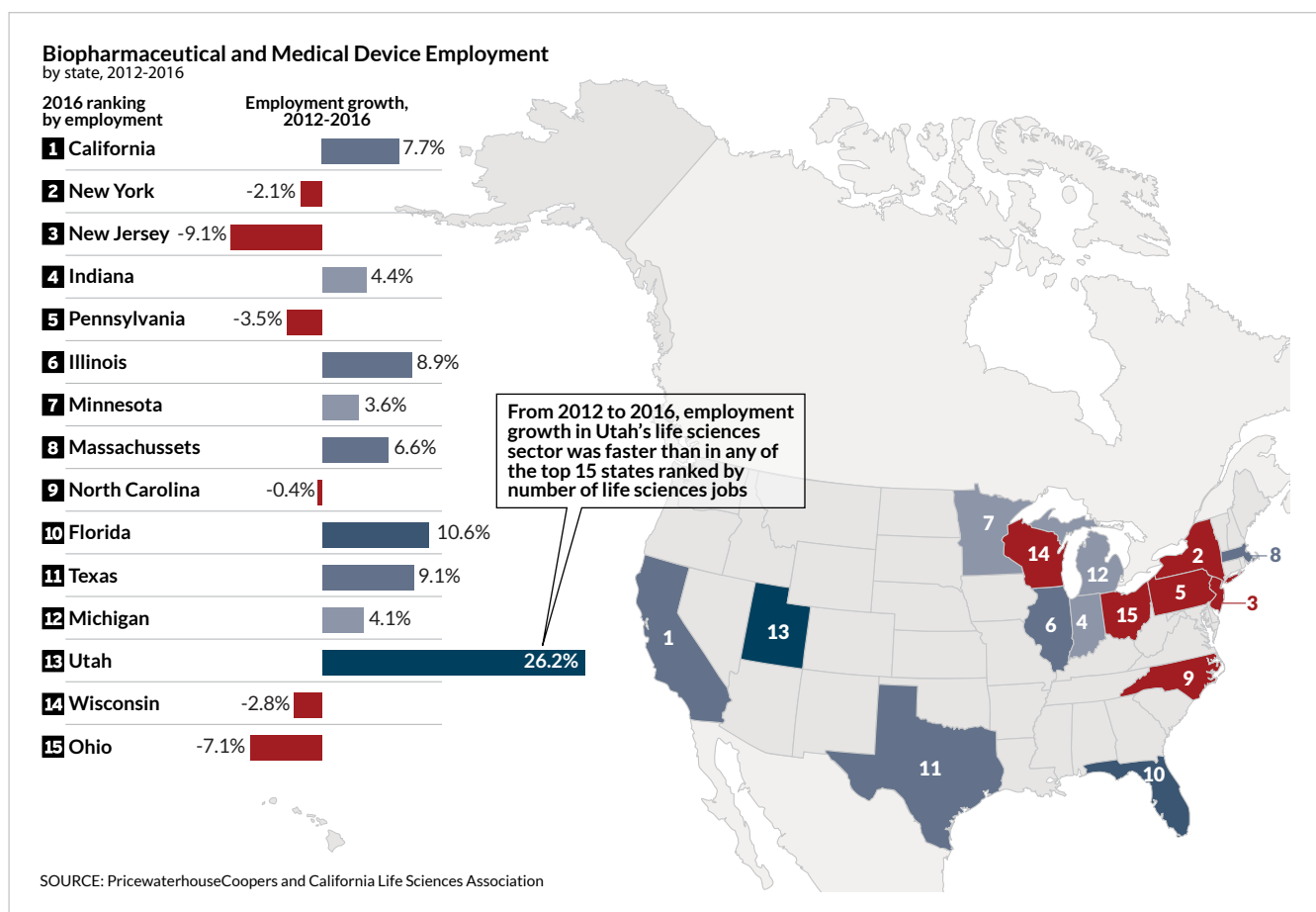
# UTAH'S LIFE SCIENCES ECONOMY

## Utah's life sciences industry is a key economic driver

Utah's life sciences industry plays a significant role in driving Utah's economy. As part of the state's strong economy, the life sciences industry is the 13th largest in the nation. In 2016, the 34,352 life sciences jobs at more than 1,000 companies accounted for \$2.7 billion in employee compensation. Utah's life sciences companies achieved \$7.4 billion in total sales, in 2016, creating \$4.1 billion in state GDP. The breadth of the industry helps maintain a diversified economy. The life sciences industry is relatively resilient amid economic change. This is because of the constant need for health care products and advancements.

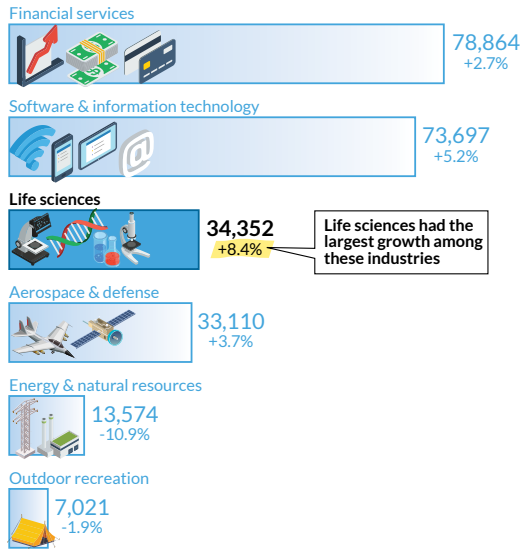
## Utah leads the nation in fastest average growth in life sciences employment

Between 2012-2016, employment in Utah's life sciences industry increased 26.2 percent, faster by far than the national average of 5.9 percent. At the state level, life sciences job growth, 8.4 percent from 2015-2016, exceeded the job growth of any of the six strategic economic industry clusters in Utah.



## The state's life sciences job growth outperformed other industry sectors in the state

### Life Sciences Employment vs. Other Strategic Economic Sectors in Utah, year-over-year growth, 2016



NOTE: Life sciences employment is from the Kem C. Gardner Policy Institute analysis for 2016. Employment numbers for other sectors and all growth rates are from GOED's 2017 Annual Report.  
SOURCE: Utah Governor's Office of Economic Development

## Utah's life sciences industry supports economic gains at large

Life sciences is a technology-driven sector that offers rewarding career paths for Utah's educated workforce. Industry employment, payroll, purchases, and construction provide for individuals and families statewide, allowing those who work and engage with this industry to gain a stronger foothold in the state's emerging 21st century economy.

Because the life sciences industry has many links to other sectors of Utah's economy, its output generates economic activity beyond employment and sales at life sciences companies themselves. As the industry expands, more inputs are required from suppliers, creating additional jobs and investment opportunities in other parts of the state's economy. Each life sciences job supported more than one other Utah job in 2016.

As a result, life sciences companies are closely connected to the rest of Utah's economy. Their spending sustains a wide range of in-state suppliers, and life sciences employees spend much of their earnings in-state. In this way, the life sciences sector indirectly supports 36,043 jobs in addition to direct employment of 34,352, for a total economic contribution of over 70,000 jobs.

### Life Sciences Industry—Direct Economic Activity in Utah, 2016 (estimated)

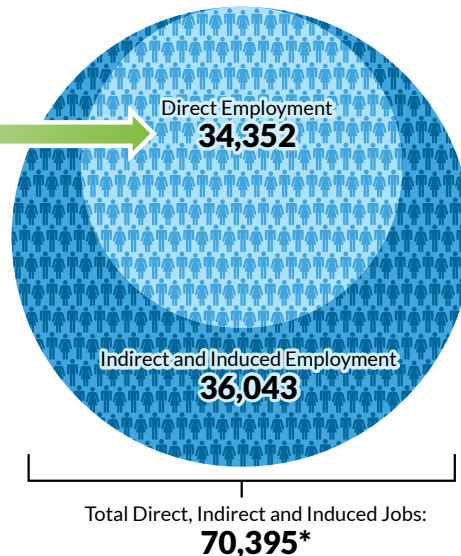
GDP (life sciences companies)	\$4.1 billion
<b>Direct employment</b>	<b>34,352 jobs</b>
Employee earnings incl. benefits	\$2.7 billion
Wages and salaries	\$2.2 billion
Sales	\$7.4 billion
Establishments	957*

Results pertain to life sciences companies themselves. Measures of direct economic activity do not include indirect and induced economic activity. Self-employed workers are not included in the analysis.

\* An establishment is a business location. Many companies have multiple Utah establishments.

### Life Sciences Industry—Economic Share in Utah, 2016

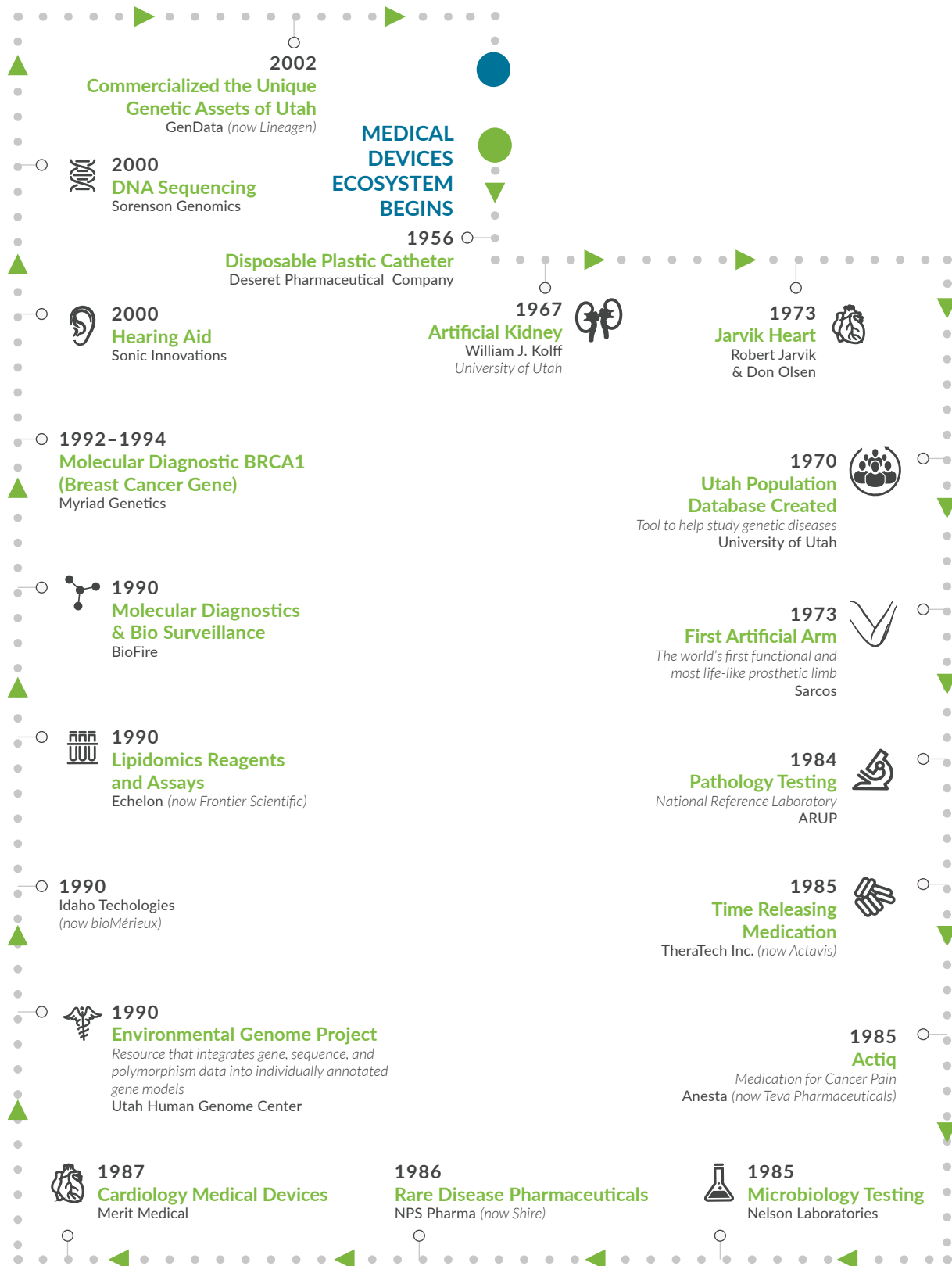
Life sciences direct employment as a percent of all Utah jobs:	<b>1.8 percent</b>
Life sciences direct earnings (including benefits) as a percent of all employee earnings in Utah:	<b>2.8 percent</b>
Life sciences direct GDP as a percent of Utah GDP:	<b>2.6 percent</b>



\*Direct jobs are provided by life sciences companies in Utah. Indirect and induced jobs are provided by Utah companies supported by the in-state purchases of life sciences companies and by employees of life sciences companies spending their earnings in Utah.

SOURCE: Kem C. Gardner Policy Institute analysis of data from the Utah Department of Workforce Services, Utah Governor's Office of Economic Development, and Bureau of Economic Analysis using the REMI PI+ economic model

# Utah has a rich history of medical innovation



Source: The Leonardo



# INDUSTRY LEADERS



The Utah life sciences industry is diverse and vibrant

A wide range of global life sciences companies anchor Utah's life sciences economy and are market leaders in medical technologies, diagnostics, biotech, and pharmaceuticals. They include firms founded in Utah, as well as those from outside of the state, that have established operations in Utah. These companies are improving the lives of people with serious disease, developing new medical devices, discovering more effective drugs and therapies, and advancing diagnostic testing. Companies such as **ARUP Laboratories**, **BD**, **BioFire Diagnostics**, **Biomerics**, **Edwards Lifesciences**, **Fresenius Medical Care**, **GE Healthcare**, **Merit Medical**, **Myriad Genetics**, **Nelson Laboratories**, **Recursion Pharmaceuticals**, **Stryker**, **Tolero Pharmaceuticals**, **Varex Imaging**, and others have facilities in Utah. Many of their leading products are produced in the state, from a variety of catheters and heart valves to diagnostic testing, stroke care technology, cancer therapies, rare disease drugs, and medical imaging products.

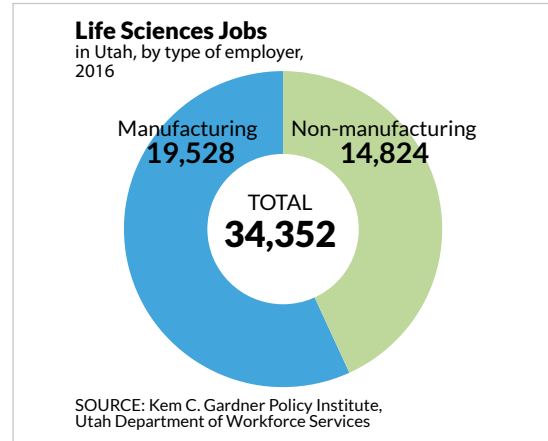
Contract service providers, such as **Biomerics** and **Nelson Laboratories**, play a key role in supporting the growth of the life sciences community. In addition, life sciences IT and software companies, including **MasterControl**, **Orca Health**, and **Verisk Health** are important partners that help strengthen Utah's life sciences community.



# Medical device manufacturers are the largest life sciences sector in Utah

Utah is a global leader in medical device manufacturing and has more than 19,000 people employed in the industry. Utah's world-class effort in arterial and vascular access devices produces 70 percent of all devices used worldwide.

More than 250 medical device manufacturers have their operations in Utah. These include homegrown companies such as **Biomerics**, **Merit Medical**, and **Nelson Laboratories** as well as spin-offs and those with headquarters out-of-state, such as **BD**, **GE Healthcare**, **Edwards Lifesciences**, **Fresenius Medical Care**, **Stryker**, and **Varex Imaging**, which have set-up facilities in Utah.



- **BD** is a global medical technology company that is advancing medical discovery, diagnostics and health care delivery. BD began operations in Utah in 1986, after acquiring Deseret Pharmaceutical. Expanding its footprint in the state, BD recently joined forces with Bard and now employs more than 1,600 workers in Sandy and Salt Lake City. In Utah, the company manufactures catheters and other devices to support and administer the infusion of medication and other therapies.
- **Biomerics** is a leading contract manufacturer for the medical device industry, specializing in the design, development, and production of finished medical devices used in diagnostic and interventional procedures.
- **Edwards Lifesciences** has a large and growing facility in Utah for research, engineering, and manufacturing of its world-leading patient-focused innovations, including heart valves and products for hemodynamic monitoring.
- **Fresenius Medical Care** manufactures and distributes dialysis equipment, disposable products and renal pharmaceuticals, operating more than 40 production sites on all continents. As the world's only vertically integrated renal company, Fresenius cares for more than 290,000 patients in its global network of more than 3,400 dialysis clinics.
- **GE Healthcare Surgery** is dedicated to improving lives during the moments that matter most by providing THE "imaging guidance platform" for the

operating room (OR). Our family of mobile C-arm products have been used by surgeons for more than 40 years, with more than 35,000 systems installed worldwide. Each day GE's products are used on over 75,000 patients, truly achieving life-changing outcomes for patients in these critical moments. It is our privilege to help doctors achieve life-changing outcomes for patients.

- **Merit Medical** develops, manufactures, and distributes medical devices for interventional, diagnostic, and therapeutic procedures in cardiology, radiology, and endoscopy.
- **Nelson Laboratories**, a Sotera Health company, is a leading provider of microbiology testing and consulting services for medical technology companies to ensure, for example, the biocompatibility of medical devices, sterilization validation, packaging validation, and microbial identification.
- **Stryker** advances complete stroke care solutions and has developed less invasive therapies to treat ischemic and hemorrhagic stroke.
- **Varex Imaging** is the world's leading manufacturer of medical devices and software for treating and managing cancer.

# Q&A

## Stryker's Mark Paul: Utah is a global hub for medical device innovation

**Mark Paul**  
President, Neurovascular Division at Stryker

*"I had to leave Utah and go out in the world to pursue my career in the medical device industry. Today, you could graduate from any of the Utah universities and get a job at either a global leader in the medical device industry or at a high tech local start-up."*



In 2017, Stryker announced another significant expansion in Utah, which has helped add to the state's already recognized and established life sciences and medical device manufacturing hub. The company opened a 137,000-square-foot facility to manufacture stroke care technology products with an additional 50,000-square-foot expansion space. In addition to manufacturing, Stryker has built a state-of-the-art neurosurgeon training center. The facility is outfitted with seven fully integrated operating rooms with a high-definition audio and imaging system that enables worldwide communications to facilitate the training experience. Stryker will train the top neurosurgeons in the country at the new training center in Salt Lake City. Stryker also expects to expand the facility and add to the company's product portfolio, including new equipment for orthopedic, spinal, and endoscopic treatments.

### Why did Stryker decide to expand manufacturing operations in Utah?

Stryker has operated in Utah since 2011, and we have benefitted from the state's unique manufacturing advantages, including:

- *Low cost basis for manufacturing:* the real estate is less expensive, and there is space to expand.
- *Partner availability:* both West Coast sterilization companies are located in Salt Lake City.
- *Location, location, location:* Salt Lake City is a major hub for Delta airlines, and eight universities and colleges are located within minutes of downtown.
- *Amazing workforce:* Salt Lake City has a high percentage of college graduates per capita, and the workforce is very positive and has a great work ethic.
- *State laws that support and protect high-tech manufacturing:* Non-competes are critical to preserving proprietary manufacturing processes and know how. Most of the building processes cannot be patented and therefore must be protected as proprietary assets.

### Why does Utah have such an amazing workforce for the medical device industry?

We are seeing more alignment from the university system to educate and prepare students for careers in the medical device industry. We mapped out more than 20 different degrees that directly link to the medical device industry. In addition, collaborations across colleges, programs, and health care institutes, such as the MedTech BioVenture MBA program at the University of Utah, are preparing the next generation of innovation leaders for the medical device industry. Stryker and others are also highly supportive of the University of Utah's Bed to Bench Side bioengineering program.

### If you were governor for a day, what would you do?

If I were governor for the day, I would put my efforts in the life sciences industry because it is an honorable industry bringing great value to people around the world. We are helping people who are suffering and sick. In addition, the industry is quite resilient despite economic changes, and our industry generally pays higher than most other industries. Alignment between state and local governments provides essential financial support, like tax breaks and incentives, which are important to attracting more life sciences companies and bringing high-paying jobs to the state. Also, once medical device companies establish roots they tend to remain for decades due to the challenges in moving FDA-audited manufacturing sites. The life sciences industry also has an amazing halo effect in creating many spin off companies, labs, machine shops, etc., creating diverse jobs that are incremental to the state.

### What else contributes to make Utah a world leader in medical devices?

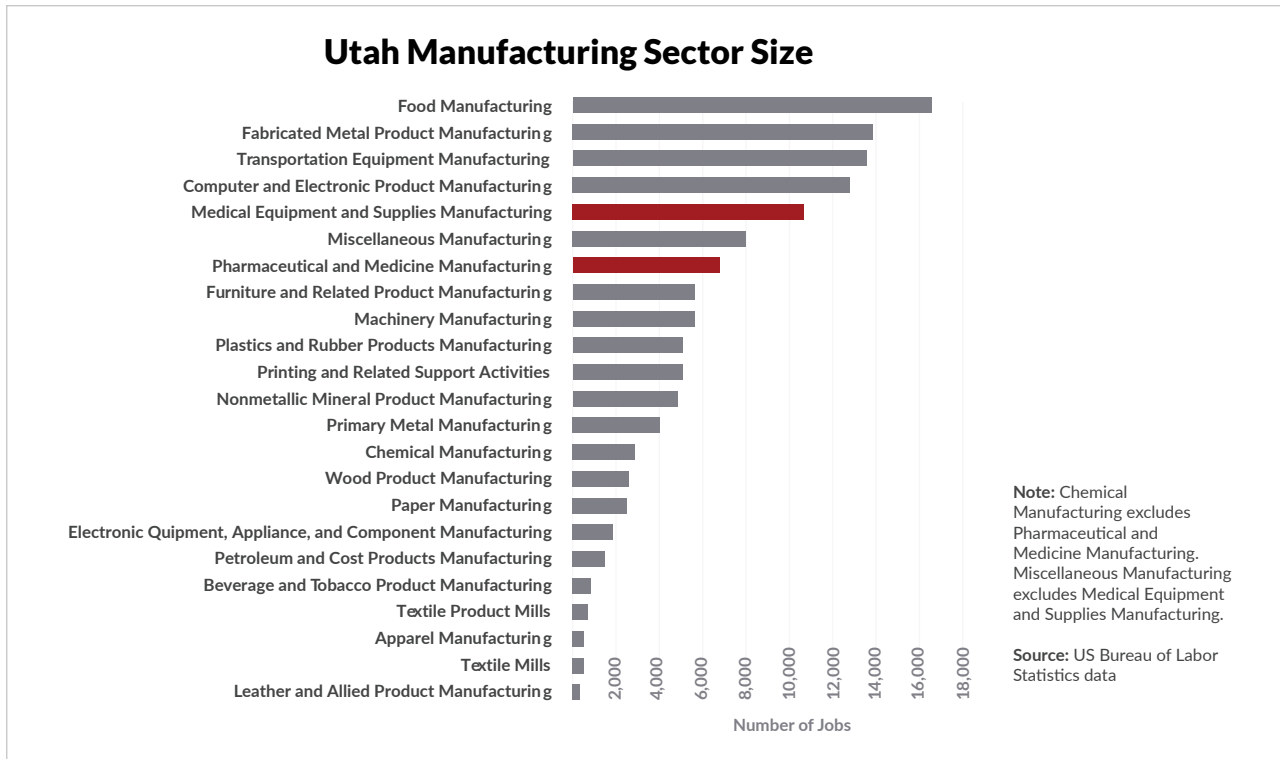
The Utah medical device industry has deep roots and extensive history from the state's excellent university research institutes. These include the artificial heart program at the University of Utah and orthopedic research at Northern Utah. Endoscopy scopes technology also came from Salt Lake City. Homegrown companies, such as Utah Medical and Merit Medical, have germinated a number of other companies that have been acquired and led to global companies, such as BD, C.R. Bard, and Edwards, coming to Utah.

**stryker** .....  
[www.strykerneurovascular.com](http://www.strykerneurovascular.com)  
 Salt Lake City

**YEAR FOUNDED: 1941 | In Utah: 2000 | Expanded: 2016**  
**NUMBER OF EMPLOYEES: 265**

Stryker is a world leading high tech medical device company. +\$12B in revenue with products in +70 countries around the world. Stryker's new factory in Salt Lake City manufacturers the latest technology to treat patients suffering from Ischemic stroke. Devices include catheters, stent retrievers, balloons, and wires all designed to enter the body in the right leg through the femoral artery and traverse into the brain's vasculature to remove clots from the brain and restoring oxygenated blood.

## Medical technology manufacturing and pharmaceutical and medicine manufacturing are prominent components of Utah's manufacturing sector in terms of job creation



## Utah's strong medical technology contract service providers drive innovation and support start-ups

Utah has industry-recognized expertise in medical device manufacturing, creating a unique environment for transforming ideas to product. This expertise is evident among the state's contract service providers who provide a full spectrum of experience and support. For example, contractors such as **Biomerics**, offer development and manufacturing services for medical technology companies. **Nelson Laboratories** provides rigorous laboratory tests across the medical technology, pharmaceutical, and tissue sectors to ensure the highest standards of quality, safety, and regulatory compliance.

Contract manufacturing continues to grow, providing a valuable resource for life sciences companies in the state. This growth is due, in part, to the outsourcing of R&D and production as companies look to streamline internal processes. The presence of a strong and diverse set of contract service providers benefits not only large, established companies, but also lowers the barriers to entry for start-up companies who no longer need to build extensive infrastructure to bring products to market. In fact, the number of companies developing medical devices with 10 or fewer employees has tripled since 2006, thus supporting further growth in this segment of the life sciences industry.

# Biotech and Pharmaceuticals

## On the front lines for new cures

Companies engaged in drug discovery and development are another key driver of Utah's growing life sciences industry. This segment of the industry consists of start-up companies, growth companies, and mature pharmaceutical companies. Many of these biotech and pharmaceutical companies—such as **Alucent Biomedical**, **Clene Nanomedicine**, **Navigen**, **Recursion Pharmaceuticals**, **Thunder Biotech**, and **Tolero Pharmaceuticals**—are pioneering new drugs, therapies and methods of drug discovery to treat cancer and other unmet medical needs. These companies are leveraging novel technologies to develop better drugs. They are also advancing precision medicine, which targets treatment based on a patient's particular genetic make-up or the genetic characteristics of a tumor. Pharmaceutical and biotechnology companies provided a total of 9,343 jobs in Utah during 2016, with research and development in biotechnology accounting for 2,475 jobs. In addition, pharmaceutical preparation manufacturing provided 1,590 jobs.

- **Alucent Biomedical** is focused on developing a novel drug and device combination therapy for the treatment of peripheral vascular disease. This therapy, Natural Vascular Scaffolding™, is effective in animal models and has successfully completed IND-enabling preclinical studies. Human clinical trials are planned for next year.
- **Clene Nanomedicine** has a drug development platform that utilizes proprietary technology to create nanocrystal therapeutic drug suspensions. Its lead asset, CNM-Au8, has demonstrated remyelination across multiple animal models and is presently entering Phase 2 human studies for the remyelination of Multiple Sclerosis lesions. Clene is also developing a second drug for anti-infective and anti-viral treatments.
- **Navigen** is developing a new class of drugs, D-peptides, to safely and effectively treat diseases with high unmet needs. The company's lead program is an HIV entry inhibitor which it expects to have in human clinical studies in the next 12

months. Navigen is also developing D-peptides for inflammatory diseases and cancer immunotherapy.

- **Recursion Pharmaceuticals** is combining innovative biological science with artificial intelligence to identify new therapies for patients in less time and for less cost compared to traditional drug discovery. Although Recursion's initial focus was on repurposing drugs to treat rare genetic diseases, the company is now expanding into new therapeutic areas, such as aging, inflammation, infectious disease and oncology.
- **Thunder Biotech** is a pre-clinical oncology company developing novel immuno-therapies to target unique biomarkers expressed on the surface of malignant tumors. In addition, the company is developing a companion diagnostic assay to monitor cancer patients. The diagnostic assay can also be used to detect cancer at its earliest stage.
- **Tolero Pharmaceuticals** is developing novel therapies to treat hematologic and oncologic diseases, including acute myeloid leukemia. The company's approach is to develop specific inhibitors for disease pathways. This concept is at the center of precision medicine, in which targeted therapeutics can be tailored for individual patients.

### Biotech and Pharmaceuticals Employment (number of jobs) in Utah, 2016

Pharmaceutical preparation manufacturing

5,278

Research and development in biotechnology

2,475

Drug wholesalers

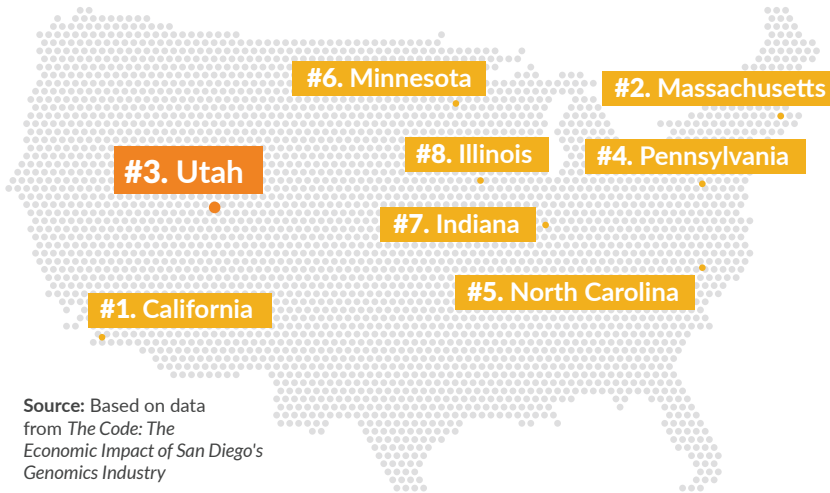
1,590

TOTAL EMPLOYMENT IN BIOTECH AND PHARMACEUTICALS

9,343

Source: Utah Department of Workforce Services

# Utah Ranks Third in the Nation in Genomics, Molecular Diagnostics and Precision Medicine



Source: Based on data from *The Code: The Economic Impact of San Diego's Genomics Industry*

The importance of companies working in this field cannot be overstated. Utah ranks as the number three genomics market in the nation, based on innovation, talent and growth metrics. **Myriad Genetics'** founding over 25 years ago was the start of the research-based diagnostics industry. In just the past five years, the company has invested over \$340 million into R&D across six specialties to help answer the most pressing questions on the minds of patients. **ARUP Laboratories** is a worldwide leader in developing and conducting diagnostic tests, with more than 3,000 employees. The laboratory and diagnostic testing landscape of Utah also includes **ApolloDx/CibusDx**, **BioFire Diagnostics**, **Lineagen**, **Sera Prognostics**, and **Sorenson Forensics**, and many others.

- **ApolloDx/CibusDx** provides a mobile diagnostic platform that delivers laboratory-quality test results in 10 minutes or less in less in food safety and clinical health applications.
- **ARUP Laboratories** is a national clinical and anatomic pathology reference laboratory. An enterprise of the University of Utah and its Department of Pathology, ARUP offers over 3,000 tests, ranging from routine screening to highly esoteric molecular and genetic assays.
- **BioFire Diagnostics** develops innovative clinical molecular diagnostics that provide fast and accurate results. Its FilmArray system is the new standard for syndromic infectious disease diagnostics, delivering faster diagnoses and more effective use of antibiotics.

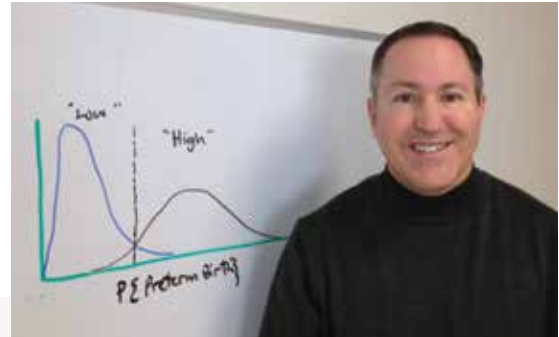
- **Lineagen** provides groundbreaking testing to help pinpoint the cause of developmental delay and autism spectrum disorder. This innovation allows for personalized medical management and treating correctly sooner.
- **Myriad Genetics** is introducing new molecular and companion diagnostic tests for a growing number of diseases. Myriad offers testing for eight hereditary cancers, including its well-know test for heredity breast cancer. More than 2.5 million patients have already benefited from this ability to test for a number of specific hereditary cancers.
- **Sera Prognostics** develops diagnostic tests for the early prediction of a woman's risk of premature delivery, preeclampsia, and other pregnancy complications. This innovative testing provides an early and accurate assessment tool to improve maternal and newborn health.
- **Sorenson Forensics** is a leading provider of advanced forensic DNA testing services, such as STR and Y-STR analysis, mitochondrial DNA sequencing, biology screening, and full serology testing. The company offers industry-best casework assistance to federal, state and local crime laboratories as well as private industry clients, including expert testimony in criminal cases.

# Q&A

*“What we are doing will make a difference in people’s lives—that’s what motivates us.”*

## Sera Prognostics' Greg Critchfield: Life sciences investing produces returns in multiples for Utah

**Gregory C. Critchfield, MD, MS**  
Chairman, President, and CEO of Sera Prognostics



### Why is the PreTRM® test important?

In the U.S., 1 in 10 women have a premature baby (delivery before 37 weeks). More than 50 percent of women pregnant with a single baby who deliver early have no known risk factors. Traditional tools fail to identify over 80 percent of such women who go on to deliver their babies prematurely. To develop the PreTRM® test, Sera took a systems biology approach. With leading researchers, we created a specimen biobank and comprehensively analyzed blood samples from women who delivered babies early, comparing them to women who delivered normally. This led to the discovery of biomarkers that are highly predictive of preterm birth, enabling us to develop the PreTRM® test. The PreTRM® test was rigorously validated to predict the risk of premature delivery by analyzing blood taken from the mother, during weeks 19 or 20 of pregnancy. The PreTRM® test provides accurate risk information to enable physicians and their patients to more proactively address the risks of prematurity, with the potential of delivering healthier newborns and reducing health care costs for society.

### What is your approach to innovation?

We focused on premature birth as a big problem that needed a better solution. Our innovative scientific approach is unique—our scientists developed the ability to discover important biomarker changes in pregnancy that were previously not known. Success has been achieved through excellent teamwork of a talented management group with broad and deep experience and through successfully raising the capital necessary to build the company.

### Why Utah?

There is a strong heritage of innovation and collaboration in Utah, as well as a good deal of diagnostic expertise. Before joining Sera, I had the privilege of serving as president of

Myriad Genetic Laboratories, where we launched seven novel molecular diagnostic products across a variety of technology platforms. Of course, this required expert workers skilled in a number of areas. As I looked around, Utah offered a unique balance of a highly educated and experienced workforce, and substantially lower costs than those found in California or Massachusetts. It was clear we had many of the elements to build a solid diagnostics company in Utah, and that we would also be successful in recruiting key people to join us. Utah has great access to the outdoors, close proximity to world-class ski resorts, and is an affordable place for families to live.

### Why are innovation and the life sciences important to Utah?

Life sciences companies build products and services that are of great value and improve the human condition. Life sciences require a highly skilled workforce, with typically higher-paying jobs. It is important to understand that these companies do not have a negative impact on the environment and can create value to help withstand economic downturns.

### If you were governor for a day, what would you do?

I would put more emphasis on funding life sciences research and technology because the industry delivers economic value in the form of life-saving products and services and high-paying jobs. Funding challenges are one of the biggest issues facing life sciences companies. We need to help these companies attract capital to give them time to create things of value. Investing in life sciences now, can and will provide significant financial returns over the years to Utah. I would definitely strengthen STEM education in our schools, as the growing life sciences industry relies on employees that are talented, well-trained, and dedicated people.



2749 East Parleys Way, Suite 200  
Salt Lake City, UT 84109

[www.seraprognostics.com](http://www.seraprognostics.com)  
[www.preTRM.com](http://www.preTRM.com)

Sera’s vision is to be a global leader in women’s health by providing pivotal information to physicians to improve the health of patients and the economics of health care delivery. Sera’s first test, PreTRM®, provides early accurate prediction of preterm delivery risk to help doctors and patients proactively address risks of prematurity.

.....  
**YEAR FOUNDED: 2006**  
**NUMBER OF EMPLOYEES: 55**

# EMERGING COMPANIES/ A PROMISING FUTURE

.....

## Utah's life sciences innovation ecosystem is fertile

Utah has a competitive advantage in the life sciences because of our trained workforce, intellectual capital, historical expertise, and government support. These components create fertile ground for the state's innovation ecosystem as we collaborate and work together to build a world-class life sciences hub.

Utah's life sciences start-ups keep the industry vibrant and translate breakthrough research into new life-changing medical products.

Utah's life sciences innovation pipeline is highly correlated to the research and collaborations at our universities, which help to produce new intellectual property, advance prototype development, and start new companies. Universities in the state bring in more than \$400 million annually in NIH research grants.

**Sera Prognostics** came out of collaboration between **Brigham Young University** and the **University of Utah**. **Lineagen** and **BioFire Diagnostics** had their beginnings in research developed at the **University of Utah**. BioFire Diagnostics' location at the University of Utah's Research Park allowed greater collaboration, which enabled the company to grow from 15 to 400 employees.

**ARUP Laboratories**, **Myriad Genetics**, and others were also spun-off from the **University of Utah**.

**Tolero Pharmaceuticals** has its roots in the **Huntsman Cancer Institute**. In 2016, Tolero Pharmaceuticals was acquired by Sumitomo Dainippon Pharma Co., for \$780 million – the largest life sciences transaction in Utah's history.

**Recursion Pharmaceuticals** was spun-off from the **University of Utah**. The company has a mission of developing 100 drugs in 10 years. To do this, they are disrupting drug development with a platform that incorporates artificial intelligence and machine learning to quickly and affordably identify potential new drugs for rare and orphan diseases. Recursion has received multiple NIH grants, which it has used to de-risk the platform and attract private venture capital.

There are also start-ups that have chosen to relocate or establish companies in Utah because of the thriving business environment and culture of innovation.

In 2015, **Clene Nanomedicine** relocated from California with a new vision for a pharmaceutical future using therapeutic elements in clean, new nanoforms.

In 2016, **PolarityTE** decided to build their start-up in Utah with the goal of being the first company to truly deliver regenerative medicine into clinical practice and fulfill the long unmet promise of tissue engineering.





## Successful mergers and acquisitions fueling growth

Over the past decade, many Utah life sciences start-ups have been successful in attracting private capital. This capital influx has fueled medical innovation and the rise of many new companies.

### FINANCING TRANSACTIONS

Company	Amount (millions)	Year
HealthEquity	\$90	2016
Health Catalyst	70	2016
Recursion Pharmaceuticals	60	2017
Collective Medical Technology	47.5	2016
Great Basin Scientific	42	2015
Sera Prognostics	40	2017
Lipocine	30	2015
Clene Nanomedicine	27	2015
Weave Communications	23	2016
Silervue	18	2016
Clene Nanomedicine	17	2016
LineaGen	16	2015
Owlet Baby Care	15	2016
Recursion Pharmaceuticals	15	2016
Amedica	11	2016
Wasatch Microfluidics	10	2016
Vital Access	10	2015
Artemis Health	10	2016

### MERGER AND ACQUISITION TRANSACTIONS

Target	Acquirer	Amount (millions)	Year
Varex Imaging	Spin-off from Varian	\$1,036	2017
Tolero Pharmaceuticals	Sumitomo Dainippon Pharma Co.	780	2016
Assurex Health	Myriad Genetics	410	2016
VISTA Staffing Solutions, Inc.	EmCare Inc.	123	2015
DFINE	Merit Medical	98	2016
Veridicus Holdings	Magellan Health	75	2016
Sividion Diagnostics	Myriad Genetics	53	2016
Catheter Connections / Argon Medical Devices	Merit Medical	48	2017
Hale Nani Investors	Avalon Health Care Group	45	2016
LSK BioPartners	HLB Co.,LTD.	33	2015
American HealthCare Lending	Prosper Marketplace	21	2015
HeRO Graft Product Line	Merit Medical	19	2016
Adpay	Ancestry.com	16	2016
Megadyne	J&J / Ethicon	N/A	2017
Distal Access (gynecology & urology)	Boston Scientific	N/A	2016
Olive Medical	J&J - Depuy Synthes	N/A	2015
Nelson Labs	Sterigenics International	N/A	2016

*“Funding the NIH is important not only to universities, but also to companies like us to de-risk technologies in order to secure private financing. A small grant from the government goes a long way to building an innovation economy.”*



## Q&A

### Recursion’s Chris Gibson: Life sciences start-ups can go far, quickly, in Utah

**Chris Gibson, PhD**  
Co-founder and CEO of  
Recursion Pharmaceuticals

.....

The conventional path to drug discovery can take 10 to 15 years and cost more than \$1 billion. This is too slow and costly for the 7,000+ different rare diseases that affect an estimated 30 million Americans. To efficiently discover therapies for these rare diseases, as well as more common indications, such as inflammation and diseases of aging, Recursion Pharmaceuticals is doing “biology at scale” - disrupting drug discovery with advanced experimental biology, automation, and artificial intelligence. Recursion’s goal is 100 drugs by 2025.

#### What is the innovation behind Recursion?

For 60 years, the drug discovery industry has seen a decline in R&D efficiency and an increase in costs. We want to treat more patients - faster - by dramatically decreasing the time and costs traditionally associated with drug discovery. To do this, we leverage artificial intelligence approaches, including machine learning, that are faster and better at analyzing and tracking cellular changes induced by specific biological perturbations. For example, diseased cells are often misshapen and abnormal in appearance and function. Looking at hundreds of parameters and tens of thousands of human cells per disease, we test the ability of drugs to restore diseased cells to a normal appearance, which is often a good predictor of a drug’s success or failure. We also work with many drugs that passed early safety trials but never made it to market, which reduces time and costs compared to starting from scratch.

#### Why is the life sciences industry important to Utah?

The life sciences industry brings high-paying jobs and highly educated people to Utah, helping to build a high-functioning and prosperous state economy. The industry also improves the visibility and prominence of the state. We want to help build Utah’s reputation for its significant contributions to society, including many life-saving, health-improving innovations.



.....

**YEAR FOUNDED: 2013**  
**NUMBER OF EMPLOYEES: 80**

[www.recursionpharma.com](http://www.recursionpharma.com)  
 Salt Lake City

Recursion Pharmaceuticals is an emerging biotechnology company that combines experimental biology and bioinformatics with artificial intelligence to efficiently identify treatments for any disease which can be modeled at the cellular level. Recursion probes rich data from high-throughput screens for many indications, including rare disease, aging, inflammation, infectious disease, and oncology.

#### PRODUCTS IN DEVELOPMENT

Tempol for Cerebral Cavernous Malformations, Mometasone for Ataxia-Telangiectasia, and dozens of discovery stage assets across rare disease and inflammation.

#### Why is being in Utah important to your company?

Utah offers great quality of life for employees and the ability to grow businesses faster with less risk than many other states. We have great access to the outdoors, including spectacular mountains, facilitating an active and healthy lifestyle. Utah's cost of living is low compared to biotech hubs in California and Massachusetts. Transportation is readily accessible, including direct flights to all major US cities, which is important for fundraising and business development. The state also offers supportive policies and an environment conducive to businesses.

#### What can be done to support the innovation industry in Utah?

We need to improve the air quality. We are at a disadvantage due to geography, so we need to improve public transportation and focus on the economic development of clean innovation industries, like life sciences and tech. We should continue to invest in education, especially in software engineering and data science, the jobs of today and the future. We need to support, and even increase, federal funding. Recursion has received \$4 million in NIH Small Business Innovation Research grants, which have helped us de-risk our technology and secure \$85 million in private venture financing. A small investment from the government and a supportive Utah business environment has helped us go far, quickly.





# EDUCATION & TALENT DEVELOPMENT

## Utah is training the next generation of life sciences leaders and strengthening the workforce

Education is one of the state's highest priorities. Utah is home to 12 major colleges and universities, providing an excellent talent pipeline of over 212,000 students. Utah boasts a number of community and technical colleges that offer a solid pathway to careers in the life sciences. Utah has an educated workforce. More than 91 percent of the population 25 years of age or over has a high school diploma and more than 30 percent have a bachelor's degree. Bachelor's and graduate awards grew by 31.3 percent over the last five years.



### Utah's Science, Technology, Engineering and Math Action Center

Utah's Science, Technology, Engineering, and Math (STEM) Action Center, prioritizes STEM education with a focus on supporting Utah's workforce of the future. STEM programs focus on addressing issues that support outreach, recruitment, advocacy, retention, and student achievement. It also aligns technology and innovation with industry needs and higher education initiatives to ensure development of the future workforce.



### Medical Innovations Pathways Program

The Medical Innovations Pathways (MIP) program was launched in 2016 through a strong partnership with the Utah Governor's Office of Economic Development, Department of Workforce Services, State Board of Education, local school districts, and industry to help meet the Utah life sciences industry's growing demand for skilled professionals. This program provides high school students with the training needed to open the door to incredible career opportunities with many of Utah's life sciences companies. Students who complete the program receive a Medical Innovations Certificate and are guaranteed a job interview with industry partner companies. Students who go to work for these companies have the opportunity to receive tuition reimbursement for college. The industry is also working with Utah's Department of Workforce Services to train and employ adult learners in medical device manufacturing.



### Invest in You Too

The Utah Department of Workforce Services is helping families break the cycle of poverty and build successful career pathways in the life sciences through its "Invest in You Too" program. The 13-week program at Salt Lake Community College (SLCC) is specifically focused on preparing single mothers for jobs in medical device manufacturing. In addition to SLCC courses, Workforce Services case managers and therapists provide intensive life skills training. These life skills classes cover topics such as work readiness, success in the workplace and stress management. These adult learners take coursework at SLCC that provides them with the training and skills needed to gain employment with leading companies in the state, such as BioFire Diagnostics, BD, Edwards Lifesciences, Merit Medical, Stryker, and others.



## BioInnovations Gateway

The **BioInnovations Gateway (BiG)** life sciences incubator, a USTAR—Granite School District partnership—helps start-up companies grow their ideas by offering valuable resources at a critical time in their development. BiG's mission is to facilitate innovation in Utah's life sciences industry by providing high-quality research facilities, office space, mentoring, and access to funding programs. The BiG program has successfully developed a model to lower the cost of launching biotech and medical device start-ups. BiG is dedicated to reducing the time and money needed for start-up companies to prove their technology, build their team, connect with experts, and attract capital.

BiG is also a one-of-a-kind academic training ground where students develop creative thinking and biotechnology work skills in a product-driven environment. Resident companies are not manufacturing for sale, but rather are involved in research, product development, validation, and preclinical testing, which allows BiG to provide this unique opportunity for student training. Residents of BiG, in partnership with Granite School District, are committed to the training mission of the facility and are asked to provide technical and/or business seminars. They are also encouraged to host appropriately trained students as interns. This provides students with hands-on, real-world experience as well as networking opportunities with industry experts.



## Salt Lake Community College

Salt Lake Community College (SLCC) Workforce Training and Continuing Education offers a **Medical Device Manufacturing: Processes and Practices** certificate program. This certificate program includes a series of courses that focus on specific competencies identified by the medical device industry. The program covers the basic core knowledge and skills required for entry-level positions in the medical device industry.

The life sciences industry, regulated by the Food and Drug Administration (FDA), must ensure their products are safe and effective for consumers. SLCC's program offers an in-depth education in basic manufacturing, FDA regulations, quality systems and good documentation and manufacturing practices.

SLCC also offers a competency-based AS degree in **Biotechnology**. This program provides students with the knowledge and training needed to pursue careers in the life sciences industry, particularly in laboratory testing, diagnostics, pharmaceutical research and development, and personalized medicine. Students gain skills and experience in DNA manipulation and analysis, expression and purification of proteins, cell culture, and enzyme and antibody assays. The program is well suited to professional development of potential and existing employees, as a Certificate of Proficiency stacks into the AS, which transfers to **Utah Valley University's** BS in Biotechnology.



## University of Utah's Center for Medical Innovation

Fueled by a collaborative effort, the University of Utah's one-of-a-kind **Center for Medical Innovation (CMI)** combines formal education programs, faculty and student project development, and support and facilitation of device development and commercialization. The center is developing a one-stop-shop environment that assists both the novice and experienced innovator through ideation, concept generation, intellectual property, market analysis, prototyping and testing, business plan development, and commercialization. The companies started from this program are creating new skilled jobs, and putting Utah on the map as an epicenter of innovation.



## Lassonde Studios

**Lassonde Studios** is a unique, new five-story home for student entrepreneurs and innovators at the University of Utah. The facility, which opened in August 2016, is the place where students from any major or background can "Live. Create. Launch." Students can apply to be one of the "Lassonde 400" residents. All students at the University of Utah are welcome to use the Neeleman Hangar, which is the 20,000-square-foot innovation space on the main floor to connect, test ideas, build prototypes, launch companies, and learn by doing. Above are four floors of themed residential space. The building and diverse engagement opportunities are managed by the Lassonde Entrepreneur Institute.

# Q&A

## Interview *with* John Langell, MD, PhD, MPH

Executive Director of the Center for Medical innovation at the University of Utah's College of Health Sciences



*“CMI’s multidisciplinary education to advance medical device innovation has created life-saving medical products, sustainable companies, and highly trained graduates.”*



.....

10 North 1900 East, Eccles RM 15  
Salt Lake City, Utah 84132

[uofuhealth.utah.edu/  
center-for-medical-innovation/](http://uofuhealth.utah.edu/center-for-medical-innovation/)

The Center's mission is fulfilled through formal education programs, faculty and student project development, and support and facilitation of device development and commercialization. The Center is planning to become a one-stop-shop environment that assists both the novice and experienced innovator through ideation, concept generation, intellectual property, market analysis, prototyping and testing, business plan development, and commercialization.

### Why is the Center for Medical Innovation (CMI) important for students and medical innovation?

To innovate in the health care space, especially medical device development, requires collaboration across many industries and must bring together people with diverse knowledge and experience. CMI partners with faculty from the sciences, engineering, business, law, and arts to create programs that educate students on how to identify medical needs to develop a product that has both clinical and business value. The products developed at the CMI can improve people's health, deliver better health care, and decrease medical costs. The companies started from our program are creating new skilled jobs, and putting Utah on the map as an epicenter of life sciences innovation. The graduates from our programs receive an incomparable education and experience that is not taught to this level at any other institution, and they are becoming the next generation of life sciences leaders.

### What is unique about the Bench to Bedside Program and how does it add value to Utah's Life Sciences Ecosystem?

The Bench to Beside program is another program at the University of Utah that brings interdisciplinary teams of students, faculty and industry leaders together to innovate, create and translate important new medical technologies to the market place. The seven-year old program has developed over 180 new technologies, filed 111 patents and started over 50 sustainable companies. Perhaps more importantly it has trained more than 1,000 students in the program's unique innovation and entrepreneurship approaches. In 2017, students in the program unveiled a catheter technology to show real-time imaging of a beating heart, a new speculum designed by women for women to improve the gynecological experience and a wearable patch to transmit patient vital signs to their health care provider in support of the hospital-at-home concept.<sup>1</sup>

### What is the BioVentures program?

The BioVentures program is a two-semester program to provide a detailed guide to the life sciences product development process, from conception to commercialization. The CMI partnered with The University of Utah **David Eccles School of Business Executive Education** to design the program. The board that created the program included C-level executives from **Bard, BD, Edwards Lifesciences and Stryker**. The goal is to offer students real-world knowledge in order to make innovative improvements in health care delivery.<sup>2</sup>

<sup>1</sup> <https://www.prnewswire.com/news-releases/university-of-utah-center-for-medical-innovations-bench-to-bedside-program-completes-7th-year-with-presentation-of-39-new-medical-technologies-300452233.html>

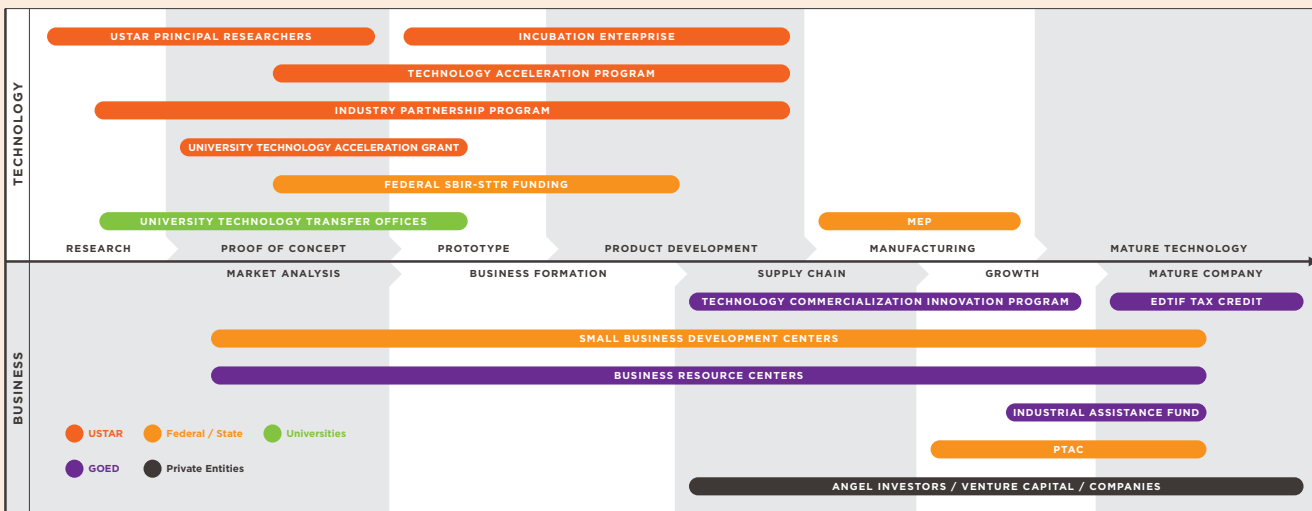
<sup>2</sup> <http://eccles.utah.edu/news/new-u-lifescience-product-development-program/>

# FOSTERING INNOVATION & ECONOMIC DEVELOPMENT

## Utah: The place to be for life sciences

The Utah life sciences industry benefits from the state’s strong business environment. Forbes Magazine has recognized Utah as “The Best State for Business & Careers” six of the past seven years. In 2017, the Tax Foundation ranked Utah’s Total Tax Climate as the 9th best in the nation. Since 2011, Utah has eliminated or

modified nearly 400 regulations to ease the burdens placed on business. Utah provides a variety of important resources, incentives, and novel programs that help companies grow from concept to commercialization and beyond (see USTAR chart below).



**The Utah Science Technology and Research Initiative (USTAR)** was established to diversify and catalyze the growth of Utah’s innovation economy. USTAR conducts its technology-based economic development mission through a diverse portfolio of programs and services focused in three areas: competitive grant programs, technology entrepreneurship services, and principal researchers. USTAR supports entrepreneurs, university researchers, and industry partnerships to build and strengthen the innovation ecosystem in Utah.

Competitive grants provide funding for entrepreneurs and researchers at critical stages in technology development. USTAR also provides services through its **Incubation Enterprise** and satellite offices. This includes incubation programs for start-up businesses and assistance in accessing Federal SBIR/STTR programs, as well as access to specialized equipment, training, and mentoring for technology entrepreneurs across the State.



Utah Governor's Office of  
Economic Development  
BUSINESS • TOURISM • FILM

## The Utah Governor's Office of Economic Development

The charter of the Utah Governor's Office of Economic Development (GOED) is based on Governor Herbert's commitment to statewide economic development. The state's economic vision is that Utah will lead the nation in economic performance and be recognized as a premier global business environment and tourist destination. The Utah GOED provides financial incentives to qualifying companies for creating new, high-paying jobs in Utah. These include corporate recruitment incentives and tax credits, such as the **Economic Development Tax Increment Financing (EDTIF)**. Special consideration is given to companies within Utah's economic clusters, including life sciences.

The **EDTIF** credit provides tax credits to attract new commercial business and new jobs to companies that are looking to expand existing businesses within the state or relocate their business from another state. The EDTIF credit has provided a positive incentive towards the growth of the life sciences industry in the state including:

- In March 2017, **Biomerics** and **GOED** announced that the medical device plastics manufacturer will build its corporate headquarters in Utah, adding up to 380 jobs to the state and an estimated \$38.5 million in capital investment. Biomerics specializes in the design, development and production of

medical devices for diagnostics and interventional procedures for the cardiovascular, structural heart, cardiac rhythm management, and vascular access markets.

- In October 2017, **GOED** announced **Stryker's** expansion in the state, creating up to 540 additional jobs, generating \$16.9 million in new state revenue and an estimated \$100 million in capital investment. This expansion will add orthopedic, spinal, and endoscopy product manufacturing to their current manufacture of neurovascular technologies.

## State Technology Commercialization Grant Programs

The State of Utah offers a number of competitive technology commercialization grant programs. **USTAR's Technology Acceleration Program (TAP)** offers non-dilutive funding for private sector entrepreneurs in the early stages of technology development (TRL 3-5) in targeted technology sectors. **GOED's Technology Commercialization and Innovation Program (TCIP)** also offers non-dilutive funding to private sector entrepreneurs with slightly later-stage technologies (TRL 6-9) to bring their innovations to market. **USTAR offers University Technology Accelerations Grants (UTAG)** that focus on technologies being developed in a university setting which have significant commercialization potential but which need additional development before they can be spun-off or licensed. Between these three grant





programs, more than \$12 million of non-dilutive funding is available annually. Although TAP, TCIP, and UTAG grants target multiple technology clusters, the majority of these grants are currently awarded to life sciences companies and researchers.



### The University of Utah Manufacturing Extension Partnership Center

University of Utah’s Manufacturing Extension Partnership (MEP) Center assists Utah manufacturing companies with services and consulting to increase their global competitiveness. MEP helps with staff training, certifications, manufacturing best-practices, product/process innovation, troubleshooting, and new market growth. MEP’s funding partners include GOED and the federal government’s National Institute of Standards and Technology (NIST)-MEP network.



### Economic Development Corporation of Utah

The Economic Development Corporation of Utah (edcUtah), partially funded by the state, is the business-recruiting arm of Utah. Many of the

businesses looking to relocate to the state are guided through the process by edcUtah staff. Thus, edcUtah plays a vital role in accelerating the growth of the life sciences industry.



### Angel Investment

The Salt Lake City Angels and Park City Angels are associations of accredited angel investors based in Salt Lake City and Park City, Utah, respectively. These investors share an interest in supporting early-stage, high-growth companies. The Salt Lake City Angels primarily invest in the Intermountain West and are interested in opportunities in technology, biotechnology, and consumer products. Over 80 percent of Park City Angels’ investments have been Utah-based, with investments in more than 15 life sciences companies in the state. These angel investors maintain an active interest in their invested companies, contributing to the growth of companies by participating on boards, providing active mentorship, and contributing through follow-on funding rounds.

# Q&A

## With serial entrepreneur, Shawn Fojtik: Why Utah for life sciences?

**Shawn Fojtik**  
CEO, Control Medical Technology and Distal Access



### Why did you decide to start your company in Utah?

I moved here 25 years ago and discovered that Utah has a vibrant and value-added medical device community that includes excellent caregivers, engineers, and professional support.

### Why is being in Utah important to your company?

Utah has a strong commitment to patient care and we can get more done for a given (venture) dollar.

### What do you think Utah does better/best?

Return on investment.

### What do you think Utah does well in supporting the life sciences industry?

Utah's overall governmental support programs (TCIP, BiG, USTAR, etc.) and teams build a positive environment for entrepreneurs interested in medical innovation. Administration costs to any start-up is the least-efficient money spent. Utah's support from lower cost office space and shared services at BiG to providing matching fund grants, helps a new company, in effect, shrink the amount of dollars that goes to administration, and focus dollars on innovation, prototyping, and commercialization.

### What is the biggest challenge for the Utah life sciences industry?

Medical device commercialization is an apprentice-like business. Future leaders need mentors that allow developing talent to see and participate in how devices are commercialized.

### How would you define or describe the Utah life sciences ecosystem?

Strong ecosystem and talent base with high-growth potential.

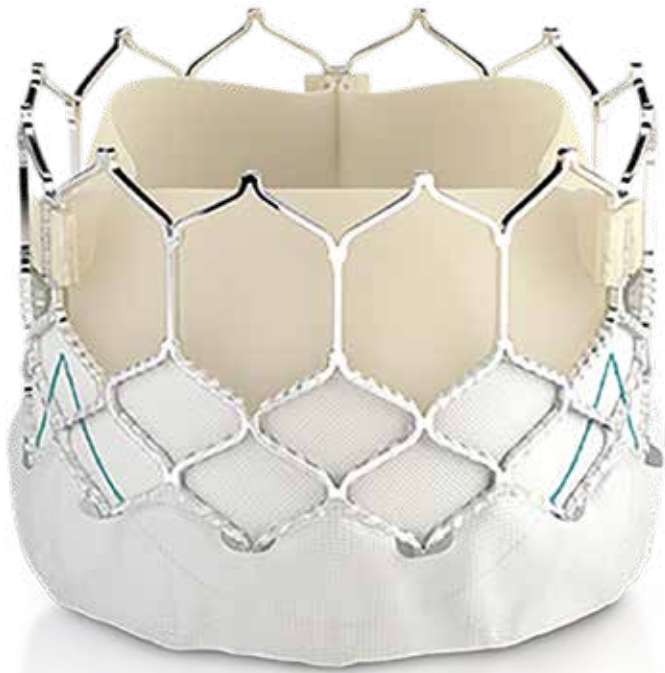
### How do you innovate?

We look for patient safety, procedural effectiveness, and/or financial gaps. Often, we draft behind more complex movements in the space like atrial fibrillation treatment or complex stent-blood clot retrievers, with a simple technology to make those procedures safer, faster, better, and/or cost less.

### What are your marketed products / products in development?

- Aspire Mechanical Thrombectomy System (blood clot removal/mechanical aspirator)
- SPINR guidewire controller (Merit Medical)
- Resectr uterine polypectomy (Boston Scientific)
- Impellr
- Shavr Tissue resector
- Pilot bone access
- Bone marrow harvest & Biopsy
- Transit XO Score focal-force angioplasty
- GPX Gel-Particle Embolics





**MEDICAL DEVICE:**  
Edwards SAPIEN 3 valve

**COMPANY:**  
Edwards Lifesciences



**MEDICAL DEVICE:**  
V. Mueller™ and Snowden-Pencer™  
open instrumentation

**COMPANY:**  
BD

# ABOUT BIOUTAH

.....

## BioUtah is focused on growing Utah's life sciences industry

BioUtah was launched in 2012 to elevate the stature and influence of Utah's life sciences industry on the national and global stage. The organization serves Utah's life sciences community through networking, advocacy, and education programs.

### Our Mission

Foster a thriving, innovative, life sciences ecosystem in the State of Utah

### Our Vision

To grow Utah's life sciences sector into a global health care innovation leader

### Our Goals

- Create rewarding jobs (attract and develop talent)
- Increase access to public and private capital
- Strengthen Utah's competitiveness through public policy and incentives
- Lead public policy efforts for the life sciences ecosystem



**To Become a BioUtah Member:**  
visit [bioutah.org/member/newmemberapp](http://bioutah.org/member/newmemberapp)

## BioUtah's Membership

4DQC  
 6S Medical LLC  
 AdvancedCFO  
 Airway Designs  
 Alucent Biomedical, Inc.  
 American West Analytical Labs  
 Ancestry  
 APL Capital Advisors  
 Apollo Medical Extrusion  
 Applied Biosensors  
 Asserta Health  
 AssurX, Inc.  
 AstraZeneca  
 ATL Technology  
 Ballard Spahr  
 Bard Access Systems  
 Bastion Biologics  
 BD Medical  
 BioFire Diagnostics LLC  
 BioInnovations Gateway  
 BioMeDx Advisors, LLC  
 Biomerics  
 BioPharm Laboratories LLC  
 Blackrock NeuroMed, LLC  
 Brinks Gilson & Lione  
 BYU Technology Transfer Office  
 CibusDx  
 ClinCapture  
 Clinical Innovations  
 CoNextions Medical  
 Control Medical  
 Corporation  
 Clene Nanomedicine, Inc.  
 Dinesh and Kalpana Patel Foundation  
 DiscGenics  
 Diversified Insurance Group  
 Durham Jones & Pinegar  
 Dynatronics Corporation  
 Echelon Biosciences, Inc.  
 E-Counseling Essentials  
 Edwards Lifesciences  
 Elute, Inc.  
 Esplin Organic Solutions  
 Effectus LLC  
 Eigengene, Inc.  
 Executech  
 Fabian & Clendenin  
 Fluidx  
 GE Healthcare Surgery  
 Genentech  
 Havilah Communications  
 Health Line International Corporation  
 Hennessy Group, Inc.  
 InClincia, Inc.  
 InnovaBio & STUDENTfacturED  
 Intermountain Healthcare  
 iVeena Delivery Systems Inc.  
 Johnson & Johnson  
 Kleinfeld Kaplan and Becker LLP  
 Knudra Transgenics  
 Kosmo Technologies  
 The KPI System  
 Lazarus Medical Technologies  
 Lefavi Wealth Management  
 Leonhardt's Launchpads Utah  
 Lineagen, Inc.  
 Marker Medical  
 MasterControl Inc.  
 Merck  
 Merit Medical Systems, Inc.  
 Michael Best & Friedrich  
 Morgan Stanley  
 Myriad Genetics  
 Navigen, Inc.  
 Nelson Laboratories, LLC  
 Nexus Spine LLC  
 Novartis  
 Novaventure Fund Ltd  
 Novo Nordisk  
 NuView Life Sciences  
 Park City Angels  
 Pathwise  
 PEEL Therapeutics, Inc.  
 PenBlade, Inc.  
 Pfizer  
 Phil Triolo and Associates LC  
 PhotoPharmics  
 PhRMA  
 PolarityTE  
 Pozzetta Scientific  
 Progenitor Life Sciences  
 ProLung  
 PROTECS  
 Recursion Pharmaceuticals  
 Rosivo Inc  
 Saarland Economic Promotion  
 Sanus Biotech  
 Sera Prognostics  
 Signpath Pharma  
 Simplicity Airway  
 SMARTAX Pro  
 Snell & Wilmer, LLP  
 Sports Medicine Research and  
 Testing Lab  
 Square 1 Bank, a Division of Pacific  
 Western Bank  
 Squire & Company, P.C.  
 Stoel Rives LLP  
 StreamDx  
 Stryker  
 Surgical Frontiers, LLC  
 Synthetic Biodesign, LLC  
 T3S Technologies, Inc.  
 Thermimage, Inc.  
 Thermofisher Scientific  
 Thunder Biotech  
 Tolero Pharmaceuticals, Inc  
 Turner MedTech, Inc  
 UCB  
 UniConnect LC  
 University of Utah  
 University of Utah, Professional  
 Master of Science and Technology  
 University of Utah Technology &  
 Venture Commercialization  
 USTAR  
 Varex Imaging Corporation  
 Vertex Pharmaceuticals  
 Vestan, Inc.  
 XableCath  
 ZIEN Medical Technologies  
 Zions Bank

.....

**Our membership continues to grow!**

To see new members, visit [bioutah.org/members](http://bioutah.org/members)



**BIOUTAH**



# BioUtah Board of Directors

## 2017-2018

### *Chair*

.....

**Richard Ji**  
BD

### *Vice Chair*

.....

**Rob Etherington**  
President and Chief Executive Officer, Clene Nanomedicine

### *Directors*

.....

**George Hamilton**  
Vice President Business Development, Intermountain Healthcare

**John Knorpp**  
Chief Regulatory Affairs Officer, Merit Medical Systems, Inc.

**John Langell, MD, PhD, MPH**  
Chief of General Surgery, George E. Wahlen VA Medical Center  
Executive Director, CMI, University of Utah

**Dirksen Lehman**  
Corporate Vice President, Public Affairs, Edwards Lifesciences

**Kimberly Linthicum**  
Vice President of Government Affairs, Myriad Genetics

**Jay Muse**  
Operating Partner, MedVenture Holdings

**Dinesh Patel, PhD, BE**  
Managing Partner, Patel Family Investments

**Tara Saucedo**  
Director of Operations, Stryker

**Brandi Simpson**  
Chief Executive Officer, Navigen

.....

**For a current list of board members,**  
visit [bioutah.org/groups/grouproster/board-of-directors-3](http://bioutah.org/groups/grouproster/board-of-directors-3)



## RECOGNITION

Life sciences economic data  
by the Kem C. Gardner Policy Institute



Content by Little Dog Communications



Design by Utah Creative



History timeline information from The Leonardo





BioUtah is an independent, non-profit 501(c)(6) trade association serving the life sciences community in the state of Utah. We are composed of individuals, public and private organizations, and state and academic institutions focused on improving health and wellness through the delivery of innovative technologies and services. Together, we create an ecosystem that fosters collaboration, promotes innovation, and accelerates health care advances.

We are passionately focused on advancing and growing Utah's life sciences industry by promoting new legislative initiatives and fostering the development of robust regional research, development, manufacturing, and testing capabilities along with a full spectrum of commercialization support resources.

Utah's life sciences industry is a key driver of Utah's economy. BioUtah is committed to growing Utah into a global leader in the life sciences sector in order to improve health care delivery, promote job creation, and economic development.

**801. 867.4061 | [kelly@bioutah.com](mailto:kelly@bioutah.com) | [www.bioutah.org](http://www.bioutah.org)**