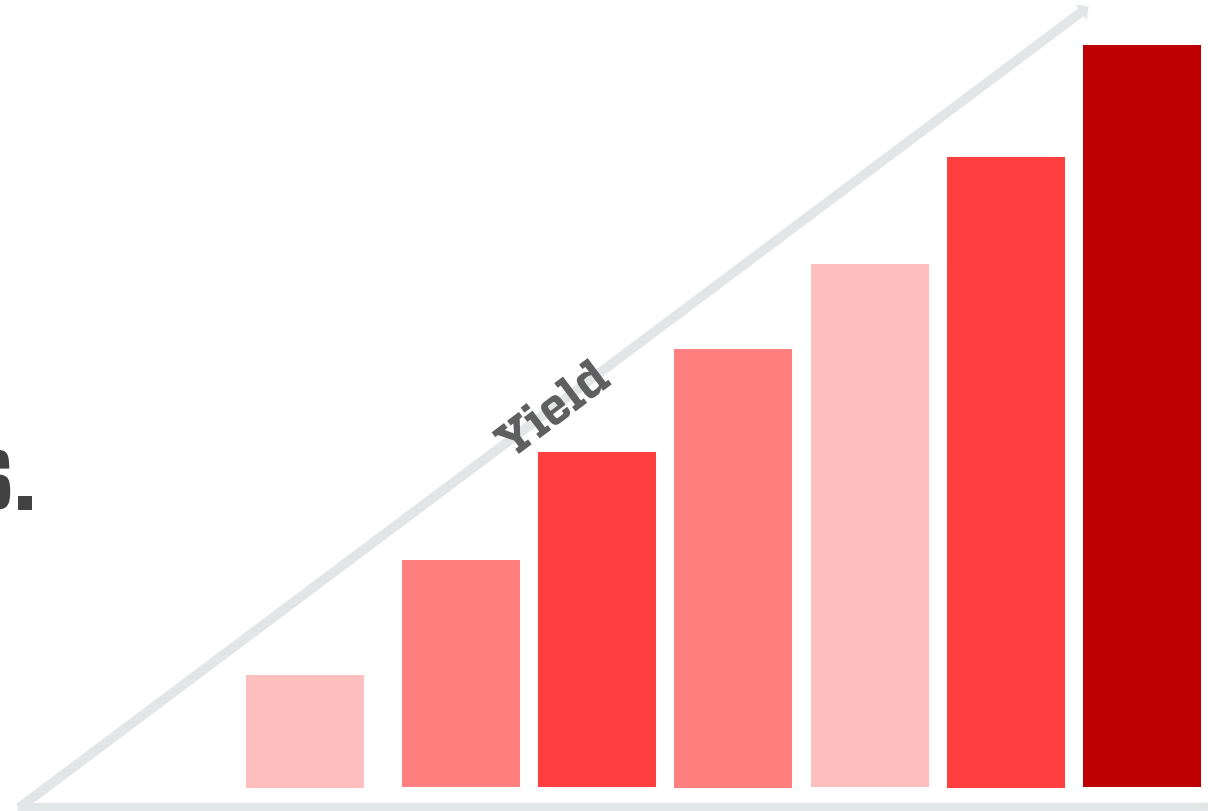




**Utah Board of Higher Education**  
**IMPACTS OF RESEARCH**  
**University of Utah**  
**President Taylor Randall**  
**November 21, 2024**

# Research Investments Yield....

- **HUMAN CAPITAL.**
- **NATIONAL  
COMPETITIVENESS.**
- **ECONOMIC  
DEVELOPMENT.**



# STEM Workforce Success.

2016 2021

Absolute growth, '16-'21    Percent growth, '16-'21

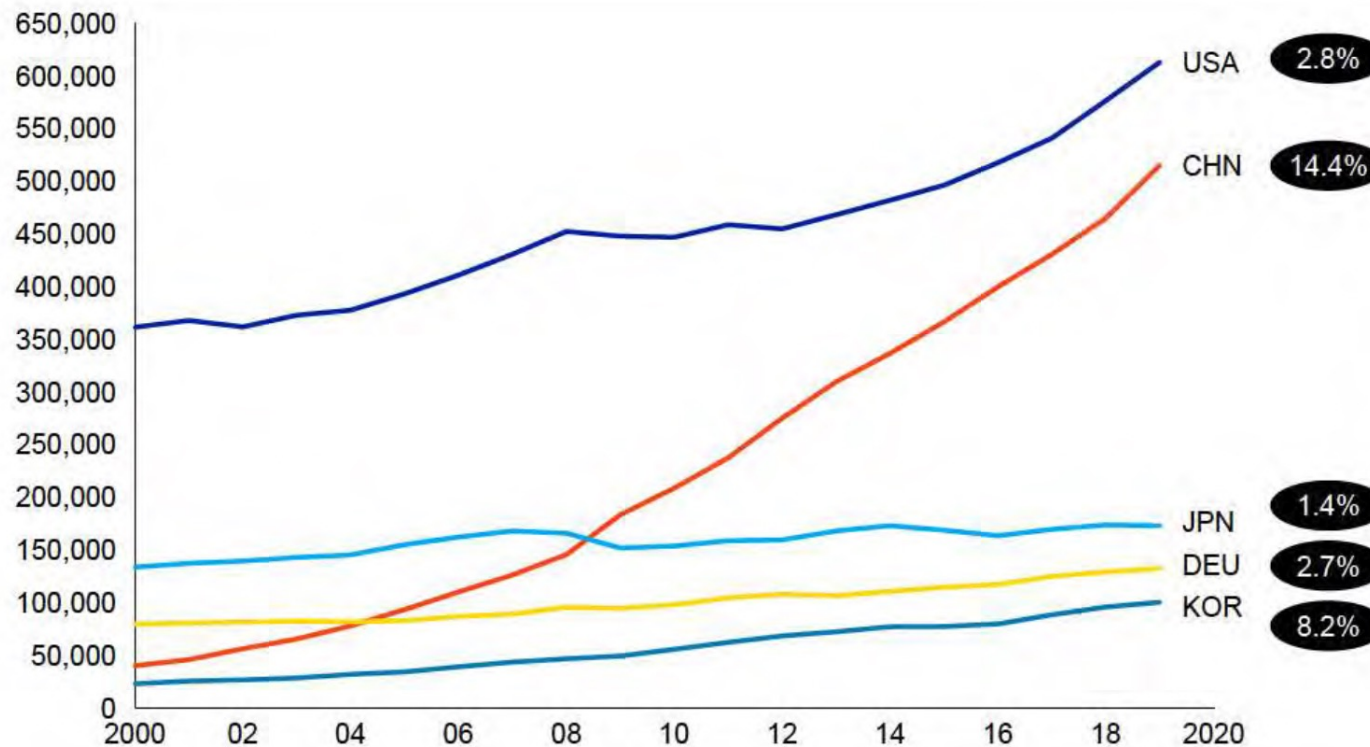
STATE	STEM completions '21, thousands	STEM completions per 1,000 pop. '21	RANK	Change, #	State rank	CAGR	State rank
California	59.1 73.2	1.9	23	14701	1	4.4%	16
New York	40.6 49.3	2.5	9	9161	2	4.1%	17
Texas	37.2 44.3	1.7	38	7120	3	3.6%	21
Massachusetts	21.6 28.2	4.2	3	6647	4	5.5%	8
Florida	23.2 28.8	1.5	40	5560	5	4.4%	15
<b>Utah</b>	7.6 13.1	<b>4.5</b>	<b>2</b>	<b>5506</b>	<b>6</b>	<b>11.6%</b>	<b>1</b>
Georgia	14.2 19.3	1.9	22	5109	7	6.3%	4
Maryland	14.1 18.2	3.1	5	4084	8	5.2%	9
Pennsylvania	28.4 32.0	2.5	10	3587	9	2.4%	34
Washington	9.9 13.1	1.9	25	3164	10	5.7%	7
Virginia	15.3 17.5	2.1	16	2256	17	2.8%	30
Illinois	22.5 23.2	1.8	30	679	28	0.6%	45

Source: National Center for Education Statistics.

# National Competitiveness.

XX% R&D CAGR, %, 2000-2019

R&D spend among top 5 OECD countries, \$ million



## Key Takeaways

Although the US still leads OECD countries in R&D spend, **significant innovation growth in Asia** is changing the global landscape

- Between 2000-2019, **China's R&D CAGR was 14.4% vs. 2.8% for the US**
- China's 2019 R&D spend was 13x 2000 levels (vs. 1.7x for US)

**China has made strides in R&D on innovative technologies**

- Patent applications in **China** outpace the **US** by **~2.7x**
- **China** leads the **United States** in **37 of 44 advanced technologies** based on quality and quantity of academic publications

Source: OECD, World Intellectual Property Organization, Australian Strategic Policy Institute

# BioTech U Companies.



Recursion®

**ARUP**®  
LABORATORIES

 **Cephalon**®

  
**Echelon**  
Biosciences

 **Myriad** genetics

BIO  FIRE® >>>



# Faculty Economics.

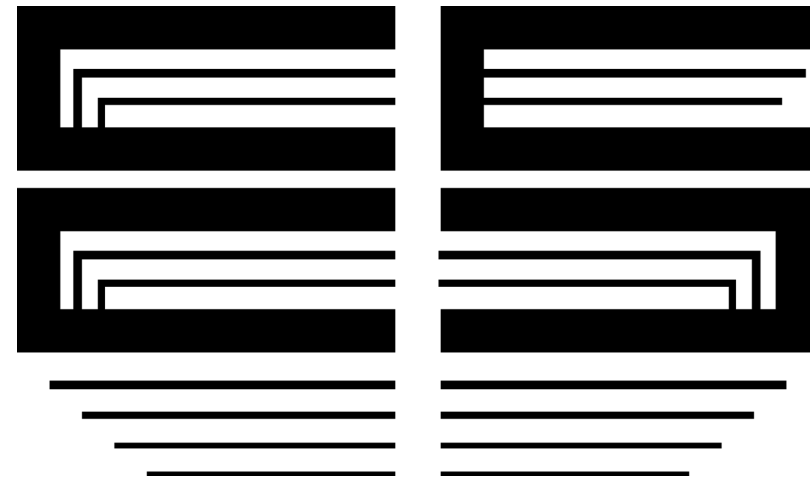
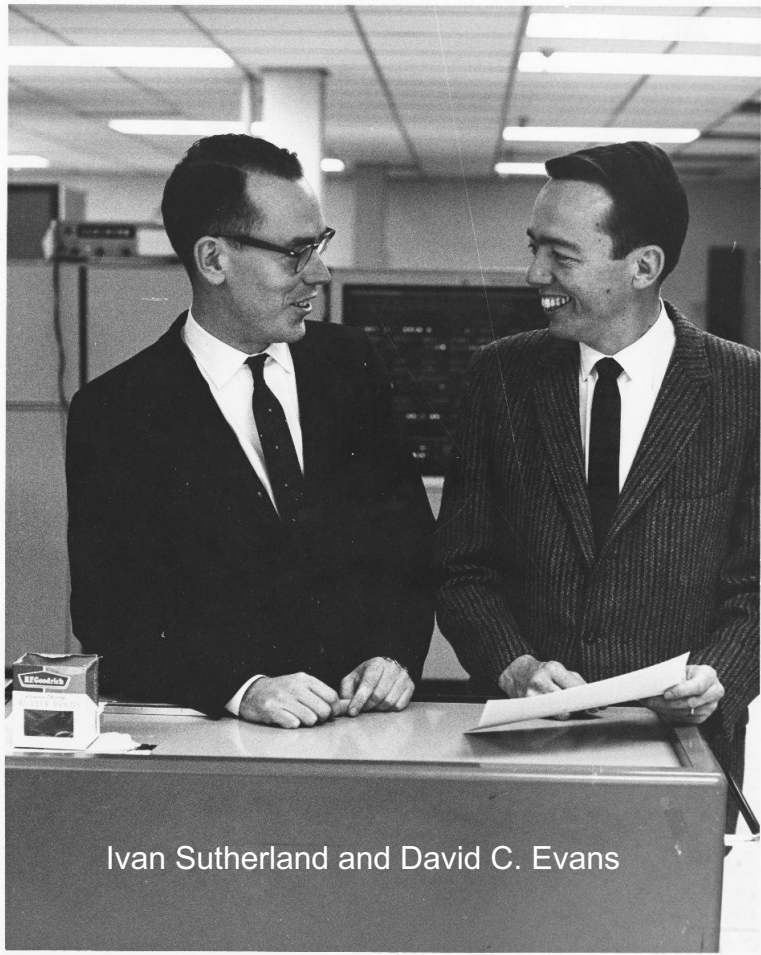
	TEACHING FACULTY	RESEARCH FACULTY
Salary:*	1x	2x
Courses Taught:	8	4
Teaching Productivity:	1	1/3 - 1/4
Research/Commercialization Grants:	\$0 per year	\$500K - \$1M per year
Graduate Students Funded:	0 per year	2 per year
Overall Economic Effect:**	~\$265,000	~\$1M - \$1.5M

\* Salary numbers may vary, multipliers are approximate.

\*\*Source: Kem C. Gardner Policy Institute Analysis of student, research and commercialization impact.

**WHAT DO LABS CREATE?**

# Evans & Sutherland.

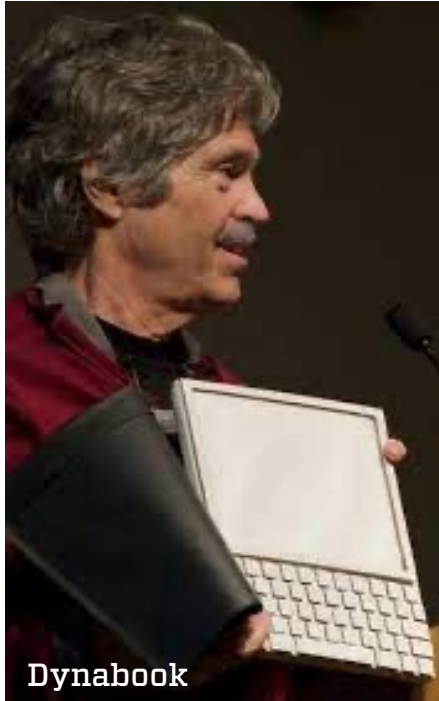


First Evans & Sutherland graphic logo mark

Founded in 1968, by David C. Evans and Ivan Sutherland, professors in the Computer Science Department at the University of Utah, who were **pioneers in computer graphics technology.**



# Alan Kay.



Alan Kay was a Ph.D. student in 1969 in the Evans and Sutherland lab. He is best known for his pioneering work on object-oriented programming and windowed **graphical user interface (GUI) design**. He went on to be influential at: Xerox PARC, Apple, Atari, Disney Imagineering, HP Labs.

# New Companies.



EVANS & SUTHERLAND

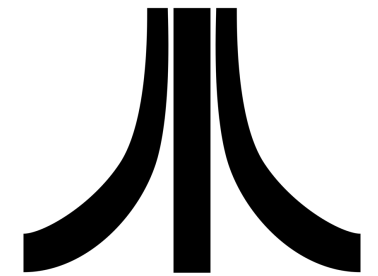


*SiliconGraphics*  
*Computer Systems*

WordPerfect  
CORPORATION



Adobe



ATARI

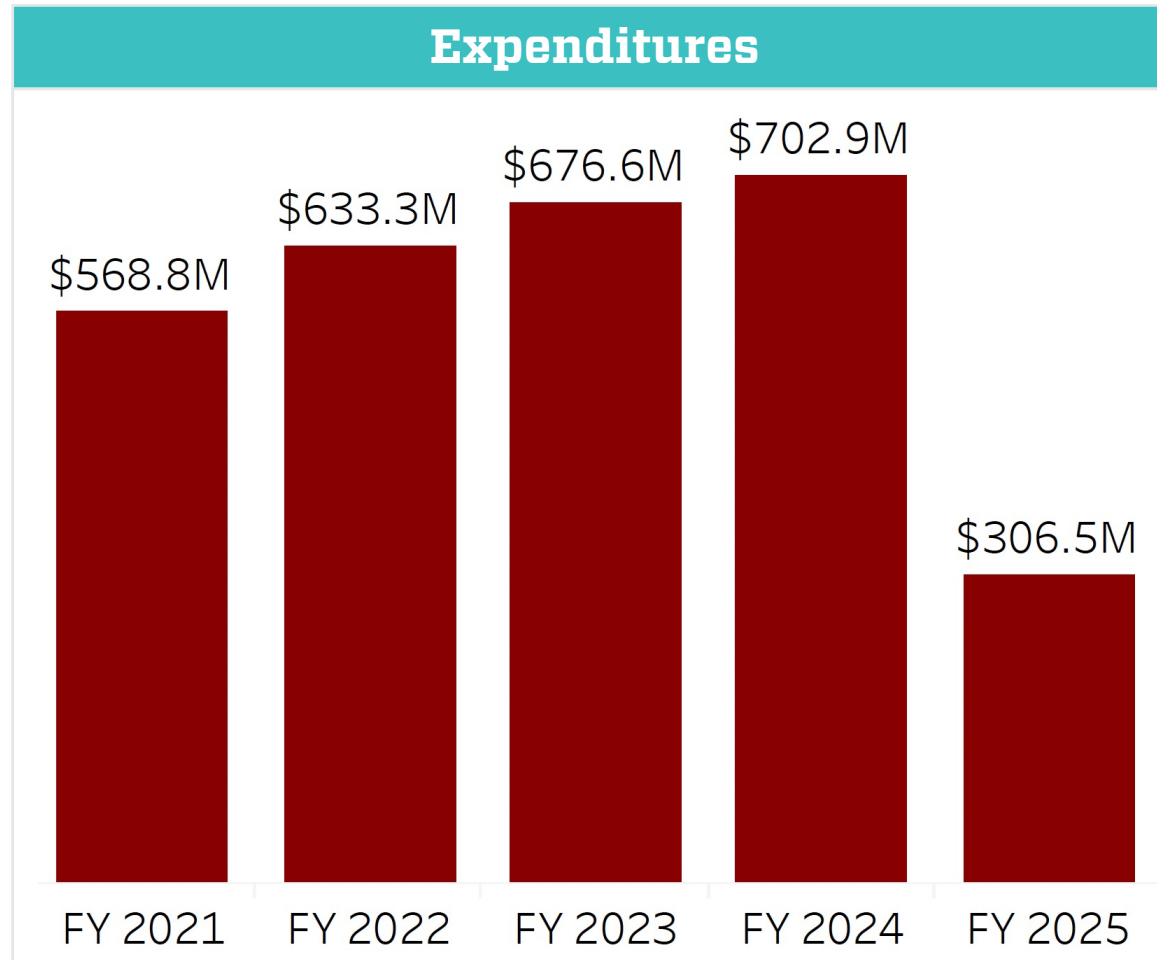
P  X A R



Netscape

**U RESEARCH NUMBERS**

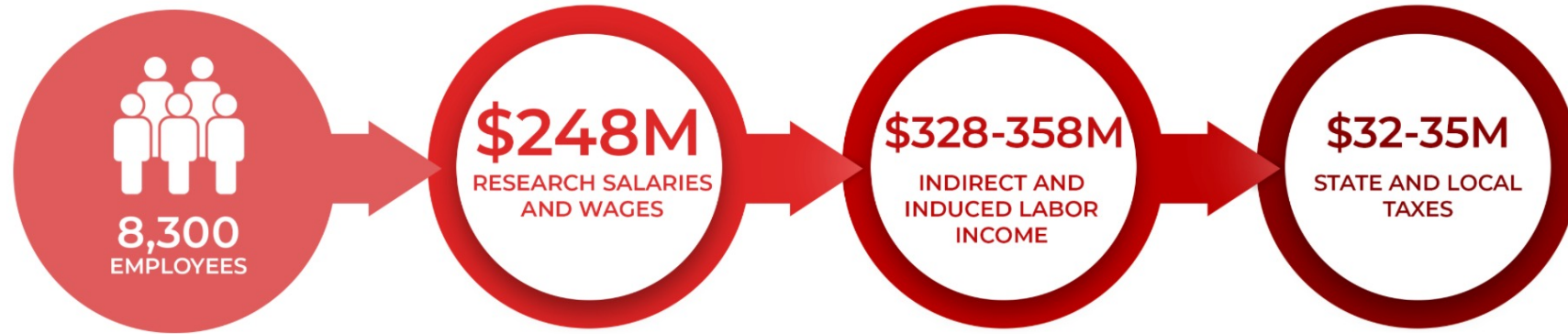
# Research Summary.



Source: Data provided by the The University of Utah Office of Sponsored Projects (OSP) and Grants and Contracts Accounting (GCA).

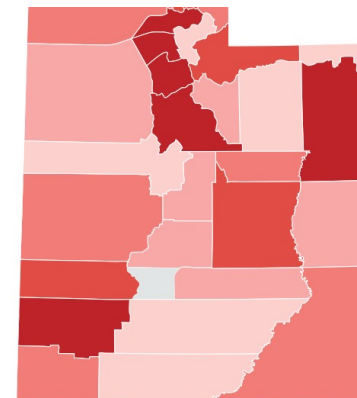
# Economic Impacts.

U Research boosts the economy and creates jobs



## Vendor and Subaward Expenditures

on Federal and Non-Federal Research Awards to University of Utah by Utah Counties (FY 2023)



FY23 Utah Expenditures by County

- \$361,000 to \$22,700,000
- \$106,000 to \$361,000
- \$27,200 to \$106,000
- \$3,900 to \$27,200
- \$40 to \$3,900

Source: Kem C. Gardner Policy Institute.

**U INNOVATION**

# AREAS OF INNOVATION MAIN CAMPUS

## \*CRITICAL MINERALS & MATERIALS

Critical Minerals Working Group



## \*ENERGY

Energy & Geoscience Institute (EGI), FORGE, Energy Futures Research Engine, WIRED Global Center



## \*AEROSPACE & DEFENSE

Aerospace Hub



## SUSTAINABILITY

GCSC, Wilkes Center, Taft Nicholson Center, Wallace Stegner Center, Peak Water, Sustainability Engine



## ART & HEALTH

Art & Health Working Group, Art & Health Innovation Lab



## FAMILY CAREGIVING

Family Caregiving Collaborative (FCC), Consortium for Families & Health Research (C-FAHR)



## WEATHER & DISASTERS

Wildfire Prevention Working Group, Storm Peak Laboratory



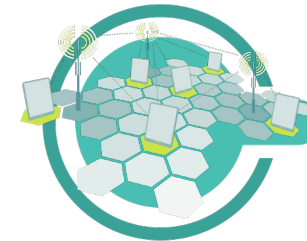
## RURAL & REMOTE

RAC Grand Challenge, Rural Community Engagement, CTSI, DCC, Area We Serve Council



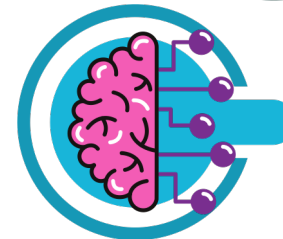
## WIRELESS & COMMUNICATION

POWDER, Scientific Computing & Imaging Institute (SCI), Communication Institute



## \*AI & CYBERSECURITY

Responsible AI, DELPHI



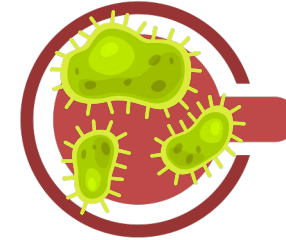
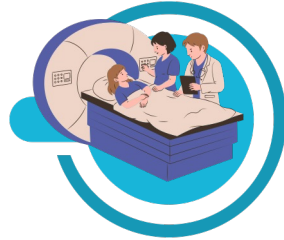
\$246M FY23

\*State priority

# AREAS OF INNOVATION HEALTH CAMPUS

## CANCER

Huntsman Cancer Institute

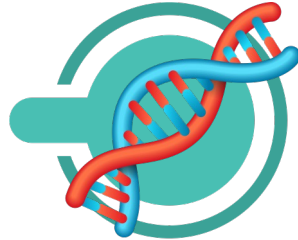


## IMMUNOLOGY

Immunology, Inflammation, & Infectious Disease (3i), Pandemic Preparedness Working Group

## \*GENETICS & GENOMICS

Center for Genomic Medicine, Genetic Sciences Learning Center

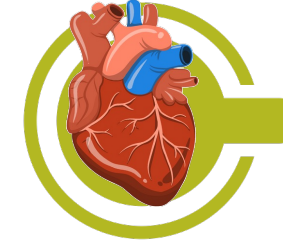


## VISION

Moran Eye Center

## DIABETES & METABOLISM

Utah Diabetes and Metabolism Research Center, Driving Out Diabetes Initiative

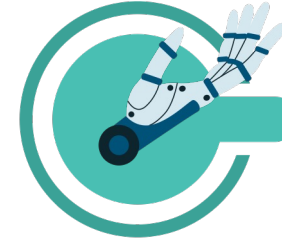


## CARDIOVASCULAR

Nora Eccles Harrison Cardiovascular Research and Training Institute (CVRTI)

## DIGITAL HEALTH

Digital Health Initiative  
Therapeutic Games and Apps Lab (GAAP Lab)



## \*MEDICAL ENGINEERING

Applied Medical Engineering (AME) Lab, Center for Medical Innovation, Utah Robotics Center

## WOMEN'S HEALTH

ASCENT, Reproductive Health Working Group, Women's Health Hub, Utah Center for Reproductive Medicine



## MENTAL HEALTH

Huntsman Mental Health Institute (HMHI), Suicide Prevention Working Group



\$522M FY23

\*State priority



# Blackrock Neurotech.

## Brain Technology Interface

Innovative brain technologies to provide new hope for people with paralysis and other neurological disorders.

Founded in 2008 by **Florian Solzbacher, University of Utah professor of electrical engineering** and director of the Center for Engineering Innovation.



# TikkunLev Therapeutics.

## Cardiovascular Research

The **Nora Eccles Harrison Cardiovascular Research and Training Institute (CVRTI)** provides groundbreaking science that leads to discoveries in new diagnostics and therapies for cardiovascular diseases.

The **discovery of CBIN1, a molecule lost in heart failure** led to a pursuit of gene therapy to regain the heart's organization and function.



**HOW CAN USHE HELP?**

# Two Things.

1. **ALIGNMENT OF STATE ECONOMIC POLICY WITH RESEARCH & WORKFORCE OBJECTIVES.**
  
2. **POLICIES TO HELP FUND RESEARCH.**
  - a. Flexibility in net tuition model
  - b. Direct investment in research
  - c. Research investment fund

**Thank You.**