



# Economic Development Update

January 18, 2018

## **Marie Kerbeshian**

Assistant Vice President and Executive Director, University of Iowa Research Foundation

## **Sarah Vigmostad**

Associate Professor, Biomedical Engineering

Founder, SynderBio

## **David Hensley**

Executive Director, John Pappajohn Entrepreneurial Center

Clinical Professor, Management & Organizations Department, Tippie College of Business

## **Dalton Shaul**

Founder and President, HealthTech Solutions

UI Human Physiology and Entrepreneurship Alum



THE UNIVERSITY  
OF IOWA

# UI Economic Development

WE MEAN BUSINESS

UI Research Foundation  
CATALYZING DISCOVERY AND INNOVATION

protostudios  
 TRI Translational  
Research  
Incubator

UI Research Park  
EXPANDING TECHNOLOGIES AND COMPANIES

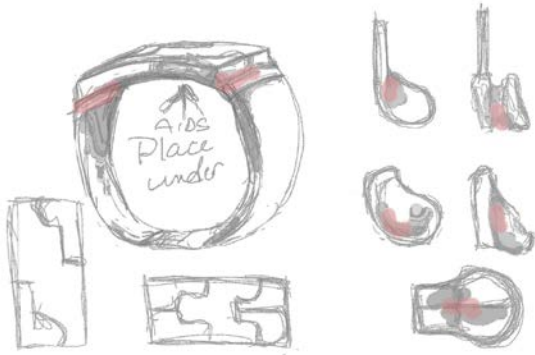
 UI Ventures  
ACCELERATING FROM THE START

THE UNIVERSITY OF IOWA  
  
John Pappajohn  
Entrepreneurial  
Center

THE UNIVERSITY OF IOWA  


# protostudios

From this...



...to this



- Housed in MERGE & Van Allen Hall
- Dry-lab space, benchtop incubator for medical device and startup development
- State-of-the-art 3D printers (plastic, metals, ceramics), milling, laser/waterjet cutter, printed circuit board fabrication.



"Surgeons are coming out of the woodwork with great ideas now that they know they can translate them easily into physical objects. The new prototyping and tech-transfer capability made possible by protostudios is going to be a real game changer."

**Dr. Matt Howard**, Chair,  
Department of Neurosurgery



# TEConomy Platform 1: Medical Devices

Iowa Biomedical Core Competency	Selected Examples of Associated Medical Devices
<b>Audiology</b>	Hearing Aids -- Measurement/Testing Devices – Oscopes – Audiometers – Impedance Analyzers – Hearing Aid Analyzers – Cochlear Implants – Bone Anchored Hearing Aids (BAHA) Implants
<b>Ophthalmology</b>	Contact Lenses – Corneal Implants – Surgical and Implantation Instruments – Surgical Lasers -- Retinal Implants – Scleral Implants -- Stents – Examination and Diagnostic Instruments – Prosthetics
<b>Medical Imaging</b>	MRIs – CT Scanners – PET Scanners – X-ray Equipment – Ultrasound Devices – Image Processing/IT Systems – Endoscopes – Contrasts Agent Delivery Systems
<b>Orthopedics</b>	Screws and Fixation Devices – Plates – Spacers – Surgical Instruments – Joint Replacement Systems – Bone Cement – Bone Substitutes – Soft Tissue Repair Matrices
<b>Dentistry</b>	Dental Materials (Amalgam, Cements, etc.) – Dental Implants – Crowns and Bridges – Dentures – Surgical/Dental Instruments – Wound Dressings and Closures – Cannulae and Syringes
<b>Cancer</b>	Focused Radiation Devices – Ultrasound Therapy Devices – Fluid Filtration Devices – Biopsy Tools – Surgical Instruments – Ablation Devices – Infusion Devices
<b>Cardiology</b>	Artificial Valves – Ventricular Assist Devices – Pacemakers – Implantable Cardioverter Defibrillators – Stents – Catheters – Guidewires – Closure Devices – Wireless Monitors – Surgical Instruments
<b>Aging</b>	Assistive Devices – Homecare Devices – Catheters – Adult Sanitary Products – Personal/Wireless Monitors – Wound Care Devices
<b>Diabetes</b>	Insulin Pumps – Insulin Pens/Injectors – Glucose Meters – Infusion Sets – Continuous Glucose Sensors – Neuropathy Detection and Monitoring Devices
<b>Neuroscience</b>	Ventricular Needles and Anvils – Neurostimulators – Aneurysm Clips – Blood Clot Retrievers – Deep Brain Stimulators – Brain Tumor Treatment Devices
<b>Perinatology/ Neonatology</b>	Catheters – Surgical Instruments – Suction and Airway Clearing Devices – Incubators – Heaters – Ventilation Assist Devices – Cosmetic/Reconstructive Surgery Devices – Resuscitation Equipment
<b>Nephrology</b>	Dialysis Machines – Wearable and Implantable Renal Assist Devices – Surgical Instruments – Hemofilters
<b>Pulmonology</b>	Tracheobronchial and Airway Stents – Thermoplasty Systems – Pulmonary Balloon Dilators – Biopsy/Brush Cytology Tools – Aspiration Needles and Devices – Ventilators – Bronchoscopy Devices
<b>Obesity</b>	Gastric Bands – Electrical Stimulation Systems – Gastric Balloon Systems – Gastric Emptying Systems



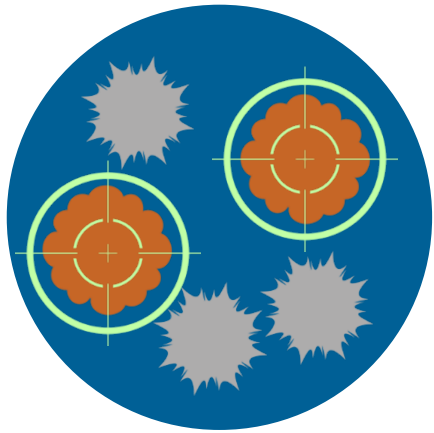


*Enabling Rapid and Accurate Cancer Diagnosis*

[www.synderbio.com](http://www.synderbio.com)

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# SynderBio: Lab Automation & Cancer Dx Company with Patented Core Technology



**Targeted  
Cell Depletion**



**Rapid  
Results**



**Biopsy Processing  
in Lab & Clinic**

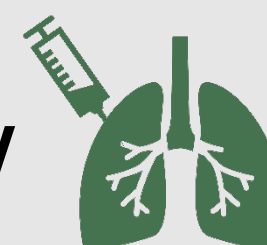
**Product-Market  
Fit in Several  
Large Markets**



**R&D Labs**



**Urology**



**Oncology**



# Dedicated Leadership Team



## **Sarah Vigmostad, PhD (UI Faculty)**

- Co-Founder, SynderBio Inc.
- Associate Professor, Biomedical Engineering, University of Iowa
- Expertise in fluid mechanics, medical device design
- Designed SynderBio prototype



## **Michael Henry, PhD (UI Faculty)**

- Co-Founder, SynderBio Inc.
- Deputy Director for Research, Holden Comprehensive Cancer Center
- Cancer Biologist, made initial discoveries leading to SynderBio core technology
- Formerly Senior Scientist, Millennium Pharmaceuticals



## **Mike Cable, PhD**

- Co-Founder, SynderBio Inc.
- 20 years experience with device-related startups-CEO, CTO, VP
- Built first SynderBio working prototype
- Born and raised in Griswold, Iowa



## **Christine Horton, BS**

- Board member, SynderBio Inc.
- >20 years experience in executive leadership in medical device industry
- Experience in key corporate areas including marketing, sales, regulatory

# Millions of Bladder Cancer Survivors: Regular Surveillance, Invasive Procedures

**2.7M**



## Bladder Cancer Patients

2.7M people worldwide are living with bladder cancer.  
79,000 new cases in US in 2017.

**\$1B**



## Patient Surveillance

\$1B spent annually in US on bladder cancer surveillance.  
Most costly cancer to manage per case.

**4x/year**



## Invasive Procedures

4x per year, bladder cancer survivors undergo cystoscopy, an invasive and costly procedure.

**0**



## Unmet Need

No non-invasive test to diagnose recurrent bladder cancer is considered effective enough to replace invasive cystoscopy.



# Current surveillance is costly and invasive. Non-invasive tests are not accurate for surveillance.



VS



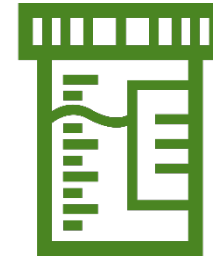
**Cystoscopy:** The current standard of care is quarterly cystoscopy, an invasive procedure performed by urologist.

**Urine-Based Cytology:** Non-invasive test use voided urine to screen for cancer. Currently not considered sensitive enough for recurrent bladder cancer.

# Enhanced Non-Invasive, Urine-Based Cytology

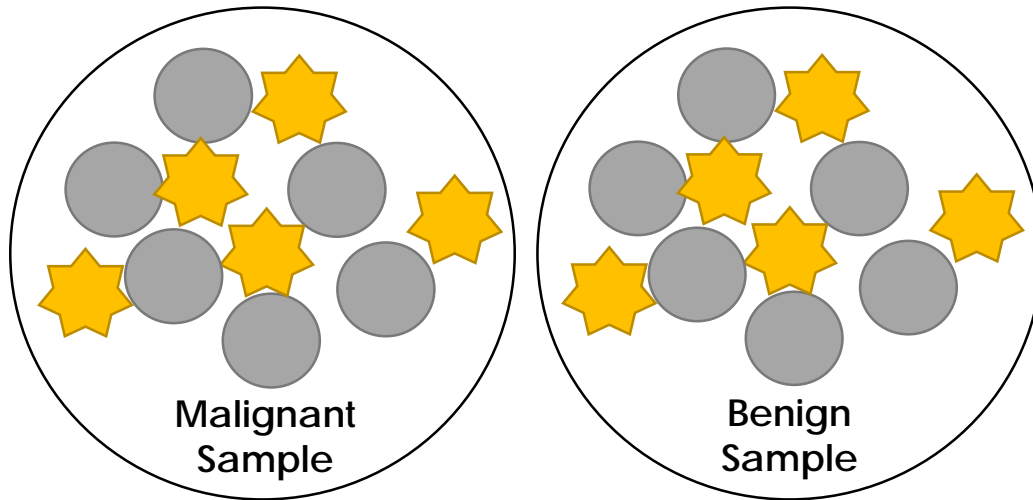


Used for decades to detect advanced bladder cancer



Performed using voided urine from patient

Now: Pathologists cannot determine if some *suspicious* cells in recurrent cancer are malignant or benign.



Standard Cytology

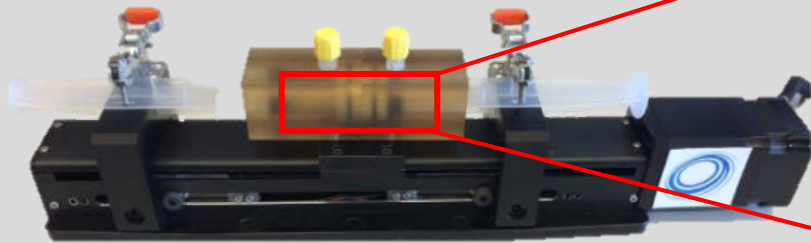
SynderBio Solution : Cytology is enhanced by the removal of benign cells. Only cancer cells remain, leading to accurate diagnosis.



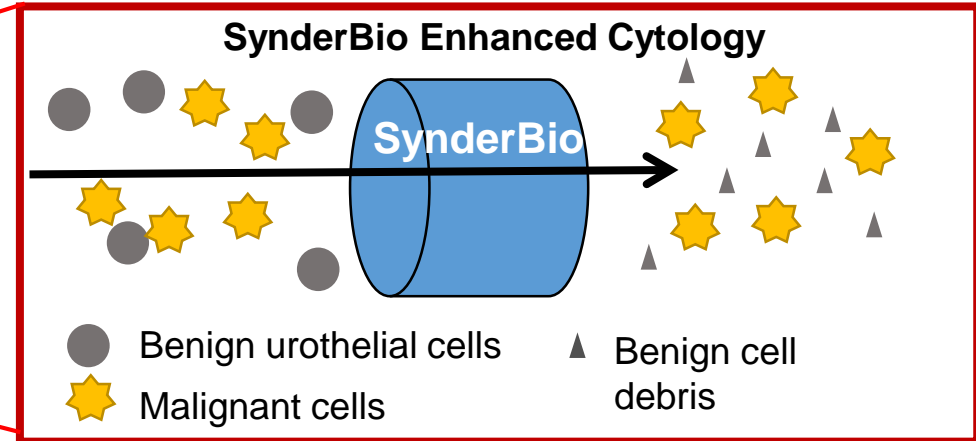
After Processing with SynderBio Instrument

# Platform Technology Ideal for Bladder Cancer Surveillance

Current instrument: small, benchtop device with disposable cartridge



**US 2014/0038231 A1**  
**PCT/US15/58255**



## Patented Approach

**Enhanced Cytology**

Eliminates benign cells, removes uncertainty, enables urine-based detection

**Non-invasive Surveillance**

Reduces frequency of invasive cystoscopy while preserving quality of patient care

**Existing Workflow**

Keeps both urologists and pathologists engaged

**Low Cost**

\$15k instrument avoids capital purchase; Main revenue: \$100 test kit

# Three Products Launched by 2021

Product 1:  
Research Instrument



Research Labs –  
Direct Path to Market

SBIR Awarded July 2017

Launch 2019

Product 2:  
Diagnostic Instrument I



Requires FDA Clearance to  
Market – 510(k)

STTR Awarded Sept 2017

Launch 2020

Product 3:  
Diagnostic Instrument II




Requires FDA Clearance to  
Market – 510(k)

Launch 2021



# Product-Market Fit in Major Markets



**Preserves  
Cell Quality**



**Non-  
invasive**



**Fast,  
Accurate  
Diagnosis**

**\$3.3B (Global - 2019)**  
Cell Separation (Cancer)

**\$1B (US - 2020)**  
Bladder Cancer Surveillance

**\$27B (Global - 2019)**  
Lab Testing (Cancer)

Launch 2019

Launch 2020

Launch 2021

# University & State Support Enables Success



From Researchers →  
Inventors

Proof of Concept →  
Company Formation

R&D Phase  
Startup Company





*Enabling Rapid and Accurate Cancer Diagnosis*

**THANK YOU**

Contact: [sarah@synderbio.com](mailto:sarah@synderbio.com)

[www.synderbio.com](http://www.synderbio.com)

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# IOWA JPEC: Delivering Campus-wide Entrepreneurship and Innovation Education

***Iowa JPEC is a nationally ranked undergraduate entrepreneurship program.***

- Two undergraduate majors – colleges of business and liberal arts and sciences (on-campus and online)
- Four certificates – engineering, performing arts, journalism, and general campus-wide (and online)
- Students from over 100 majors take courses in entrepreneurship
- Teach approximately 120 sections of courses annually; enrollments over 4,000
- Program incorporates experiential learning, professional development and global experiences





# IOWA JPEC: Engaging Students with the Iowa Business Community

*Assist Iowa startup and early-stage companies with strategic business and growth planning.*

## FY17 Impact in Iowa:

- **59 consulting projects** were completed in **15 counties** for a variety of small and early stage businesses during FY17
- These included five projects focused on international expansion
- **26 student interns** were placed in 19 startups across the state, primarily in Johnson, Linn, Mahaska, and Polk counties



# IOWA JPEC: Supporting Commercialization of UI Research and Technology

## ***Iowa Medical Innovation Group***

- Interdisciplinary 10-month program among colleges of Business, Engineering, Law and Medicine
- 7-9 students per team working with UI faculty, UI Research Foundation and community partners to solve a significant medical challenges
- Funding through private gift to support prototyping, customer discovery and business planning
- Goals include to commercialize new technology and learn innovation process



# IOWA JPEC: Venture School Training for Iowa Entrepreneurs

*Intensive entrepreneurship training program using nationally recognized Lean LaunchPad curriculum.*

## FY17 Impact in Iowa:

- Cohorts included Cedar Rapids, Des Moines, Iowa City, Quad Cities, Sioux City and online:
- **58** startups and **128** entrepreneurs
- Partnerships with local Chambers, SBDC's, Community Colleges, and Iowa Farm Bureau
- Examples include:
  - Tillage (Ames)
  - IntelliDrive (Prole)
  - The Germbot (Quad Cities)
  - Treepans (Sioux City)



# IOWA JPEC: Faculty Innovators Training for UI Faculty Entrepreneurs

*Intensive entrepreneurship training program using nationally recognized Lean LaunchPad curriculum.*

- National Science Foundation (NSF) I-CORPS Sites grant
- Three-year, \$300,000 National Science Foundation I-CORPS grant awarded spring 2015 to train and support faculty entrepreneurs
- Over 50 faculty with commercialization projects have been trained to date





# IOWA JPEC: Preparing Iowa Youth for Professional and Entrepreneurial Success

## ***Jacobson Institute for Youth Entrepreneurship***

*Provides teacher training and curriculum for K-12 programs in Iowa and nationally.*

### FY 17 Impact in Iowa:

- 196 active Biz and STEM Innovator teachers
- 106 schools in 50 counties
- 3 summer camp locations
- 14,908 students



# IOWA JPEC: Fostering Student Entrepreneurship

## *UI Student Ventures*

- Bedell Entrepreneurship Learning Laboratory
- Founders Club
- Summer Accelerator
- Iowa Startup Games
- Elevator Pitch Competitions
- Business Model Competitions
- Mentoring
- Training
- Technical Support
- Networking/Connectivity



# IOWA JPEC: Student Entrepreneurial Success



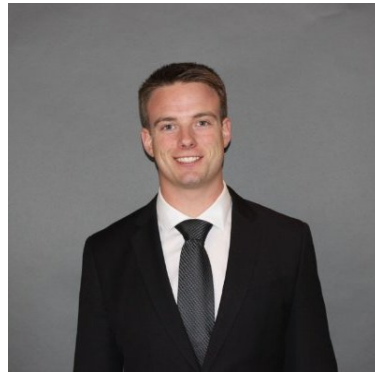
## **HLT**

Alec Whitters  
Adam Keune



## **White Ivy Events**

Amanda Burrell



## **TelePharm**

Roby Miller



## **SwineTech**

Matthew Rooda  
Abraham Espinoza



## **Premiere Dance Project**

Amanda Gustafson  
Aunica Harvey





# HealthTech Solutions

*Maximizing the Gift of Life*

## TXP Chat™

**Collaborate | Manage | Protect**

***Reducing Organ Waste with Intelligent,  
HIPAA-compliant communication technology.***

**Presented By:**

**Dalton Shaull, CEO/Founder**  
***[dalton@organizerhope.com](mailto:dalton@organizerhope.com)***

**An Iowa City, IA Company**







**Dalton Shaull, BS**

Founder, CEO  
Tx Center Success



**Robert Emery, MD**

CSO



**Eric Pahl, BSE Ph.D.c.**

Founder, CTO



**Beth Hannan**

OPO Success



**Hans Johnson,  
MS, Ph.D.**

Senior Architect



**Manny Villafana, Ph.D.**

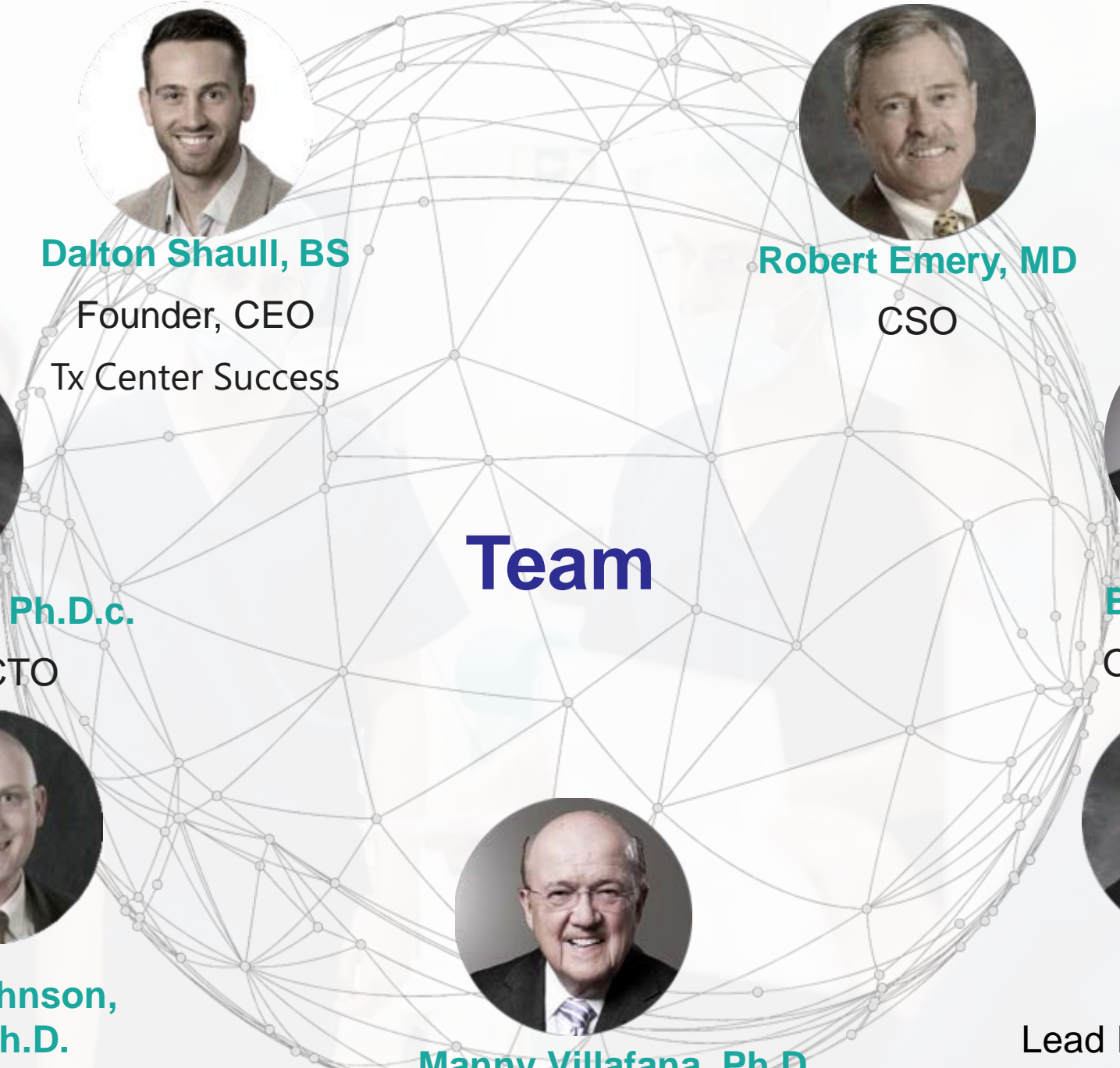
Adv. Board Chairman



**Jacob Veal**

Lead Engineer, Product  
Owner

# Team



# lowans are dying due to preventable bottlenecks in the organ supply chain...

Today, 713 lowans wait for life-saving organ transplants, over half have been waiting for more than 1 year.

Last year:

- 84% of transplants received by lowans were from deceased donors (as opposed to living donors).
- 238 lowans received transplants.
- 448 were added to the waiting list.
- ***17 died waiting.***
- ***34 became too sick while waiting and were removed from the list.***

# United States Organ Shortage Crisis

**+122,000**

**Men, Women and  
Children on  
the Waitlist  
*(highest ever)***

**22**

**Americans  
Die Every Day  
Waiting**

# Economic Impact

Approx. 1/3 (**\$34B**) of Center for Medicaid and Medicare Services (CMS) Budget is associated with Dialysis Costs

A kidney transplant saves \$1.45M per recipient for CMS and add an avg. of 9.9 years of life.

Kidney Transplants are the highest discarded organ in the U.S.

Our product, *TXP Chat*<sup>™</sup> has facilitated 50+ lifesaving transplants in the State of Iowa.



*"The HTS standard will speed up organ placement, improved organ and care quality"*



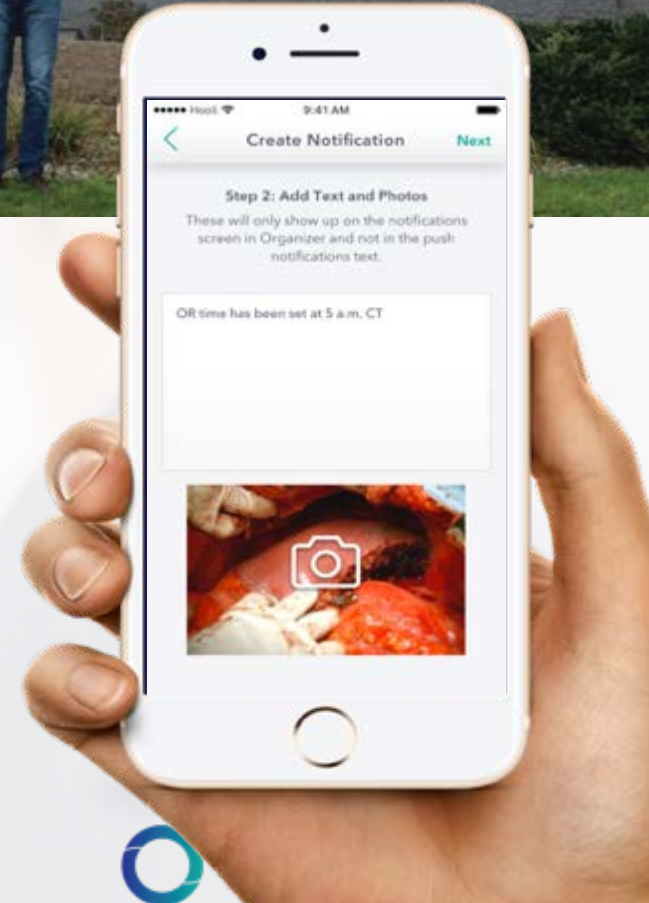
*"Tracking and reporting data will improve quality of care"*



*"Significant time, cost, participant efficiency, and reporting savings"*



*"A foundation for empirically-derived surgical decision assistance for organ transplant"*





*"When you have exhausted all possibilities, remember this--you haven't." Thomas Edison*

- **UNIV. OF IOWA: Iowa JPEC, UI ENGINEERING, UIHC**
  - **Iowa JPEC:** approx. **\$40k** in Iowa JPEC sponsored competitions (**\$150k total**), reimbursed travel, free office, advisors/mentors, *access to alumni network (\$100k)*
  - **Engineering:** student interns (**4x**), Storer Award (**\$6k**), hackathon/talent
  - **UIHC:** pilot site for our technology
- **IICORP**
  - Secured **\$250k** SBIR Phase 1 Grant from the National Institute of Health (NIH) 12.6% national success rate. 1 of 3 in IA
  - IICORP Assistance: **\$50k**; Working on Phase II
  - PitchBook for Series A prep.
- **IOWA ECONOMIC DEVELOPMENT AUTHORITY (IEDA)**
  - Received a total of **\$125k** from IEDA programs (POCR + DEMO)
  - PROPEL/ACCELERATION fund: **\$300k**
  - IA Venture Angel Tax Credit Program – **25% (tax credit/rebate)** – helped bring in **\$1M** angel financing
- **WELLMARK BLUE CROSS BLUE SHIELD**
  - Secured **\$100k** convertible note – Wellmark Venture Fund – Equity Dynamics

# Building economic ecosystems: impact

**46** companies in UI Research Park (7 new in FY2017) employing

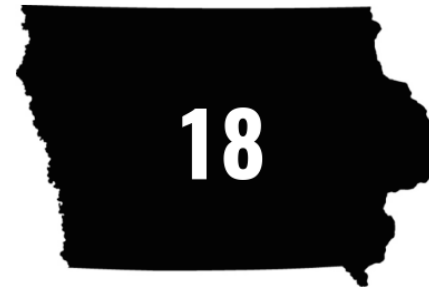


**\$4M+**

Received by 9 UI Ventures companies plus \$8M+ from private investors

**\$83.3M**

Corporate-sponsored research (\$2M from Iowa companies)



deals (licenses and options) with Iowa companies

**240**



New businesses served by JPEC, with estimated job creation of 300

**13**



new Iowa startup companies