TABLE OF CONTENTS

3 | Introduction
5 | Student-driven Innovation
6 | B2B Evolution: 2016 State of the Program
8 | 2015-16 B2B Demographics
9 | 2015-16 B2B Team Summaries
31 | Thank You to Sponsors & Mentors
32 | Competition Night
34 | How to Get Involved as a Sponsor or Mentor
“Our students will transform science and medicine in ways we never thought possible.”
Dear Colleagues,

Our students are changing the world.

The Bench-to-Bedside (B2B) competition is one of our most popular and impactful student programs, challenging students to the hands-on act of inventing, designing and prototyping medical devices and apps.

With a toolbox of six months, $500, a passion for innovation and the mentorship of dedicated faculty and industry professionals, students from multi-disciplinary backgrounds collaborate to transform science and medicine. Since 2010, B2B has mentored 624 participants on 147 teams that have invented 145 medical devices, filed 107 patents, and launched 38 companies.

For the 2016 competition, B2B awarded nearly $80,000 in prize money to winning teams. Teams presented real-world devices developed through collaborations across many unique disciplines including medicine, engineering, informatics, business, law, film & media arts, architecture, mathematics, biology, chemistry, computer science and others.

We are grateful to Zions Bank for their continued generous and important support of the competition, year after year. We believe investing today in the leaders, innovators and entrepreneurs of tomorrow is a roadmap to ensuring Utah’s future success.

Finally, I want to express thanks to the B2B student leadership, for taking charge of the program this year. Additionally, faculty mentors John Langell, MD, PhD, assistant professor of surgery and director of the Center for Medical Innovation; and Troy D’Ambrosio, executive director of the Lassonde Entrepreneur Institute, have supported our students and partnered them with the right mentors to raise the bar even higher.

Our students will transform science and medicine in ways we never thought possible. I’m looking forward to seeing what they come up with at next year’s competition and hope you’ll join me there.

Sincerely,

Vivian S. Lee, MD, PhD, MBA
CEO, University of Utah Health
Dean, School of Medicine
A. Lorrí Bétz Senior Vice President for Health Sciences
The Bench-to-Bedside (B2B) competition is now entering its seventh year and has continued to grow in both scale and impact. B2B companies from previous years are driving forward with their innovative new technologies. As a result several have obtained regulatory clearance and have introduced their products to market.

B2B is an exciting and vibrant program that introduces medical students, engineering students and business students to the fascinating world of medical device innovation. It is a trans-disciplinary experiential educational program that teaches the impact and power diversity of thought can bring to the innovation process. Over the first six years of the program it has grown immensely in both scope and quality. We have now engaged over 600 students into 143 cross-disciplinary teams that have spawned nearly 150 innovative new health care technologies. Additionally, more than 40 of these teams have move forward to commercialize their creations.

During the seven-month B2B program, student teams form “startup” companies to identify an unmet clinical need and design a technology solution to address the need. The process includes evaluating the intellectual property landscape, prototyping designs under regulatory requirements and constructing a business plan. Each team is allotted up to $500 to develop their medical device concept. Teams are also granted access to over 100 University of Utah physicians from a range of specialties that serve as consultants, key opinion leaders and stakeholders.

B2B culminates in formal presentation of all team projects at an annual awards competition, an event drawing participation from faculty physicians, residents, industry leaders, venture capital firms, local and national media and the highest echelons of University leadership. Projects are evaluated and scored for business strategy, design quality and health care impact by a panel of judges comprised of industry leaders, physicians, business experts, engineers and media. Top teams are collectively awarded over $75,000 in prizes intended to provide initial funding to support further milestone-based project development. The B2B competition has quickly become one of the University of Utah’s most popular student programs.

In 2016, we chose to honor an amazing individual with the introduction of the John Noorda Consumers’ Choice Award. John was a successful entrepreneur in software and business development. He also gave back to society, serving in many philanthropic trustee and director roles, including as a trustee of the Ray and Tye Noorda Foundation honoring his parents.

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John was a valued board member and team mentor for the University of Utah Center for Medical Innovation. He was passionate that the best ideas and innovations come from interdisciplinary teams that leverage the diversity of thought that occurs when medical, engineering and business experts work together to solve problems. He saw our students as the critical key to this success. He was dedicated to working with the University to find ways to make innovation and creativity available to everyone.

In our sixth year we had the chance to welcome some of our earlier teams back, with the introduction of the Legacy component. Some of these teams have gone on to not only receive utility patents, but also FDA clearance. This means we now are seeing these amazing, student-driven ideas in the market. This is a truly exciting phase, not only for the companies, but for B2B. As we see these innovations start to have real impact in the care of patients, we realize we are only beginning to see the long-term effects of programs like B2B.

Since its inception, enthusiasm for B2B has been remarkable, and it only continues to grow. The creativity and “out of the box” thinking shown by these teams has resulted in several unique design concepts. Every year the students continue to impress us, and we always look forward to the next year to see way unique concepts will emerge.
Our dear friends, colleagues and innovation enthusiasts, as this year’s competition draws to a close, we look back and are profoundly impressed by the interest, involvement, and support the Bench-to-Bedside (B2B) program has had over the past six years. B2B is a fully extracurricular program designed to introduce students to the medical device design industry. What these students have been able to accomplish in just six short months on a budget of $500 is a testament to the students’ perseverance, resourcefulness, and ingenuity.

2015–2016 B2B students covered a wide variety of health care challenges by innovating solutions from breathing sensors for infants to biodegradable esophageal stents. The students’ passion and dedication to the progression of the medical field are reflected in the quality of their projects. Their success was made possible through the support of local biotechnology, academic, clinical and educational communities.

B2B is a student run program, and as such we leaned heavily on a committee of student leaders to recruit students from all corners of the University. These leaders were also responsible for organizing workshops, communicating with mentors and teaching participants through their knowledge and experience about medical device innovation. We extend a special “Thank You” to the following committee members for all their hard work this year. This program would not exist without them.

**Engineering Chairs:**
- Rami Shorti
- Kapil Sharma

**Medical Chairs:**
- Brian Zenger
- Maziar Nourian
- Brian Coburn

**Business Chair:**
- Joe Fogg

**Marketing Chair:**
- Navkerat Dhaliwal

**Financial Chair:**
- Braden Call

**Secretary:**
- Samantha Bidlack

“...The students’ passion and dedication to the progression of the medical field are reflected in the quality of their projects. Their success was made possible through the support of local biotechnology, academic, clinical and educational communities.”

This year, to help increase recruitment and enthusiasm for our program, we added the position of marketing chair to the committee and joined forces with an extraordinary group of people working in Health Sciences Marketing and Communications. With the help of Aaron Lovell, Laurie Robison, and Navkerat Dhaliwal we significantly increased interest and involvement in the program from the previous year. Aaron Lovell and Laurie Robison annually produce the B2B Competition Report, which has helped us showcase the competition’s outcomes and served as a tool for recruiting committed students. Thank you, Aaron, Laurie and all those at MarComm.
The first steps of medical device innovation can be daunting. The constant struggle of taking needs identified at the bedside of patients and working to identify a solution that will have a significant impact is not without its unique challenges. We have been able to foster relationships and implement tools to help our students complete this tough competition.

First, we improved upon the online system to track team progress via Instructure CANVAS. Team formation and project identification moved substantially smoother. Thank you to Jean Shipman, Tallie Casucci and the Eccles Health Sciences Library Innovation Team for making this system possible.

Second, through the Center for Medical Innovation each team was paired with an industry mentor. These mentors served as advisors, community resources and positive influences on our teams. To our mentors: We have learned a tremendous amount from you this year. Thank you for your willingness to participate and your patience in developing the innovators of tomorrow. We hope you will continue to join us for years to come.

Third, working with Troy D’Ambrosio and the Lassonde Entrepreneur Institute we have redefined B2B’s business components to better allow teams to connect into the Utah Entrepreneur Series and various other Lassonde programs. We sincerely hope teams will take advantage of these opportunities. Thank you to Troy D’Ambrosio for his kindness and support this year.

Finally, the Center for Medical Innovation brought on three Law Fellows—students at the S.J. Quinney College of Law—to help teams develop claims and analyze the intellectual property space surrounding them. Thank you to Austen Paulsen, Dave Duncan and Thomas Woodland for increasing the quality of our provisional patents and focusing teams on long lasting utility and design patents. The Law Fellows are one of our best resources that are so easily available that can be utilized in the future development of ideas and companies.

To our dear friends, classmates and participating students, we would like to conclude by saying there isn’t a better time than now nor a better place than here at the University of Utah to explore your passions and aim for the stars. There is no comparable infrastructure of outstanding faculty, resources and mentors in the world who can provide you with the guidance you need to become a successful innovator. If you will continue to develop your products far into the future, we can promise that you will look back on this time with fondness and gratitude.

And finally, to all those who have made this competition possible, through donations of your time, money, talent and resources—thank you. To our lead sponsor, Zions Bank and Scott Anderson—thank you. Thanks to the Center for Medical Innovation and its wonderful employees, especially Megan McIntyre. Megan is the heartbeat of the B2B program. Her support and guidance ensure the longevity and continued improvement to this program. Thank you to John Langell for his outstanding leadership. Without his passion, patience, and persistence in supporting the B2B, the immense progress made this past year would not have been possible. To Vivian Lee, our engineering team and all of our faculty, judges and mentors, words cannot express how grateful we are to you for making this program possible. We hope we can all continue to support each other as we strive to make the future of medical innovation amazing.

Jacob Whittle, Bench-to-Bedside Student Co-President
Alexis Allen, Bench-to-Bedside Student Co-President
Ben Fogg, Bench-to-Bedside Student Director
# B2B DEMOGRAPHICS

## B2B Competition Results by Year

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<tr>
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<tr>
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<td>112</td>
<td>116</td>
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<td>LLCs Formed</td>
<td>11</td>
<td>3</td>
<td>12</td>
<td>7</td>
<td>4</td>
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## Disciplines Represented in 2016

- Bioengineering: 43
- Biology: 1
- Business: 11
- Computer Science: 3
- Design: 5
- EAE: 9
- Engineering: 1
- MD: 1
- Mechanical Engineering: 7
- Medicine: 34
- Pharmacy: 1
- Physics: 1
- Public Health: 2
- Videography: 1
- **TOTAL**: 120

Image courtesy of the University of Utah
# 2015-16 B2B TEAM SUMMARIES

| 1.  | ABS                  | 23.  | Screw Interface       |
| 3.  | Ambendo              | 25.  | Through the Cords     |
| 4.  | Artificial Cornea    | 26.  | TSV                   |
| 5.  | Asensus Pain         | 27.  | Tube-Stow             |
| 6.  | Aspen 3D Stent       | 28.  | UGown                 |
| 7.  | Barolock             | 29.  | Umbilikit             |
| 8.  | Boomerang            | 30.  | Utah Tonsil Clamp     |
| 9.  | Carethera MTM        | 31.  | UVAC                  |
| 10. | Crohno               | 32.  | Wacian-Pleth Patch    |
| 11. | Fin Blade            |       |                       |
| 12. | Improved Neonatal    |       |                       |
|     | Bronchoscope         |       |                       |
| 13. | iPace                |       |                       |
| 14. | Healthx              |       |                       |
| 15. | HemoStick            |       |                       |
| 16. | Pediatric Oxygen Supply |   |                       |
| 17. | Play Rx              |       |                       |
| 18. | PlusOne Baby         |       |                       |
| 19. | Polysanus            |       |                       |
| 20. | Project Labyrinth    |       |                       |
| 21. | Renaissance Astronaut|       |                       |
| 22. | RevoCap              |       |                       |
| 23. | Screw Interface      |       |                       |
| 24. | Sybo Technology      |       |                       |
| 25. | Through the Cords    |       |                       |
| 26. | TSV                  |       |                       |
| 27. | Tube-Stow            |       |                       |
| 28. | UGown                |       |                       |
| 29. | Umbilikit            |       |                       |
| 30. | Utah Tonsil Clamp    |       |                       |
| 31. | UVAC                 |       |                       |
| 32. | Wacian-Pleth Patch   |       |                       |

**Legacy Teams**

1. Cinluma
2. Easy Arm
3. Excisoseal
4. Glo Light
5. mDOT
6. Precision Cautery
7. Random Breakfast
8. StreamDx™
9. XEnd Medical Systems

(Note: Team summaries were written and submitted by members of each B2B team. The teams themselves are responsible for the material claims therein. They have been edited for readability.)
ABS

**Problem:** Shoulder separation affects approximately 162,504 stroke survivors per year. Shoulder separation braces in the market are expensive and require two people to put them on to have the right fit.

**Solution:** ABS offers a simple cost effective shoulder separation brace that can be put on by the patient independently, without the assistance of a care provider. ABS is designed to enhance independence in daily life for patients.

**Team Members:**
- Austen Archibald: Medicine
- Bryce Mortensen: Medicine
- Silas Pimentel: Medicine

AccHeme

**Problem:** Approximately 1.62B people worldwide are anemic. The majority of undiagnosed anemia cases are in developing countries. Community-based health workers in these areas need an easy-to-use, reliable screening method to detect anemia.

**Solution:** Our device design uses optics to provide a quick, durable and accurate solution. An ear clip comfortably secures to a patient’s ear lobe, assessing skin thickness and vasculature as a means of detecting anemia. We have done on-site validation in rural India to ensure design specifications and marketing requirements are compatible with the resources, training and challenges of the target market.

**Team Members:**
- Andrew Engelby: Bioengineering
- Tyson Schwab: Bioengineering
Ambendo

Problem: Non-adherence to medical self-care recommendations costs consumers an estimated $300 billion annually. This is especially relevant to physical therapy, where 65% of patients do not adhere to prescribed exercise routines. In addition, performing exercises contrary to instruction can result in further injury.

Solution: Ambendo is a firmware solution for PT clinics and patients that helps ensure compliance on the patient side and aid in future diagnosis. Using cameras and image registration software, Ambendo guides patients and provides encouragement through exercises, both in clinic and at home, and provides actionable feedback.

Team Members:
Vince Thornberg  Bioengineering
Minna Wang  Bioengineering

Artificial Cornea

Problem: Corneal visual impairment is a major cause of blindness worldwide. An underestimated eight million new cases occur every year, many of these affecting children. Current treatment includes corneal transplant using donor tissue, which is extremely limited globally. The alternative is an artificial cornea that also requires donor tissue and a long recovery time.

Solution: We have developed a new cost-effective artificial cornea device that removes dependency on donor tissue and dramatically reduces incision size, eliminating the need for sutures. The device will greatly increase the accessibility of treatment, reduce cost and shorten recovery time.

Team Members:
Alexis Johnson  Bioengineering
Thomas Lawyer  Medicine
Kent Ogden  Bioengineering
Samuel Thomas  Medicine
Asensus Pain

Problem: Needle punctures are painful, and fear of needles results in patient non-compliance with vaccine regimens and other preventative care. Additionally, injected anesthetics require waiting up to 20 minutes before full-strength anesthesia is achieved, resulting in longer procedures.

Solution: Asensus is a pain-free, needle-free alternative to traditional local anesthesia. This pioneering technology provides a full anesthetic effect through application of electrical energy via a set of electrodes strategically placed on the surface of the skin. Asensus has the potential to provide pain-free local anesthesia and open new markets for skin numbing prior to injections, venous lab draws or IV placement.

Team Members:
Christopher Duncan  Medicine
Zack Kagan  Bioengineering
David Kluger  Bioengineering
David Page  Bioengineering
Andy Phillips  Medicine

Aspen 3D Stent

Problem: Benign esophageal stenosis is commonly associated with gastroesophageal reflux disease, a disease affecting 40% of adults. Current treatment is through serial esophageal dilation and implantation of an esophageal stent. Up to one-third of patients experience stent migration or other complications from standard stents.

Solution: The Aspen 3D Stent is a 3D-printed stent tailor-made to fit each individual patient. This minimizes the risks of stent dislocation and tissue embedment while maximizing stent tolerance. Made from a bioabsorbable material, surgical removal of the stent is unnecessary. The stent degrades through natural body processes and passes harmlessly through the GI tract.

Team Members:
Rich Alexander  Medicine
Holden Leon Brown  Business
Khalid Rashid  Bioengineering
Guang Yang  Medicine
Michele Zabriskie  Medicine
Barolock

**Problem:** Current ball-in-socket hip implants have an inadequate lifespan. Replacing a worn implant requires additional surgery, along with its attendant expenses and recovery time.

**Solution:** Barolock improves the effectiveness and longevity of standard ball-in-socket hip implants. It uses a flexible membrane attachment to reduce inflammation and decrease the chance of dislocation. It promises to increase of the hip implant life by allowing metal-on-metal parts, thus reducing the need for revision surgery. This will save money, decrease patient discomfort and enhance orthopedic healthcare.

**Team Members:**
- Daniel Evans: Medicine
- Patrick Evans: Medicine
- Aaron Hsu: Computer Science
- Dallin Hubbard: Medicine/Bioengineering
- Jeremiah Morgan: Mech. Engineering
- Jacob Whittle: Mech. Engineering

$5,000 - Best Medicine Award

Patrick and Daniel Evans spent some time with their grandfather, Dieter Uchtdorf, who paid a visit to B2B Competition Night.
Boomerang

**Problem:** Over 1 million cardiac catheterizations occur every year in the United States. Surgeons need a better way of removing cardiovascular devices, which can break, migrate, or become embedded in the lumen wall. Current retrieval devices made from pre-formed loops require doctors to try multiple sizes and orientations before a successful retrieval. Even then, certain devices fail to be captured.

**Solution:** Boomerang’s endovascular device allows for retrieval and manipulation of foreign bodies in the cardiovascular system regardless of the object’s size, shape, or orientation. Boomerang offers a more universal sizing platform, adds a unique loop-forming capability and is able to detach embedded devices from vascular walls without tearing the lumen.

**Team Members:**
- Zach Henderson (Design)
- Stefan Neiderauer (Bioengineering)
- Hallie Thorp (Bioengineering)

Carethera MTM

**Problem:** Medication therapy management (MTM) is one of the most underutilized Medicare benefits because of reimbursement and time limitations.

**Solution:** Our solution easily integrates with pharmacy’s dispensing software and will enable pharmacists to perform MTM using evidence-based recommendations. The product will simplify the MTM practice and reduce time spent by 30%, improving patient outcomes.

**Team Members:**
- Raheel Aslam (Computer Science)
- Keaton Crockett (Pharmacy)
- Daanish Hoda (Medicine)
Crohno

**Problem:** Half of the roughly 700,00 people in the U.S. who have Crohn’s Disease experience colonic structuring, narrowing of the colon due to inflammation or scarring. The current standard of care—medication, and often surgical resection—is inadequate due to a high recurrence rate, and can lead to complications.

**Solution:** Crohno proposes a minimally invasive, temporary, colonic stent with an expandable balloon backbone. The temporary, gel-filled device will be retrievable using a standard surgical snare and will lead to better treatment options for patients with stricturing Crohn’s Disease.

**Team Members:**
- Hallie Thorp  
- Skyler Perkes  
- Sean Young

Fin Blade

**Problem:** Carpal tunnel release surgeries are among the most common surgical procedures in the US. These typically require general anesthesia with its associated risks and costs. An inexpensive, minimally invasive, low-risk method of carpal tunnel release is needed.

**Solution:** Fin Blade is a small cutting tool that does not require general anesthesia. After local anesthesia, the device is inserted like a needle or through a tiny incision. The operator monitors the device and surrounding structures via ultrasound. Fin Blade reduces cost, scarring, infection and other risks associated with current methods. The device can also be used in a variety of similar procedures.

**Team Members:**
- Blake Corcoran  
- Ben Fogg  
- Kellen Hilton  
- Jason Schafer

$10,000 - 1st Runner-up
Improved Neonatal Bronchoscope

**Problem:** Neonatal patients with restricted airways need a more direct and reliable air source during typical rigid bronchoscopies.

**Solution:** By redesigning the geometry of the bronchoscope we can redirect the airflow to the patient without sacrificing any other current bronchoscope features. Our improved neonatal bronchoscope provides better, more reliable airflow for neonatal patients.

**Team Members:**
- Josh Burton
- John Nelson
- Trent Parry
- Kyle Thornley

$5,000 - Best Global Health Innovation Award

iPace

**Problem:** Bell’s palsy, the most common cause of facial paralysis, includes the inability to close one’s eye and requires protective measures. If the eye does not get covered, damage to the cornea can result in permanent vision loss.

**Solution:** iPace offers a device that protects the eye without limiting vision at a minimal cost and risk to a patient. The device utilizes an electromagnetic pacing system to induce contraction of the muscles of the eye to simulate the protective blink response. Blinking protects the eye by applying tears across the cornea and creating a physical barrier against foreign objects or bright light.

**Team Members:**
- Martin de la Presa
- Nate Rhodes

Bench-to-Bedside
**Healthx**

**Problem:** Amblyopia is the most common cause of vision loss in children. Current solutions and treatments are not tailored to individual patients.

**Solution:** HealthX is a novel and comprehensive solution for ophthalmology clinics and their patients aimed at diagnosing and treating amblyopia through video games. It provides a fun experience for all kids and is an inexpensive solution.

**Team Members:**
Ahmad Alsaleem  
Dainel

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**HemoStick**

**Problem:** Anesthesiologists currently estimate intraoperative blood loss by visual inspection of the suction canister fluids, documentation of blood-soaked sterile linens, and amount of irrigation used. This technique can lead to an error in estimating the amount of blood lost.

**Solution:** HemoStick is designed to measure all expected hemoglobin concentrations in a suction canister and calculate blood loss more accurately. This enables the anesthesiologist to transfuse a more accurate amount of blood back to the patient, leading to fewer intraoperative complications.

**Team Members:**
Brian Burnett  
Miles Christensen  
Myron Lance  
Sean McCandless
**Problem:** Many children require intermittent or nightly oxygen therapy. Unfortunately, the current standards of oxygen delivery are often irritating and uncomfortable, resulting in poor patient compliance.

**Solution:** We propose a novel oxygen delivery device incorporating oxygen tubing into a comfortable, hooded garment. The tubing directs airflow from the perimeter of the hood towards the face, creating a higher concentration of inhaled oxygen.

**Team Members:**
Ali Eisenbeiss | Bioengineering
Meliss Gulbransen | Bioengineering
Jessie Lam | Bioengineering
James Newton | Bioengineering

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**Play Rx**

**Problem:** Following transplant procedure, medication compliance is critical to recovery and returning to normal life. Unfortunately, up to 30% (annually) of transplant patients end up losing their organs because of medication mismanagement related to non-compliance. Noncompliance is especially prevalent in children and young adults.

**Solution:** Care Companion, by Play Rx, alerts patients when it is time to take medication and guides them interactively through the process. Graphical representation and clear labeling make it easy for patients to stay on track with the type and dose of medication needed. Patients are rewarded for compliance and develop deeper connection with their health.

**Team Members:**
Ajinkya Dhote | EAE
Seth Johnson | Non-student (design)
Tara Mleynek | EAE
Spencer Nelson | EAE
Sam Russell | EAE
**PlusOne Baby**

**Problem:** Sudden unexpected infant death (SUID) occurs approximately 3,500 times per year in the U.S. All parents, especially first-time parents, worry about their children’s health. Currently no products allowing parents to verify a child’s breathing exist that don’t require wires, electrodes or physical attachments to the child.

**Solution:** PlusOne Baby provides peace of mind to parents. Using standard wireless technologies, it passively detects and measures respiratory rate and breathing patterns with absolutely no physical contact to the child. Auditory alarms allow early intervention in serious or life-threatening situations.

**Team Members:**
- Spencer Madsen  
  Bioengineering

**Polysanus**

**Problem:** Patients on dialysis have a rapid decline in health.

**Solution:** Using a new material, Polysanus aims to improve the dialysis process and extend the health of patients waiting for a new kidney, and maybe even improve their quality of life at the same time.

**Team Members:**
- Patrick Nichols  
  Engineering
Project Labyrinth

**Problem:** 22 US military veterans will commit suicide today. 260,000 post 911 veterans have been diagnosed with a traumatic brain injury since 2001, and significant evidence suggests that traumatic brain injury affects PTSD and contributes to suicide.

**Solution:** Project Labyrinth’s “M’s Ocular Divergence,” a neurofeedback algorithm, allows patients to explore a virtual 3D environment using electroencephalogram (EEG) data. Patients are positively reinforced with movement, corresponding to certain regressed brain activity. This neurofeedback may alleviate symptoms of PTSD and reduce suicide incidence. The open source algorithm was distributed to 152 VA hospitals across the US in May 2016.

**Team Members:**
- George Martin Bammes  
  **Business**
- Yash Bangera  
  **EAE**
- John Fenley  
  **Physics**
- Siddartha Ravichandram  
  **EAE**
- Franziska Witchmann  
  **EAE**

$5,000 - Entertainment Arts and Engineering Award

Renaissance Astronaut

**Problem:** People set goals to improve many aspects of their lives. But those goals are often unrealistic, or people become discouraged or distracted by life. These difficulties are amplified in individuals with depression or otherwise experience decreased motivation.

**Solution:** Renaissance Astronaut is a game that will help people set achievable goals and stay motivated to accomplish them. Rather than a “gamified” approach to to-do lists, Renaissance Astronaut is primarily a game. Its low-pressure design focuses on teaching players to enjoy going through the stages of change.

**Team Members:**
- Jacob Broderick  
  **Biology**
- Nathan Broderick  
  **Videography**
- Sarah Broderick  
  **Bioengineering/Business**
RevoCap

Problem: Many developing countries lack access to safe anesthesia due to lack of capnographs.

Solution: RevoCap provides an affordable and portable capnograph that is ideal for developing areas because it doesn’t rely on the electrical grid.

Team Members:
Sean Ermer  Bioengineering
Arad Lajevardi-Khosh  Bioengineering
Maziar Nourian  Medicine
Kit Osborn  Public Health
Scott Potter  Medicine
Ahrash Poursaid  Business

Screw Interface

Problem: Cancellous bone screws are frequently used in orthopaedic procedures such as hip replacements, pelvis repairs and others. If screws are over-torqued they lose purchase. Corrective options are often limited to larger screws, a different screw trajectory or an injection of material to bind the screw in place.

Solution: We propose a bioabsorbable interference device that can be placed into the hole of the over torqued screw, preserving the original screw trajectory and helping the screw regain purchase. The fix is immediate. It does not enlarge the hole, eliminates time spent mixing and curing glue.

Team Members:
James Ehlers  Business
Suleiman Lapalme  Medicine
Sybo Technology

**Problem:** During invasive surgical procedures, doctors are frequently required to adjust operating room (OR) lights, often at critical or inconvenient times. Rather than make adjustments, doctors may simply continue operating in poor lighting conditions. This can lead to surgical errors, including a retained surgical item (RSI).

**Solution:** SyboT will use two cameras to simultaneously optimize surgical lighting and prevent RSIs. One camera tracks instruments; the other detects an infrared signal from the doctor’s eyewear and adjusts lighting on demand. The surgeon simply looks at the patient and pushes a foot peda. SyboT recognizes the location and orientation of the IR signal and adjusts to illumination accordingly.

**Team Members:**
- Ali Filsoofi
- Jared Gabaldon
- Brody King
- Eric McClain
- Pouya Sabetian
- Sean Shoemaker
- Mech. Engineering
- Mech. Engineering
- Bioengineering
- Mech. Engineering
- Mech. Engineering
- Information Systems

$2,000 - Eccles-Marriott Library Award

Through the Cords

**Problem:** Over 40 million intubations occur annually in the US. Providers often require multiple attempts to intubate, which increases the incidence of complications. Visual constraints, inability to direct the tube and failure to verify proper placement are often to blame.

**Solution:** Our proprietary tube introducer is steerable and color-coded to provide visual feedback and greater control, helping providers properly intubate on the first attempt. It simplifies difficult airway placement, reducing injuries, preventable deaths and associated health care cost.

**Team Members:**
- Ben Fogg
- Mackenzie Hales
- Samer Merchant
- Medicine
- Business
- Bioengineering

$10,000 - 2nd Runner-up
**TSV**

**Problem:** Current balloon dilators used for dilating a stenotic trachea do not provide simultaneous ventilation to the patient.

**Solution:** TSV’s device provides ventilation to the patient during surgery and provides an integrated method for delivering a drug to the patient after stenosis dilation. The balloon is created through blow molding; its strength is on par with industry standards.

**Team Members:**
- Kit Osborn, Public Health
- Mazir M. Nourian, Medicine
- Ahrash Poursaid, Bioengineering

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**Tube-Stow**

**Problem:** 345,000 people go home with gastroenteric feeding tubes every year in the United States. Individuals with feeding tubes constantly struggle with skin irritation, infections, pressure ulcers, accidental tube removal and a noticeable feeding tube that is just in the way.

**Solution:** Tube-Stow offers a comfortable way to secure, protect, and conceal feeding tubes. Tube-Stow is a comfortable waistband that provides convenient access, low profile tube storage, a barrier between the tube and skin and secure attachment.

**Team Members:**
- Ben Fogg, Medicine
- Carl Yeip, Design
- Amir Varedi, Medicine
**UGown**

**Problem:** Current surgical gowns inconveniently require the help of another, usually non-sterile, individual to assist in putting them on in the operating room.

**Solution:** UGown is a self-donning surgical gown that eliminates the need for external assistance and enhances OR sterility.

**Team Members:**
Johnny Le  
Computer Science  
Christopher Quach  
Bioengineering

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**Umbilikit**

**Problem:** High rates of at-home and rural births in developing countries are complicated by a severe lack of appropriate medical equipment and poor sanitation. Increasing rates of infection and infant mortality are often the result.

**Solution:** We have developed a simple umbilical cord cutting kit for new mothers. Our 100% biodegradable flat pack kit is up to 70% smaller than current standard birthing kits. It provides a blade-free cutting mechanism for safety, and can be easily understood no matter the language or demographic of the mother or caregiver.

**Team Members:**
Brian Charlesworth  
Design  
Jackson Richards  
Medicine  
Tyson Schwab  
MD, Bioengineering  
Malory Young  
Design

$5,000 - Best Engineering Award
Utah Tonsil Clamp

**Problem:** About 730,000 children and teenagers undergo tonsillectomy each year. Anywhere from 3-5% of these patients will return to the hospital with severe bleeding following surgery. These complications can be costly and traumatic for young patients. Where patients live far from medical care, the bleeding can be life-threatening.

**Solution:** The Utah Tonsil Clamp simply and effectively stops bleeding following tonsillectomy surgery. This carefully designed clamp safely applies precise pressure to the site of bleeding in a matter of seconds. Any medical professional can use the clamp. And during an emergency, a friend or family member could apply it. This device will reduce cost, treatment time, and risks associated with tonsillectomy.

**Team Members:**
- Scott Anjewierden
- ChaiDee Brown
- BreAnna Lackey
- John Lackey

UVAC

**Problem:** Postpartum hemorrhaging is the world's leading cause of maternal death. Over 90% of those deaths occur in developing countries. It occurs when the uterus does not contract down to a normal size after birth. Current treatments are ineffective, complex, or too expensive and are not uniformly adopted.

**Solution:** The UVAC (Uterine Vacuum Assisted Contraction) is a reusable, inexpensive handheld device that stops postpartum hemorrhaging by artificially contracting the uterus with a low-pressure vacuum. This mimics the body's natural response to compress the blood vessels and stop blood flow.

**Team Members:**
- Sarah Broderick
- Zack Eyre
- Thomas Goates
- Paul Holman
- Jared Pieper

$5,000 - Best Green Award
$5,000 - John Noorda Consumer Choice Award
Wacian-Pleth Patch

**Problem:** Many surgical settings in low and middle-income countries lack the ability to continuously monitor patient vital signs during perioperative procedures.

**Solution:** Wacian-Pleth Patch offers low-cost solution combining a reusable electronics package with a disposable sensor-embedded patch to provide continuous wireless monitoring of heart rate, respiration, and oxygen saturation.

**Team Members:**
- Azmi Ahmad  
  Bioengineering
- Benjamin Fogg  
  Medicine
- Stefan Niederauer  
  Bioengineering

Cinluma

**Problem & Solution:** Cervical cancer is the leading cause of cancer-related death among women in developing countries, where treatment options are. The heated probe of our portable, thermal coagulation device destroys lesions before they can become cancerous. This method is fast, effective, and specifically designed for use in resource-limited settings.

2015 B2B Competition Grand Prize winner
Easy Arm

**Problem & Solution:** Patients in a supine position during a CT scan must either hold their arms to their sides, compromising imaging quality, or hold them above their heads for prolonged periods of time, causing fatigue and possible injury. Easy Arm provides a comfortable place for patients to rest their arms above their heads and minimizing injury risk.

*2015 Best Green Award winner*

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Excisoseal

**Problem & Solution:** A method is needed to surgically remove the uterus in a minimally invasive and efficient way that reduces the risk of disseminating cancerous uterine tissue throughout the abdomen. Our device reduces the risk of spreading cancerous tissue during morcellation.

*2015 Best Medicine Prize winner*
**Problem & Solution:** While performing gynecological exams and procedures, clinicians require a means to properly illuminate the vaginal cavity. The Glo Light is a streamlined, single-use device provides an elegant solution to some of the most common clinician complaints regarding speculum use. It is easy to use with any speculum, allows for custom placement and provides 120 degrees of light.

*2013 B2B Competition runner-up*

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**mDOT**

**Problem & Solution:** Tuberculosis (TB) medication noncompliance is a major driver of treatment failure and worldwide health care costs. Mobile Directly Observed Therapy (mDOT) is an off-the-shelf solution linking mobile health and automated pharmacy technologies to combat medication noncompliance.

*2015 B2B Competition runner-up*
**Precision Cautery**

*Problem & Solution:* Bleeding during sinus surgery is difficult to control with current tools. Precision Cautery will offer a small, flexible device that delivers bipolar coagulation to stop bleeding in hard-to-reach areas.

*2015 Best Engineering Prize winner*

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**Random Breakfast**

*Problem & Solution:* Compliance is going to be the next tracked component of health. For compliance tracking to catch on, companies will need programs that nudge behavior. Random Breakfast focuses on nudging physical behavior through video games. We take extremely fun video games and reward players with extra bonuses for healthy behaviors.

*2015 Media Award winner*
StreamDx™

**Problem & Solution:** An improved at-home diagnostic tool for severe lower urinary tract symptoms is needed to qualify patients for surgical corrective intervention. StreamDx™ measures urinary flow for LUTS patients in the comfort of their own homes.

*2014 B2B competitor*

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XEnd Medical Systems

**Problem & Solution:** Intraocular injections often result in infections, which can lead to blindness or eye loss. The XEnd needle is designed to prevent bacteria from being transported during injections. It is expected to sharply lower treatment and liability costs resulting from needle-caused infections and contaminations.

*2014 B2B Competition Grand Prize winner*
THANK YOU!

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Competition Night

April 4, 2016

Held at the Utah State Capitol Rotunda, the 6th Annual Bench-to-Bedside Competition Night was attended by a host of university, community and business leaders and innovation stakeholders.
GET INVOLVED AS A SPONSOR OR MENTOR

We welcome community participation. If you or your organization would like to get involved, please let us know.

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