



SPONSORSHIP PACKET  
2015-2016

FORGING INNOVATION



*Date*

*Recipient Name*

*Name of Company*

*Address*

*Address Line 2 (City, State, Zip)*

Dear \_\_\_\_\_,

I am the team lead of Cornell Engineering World Health (EWH), an interdisciplinary team that aims to promote global health by creating innovative low-cost solutions to problems in underdeveloped countries. Like (Insert company name)'s mission, we advocate for (find some comparison/similarity between EWH and the company).

As a relatively young project team, we have accomplished tremendous success in the past few years. With a group of diverse, passionate, and driven students, our team was able to create several applicable products including a low-cost vital signs monitor and a passive vaccine refrigerator, which won third place in the international Engineering World Health competition. In addition to creating physical prototypes, we also promote application through outreach and exposure. Most recently, our team collaborated with MEDLIFE International and volunteered in Lima, Peru, where we immersed ourselves into a different culture and obtained inspiration for new projects. As a result, this year, we are collaborating with Forefront to develop other medical solutions.

We would like to ask that you consider becoming one of our 2015 Corporate Sponsors. Despite our ambition and aspirations, we will not be able to improve upon our current projects and innovate future projects without support from esteemed and established corporations, like (insert company name). In addition to heightened visibility through positive publicity, your sponsorship can also lead to recruitment benefits. We believe your mission and goals align with those of EWH and we are confident our partnership will be able to make a significant impact in improving Global Health.

Included in this sponsorship package are details regarding our past projects, our team, our future goals, and breakdown of how the donations will be allocated. Please feel free to reach out to me if there are any questions or if you would like additional information about our organization. Thank you in advance for taking the time to read this sponsorship proposal package and we look forward to our partnership.

Sincerely,

*Print Name*

*Team Lead, 2015*

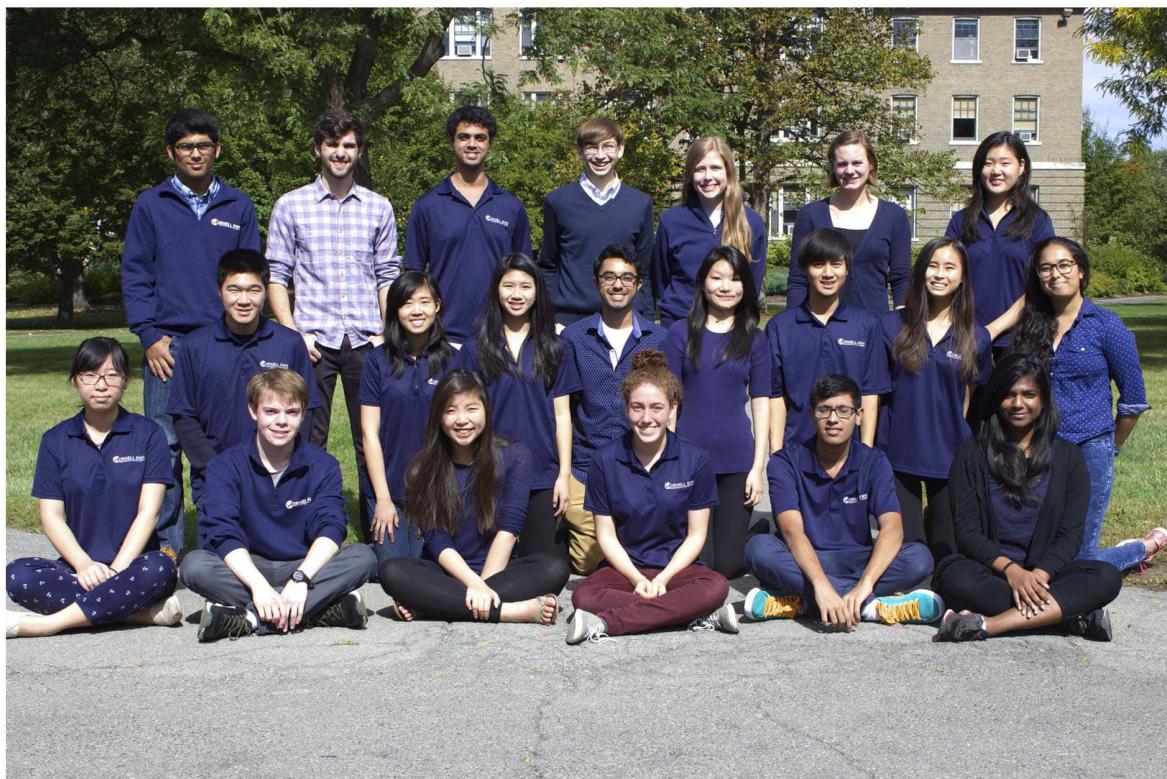
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# MISSION

## ABOUT US

The Cornell Engineering World Health chapter was founded in the fall of 2012 by a group of undergraduates who wanted to make a meaningful impact in the world, even as students. This mission has become the core foundation of EWH as a project team that seeks to make innovative and low-cost medical devices for developing countries and low resource communities. From idea conception, to design, to final prototyping, Cornell EWH has created several devices with the potential for impact. Over the course of the last three years, EWH has grown into a multi-disciplinary team with students in electrical, mechanical, biological, computer, and chemical engineering, as well as global health and economics.



# TEAM

## OVERALL

The project team is comprised of three technical sub-teams (bio and structural, electrical, and CS) and a business team. Together, the sub-teams collaborate on different aspects of a project to create a robust and innovative low-cost engineering solution to medical problems in developing countries.

### BIO / STRUCTURAL

Design, construction, and testing of the passive elements of projects and entire projects themselves. Projects range from creation of a biologically based antimicrobial fabric to a passively cooled vaccine refrigerator.

### BUSINESS

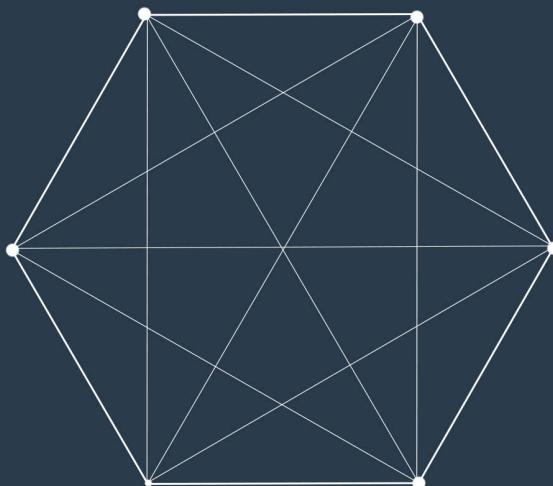
External networking, financial management, and internal administrative support for all technical sub-teams. Projects have ranged from the creation of a team website to bringing industry experts to coach the team.

### ELECTRICAL

Design and creation of hardware elements and projects involving fields from embedded systems to analog circuit design. Projects have included a redesign of a simplified and networked vital signs monitor.

### COMPUTER SCIENCE

Development of app and web designs and data visualization tools for all projects. Elements have included the networking system for a series of vital signs monitors.



# THE DESIGN PROCESS\*

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## HOW IT WORKS

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We address real-world problems by designing and implementing practical medical devices. To do this, EWH follows three main steps to design and implement a successful, novel medical solution.

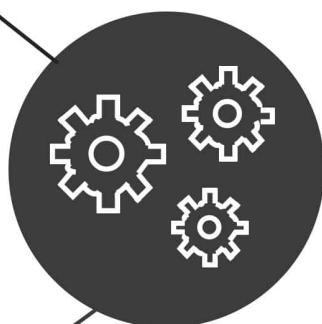
## STEP 1 PROBLEM IDENTIFICATION



We start with identifying a real unaddressed need from a specific resource-poor community. To do this, we contact healthcare workers and NGOs who are embedded directly into a community. From their experience, we identify problems that can be solved with an engineering solution.

## STEP 2 TECHNICAL PROTOTYPING

Once we have an objective in mind, we begin identifying target specifications and researching current technologies. We then adapt these ideas to create a novel medical device that is rugged, easy to use, and practical. We iterate through prototypes as we test them in environmental simulations, until we have a robust product.



## STEP 3 IMPLEMENTATION



Beyond just engineering the device, EWH seeks to implement it in the field. We communicate with various contacts to get our devices field-tested and gain feedback on our design. We also aim to gain first hand experience of where our devices may be implemented to improve our designs.

# TRIP TO PERU

Aside from creating prototypes, Cornell Engineering World Health actively participates in outreach activities in order to integrate with local communities and find inspiration for future projects. Most recently, members of our team travelled to Lima, Peru for eight days, where they partnered with MedLife International, a nonprofit organization that runs many mobile clinics. During the trip, our team shadowed health care workers and worked alongside them to serve local patients and completed several projects, including building a staircase to help facilitate transportation for the community. Through this eye-opening experience, our members not only grew as individuals through their first-hand exposure to the implementation of global health initiatives but also helped bring back ideas and stories that guide the future progression of the team. As our team continues to grow, we hope we can continuously build upon these valuable first hand experiences by creating more opportunities to interact with the world.

“ Often, we treat these people and their condition more as a *concept* rather than a *human entity* with whom we interface. This experience helped shed light on the actual *lifestyle* of the people we design products for, along with providing an insider *perspective* on how a developing community lives and the unique region-specific illnesses it faces.”



“It made me realize that engineering has to work in *conjunction* with *people* and their *governments* in order to have any effect.”



“The experience of visiting and seeing the low resource environment puts *context* into the work we do back at Cornell. Our hope is that in the *future*, EWH will continue to send members abroad each year to gain both valuable research information and reinforced *motivation*. ”

# VITAL SIGNS MONITOR

Many health care systems in the developing world lack the resources to provide valuable medical services to underprivileged communities. The World Health Organization estimates that 70% to 96% of medical equipment in these countries is broken with many medical facilities not having the financial capabilities to replace important parts for these existing devices. One such device commonly utilized is a vital signs monitor (VSM), a diagnostic instrument capable of logging a patient's heart-rate, blood pressure, temperature, and pulse oximetry.

## PROBLEM DEFINITION

The Cornell EWH chapter contacted medical professionals abroad regarding the scarcity of affordable VSMs, and gauged the necessity of such an instrument in evolving healthcare systems. It was determined that a more advanced, affordable VSM could serve a much needed medical service. Building upon this idea, Cornell EWH began developing an idea that would later evolve into a more complex system of networked VSMs capable of remotely sharing real-time patient information with medical professionals to augment timely medical services.

## SOLUTION

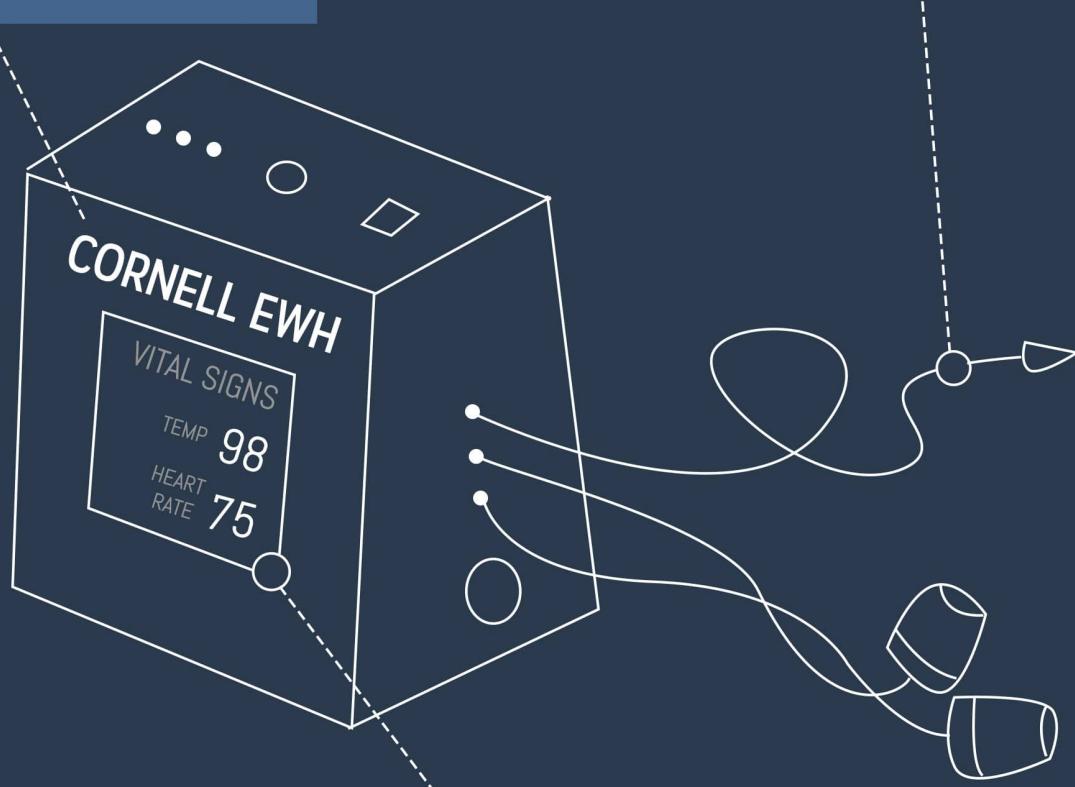
The device has the ability to send the collected information through a radio frequency to a central location known as the “base station”, which maintains two databases for patient and nurse information. The base station records information such as the nurse’s mobile phone number for SMS messaging which facilitates quicker response times if a patient’s health suddenly deteriorates. Along with receiving an SMS message, the VSM indicates visually of the patient’s worsening condition via buzzers and LEDs. Accompanying SMS messaging, a nurse is able to monitor any patient’s status through a web application accessible from any internet-enabled device.

**DATA INPUT / TOGGLE**

Patient information enters via a system that toggles through successive displays: age, gender, weight, diagnostic location and a final screen displaying collected data.

**SENSORS**

A minimalistic design, the VSM collects vitals via a temperature sensor and two pulse sensors, recording data at a finger and toe to ensure accuracy.

**DISPLAY**

Information is then to be read via the device itself or over the network to which the monitor belongs.

# VACCINE FRIDGE

In the fall of 2013, our EWH chapter contacted medical professionals regarding the feasibility of a passively cooled vaccine fridge, including a representative from Doctors Without Borders (DWB) based in Nairobi, Kenya. We found that the current cooling process is primitive; it is an off-the-shelf cooler with multiple ice packs. This is the only means to keep the vaccine cool during lengthy, arduous trips. Seeing the need, Cornell EWH embarked on designing a passively cooled vaccine fridge that could maintain the necessary cold temperatures for several hours, allowing NGO workers to transport the vaccines further during a campaign without the fear of spoilage.

We engineered the fridge to be portable for workers to use when accessing remote villages by foot, while reducing thermal conductivity to improve conservation of low temperatures inside. To achieve this, we used HPMI plastic for its lower thermal conductivity and durability. Additionally, we chose aerogel insulation, for its low convectivity and conductivity coefficients. To help prohibit heat from entering the fridge, we designed the fridge in a cylindrical shape, decreasing the surface area available for heat transfer.

We designed and 3D-printed special vaccine casings to protect the vials from our simple coolant - water. Once we completed the design and implementation of our fridge, we ran a simulation to mimic the operational environment. These demonstrated that the fridge could hold 138 vaccine doses and maintain a temperature within a 2-8 degree Celsius desired range for 16 hours. Our test showed that our portable cooler can be very useful for the NGO workers to transport lifesaving vaccine in some of world's most isolated and hard-to-reach areas.



For remote African villages with limited accessibility, it is not only difficult to store vaccines on-site due to a lack of electricity, but it is also difficult to have vaccines delivered before they spoil due to warm temperatures. Currently, vaccine refrigeration and the maintenance of the cold chain remains a pressing issue.

EACH YEAR, VACCINE-PREVENTABLE DISEASES CLAIM THE LIVES OF OVER 1 MILLION CHILDREN ACROSS THE WORLD

# WATER MONITORING

## COLLABORATION WITH FOREFRONT

This year, Cornell Engineering World Health is collaborating with Forefront, a non-profit organization that aims to provide sustainable change to underdeveloped communities with a four-phase approach. In the second phase of the plan aimed at creating clean drinking water, Forefront and Cornell EWH have partnered to create a remote water quality monitoring device for a well recently implemented in the village of Pallapatia, India. Our chapter of EWH is responsible for creating a working prototype of a water monitoring system that we aim to complete and install by the summer of 2016. Cornell EWH is working in a full team, cross-sub-team effort to develop the structure, integrated electronics, and data visualization for the remote monitoring device; providing both Forefront and the villagers of Pallapatia a reliable stream of information about the drinking water.



PALLAPATLA, ANDHRA PRADESH  
INDIA

## **WHAT WE NEED**

Many different components go into making a full medical device; from circuitry and microcontrollers to plastics and insulation. For each project EWH makes, we often need new materials and equipment to build a quality device. Within a database, we have listed some of the major categories of materials used in past projects as well as equipment we kindly hope may be donated.

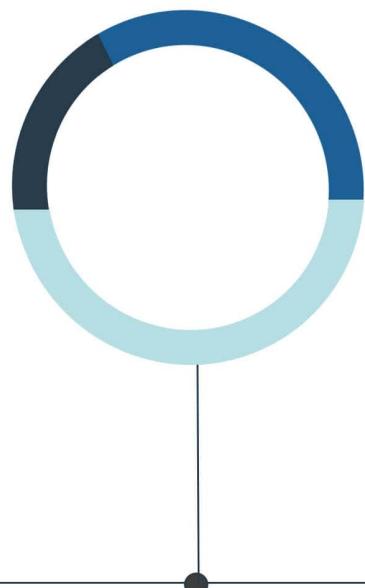
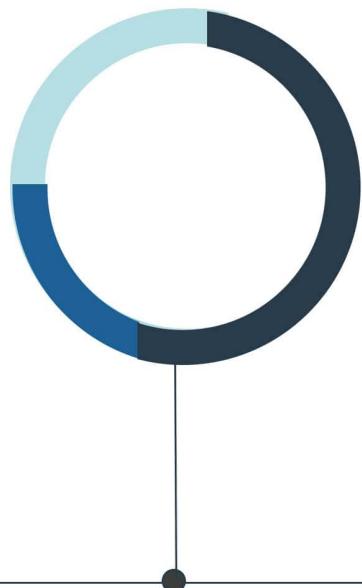
### **DONATIONS IN KIND**

Wave Function Generator  
Soldering Iron  
Multimeter  
Digital Power Supply

## SAMPLE EXPENSES 2014-2015

ITEM / DESCRIPTION	AMOUNT
<b>VITAL SIGNS MONITOR</b>	
CIRCUITRY	\$140.00
Adhesive Components used on Circuit Board	
MICROCONTROLLERS	\$450.00
Provides the 5 display toggling system	
SENSORS	\$200.00
For the pulse in finger, toe, along with temperature sensor	
CABLES / SCREEN	\$330.00
Where the actual Vital Signs are displayed	
MISCELLANEOUS	\$700.00
Tools needed to create VSM, Oscilloscope	
<b>PASSIVE VACCINATION REFRIGERATOR</b>	
PLASTICS	\$521.71
INSULATION	\$399.59
PROBES	\$214.70
MISCELLANEOUS	\$455.95
<b>PERU TRIP</b>	
<b>LODGING AND PARTNERSHIP FEES</b>	\$1500.00
Partnership fee with MEDLIFE which includes lodging and other living expenses	
<b>TRANSPORTATION</b>	\$4879.00
Airfare for 5 people	
<b>MISCELLANEOUS SUPPLY COSTS</b>	\$100.00
<b>GENERAL EXPENSES</b>	
NATIONAL EWH REGISTRATION FEE	\$600.00
NATIONAL EWH COMPETITION FEE	\$100.00
<b>TOTAL EXPENSES</b>	<b>\$10,590.95</b>

# BENEFITS OF SPONSORSHIP



## ALIGNED INTERESTS GLOBAL HEALTH

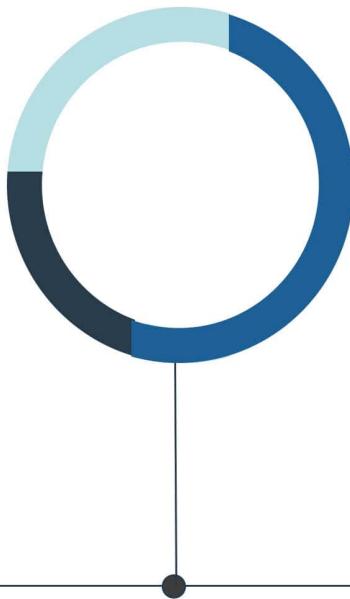
Sponsorship will promote positive publicity for the organization as a whole due to similar goals of advocating world health. You are contributing to the innovation of technology promoting global health initiatives. Furthermore, your donation enables the students of Engineering World Health to create higher quality devices that will last longer for the communities we help.

## ALIGNED INTERESTS SUPPORT ACADEMIA

Your support allows young motivated students to be able to learn great hands on skills while working toward the end goal of making a difference. Furthermore, supporting EWH will enhance credibility of the firm as supporting student-run organization shows well-roundedness of the company and their compassion for inspiring tomorrow's leaders.

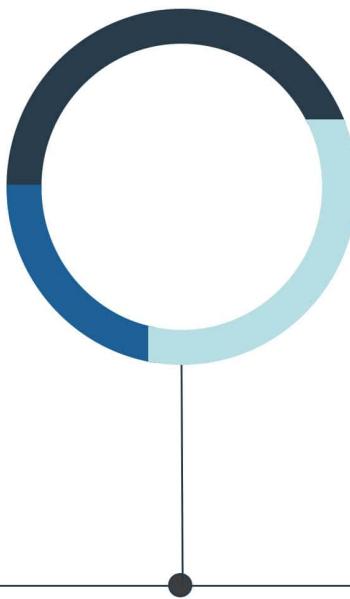
## NAME RECOGNITION RECRUITMENT

Cornell Engineering World Health is a highly competitive project team. Our passionate and diligent members will become assets to the future technology market. By sponsoring our organization, our students, as well as their peers, will recognize a company name, creating recruitment opportunities for both internships and full time jobs.



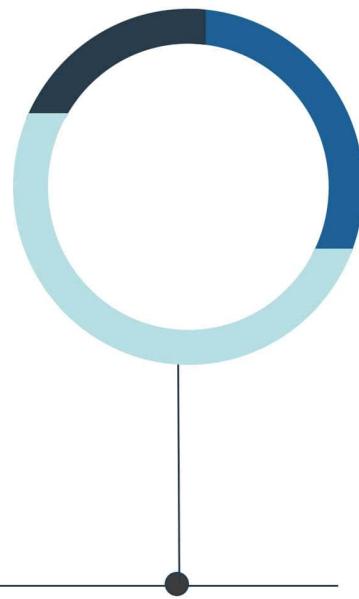
## CHARITY TAX REDUCTION

Your charitable donation provides an opportunity for a tax deduction at the end of the year whether it is monetary or an in-kind-donation. Furthermore, personal contributions may be matched by corporate initiative.



## VISIBILITY LOGO PLACEMENT

Cornell Engineering World Health will provide company visibility by placing the company logo on a variety of team advertisement methods, including t-shirts worn at all recruiting and school-wide events, the team website, team posters, and the sponsorship packet. Companies may even receive international coverage with placement on our projects.



## VISIBILITY MEDIA COVERAGE

In addition to logo placement, companies will receive media coverage by our participation in large-scale competitions that are sponsored by various top technological companies. Companies may be featured in media coverage and other promotional events that are broadcasted within the industry.

