

360° VIEW

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News from Rice 360°: Institute for Global Health



international **exchange**

collaboration across the oceans boosts the power of student-driven solutions



From the provost: celebrating Dr. Richards-Kortum

At Rice, we are well aware of Dr. Richards-Kortum's extraordinary contributions to teaching, research and translational impact. Her work has been recognized by some of the most elite scientific honors, including induction into, among others, the National Academy of Sciences, the National Academy of Engineering, the National Academy

of Inventors and the American Academy of Arts and Sciences.

This summer, Dr. Richards-Kortum was awarded a University Professorship – Rice's highest academic title. She is one of only seven University Professors in the history of Rice University to receive this honor, and the first in a decade. Her appointment as the Malcolm Gillis University Professor reflects her illustrious career and celebrates her commitment to developing innovative technologies to address some of the most intransigent global health issues.

Rice has a long history of faculty members with a passion for teaching, growing the leaders for the next generation and working collaboratively across campus. Even within this good company, Rice 360°, the award-winning engineering

program in global health that Dr. Richards-Kortum created, is one of the most creative and transformative educational programs in Rice's history. Along with her colleagues, Dr. Richards-Kortum challenges young men and women to imagine solutions to global health disparities by designing and implementing meaningful, innovative technologies.

I was certainly well aware of Dr. Richard-Kortum's excellent work long before my arrival at Rice. Truly, she models the way for all of us in research, teaching, and service to the world.

MARIE LYNN MIRANDA, PH.D.

*Howard R. Hughes Provost
Professor of Statistics,
Rice University
Founding Director,
Children's Environmental
Health Initiative*

Circling back: andrea ulrich '12

Andrea Ulrich graduated from Rice University in May of 2012 with a Bachelor of Science degree in Bioengineering. In a speech at the 2015 Rice 360° Global Health graduation breakfast, she spoke of continuing her adventures that started at Rice in the Oshman Engineering Design Kitchen (OEDK).

When she speaks of her mission to improve health-care for all, Andrea says she



Andrea Ulrich '12.

most often finds herself remembering her experiences at Rice, with the Beyond Traditional Borders (BTB) program. "This program

[BTB] really ignited in me the idea and the passion that it was possible to make a difference, that I had something to offer and that innovation – whether it's a new device or an improved process – can make significant improvements in the quality of life for others or even save lives."

As a member of the Rice team that pioneered Breath Alert, a device that alerts nurses when an infant is suffering from apnea of prematurity, Andrea was able to begin her job search with a strong resume. Her first job was as a Senior Strategy

Analyst for Accenture, where she worked with Fortune 500 clients in biopharmaceutical, mining and chemicals industries and volunteered with the company's international development component.

Searching for ways to further pursue her passion for healthcare, she applied for a fellowship with Global Health Corps and, through this connection, joined the Inter-American Development Bank as a Social Protection and Health Consultant.

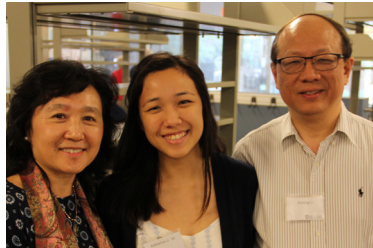
Based in Washington, D.C., Andrea designs and supports public health interventions for economically disadvantaged people in the region. She is currently designing a five-year micronutrient supplement program across two countries to improve the long-term well-being of more than 6,000 children from infants to two-year-olds.

Andrea says pursuing her adventure after Rice graduation wasn't easy, but she persevered. When she kept her mission at the forefront, she felt surer of herself and things started clicking into place, leading her to a job she loves.

Have a success story to share?
Contact Liz McGuffee at lizmcguffee@rice.edu.

Going beyond: agents of change

On May 15, 2015, 32 students were honored at a breakfast celebrating graduates who have participated in the Rice 360° Global Health programs and minor. Students, parents, friends and faculty joined in the festivities, which were held in the Oshman Engineering Design Kitchen (OEDK).



Katherine Li '15 and her parents.

During the breakfast, Rice University Bioengineering Professors Dr. Rebecca Richards-Kortum and Dr. Maria Oden challenged the students to be "agents of change." Dr. Richards-Kortum



Pooja Yesantharao '15 with her parents.

said that to be an agent of change, the students needed tools. Some of the tools were developed in Rice classes; others were realized working in the OEDK on senior projects; other tools were acquired working in Brazil, Ethiopia or Malawi. Resources, she said, are another important tool. So, to start the process, the two gifted each graduate with a \$100 gift card, with the challenge to use the funds to initiate change. To see how students met the challenge, visit www.facebook.com/BTB.Rice360.



Above: Michael Gwede '15, second from left, and Pablo Henning '15, second from right, with family members.



Left: Karen Haney '15, Hannah Millimet '15, Dr. Maria Oden, Dr. Rebecca Richards-Kortum and Hannah Wiley '15.



Team
Blantyre:
interns
from Rice 360°
and their
counterparts from
Malawi Polytechnic.

Memos to – and from – Malawi becoming global citizens

Starting point: Blantyre, Malawi

Since 2007, 47 Rice students have spent their summers in Blantyre, Malawi, collaborating with healthcare professionals at Queen Elizabeth Central Hospital and students and faculty members at Malawi Polytechnic (Poly), a college of the University of Malawi.

Armed with problem-solving techniques, knowledge acquired in global health technology classes and hands-on experience in the Oshman Engineering Design Kitchen

(OEDK), the students spent their summers teaching classes, training healthcare professionals, troubleshooting, field-testing prototypes and more. More than any classroom learning, the students' lives were enriched and their passion for being a part of the solution to global healthcare was ignited a hundred fold.

Return trip: Houston

With support from the Lemelson Foundation and Rice 360°: Institute for Global Health, in 2014, Rice launched a student exchange

program that would initiate a reciprocal exchange, bringing students from the University of Malawi to Rice University. The partnership between the universities is designed to replicate the success of Rice's award-winning, engineering education program for global health and promote shared innovation between students at the two campuses.

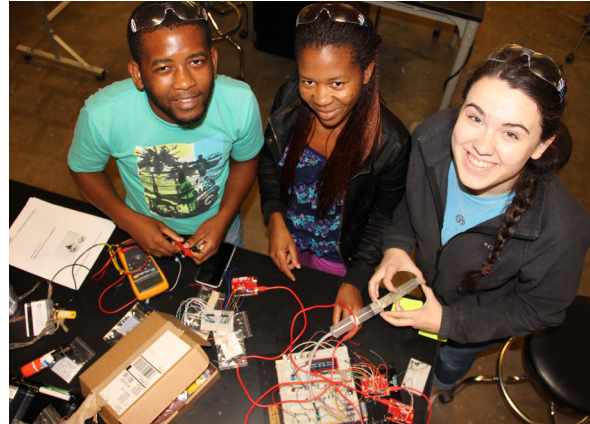
Across the ocean

Students from Poly, including Eckharie Beulah, James Fingulani, Nehuwa Namuthuwa and Florence Sadyalunda, and Rice students Hanna Anderson '16, Bailey Flynn '15, Mikaela Juzswik '18, Harrison Lin '18, Whitney Orji '16, Elizabeth Peacock '18 and Leah Sherman '18 worked at OEDK. Similarly, three Rice students, including Catherine Dunaway '18, Emily Johnson '17 and Sarah Hooper '17, teamed up with Poly students Francis Masi, Andrew Ndalama and Charles Nyalugwes at the University of Malawi's Polytechnic Innovation Design Studio (PIDS).

PIDS, which was established in the spring of 2015 with the collaboration of Rice 360°, aims to be a space where inter-institutional, interdisciplinary teams work to identify challenges to healthcare delivery in low-resource settings and to design and



Rice students collaborate with engineering students from Polytechnic Innovation Design Studio.



Poly students Eckharie Beulah, Florence Sadyalunda and Rice's Elizabeth Peacock '18 working at OEDK.

prototype innovative technologies using locally available resources.

And it works

Through collaboration, the participating students quickly took advantage of one another's expertise. In Malawi, when presented with a problem where a suction pump device often overflowed, Rice students quickly appreciated the creativity and resourcefulness their Poly counterparts offered. In the OEDK, the Poly students learned to appreciate the power of rapid prototyping and design methodology.

Changing perspectives

Dr. Maria Oden, director of OEDK, believes that the Rice-Malawi partnership will foster an "innovation ecosystem" based on two-way collaboration. "This hands-on approach – which has worked well at Rice – fosters entrepreneurial thinking and helps students make the leap from a promising prototype to a sustainable product that can directly impact lives," she said.

"When I went to Malawi, I came back a different person. And I am pretty certain that these students return to Blantyre or Houston different as well," said Dr. Rebecca Richards-Kortum, Malcolm Gillis University Professor and Rice 360° director. "With this bilateral, bicultural exchange, students from both universities are in the field working together not only to come up with solutions, but also to implement them and see the other technologies that have been previously implemented. It's a nice moment."

Other angles: events of interest

Friday, October 23 Rice Families Weekend

10 a.m. to 12 p.m. Rice 360° Global Health corner will be open during the Oshman Engineering Design Kitchen (OEDK) Open House. Come see the amazing technologies designed by our undergrads.

1 to 2 p.m. Yousif Shamoo Ph.D., Vice Provost for research and professor of Biosciences presents *Hospital Superbugs: Where did they come from and how can we beat them?*, a talk addressing the origins of antibiotic resistant hospital infections. Herzstein Hall, Room 210.

Sunday, November 1 Summer interns visit with Austin doctors

Renata Wettermann '17 and Sarah Hooper '17 will visit with Rice alumni in the Austin area, sharing their experiences from their summer in Malawi and demonstrating technologies under development in the Rice 360° Global Health classes. For more information, contact lizmcguffee@rice.edu.

Thursday, November 12 OEDK Elevator Pitch Competition

4:30 to 7:30 p.m. Seventh annual competition where student teams or individuals present 90-second pitches for concepts designed to solve global problems. Held in the Shell Auditorium at The Jones School of Business. For more information, visit www.oedk.rice.edu/ep.

Friday, November 13 Rice Homecoming Weekend

10 a.m. to 4 p.m. Fellows from the Rice 360°: Institute for Global Health will be welcoming visitors at the OEDK Open House. Guests are invited to learn how the institute innovates for global impact.

4 to 6 p.m. Rice Alumni in Medicine (RAM) invites alumni, parents and students to a reception and panel discussion about the breadth and depth of medical research at Rice University, including the global health program. Brockman Hall, Room 101. For more information, contact Nellen Hawkins at 713-348-5824 or nellen.hawkins@rice.edu.



Rice 360°'s first Brazil interns, Pablo Henning '15 and Meg Gore '16, seen here with the mobile cervical cancer screening unit, spent their summer internship working at Barretos Cancer Hospital.

SUMMER INTERNSHIPS BY THE NUMBERS

FIVE
LANGUAGES
attempted
(if not mastered)

423,000
AIR MILES earned

174
BLOGS
penned

THREE
COUNTRIES

72 CPAPs
in use

25 TECHNOLOGIES
demonstrated

52 Faculty nights
ON THE ROAD

19 New foods
TASTED
by students

FIVE
HOSPITALS
visited

INESTIMABLE Life-changing experiences

Extending the circle: students tackle morphine dosing issues

Palliative care is used to relieve patients of excessive pain, oftentimes through the administration of specific morphine dosages. In low-resource countries, the administration and record-keeping of morphine can be compromised.

Over the past several summers, Rice 360° students at St. Gabriel's Hospital in Namitete, Malawi began to tackle the problems and in the process, had life-changing experiences.

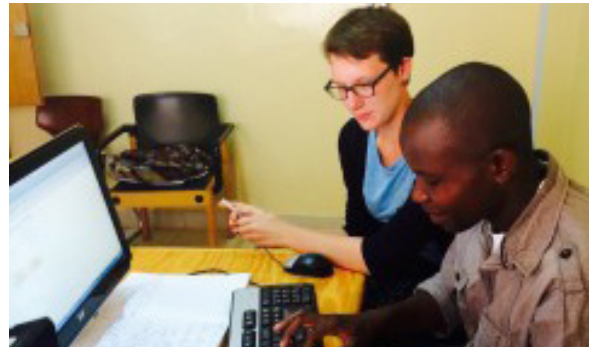
Morphine dosing

Renata Wetterman '17 is a premed student and rising junior at Rice University.

Renata went to Malawi to study the issue of morphine dosing, particular the Morphine Tracker, software that tracks the doses of morphine that a patient is given. Although the team made strides in furthering the use of the life-saving technologies they brought with them, lessons were hard learned. "Unfortunately," she writes, "the real world is a great deal messier than life inside the hedges." In the Oshman Engineering Design Kitchen and the BioScience Research Collaborative (BRC), she says that their devices seemed to work perfectly and it was disheartening to see they were not being used to their full extent.

As a self-described "semi-ridiculous combination of optimistic and Type A tendencies," she and her fellow interns began to step back and re-evaluate. In the end, they adopted a three-pronged approach to assure the Morphine Tracker's future effectiveness in palliative care. They altered the tool to suit the needs of staff at St. Gabriel's; they initiated a communication program, including tutorials, to build awareness; and third, they

wrote an extensive, picture-laden manual that is available to all.



A St. Gabriel's Hospital staff member trains Renata Wetterman '17 in the Morphine Tracker.

Medical records

Due to resource constraints, palliative care programs in sub-Saharan Africa rely on home-based programs which impair medical record keeping and data collection. To remedy this, Kamal Shah '15 and other previous Beyond Traditional Borders interns at St. Gabriel's in Namitete tackled the problem, eventually developing DataPall, an electronic medical records system tailored to the needs of palliative programs in Malawi.

The program was implemented at St. Gabriel's and at Tiyanjane Clinic, two of the country's leading palliative care providers in the summer of 2012. With the support of the Malawi Ministry of Health, the team continues to refine DataPall with the aim to implement it throughout Malawi in the coming months.

These are just two stories from Owls Beyond Borders. For more information, please visit www.rice360.rice.edu/owlsbeyondborders. To learn how you can help support the program, contact Liz McGuffee at lizmcguffee@rice.edu or (713) 348-4491. Or donate on line at www.rice360.rice.edu/donationform.



RICE 360°

INSTITUTE *for* GLOBAL HEALTH

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From the center: day one project neo-natal unit a reality



Construction of the neonatal wing at Queen Elizabeth Central Hospital in Blantyre, Malawi is complete and serving patients. Thanks to all who donated to the Day One project over the last three years—you helped make this a reality! The facility, shown here, provides the tools and space for healthcare professionals to care for newborns.