Siemens Healthineers Employees Mentor Global Health Innovators

Mentors worked with STEM students to guide them in their pursuit to prevent and eradicate disease around the world.

Siemens Foundation CEO David Etzwiler commemorates the conclusion of the 2019 Siemens Foundation / PATH Fellowship Program with this year's fellow class.

The future of healthcare is today.

Each year, the Siemens Foundation enables a group of students to conduct research alongside mentors from PATH and Siemens Healthineers during a 12-week program that addresses some of the world's most pressing health needs. The goal: Pursue unique healthcare challenges in ways that can help prevent and eradicate disease and improve the lives of potentially millions of people around the world.

This past summer marked the fourth consecutive year of the Siemens Foundation's partnership with the Seattle-based PATH, a global leader in the development of sustainable and innovative healthcare solutions for underserved communities. Six student fellows received support from the Siemens Foundation, and worked with several mentors from Siemens Healthineers teams across the company's Laboratory Diagnostics, Point of Care Diagnostics and Molecular Diagnostics businesses.

Those six students were selected from more than 400 applicants.

Mentors behind the Siemens Foundation PATH Fellowship

The mentor team from Siemens Healthineers featured: **Nathan Small**, Laboratory Diagnostics Assay Development R&D Project Manager; **Kenneth Mullert**, Product & Solutions Development Manager, Laboratory Diagnostics Medical and Biostatistical Design Quality; **John Benco**, Point Of Care R&D Strategy; **Sai Patibandla**, Ph.D., Senior Director, Laboratory Diagnostics Assay Development; **Kerry Embry**, Principal Mechanical Engineering Practice Lead, Laboratory Diagnostics Global Engineering; and the tandem of **David Ledden**, Ph.D., Principal Key Expert and Head of Point Of Care Immunoassay R&D, and **Jeffrey Mayfield**, Biochemical Engineers, Point Of Care R&D.

These mentors comprised a strong partnership with the Siemens Foundation and PATH.

"The Siemens Foundation's mission is to grow and develop the next generation of scientists and engineers with a view to improve people's lives across the globe," observed John Benco. "PATH's mission is to solve global health challenges through innovation. Our partnership and support of the PATH Fellowship program is an important aspect towards realizing our joint missions."

David Ledden has been a mentor for over 20 years, but this was his first year in the PATH program. "The most important element is the education aspect for fellows and mentors," David said. "It's is a two-way street. I know that I have expanded my own knowledge where I have learned some things that I hadn't seen in my time in this industry. It was impressive to see students present their work and defend their findings."

According to Kerry Embry, the decision to mentor is clear. "The development of students and emerging engineers is vital to the future of those involved and the growth of Siemens Healthineers," Kerry noted. "Mutual sharing of experience and new ideas promote and advance the future."

Sai Patibandla agrees. "These students are trying to find solutions to real-world issues in under-developed areas," Sai said. "This is one of the many ways that Siemens Healthineers invests in innovation and learning. The students are emerging scientists and are exposed to good laboratory experiences and career opportunities in healthcare."

PATH Fellows Projects

Those opportunities manifested in the research pursued by the fellows.

Developing testing methods for diagnosing tuberculosis
PATH Student: Stephanie Torres Martinez
Siemens Healthineers Mentor: Sai Patibandla
Summary: The project goal was to evaluate sample prep methods to improve detection of a TB-specific biomarker present in urine of TB-positive patients. As the selected fellow, Stephanie worked in a real-lab environment to contribute to novel research, enhance her skills in basic lab work and equipment, and grow her knowledge in experimental design and testing as well as several key areas of diagnostics research (notably, assay development).

Assessing diagnostic tests to support malaria elimination
PATH Student: Miguel Velasco
Siemens Healthineers Mentor: John Benco
Summary: The goal was to support the rapid development, commercialization and implementation of promising, cost-effective and impactful diagnostic technologies for malaria elimination. Miguel assessed lactate dehydrogenase (LDH) concentration of *Plasmodium knowlesi* in culture—LDH concentration was quantitatively determined using enzyme-linked immunosorbent assay (ELISA) and qualitatively using rapid diagnostic tests (RDTs).

Testing different methods to increase sensitivity in lateral flow tests
PATH Student: Fiona Chace-Donahue
Siemens Healthineers Mentors: David Ledden, Jeffrey Mayfield
Summary: With a focus on malaria, this project addressed lateral flow test optimization to improve sensitivity. Fiona tested and compared different published methods intended to improve the sensitivity of a lateral flow test and assessed the impact on the sensitivity and specificity of the test. Her experience helped her improve skills of selecting and replicating methods found in scientific literature, and learning immunoassay concepts as applied to lateral flow tests.

Understanding and analyzing the process and results of a new malaria diagnostic
PATH Student: Emily Reichert
Siemens Healthineers Mentor: Kenneth Mullert
Summary: Malaria parasites express an antigen called hrp2—this protein is detected by many commonly used rapid diagnostic tests (RDTs). This project centered on the large variation in hrp2's expression between different age groups and transmission settings. Understanding and quantifying the variation helps develop more highly sensitive RDTs. Emily analyzed a range of data sets, developed statistical models, and interpreted and translated results—ultimately providing evidence that can inform national malaria strategies.

Product development, devices and tools
PATH Student: Jia Hao "Joe" Wang, Kimberly Ventura
Siemens Healthineers Mentors: Kerry Embry, Nathan Small
Summary: This project centered on PATH's collaborative R&D with universities, manufacturers and other institutions to develop products that are appropriate and affordable for developing countries. Joe and Kimberly worked on the testing of devices, design and construction of test fixtures, the creation of control documentation and reports, shop machinery operation, CAD drawings and lab documentation.

Equipping Doctors with Solutions

According to Jeff Mayfield, Fellow Fiona Chace-Donahue's original plan was to pursue medical school. Following her PATH fellowship, Jeff noted that "Fiona discovered a real appreciation for R&D and her experience may have reshaped her thoughts as to her career pursuit—to maybe equipping doctors with diagnostic solutions."

Nathan Small said he enjoyed working with the students. "Their out-of-box perspective challenges you to bring new team members up to speed quickly and even helps us better serve challenging markets," Nathan noted.

Concludes Kenneth Mullert, "The support that Siemens Healthineers provides to improve health outcomes worldwide and teach and train the next generation of scientists to confront these will ultimately help improve healthcare quality and access in extremely low-resource environments."