Stony Brook University undergraduates have excavated ruins in Iraq, traveled to the jungles of Madagascar and navigated the Atlantic collecting marine life — all in the name of science. These experiences are the result of a research-based curriculum that encourages innovation and the University’s focus on mentorship, which pairs undergraduate researchers as early as freshman year with faculty mentors. Through sage advice and hands-on guidance, mentors provide student scientists with every opportunity to excel in their chosen fields and prepare for future careers; they’re nurturing a whole generation of future scientists.

For Shanawaj “Roy” Khair, mentorship has been particularly important for his burgeoning career. Khair graduated from Stony Brook in 2016 with a degree in biology. He got a job soon after in the school’s gastroenterology lab as a research analyst, collecting tissue samples. The professor who mentored him throughout his four-year undergraduate career as his teacher — Ellen Li, MD, PhD, of Stony Brook Medicine’s Division of Gastroenterology and Hepatology — continued to mentor him in his professional career as his boss.
The experience students get in terms of teamwork and collaboration is extremely valuable,” said Karen Kernan, director of the URECA program.

Khair is exactly the kind of student Stony Brook attracts: a self-starter who’s passionate about science. While still a high school student, Khair met with local college professors to do research, conducting a small experiment on the relationship between the microbiome and obesity in mice. He would go on to win a Gates Millennium Scholarship — a prestige grant that helps pay for college. Khair could have continued his education at any number of schools, but said he was drawn to Stony Brook because it was such a well-known name in the research community and would give him the chance for in-depth study of the topic he’d found so intriguing.

During his time at Stony Brook, Khair continued researching the gut microbiome under the tutelage of professors and postdocs. His mentors taught him how to publish work — a necessity in the scientific community — and how to conduct a long-term research project.

“My job is to make the paths for students like Rizy as easy as possible,” said J. Peter Gergen, a professor in the Department of Biochemistry and Cell Biology and another of Khair’s mentors. “They have to step on the gas, but I make it clear where to make the turns. I let them drive through the maze.”

Khair plans to put his education to good use as a physician-scientist, a position that gives doctors the opportunity both to see patients and conduct research. On the advice from his mentors, he is applying to MD-PhD programs and hopes to continue his studies next fall.

“Medical adversity is a common theme in my life, especially coming from Bangladesh, where the medical treatment is not up to par,” Khair said. “My mom and I both have asthma and my dad has diabetes. The process of low medicine works and how it alleviates adversity — I’ve seen at Stony Brook.”

With so many opportunities to excel and the support of his mentors, Khair will go into the medical profession with a far more extensive background than many of his peers.

A Deeper Learning Experience

The kind of research experience and mentorship that Khair received during his tenure at Stony Brook is commonplace at the University. It’s part of a system that sets up students for success when they leave college and go into the workforce, said Karen Kernan, director of Stony Brook’s Undergraduate Research and Creative Activities (URECA) program. URECA involves students from every discipline in research and culminates each year in a celebration of achievements.

“The experience students get in terms of teamwork and collaboration is extremely valuable,” Kernan said. “Research complements what they’re learning so much deeper.”

Stony Brook faculty work hard to make sure these research opportunities are offered to the whole student body. During Gergen’s nearly 30 years at the University, the number of students involved in research has more than doubled, he said. “The school has made a concerted effort to involve minority students and students coming from lower socioeconomic backgrounds. And it has worked.”

While incoming students, like Khair, with a solid background in science are commonplace, many come to the school without any research experience at all. Stony Brook faculty quickly bring them up to speed.

“I think the students — particularly the undergraduates — they feel confident and want to keep working hard. It’s a wonderful learning experience.”

Sarah McTague ’18 is a biomedical engineering major, studies diabetes and heart disease.

A Deeper Learning Experience

“Working in an actual lab and seeing people do actual science not only teaches me, but also inspires me,” said Sarah McTague. “It encourages me to keep working hard.”

A Deeper Learning Experience

Working in an actual lab and seeing people do actual science not only teaches me, but also inspires me,” said Sarah McTague. “It encourages me to keep working hard.”

Sarah McTague ’18, who’s passionate about marine science, is also grateful for Stony Brook faculty’s mentorship. She said she’s especially appreciative of her mentor Christopher Gobler, from her exposure and tutelage. Gobler, a professor at Stony Brook University’s School of Marine and Atmospheric Sciences (SoMAS), conducts research on plankton ecology and has given McTague the opportunity to study in his lab, learning the ins and outs of marine science.

McTague has been curious about marine science since her parents took her whale watching as a child. This curiosity blossomed into a full-fledged career path once she decided to attend Stony Brook. Through the marine science club, she heard about a semester at sea program administered by the Sea Education Association and jumped at the opportunity to spend 30 days crossing the Atlantic in a research vessel while studying jellyfish and ocean acidification. Upon her return to dry land, McTague continues to study the organisms that inhabit the ocean. The experience, she said, has increased her interest in the field and solidified her desire to become a professional scientist.

“Working in an actual lab and seeing people do actual science not only teaches me, but also inspires me,” said Sarah McTague. “It encourages me to keep working hard. It’s a wonderful learning experience.”

Multidisciplinary Guidance

All this guidance and research experience is meant to prepare students for future careers and inspire potential breakthroughs — in science. Stony Brook is well-known for groundbreaking discoveries, such as revealing the cause of Lyme disease and inventing an ultrasound method to speed up bone fracture healing.

Michael D’Aguiar: “It’s working his way toward joining the ranks of Stony Brook’s scientific superstars. The electrical engineering student is inventing technology that will embed on a human body and collect energy that can be used to power everything from a computer to a light bulb. He considers energy to be a broad term, including chemical and mechanical processes such as calorie expenditure and limb movement. He wants to invent tiny energy scavengers that can power everything from a computer to a light bulb. He wants to invent tiny energy scavengers that can power everything from a computer to a light bulb.

His return to dry land, McTague continues to study the organisms that inhabit the ocean. The experience, she said, has increased her interest in the field and solidified her desire to become a professional scientist.

“Working in an actual lab and seeing people do actual science not only teaches me, but also inspires me,” said Sarah McTague. “It encourages me to keep working hard.”

Sarah McTague ’18, who’s passionate about marine science, is also grateful for Stony Brook faculty’s mentorship. She said she’s especially appreciative of her mentor Christopher Gobler, from her exposure and tutelage. Gobler, a professor at Stony Brook University’s School of Marine and Atmospheric Sciences (SoMAS), conducts research on plankton ecology and has given McTague the opportunity to study in his lab, learning the ins and outs of marine science.

McTague has been curious about marine science since her parents took her whale watching as a child. This curiosity blossomed into a full-fledged career path once she decided to attend Stony Brook. Through the marine science club, she heard about a semester at sea program administered by the Sea Education Association and jumped at the opportunity to spend 30 days crossing the Atlantic in a research vessel while studying jellyfish and ocean acidification. Upon her return to dry land, McTague continues to study the organisms that inhabit the ocean. The experience, she said, has increased her interest in the field and solidified her desire to become a professional scientist.

“Working in an actual lab and seeing people do actual science not only teaches me, but also inspires me,” said Sarah McTague. “It encourages me to keep working hard.”

Sarah McTague ’18, who’s passionate about marine science, is also grateful for Stony Brook faculty’s mentorship. She said she’s especially appreciative of her mentor Christopher Gobler, from her exposure and tutelage. Gobler, a professor at Stony Brook University’s School of Marine and Atmospheric Sciences (SoMAS), conducts research on plankton ecology and has given McTague the opportunity to study in his lab, learning the ins and outs of marine science.
D’Agati the tools he needs to apply his training as an electrical engineer to his unique task. With such an interdisciplinary approach to his studies, D’Agati is able to use his knowledge to work on problems that cross several fields of study, such as nanotechnology and bioengineering.

This approach has paid off — and not only in the lab. D’Agati won a Goldwater Scholarship, an honor bestowed on only 202 scholars nationwide in 2016, which will pay for part of his tuition and expenses.

D’Agati has been involved with Stony Brook faculty since he was in high school, enrolling in programs such as the Simons Summer Research Program, which is open to high school students across the country interested in studying science or math. His mentor, Balaji Sibarikan, director of the Multi-Functional Nano-Biosystems Lab, has been a staunch advocate of his work. Sibarikan said he took D’Agati under his wing, pushing him to learn hands-on research. He also made sure D’Agati had ample opportunity to assist graduate students with their experiments, adding another layer to his education.

“During his entire time in my lab, I have served as his auxiliary faculty advisor,” Sibarikan said. “This included supporting technical courses that complement his research projects, providing opportunities to co-author conference submissions and peer-reviewed journal articles, and helping him to apply for undergraduate research fellowships.”

D’Agati said the University’s commitment to mentorship is unparalleled compared with other universities, where students have to fight to be heard, and has contributed to his success as a scientist.

Melina Seabrook ’17, who studies anthropology, agrees with D’Agati’s assessment. She said the research community at Stony Brook is relaxed and friendly, which fosters a low-pressure environment in which students can seek out professors for advice.

And there are more than happy to provide that advice. Elizabeth Stone, a professor in Stony Brook’s Department of Anthropology and Seabrook’s mentor, describes mentorship as the ritual of moving people from student to professional. “It’s a process by which you allow them more and more rope to develop their own ideas and their direction,” she said. “That is something you don’t get everywhere. [Stony Brook] faculty are more than happy to talk to students about what they’re interested in and what they want to do.”

Seabrook is a go-getter who knows exactly what she wants to do: become an archaeologist.

“The senior works with Stone to map archaeological sites, even traveling to Iraq to assist her professor on digs. Seabrook spent 10 weeks excavating pottery, bones and possible artifacts used by ancient civilizations, and exhibited a level of dedication that impressed her mentor.

“Melina was really great during thedig,” Stone said. “Her field notes were better than everybody else’s. She paid attention.”

Making a Difference

When students discover their interests, they pursue them 100 percent. Rima Madan ’17, a biology and anthropology double major, traveled to Madagascar in summer 2014 to study healthcare. She said she returned to the United States with a deeper appreciation for science — and her own opportunities at Stony Brook.

“When I got to Stony Brook, I realized how many opportunities there are,” Rima Madan said. “I have a couple of different mentors, which is really helpful. I was able to grow and learn and build character.”

Because of her experience and know-how, Madan already has been accepted to SUNY Upstate Medical University in Syracuse, NY, where she hopes to specialize in neurology. She attributes her success to mentors who encouraged her, challenged her and gave her the support she needed to achieve.

“When I got to Stony Brook, I realized how many opportunities they are,” she said. “I have a couple of different mentors, which is really helpful. I was able to grow and learn and build character.”

With such a strong foundation and solid support system, all six students have said they are excited to continue their work in science. As they carry on with their studies and progress within their respective careers, they hope to continue the legacy of Stony Brook, giving back to the community as mentors themselves and taking research to new heights.

Melissa Blauhoff-Sedlacko (a writer and editor based in Washington, D.C. She’s reported for National Geographic, The Atlantic, NPR and Reuters, among others.)