A publication for alumni, donors and friends of the COLLEGE OF BIOLOGICAL SCIENCES at the UNIVERSITY OF MINNESOTA

BIO

MEET A FEW COLLEGE OF BIOLOGICAL SCIENCES FACULTY CAPITALIZING ON THEIR BIOLOGY EXPERTISE.

BUSINESS as USUAL

Not
People, Pets and Plants: The Role of Human Actions in Creating and Solving Water Problems

OCTOBER 26 at 4 p.m.

Cowles Auditorium, Humphrey School of Public Affairs
Free and open to the public
RSVP at diversity.umn.edu/women/adarsvp

In her own words

Sarah Hobbie will deliver the University’s Ada Comstock Distinguished Women Scholars Lecture.

Recipient of this year’s Ada Comstock Distinguished Women Scholars Award Sarah Hobbie is in good company. She shares the honor with a long list of accomplished women faculty members including Comstock, who was a Minnesota native and University of Minnesota professor who went on to lead both Smith College and Radcliffe College.

Hobbie is a professor in the college’s Department of Ecology, Evolution and Behavior (EEB), a member of the National Academy of Sciences and co-leader of the long-term research program at Cedar Creek Ecosystem Science Reserve.

Her pioneering studies in urban ecology illuminate how common household activities and urban vegetation contribute to nutrient pollution of urban lakes and streams, while also shining a light on potential solutions to water-quality challenges in cities.

“Sarah has worked tirelessly with collaborators globally to understand how plants and microorganisms influence ecosystem functions and how ecosystems respond to global change,” says Jeannine Cavender-Bares, associate professor in EEB and co-chair of the Women’s Faculty Cabinet.

You are invited to hear Hobbie’s lecture October 26 at Cowles Auditorium.
1 The Petri Dish
A new event series puts a cross-disciplinary spotlight on the impact of biology on our lives.

2 New and noteworthy
Citizen science at Cedar Creek, a "multiomic" platform for identifying meaningful mutations, and microbiome momentum.

3 Research highlights
A surprise cancer culprit, the evolutionary implications of butterfly diets and lions’ last stand.

6 Not business as usual
Meet a few College of Biological Sciences researchers putting their expertise to work.

12 Something to prove
CBS continues to lead the way in evidence-based teaching and student-driven research experiences.

14 Bay Area benefactors
Two Bay Area alumni-turned-donors maintain Minnesota ties through scholarship support.

CBS researchers are putting their biology expertise to work in the business sector.
An emphasis on engagement

This summer, I spent time with some of our incoming students at Nature of Life. Amidst black bear sightings and a severe thunderstorm that toppled numerous trees and cut off power to Itasca Biological Station and Laboratories, I was struck by how quickly a camaraderie and sense of community formed. Observing students’ transformation as they began to connect with their peers and the faculty was wonderful.

I think it’s safe to say that we biologists find the world fascinating. From early and ongoing efforts to catalogue the rich abundance of species to sequencing the human genome and making sense of the microbiome, we are motivated to investigate questions, big and small, about how life works.

At CBS, we work hard to nurture that curiosity in our students. We continue to lead the way in investigating the most effective ways to teach biology and provide authentic research experiences few institutions can match. Our Department of Biology Teaching and Learning — the only department of its kind — is at the vanguard of evidence-based teaching. From integrating active learning into the curriculum to creating new opportunities for students to ask and answer their own research questions, the undergraduate experience continues to evolve.

Knowing how life works is just the start, though. In this issue of BIO, you’ll have a chance to learn about a number of faculty who are taking their biology expertise to the marketplace. These business ventures are as varied as you would expect from a college that covers the breadth and depth of biology from a startup working on a novel cancer therapy to an effort to develop an educational app that makes photosynthesis more accessible.

I think you will be inspired by the stories of members of the CBS community deeply engaged in creating new knowledge and using that knowledge to make a difference. I know I am.

Valery Forbes
Dean, College of Biological Sciences
**THIS FALL**, the College of Biological Sciences brings you the Petri Dish, a series of curiosity-driven conversations with some of the University’s most engaging experts. They will explore how biology affects our lives and what it means for our future.

Join us at Bedlam Theater in Lowertown St. Paul for three fascinating evenings of lively conversation, music and science-y fun.

Hope to see you there!

**OCTOBER 5**

*Where the Wild Things Aren’t*

The future of wilderness and wildlife from the Serengeti to the Arctic

With Craig Packer, Aaron Doering and Jessica Hellmann

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**NOVEMBER 2**

*It’s Complicated*

Our evolving relationship with the microbial world in and around us

With Dan Knights, Michael Sadowsky and Cara Santelli

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**DECEMBER 7**

*Our Parasites, Ourselves*

The counterintuitive, complex relationship between people, environment and policy

With Marlene Zuk, Kristen Nelson and Dominic Travis

Reserve your tickets at [z.umn.edu/petridish2016](http://z.umn.edu/petridish2016)
NEW & NOTEWORTHY

READY, SET, TRACK!

THIS SUMMER, Cedar Creek Ecosystem Science Reserve launched a year-long effort to identify the numerous bird and mammal species found at the field station with help from the public. Cedar Creek is inviting “citizen scientists” to participate in its Wildlife Tracking Survey.

“Systematically surveying our 5,400 acres for track and sign, and learning the stories of animal movement and habitat use instead of just relying on chance encounters will help researchers understand what lives here and help community members appreciate how diverse and important this reserve is,” says Caitlin Barale Potter, Cedar Creek’s education and outreach coordinator.

“By becoming a part of our Wildlife Tracking Survey team, people from all walks of life can be a part of the highly-respected science that goes on here,” she says. “Plus, we’ve got 28 miles of sand roads — perfect for novice trackers and an easy way to quickly collect interesting data!”

GET INVOLVED! > Attend tracking training at Fort Snelling State Park Oct. 15-16 then put your new skills to work Oct. 22 at Cedar Creek! RSVP to Caitlin Barale Potter at 612-301-2602.

PENCHANT FOR PATTERNS

PROTEIN PRODUCTION within cells should operate like a well-oiled machine. But when it doesn’t, cellular functions can go haywire causing numerous problems within DNA or RNA transcription which can serve as a catalyst for cancer and other diseases.

Understanding the many moving parts involved is a major challenge for researchers looking to unravel the complex processes in play. Tim Griffin, a professor in the college’s Department of Biochemistry, Molecular Biology and Biophysics, is about to make the work of identifying mutations that give rise to novel proteins — and offer a path to potential therapies — a lot easier.

Griffin and colleagues are developing a “multiomic” platform for cancer researchers that integrates genomic, proteomic and metabolomic data in a single place, allowing them to track down novel proteins resulting from mutations.

“Our goal is to give users the ability to take their research result and, in one click, interface with a database that tells them all they need to know about a gene mutation as they look for correlations with specific types of cancer,” says Griffin. “A protein gone bad could be a target for therapy. Or it could be a biomarker of the cancer.”

POST-DOC POWER!

POST-DOCTORAL RESEARCHERS occupy a unique niche in the academic ecosystem. Just beginning their own careers as researchers, they are well-positioned to branch out and bridge disciplines.

Earlier this year, the college launched the Grand Challenges in Biology Postdoctoral Program to encourage just that kind of collaboration.

Four teams made up of a post-doctoral associate and at least two faculty members from different disciplines are pursuing a variety of projects from addressing phosphorus runoff in waterways to understanding the biological mechanisms underlying sex chromosome disorders.

“Each of the proposals chosen represents the kind of cross-pollination between disciplines and across labs that will help propel this college forward,” says CBS Dean Valery Forbes. “Post-docs are the catalysts for these unique partnerships.”

Many of the microbes that are vitally important to the health of our bodies and our planet’s ecosystems remain mysterious to us from a scientific standpoint because their interactions are so complex.”

DAN KNIGHTS, ASSISTANT PROFESSOR IN THE BIOTECHNOLOGY INSTITUTE

Knights is among the researchers in the college investigating aspects of the microbiome. The University of Minnesota was one of a number of institutions recently recognized by the White House for its commitment to advancing microbiome research.
Surprise Cancer Culprit

While looking for a missing cause of a common type of mutation in breast cancer cells, Reuben Harris and colleagues uncovered the biochemical culprit and found that it may also be a general source of mutation in other cancer types.

The researchers found that an enzyme known as APOBEC3H-I is the most likely cause of these previously unexplained mutations. Harris is a professor in the college’s Department of Biochemistry, Molecular Biology and Biophysics and a Howard Hughes Medical Institute Investigator.

In breast cancer the solution became apparent in tumors lacking a related enzyme called APOBEC3B. All breast tumors with an APOBEC mutation footprint have APOBEC3B and, if they lack this enzyme due to a naturally occurring deletion, they invariably have APOBEC3H-I. The mutational contribution of APOBEC3H-I was also clear in lung cancer, in addition to expected mutational footprints from tobacco smoke and ageing.

These findings are important because they provide a molecular explanation for a major source of mutation in many different types of cancer. The results point the way to fine-tuning the treatments of these cancers by inhibiting these enzymes in order to limit the development of mutations that undermine many current cancer therapies.

“Our results encourage the development of new cancer treatments that work by combining existing therapies and an APOBEC inhibitor to stop tumor cells from evading therapy.”

—MARY HOFF

Reuben Harris identifies an unexpected cause of mutation in cancer.
During the last century, Africa has lost nearly 90 percent of its lions as the continent’s human population expanded, according to the conservation organization Panthera. But lions have a formidable ally in Craig Packer, a professor in the college’s Department of Ecology, Evolution and Behavior.

Conserving lions will be tough and expensive, and Africa’s woefully underfunded parks and preserves offer little help. Packer says the cheapest way to preserve lions and people is to separate them, where possible, with fences, as is already done around preserves throughout South Africa. And as human expansion continues “fencing is the future,” he says. “So the rest of the continent will eventually look more like South Africa.”

But fencing can also inhibit the migration of large herbivores like wildebeest and zebra, on which lions depend. And it can sometimes lead to lions depleting their prey. New research by Packer, graduate student Meredith Palmer and partners from South Africa’s University of KwaZulu-Natal, relies on camera traps to track the behavior of lions and prey species within dozens of fenced parks, with the goal of identifying the steps necessary to enhance ecological stability within each reserve.

For example, in the absence of lions, prey freely feed at water holes and near bushes. But with lions in the mix, prey animals may choose to avoid the best grazing opportunities, thereby limiting their overall food supply. By revealing complex predator-prey dynamics, the cameras will gather data invaluable to wildlife managers.

“Lions are in trouble everywhere, except where the reserves are safely fenced,” Packer notes. “So we have gone to South Africa to understand problems that will become increasingly common in the future and work to find solutions that will apply to wildlife management across the whole continent.” —DEANE MORRISON
What role do nutrients play in shaping the evolutionary history of a species? Ecology, Evolution and Behavior associate professor Emilie Snell-Rood embarked on an ambitious study to find out by looking at 96 butterfly species belonging to five closely related families of butterflies.

“It’s really hard to quantify diet,” she says, noting that prior studies have provided coarse comparisons across animals — for instance, carnivores versus herbivores. “We wanted to test the idea that nutrition shapes life history evolution at a finer level.”

Butterflies are ideal subjects for this type of study because many species have specialized to feed on only a few types of plants. Furthermore, ecologists have precisely measured the nutrient content of those plants.

Snell-Rood drew on this pre-existing body of knowledge to correlate the nutrition of different species’ food with a broad range of phenotypic features.

After capturing the colorful insects and measuring the size of their eggs, testes, bodies, brains, and eyes, Snell-Rood then looked at three elements in the butterflies’ diets: nitrogen, sodium, and phosphorus.

She found that butterfly species with nitrogen-rich diets tended to have larger numbers of eggs. Butterflies with diets high in both nitrogen and sodium tended to have larger eyes, key to finding both food and mates, which puts big-eyed beauties at an evolutionary advantage.

One implication: Modern society is altering the balance of nutrients in the environment potentially giving a leg up to some species. “We are changing evolutionary selection pressures on traits,” says Snell-Rood. “Pests might be evolving to be more fecund because, on average, their diet is of higher quality.”

“We wanted to test the idea that nutrition shapes life history evolution at a finer level.”

—COLLEEN SMITH
Not BUSINESS as USUAL

Meet a few of the College of Biological Sciences faculty using their biology expertise to develop commercial solutions to environmental, health and education needs.
Larry Wackett never planned to get involved in translational research, but in the mid-2000s he realized that he might have a solution to a pressing problem: melamine contamination in China’s milk supply. In 2008, reports began rolling in about milk and infant formula tainted with melamine, a chemical that gives the appearance of higher protein content. Hundreds of thousands of people, including many children and babies, fell ill. But without a test that could be used in the field and provide on-the-spot results, identifying the source of the melamine remained problematic.

“I realized that an enzyme we studied that breaks down melamine could be used in a quick test,” says the Distinguished McKnight University Professor. Wackett enlisted an undergraduate in his lab to work on stabilizing the enzyme, which the University then licensed to BioScientific. Within six months, the company was selling the test in China.

“It was really gratifying. This thing we had studied for fundamental reasons had an important use in the end. It got me thinking.” He caught the translational bug and ended up launching his own startup focused on water bioremediation.

The particulars may vary, but Wackett’s experience points to a common motivator among many academic researchers who jump into the commercial fray — the opportunity to make a direct impact and improve lives.

“Biology underpins solutions to nearly all of our greatest challenges to the environment and human health,” says College of Biological Sciences Dean Valery Forbes. “Given the breadth and depth of the science going on in this college, it makes a lot of sense that the discoveries and new technologies developed by our faculty are catalysts for industry collaborations of all kinds.”

THE CLIMATE for such collaborations has never been better. The University of Minnesota recently celebrated a milestone: 100 startups in 10 years. And last year, the University’s Office for Technology Commercialization (OTC) finalized a major licensing deal with the University of Texas’ M.D. Anderson Cancer Center for use of the Sleeping Beauty Transposon technology developed by geneticist Perry Hackett. The center used the technology to create a first-of-its-kind nonviral gene therapy treatment that targets cancer by supercharging a patient’s immune system.

Hackett is a veteran “bio-entrepreneur” who has been involved in startups and technology commercialization for decades. When pondering what to do with the funds he received as part of the deal, his first thought was to invest them in the Center for Genome Engineering, which he co-founded. This summer, the Hackett Fund for Genome Engineering was presented to the center’s current director Dan Voytas, creating a mutually beneficial feedback loop between academic research and industry.

THE FOCUS on entrepreneurship is happening at the highest level,” says Anne Hall, technology strategy manager for the life sciences in OTC. Hall points to “ecosystem changes” at federal funding agencies, which are increasingly asking researchers to think about how to translate their results for the public good.

Both the National Science Foundation and National Institutes of Health introduced new programs in recent years designed to boost entrepreneurship within the ranks of life sciences researchers. That push to turn new knowledge generated by University researchers into novel approaches to addressing a wide range of issues is driving a surge in business interest and activity.

At the same time, Hall notes growing receptivity among researchers to commercializing their findings. “It’s exciting that even the newest faculty are very enthusiastic about industry collaboration and consider it an important aspect of their research programs.” —STEPHANIE XENOS

“Given the breadth and depth of the science going on in this college, it makes a lot of sense that the discoveries and new technologies developed by our faculty are catalysts for industry collaborations of all kinds.” — Valery Forbes

MEET A FEW OF THE CBS FACULTY ENGAGED IN COMMERCIAL-ACADEMIC CROSS-POLLINATION.
“It’s the right idea at the right time. No one else is working on this yet. It’s a totally novel approach.”

Reuben Harris has made some amazing breakthrough discoveries over the years, among them the role of APOBEC enzymes in cancer. As it turns out, a pair of APOBEC enzymes generate a “mutation signature” common across all cancer types, second only to age-related mutations.

It’s a stunning insight, but the process of turning findings into therapies falls outside of the scope of an academic research lab. So Harris decided to make a bold move and launch his own startup. His big idea? Impede the APOBEC enzymes’ ability to mutate and, consequently, slow down the “evolvability” of cancer.

Harris and colleagues launched ApoGen in 2014 to develop therapies that do just that.

While current treatments are often effective in the short term, they fail in the long run as tumors evolve and adapt to the interventions. Slowing down their progress could improve outcomes for numerous cancer patients. “It’s the right idea at the right time,” says Harris. “No one else is working on this yet. It’s a totally novel approach.”

Now in talks with investors, the company is poised to ramp up. Despite the heavy commitment required to get a business off the ground, Harris sees what he does in his dual roles as investigator and entrepreneur as complementary. “There’s a nice synergy between the two,” he says. “You have to fully understand how something works before you can do anything about it, and that’s a huge opportunity on the academic research side of things.”
Photosynthesis isn’t a game, or is it?

Ask a biology teacher about which concepts are the most difficult to teach and photosynthesis is very likely to come up. “Photosynthesis is a universally problematic topic fraught with misconceptions and loathed by teachers and students despite being hugely important,” says Sehoya Cotner, “I threaten to talk about it when my students are getting off topic.”

When Twin Cities-based Andamio Games approached Cotner about lending her expertise in the development of an iPad app about cell respiration and photosynthesis for use in high school biology courses, she was undaunted despite a lack of gamer cred. She agreed to take up the challenge of translating the tricky topics for the unfamiliar medium.

Cotner sees educational gaming as a natural extension of the technology-enabled interactivity already common-place in active-learning classrooms. Moreover, the biology education expert sees some significant upsides to teaching with this particular kind of technology.

“It allows you to test what knowledge students already have and calibrate accordingly,” says Cotner. In gaming parlance, “you can’t get to level two until you understand level one,” she explains.

She’s also a fan of the functionality. “The game includes actual labs students can do and experiments can fail, which is amazing because it allows them to make mistakes without the time investment of physical experiments.” The game also includes a group-play option so students can solve problems together.

Best of all? Students collect points they can use to grow a virtual garden based on their mastery of photosynthesis to make that perennial favorite: chips and salsa.

SEHOYA COTNER
CONSULTANT, ANDAMIO GAMES; ASSOCIATE PROFESSOR, BIOLOGY TEACHING AND LEARNING

“Gaming allows you to test what knowledge students already have and calibrate accordingly.”
Dan Voytas is an old hand when it comes to startups. He launched his first biotech company years ago while still a faculty member at Iowa State University. The company didn’t take off, but the experience left its imprint on him all the same. “One thing that became evident to me — and I feel even more profoundly now,” says Voytas, “is that there’s a lot of satisfaction in seeing things move from the lab to the real world.”

Voytas is chief scientific officer of Twin Cities-based Calyxt, a biotechnology company focused on developing crops with healthier characteristics using TALENs (transcription activator-like effector nucleases), a technique developed by Voytas and a colleague to modify specific genes in a cell. Science named TALENs one of 2012’s top scientific breakthroughs.

At Calyxt, Voytas is using the precision gene-editing technique to improve disease resistance in plants, and modify plant oils and carbohydrates to make them healthier and easier to process.

This time around, all signs point to success. After several years fine-tuning the technology and building capacity in other areas, including hiring a CEO and building greenhouses, Calyxt is poised to begin testing a wide range of new soybean varieties with an eye to launching its first commercial product in 2018.

Says Voytas: “It’s been remarkable to see how quickly things have developed in the genome engineering field and to be part of that.”
Pool water is a tricky business. Keeping it free of bacteria and crystal clear involves carefully maintaining a chemical cocktail that includes chlorine and cyanuric acid, which keeps chlorine from degrading under sunlight. But, over time, cyanuric acid builds up in the water and weakens chlorine’s bacteria-battling abilities. The solution: drain the pool and start over, wasting an enormous amount of water in the process. With millions of residential and commercial pools in the United States alone, that adds up to billions of gallons of water a year.

“In the not-too-distant future, water will be more precious than oil. We need to do a better job of reusing it,” says Larry Wackett.

Wackett and University colleague Ali Aksan launched Minnepura Technologies with an eye to doing something about the problem. The researchers developed a device to filter chemical-laden pool water using enzymes packed in a silica casing to eliminate contaminants in water. Their company, named one of the top startups of 2016 by the National Council of Entrepreneurial Tech Transfer, is testing and evaluating prototypes, and expects to launch a commercial product next year.

Starting Minnepura has delivered dividends for Wackett’s students, too. Undergraduate Chris Nguyen, who is studying biology and supply chain management, is learning about the business side of biotechnology as an intern with the company. Plus, Wackett says the experience provides useful insights he can pass on to his students.

“Because of this experience I’m able to talk not just about the nuts and bolts of the science but how it works in the real world.”
Robin Wright has a simple goal for the nascent Department of Biology Teaching and Learning: to be leaders in demonstrating what excellent biology teaching looks like. That means both teaching and doing research to understand why certain approaches work and how to scale them for broad use. “We know active learning works. What we’re interested in is why it works,” says Wright. Her ambitions for the department may sound lofty, but they are rooted in precedent. Already a leader in the use of active learning, Wright and her colleagues are building on that momentum on a number of fronts.

RE-ENVISIONING THE RESEARCH EXPERIENCE
Creating opportunities for students to ask and answer their own questions, especially questions with real-world relevance, is key. That starts with redefining the purpose of lab.

New faculty, FRESH perspectives
While their backgrounds vary, Abdi Warfa, Anita Schuchardt and Murray Jensen have one key thing in common. The department’s newest faculty members share a longstanding interest in understanding how students learn science best.

Making the move to the Department of Biology Teaching and Learning (BTL) was really a “no-brainer” for Warfa, who, until recently, taught biochemistry at Metropolitan State University. Observing students’ struggle to learn the subject matter, he was motivated to better understand the barriers to learning. “As someone interested in how students learn, a department whose mission is ‘to discover, apply and share research-based strategies that transform biology education’ was a perfect match,” he says.

Schuchardt recently completed a second doctorate in learning sciences and policy after spending time...
“Lab is where you learn how scientists think, how to approach problems, how to work as a team member. It’s learning how science is done,” says Wright. Part of making that possible requires new kinds of research spaces — active learning labs — that facilitate collaboration and curiosity-driven experimentation.

Ultimately, Wright believes that giving students more freedom and responsibility will deepen their interest in the basics of biology. “Many of our students are focused on making a difference in the world. With active-learning labs, we ask them to take their own interests as a starting point for applying what they know about mitosis, metabolic pathways and other basic concepts,” she says. “It helps them see how biology matters in their lives and how they can use it.”

AN EMPHASIS ON INCLUSION
Part of being an effective educator and mentor depends on connecting with students with very different life experiences. Race, ethnicity, religion, socio-economic status, gender and culture all figure into it, which is why Wright sought out funding from the Howard Hughes Medical Institute for a program called the Faculty Fellows for Inclusive Excellence in Mentoring. The program launched late last spring and runs a full academic year. It includes workshops on aspects of inclusion designed to provide faculty with a framework for thinking about teaching at the secondary level. Her experience as a high school science teacher sparked a desire to influence how science is taught. In particular, Schuchardt sees value in cross-pollination between biology and math, engineering and computation. Joining BTL is an opportunity to not only teach the way she wants to, but to advance the broader conversation about science education. “This is still a relatively unexplored area,” says Schuchardt, “and BTL seems to be at the forefront in many ways.”

Jensen, though a newcomer to the college, is a University veteran. As he puts it, he got his graduate degree at the U of M and never left. Jensen brings with him a background in physiology and anatomy. His interest in technology in the classroom and fostering cooperative learning align with the philosophy of BTL. Says Jensen: “The name of the department, it’s what I do!”

SHARING THE WEALTH OF KNOWLEDGE
Investigating the best ways to teach biology is just the start. Wright is committed to putting knowledge produced by the department’s faculty and other biology education experts in the hands of biology instructors everywhere. She launched CourseSource, an open-access journal of peer-reviewed teaching resources for college biological sciences instructors, to fill that need.

“It’s emerging as an important avenue for people to publish education materials,” says Wright. “It’s a way for the cool stuff people are doing in class to get out there. This journal is a place to make sure those activities and innovations are available in a replicable way that educators can adapt in their own courses.” — STEPHANIE XENOS
To say that Gary Silberstein (M.S. Zoology ’66/Ph.D. Cell Biology-Biochemistry ’72) is an avid surfer is wildly understating the fact. To Silberstein, surfing is not mere sport; it is a way of life.

In fact surfing, which he has been doing since he was 15 years old, helped direct the Bay Area native as he pondered major life decisions. For one, it led him to Minnesota.

As an undergraduate in the early 1960s, Silberstein remembers surfing in San Francisco. When the waves were great, this meant cutting classes at University of California, Berkeley for the free and easy ocean life. Recognizing he needed serious discipline to break his surf “habit,” he decided “to get as far away from the ocean as possible.” And you can’t get much farther away than Minnesota!

As Silberstein puts it, he was looking to “break his own ecosystem and test himself in a new and different place.” So he said so long to his beach-filled days and turned his attention to the life of the mind halfway across the country at the University of Minnesota where he studied zoology, cell biology and biochemistry with professors who, he says, “opened the wider world of biology to me.”

After completing his doctoral program, Silberstein went full circle heading back to the Bay Area where he spent part of his days in academic environs advancing breast cancer research and the other part dropping in on fabulous Santa Cruz waves in the Pacific Ocean.

Now nearly a decade retired from his research laboratory at the University of California, Santa Cruz, Silberstein is focused on helping students, specifically underrepresented minority...
Returning to her roots
Alumna Lolly Schiffman attributes her success to the education and mentoring she received as a CBS undergraduate. A new scholarship in memory of her daughter will open those doors for current students.

When Lolly Schiffman (B.S. Biology, ’73/M.D. ’78) reflects on what most contributed to her success as a physician, she is crystal clear on where credit is due.

“I got here through education. I reached my goal of being a doctor through education,” she says.

A native Minnesotan, Schiffman studied biology and attended medical school at the University of Minnesota. She felt particularly fortunate to be under the auspices of the College of Biological Sciences as an undergraduate. The college had just formed a few years earlier. Schiffman recalls the benefit of the smaller classes and mentoring she received.

“The college informed me that my grades were good, and I could graduate summa cum laude if I completed a final project,” she says, wondering whether her undergraduate career would have closed with such distinction had she been enrolled in a different program.

After graduating from medical school, Schiffman headed to the Bay Area for her medical residency. She stayed on and spent most of that career as a physician at Kaiser Permanente in Richmond, California. She devoted much of her career to improving the health outcomes of people living with diabetes, in part, through patient education.

“It was clear that obesity was an epidemic, and that diabetes was following close behind,” says Schiffman. “Diabetes is the ultimate self-care disease. I was convinced that something could be done, and I always enjoyed patient education.”

Just as she was thinking of retiring, Schiffman suffered a personal tragedy: she lost her only child, a daughter, to a senseless act of gun violence. It was through this heartbreak that Schiffman conceived of the idea of a scholarship — the Suzanna Ashmore Nelson Memorial Scholarship — to memorialize her daughter’s life and acknowledge the role of education in her own.

“This is how I can honor my daughter and pay homage to a place that gave me so much.”
The college welcomed the largest incoming class in its history this September. Close to 600 freshmen donned tie-dye maroon-and-gold Nature of Life T-shirts this summer and made their way to Itasca Biological Station and Laboratories for Nature of Life. To put things in context, this year’s freshman class is nearly double what is was just a decade ago.

The need for graduates in STEM fields continues to grow and applications from highly qualified students far exceed the number of spots available at CBS each year. Increasing our enrollment to meet that demand makes sense. At the same time, it’s imperative that we increase student scholarship support to ensure that students are able to take full advantage of the wealth of opportunities available to them without worrying about being able to afford their college education.

If you want to understand the impact scholarship support can have, consider Karimatou Bah, a biochemistry senior and aspiring physician who wants to work in low-income communities. Karimatou received the inaugural Zoology Department Memorial Scholarship this fall. As an undergraduate, she participated in research in faculty labs, volunteered at Regions Hospital, actively participated in student life, and is now working hard to prepare for the medical school entrance exam, all while keeping up with the rigorous coursework required of CBS students.

She says it best. “If you want to go to medical school, you need to volunteer in a hospital, and if you want to be a biochemistry major, you might want to do research. It’s good to have this financial burden lifted off my shoulders so I can focus on those things.”

Karimatou makes another important point about scholarship support — it’s not just about paying for college. Scholarships are a vote of confidence from the broader CBS community.

As the college gets bigger, we are committed to getting better. That means letting our many bright, engaged undergraduates know we believe in their future, and are committed to helping them succeed.

REEDE WEBSTER
Director of Advancement
FY16 Fundraising Facts & Figures

Scholarships & fellowships

CBS awarded 162 scholarships and 28 fellowships in FY 2016. Awards ranged from $500 to $5,000 for scholarships, $1,000 to $12,500 for fellowships and totaled $443,579.

Distribution of funds

519 DONORS

$1,725,718 TOTAL FUNDS RAISED FROM PRIVATE DONORS

How to make a gift »

Send a check in the enclosed envelope or donate online at give.umn.edu. (Click on “Give Now”). Whether you write a check or give online, be sure to note that your gift is for College of Biological Sciences scholarships. You may specify the scholarship if you like.

Questions?
Contact Reede Webster at webst033@umn.edu or 612-624-9460.

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Jeanne Wehner
The Welch Charitable Fund – Renaissance Charitable Foundation Inc.
Robin L Wright M

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A family tradition

Allie, Emily and Erica Ellingson share more than a last name. The sisters share a passion for science and a desire to make a difference. Allie (Genetics, Cell Biology and Development, ’10) is an OB/GYN resident at the University of Minnesota. Emily (Ecology, Evolution and Behavior ’14) is studying optometry at the State University of New York (SUNY) College of Optometry in New York City. Erica (Class of 2020), who is just starting her undergraduate studies, has her sights set on a career in health care, as well.
“CBS has such well-rounded students who are invested in their classes but many other areas as well. We’re really lucky to be part of this.” – EMILY ELLINGSON
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