CBS TURNS 50

SELECTING for SYNERGY

PLUS: A BOOST TO BIOLOGY EDUCATION • A NEW CAMPUS CENTER AT ITASCA • CBS ALUMNI’S HEALTHY LIFE CHOICES • CELEBRATING SCHOLARSHIP SUPPORT
The college embarks on a BOLD, COLLABORATIVE STRATEGY to explore emerging research frontiers
INSIDE THIS ISSUE

Intriguing findings by CBS researchers; the Gopher iGEM team wins big in Boston

A first-of-its-kind department is taking biology education to the next level

The new campus center at Itasca Biological Station and Laboratories opens for business

Meet a handful of young alumni looking to make a healthy impact in their communities and beyond

Snapshots from a celebration of scholarship and fellowship support

2014 College of Biological Sciences donor honor roll
The College of Biological Sciences has evolved alongside rapid developments in the biological sciences over the past five decades. Since Dr. Richard Caldecott became founding dean in 1965, the college's imprint has expanded across two campuses and into emerging disciplines. CBS faculty and students have made myriad discoveries with implications for the environment, human health and more, and boosted our understanding of the basic mechanisms of life. Over the coming year, we will highlight some of these achievements and celebrate our curiosity-driven community. Look for #cbs50 on Facebook and Twitter (@umncbs)!
LOOKING BACK OVER THE PAST FIVE DECADES, the college and the biological sciences as a whole have evolved in exciting and unexpected ways. And we continue to build momentum. In the last year alone, we have made progress on new initiatives and achieved long-term goals. Here are just a few examples.

The college is building research capacity in emerging areas: CBS is investing in researchers who bring new areas of expertise that complement our existing strengths. We have welcomed more than a dozen new faculty so far and continue searches in several research areas.

We opened the doors to a new campus center at Itasca: Itasca supporters gathered this fall to dedicate the new campus center at Itasca Biological Station and Laboratories. The dedication marked the beginning of a new era for research and education at this vital outpost of the biological sciences at the University of Minnesota.

The drive to transform biology education continues: The college launched the first-of-its-kind Department of Biology Teaching and Learning this summer. The new department will build on the national reputation of our active-learning approach and create new knowledge around evidence-based teaching.

CBS researchers are making high-impact discoveries: CBS faculty and students continue to produce insights into the mechanisms underlying disease, human-impacts on the environment and much more. You will read about some of those discoveries in the pages of this publication.

Thanks to the vision and commitment of those who came before — thanks to you — the College of Biological Sciences is poised to do great things. Stay tuned! —TOM HAYS

“Emerging technologies today, like no time previously, offer researchers amazing powers to discover, characterize, and exploit new biological mechanisms. We must inspire our talented students to become the next generation of discoverers and problem solvers.”

PHOTO: JOSH KOHANEK

Just Getting Started

DR. THOMAS HAYS
Interim Dean
Professor, Genetics, Cell Biology and Development
HOW DOES EATING AFFECT ECOSYSTEMS? Herbivores like elephants, rabbits and kangaroos can offset the negative effects of agriculture on biodiversity by chowing down on tall, fertilized plants and giving the shorter guys a shot at some sun. Lead authors: Drs. Elizabeth Borer and Eric Seabloom

ARE CHIMPS NATURAL BORN KILLERS? Or did humans give them a taste for blood? As it turns out, chimps occasionally knock each other off regardless of how much contact they have with humans. Lead author: Dr. Michael Wilson

GOT GAS? When frozen lakes thaw, they release thousands of years’ worth of greenhouse gases. After an initial burst of emissions, however, they quickly start re-burying all that carbon beneath the waves. Lead author: Dr. Jacques Finlay

DOES EVERYONE LEARN THE SAME WAY? Fruit flies were tested for their ability to learn associations between a yucky taste and either a color or an odor. Conclusion: different populations learned better with different cues—i.e. varying neural mechanisms must have been at play. Lead author: Dr. David Stephens

HOW SALTY IS TOO SALTY? Road salt runs off into roadside ecosystems and gets into the plants and insects that eat them. Male monarch butterflies grew bigger flight muscles as a result, and females grew bigger brains, but overall, the increased salt concentration was toxic. Lead author: Dr. Emilie Snell-Rood

MIGHT DIET CAUSE METABOLIC EVOLUTION? Gutsy investigations compared the livers of humans, chimps and macaques. Each species expresses different metabolic genes in response to the types of food they eat. So … part of being human is eating like a human. Lead author: Dr. Ran Blekhman

WHAT’S THE SECRET TO CELL SURVIVAL? What allows some malignant cells to circumvent the normal process of cell death that occurs when chromosomes get too old to maintain themselves properly? As it turns out, cancer cells evade death by turning on a gene called Ligase 3 that keeps their chromosomes fusing properly. Lead author: Dr. Eric Hendrickson

CBS researchers constantly puzzle over the mysteries of life. Here are some of this year’s most interesting discoveries. »

OUTSIDE-THE-BOX BIOLOGY

Students put synthetic biology to work to address water pollution.

The Gopher iGEM team won gold for best environmental project at the International Genetically Engineered Machines (iGEM) competition at MIT in November. Their award-winning project uses biological agents to convert harmful environmental toxins into a less toxic form, says Basem Al-Shayeb, a student team leader and a CBS undergraduate majoring in microbiology and genetics.

“We’ve designed a device that contains encapsulated microbes that are genetically engineered,” explains Al-Shayeb. “Those can pick up methylmercury and mercury ions from a contaminated water source, and convert that into a less toxic form that is eventually captured and disposed of sustainably.”

Learn more about their device at z.umn.edu/iGEM2014
FOOD FOR THOUGHT
A new study finds diets that are healthier for humans are also healthier for the environment.

As cities and incomes increase around the world, so does consumption of refined sugars, refined fats, oils and resource- and land-intensive agricultural products such as beef. A new study led by Regents Professor David Tilman shows how a shift away from this trajectory and toward healthier traditional Mediterranean, pescatarian or vegetarian diets could not only boost human lifespan and quality of life, but also slash greenhouse gas emissions and save habitat for endangered species.

The study, published in Nature, synthesized data on environmental costs of food production, diet trends, relationships between diet and health and population growth. The integrated analysis painted a striking picture of the human and environmental health costs of our current diet trajectory as well as how strategically modifying food choices could reduce not only incidence of type II diabetes, coronary heart disease and other chronic diseases, but global agricultural greenhouse gas emissions and habitat degradation, as well.

“We showed that the same dietary changes that can add about a decade to our lives can also prevent massive environmental damage,” says Tilman. “In particular, if the world were to adopt variations on three common diets, health would be greatly increased at the same time global greenhouse gas emissions were reduced by an amount equal to the current greenhouse gas emissions of all cars, trucks, planes, trains and ships. In addition, this dietary shift would prevent the destruction of an area of tropical forests and savannas as large as half of the United States.” —MARY HOFF
Selecting for SYNERGY
WHAT HAPPENS when you take a dazzling blue biosphere, set it spinning around a fiery ball of gas, and add a few drops of primordial stew? If you’ve got the patience to wait a few billion years, you’ll probably notice that things start changing.

Today, though, the pace of change might steal your breath. With each revolution about the sun come new waves of technology that redefine not only our interactions with nature, but the way we approach science. The College of Biological Sciences is responding with an ambitious plan to spark interdisciplinary collaborations and keep ahead of the curve.

In 2011, emeritus dean Robert Elde envisioned an unprecedented initiative at the University of Minnesota. Elde’s big idea was to hire 16 new faculty members who would both augment the college’s existing strengths as well as launch it to the forefront of emerging fields. Since then, the college has recruited more than a dozen new faculty, and the search for innovative investigators isn’t done yet. Moreover, points out Interim Dean Tom Hays, the new faculty will attract the very best graduate students and drive discovery of new knowledge.

“This is not the way we normally do things,” says Scott Lanyon, head of the college’s Department of Ecology, Evolution and Behavior (EEB). In fact, it’s not how virtually any institution does things. Typically, faculty are hired to fill individual openings. This new approach breaks the mold by hiring “clusters” of faculty with research interests that transcend departmental affiliation.

Think of it like this: If you hire one expert, she’s on her own as the new prof on the block. If you hire 16, you’ve not only deepened your talent pool, but you’ve also created quite the occasion to go swimming.

“The concept of hiring clusters was top-down,” says Lanyon, who was involved in early cluster hiring efforts. “The selection of the clusters, however, was bottom-up.” Current faculty selected future collaborators in research categories where the college had previously lacked capacity. This process required all new protocols, intense searches, dozens of interviews, constant seminars and ongoing participation of faculty.

After all that effort, there’s a spirited verve on campus as new faculty assemble their labs. They’re bringing not only fresh perspective and cutting-edge techniques to old problems, they’re also throwing entirely new genres of research questions into the mix. It’s these questions, spanning interdisciplinary approaches in mathematics, physics and computer science, that help to bridge departmental gaps.

“As we build an understanding of how systems tend to work, we try to draw mathematically explicit generalizations to develop theories that predict how we expect systems to change, especially with regard to climate change and disease.” —ALLISON SHAW

“The dream is to figure out not only how to understand and predict, but to manipulate and prescribe how to achieve a healthy microbiome.” —WILL HARCOMBE
and environmental interactions lie the mathematical underpinnings of life. “As we’re able to collect more and more data with genomic tools, automated observation, and remote sensing, we need more computational techniques to manage and analyze that data,” says Allison Shaw (Theoretical Biology).

Using the complementary languages of mathematics and programming, Shaw describes and predicts how species will behave in various scenarios. Her quantitative and modeling skills represent research tools that are becoming increasingly critical across all scientific fields.

In coming decades, millions of genomes will be sequenced. Sophisticated computational models won’t simply describe the dynamic ecosystems around and within us—they’ll strive to predict how those systems might respond to changing global conditions. Researchers are working on piecing together the molecular blueprints of life, and even re-designing some of them to solve our planet’s biggest problems.

As the college enters this new era in the life sciences, the research clusters will enable the serendipitous fusions of intellect and skill that push the envelope of what is possible. In other words, things are changing at the College of Biological Sciences. And that’s just the beautiful nature of life. —COLLEEN SMITH

Learn more about research clusters at z.umn.edu/cbsresearchclusters

“The next 20 years will be a new era driven by the decreasing cost of DNA synthesis. We can already read DNA cheaply, but now we’re becoming able to write DNA cheaply.” —MICHAEL SMANSKI
Exploring Bio-diversity

Students, faculty and staff explored bias and identity through a collaboration with artist Wing Young Huie. The results are eye-catching.

How do you think others see you? What don’t they see? What qualities about yourself do you wish others would see? Who are you off-campus that you aren’t when you are on campus?

Those are a few of the questions members of the CBS community asked one another through a series of workshops with Wing Young Huie, a Minneapolis-based photographer whose in-depth visual explorations of community and identity have earned him international recognition. The workshops, made possible through a Transformation Award from the U of M’s Office of Equity and Diversity, were designed to spark dialogue and boost self-awareness. At the end of each workshop, participants had the opportunity to be photographed with a statement. Sometimes ambiguous, sometimes not, the sentiments ask the viewer to consider another point of view.
IN ACTIVE-LEARNING CLASSROOMS, STUDENTS FORGO TRADITIONAL LECTURES AND INSTEAD WORK IN GROUPS TO ANSWER BASIC RESEARCH QUESTIONS WITH REAL-WORLD IMPLICATIONS FROM ADDRESSING KILLER DISEASES SUCH AS MALARIA TO CREATING MORE RESILIENT FOOD CROPS.
MORE THAN A DECADE AGO, the College of Biological Sciences introduced Foundations of Biology, a course premised on “active learning” in which students spend class time using biology to solve real-world problems instead of listening to lectures. The approach has been a resounding success. Last year, Science, the nation’s leading scientific journal, recognized the signature course with an award for innovation in inquiry-based instruction. The college is building on that momentum with the launch of the new Department of Biology Teaching and Learning.

“Across the nation, many biological sciences departments have, or are recruiting, one or two people to do biology education research. Our department will be the first to devote its entire research focus to issues of teaching biology,” says Robin Wright, head of the new department and the college’s senior associate dean for undergraduate initiatives.

The new department will boost biology education at the U of M by:

• Serving as a nexus for research on the most effective ways to teach biology to undergraduate students.
• Training graduate students in evidence-based teaching and education research.
• Driving collaboration with education experts in the College of Education and Human Development on graduate and certificate programs focused on advancing understanding of how students learn biology best.
• Providing undergraduates taking introductory biology with unprecedented opportunities to do original research and an effort to develop an integrated, technology- and community-supported approach to increasing student retention.

As the college develops transformative strategies to improve biology education, the next decade promises even greater innovations.

—STEPHANIE XENOS

“CAN ANYONE TELL ME why it wouldn’t be good for a diploid organism to have an odd number of chromosomes?” asks Elizabeth Bastiaans. The question goes out to hundreds of students in a large lecture hall. While it’s one thing to engage students in classrooms designed for interaction, what about large lecture halls?

A soft green ball sails through the air over the heads of students and the tops of computer screens. A student catches the ball and gives her answer, her voice amplified by a microphone buried inside the padded projectile. It’s one of the ways Bastiaans and co-instructor Annika Moe, both Howard Hughes Medical Institute-supported teaching post-doctoral fellows in the Department of Biology Teaching and Learning, are engaging students in the space.

Clickers that allow students to answer questions and see real-time results, video lectures that make it possible to “flip” classes so that more face time can be spent on discussion, and, yes, a flying microphone, are a few ways the college is making the lecture-hall experience more engaging for a new generation of students.
This fall, donors and friends gathered at Itasca Biological Station and Laboratories to mark the beginning of a new era of education and research. Surrounded by lush green woods, the cabin-lined shore of Lake Itasca, and the open playing fields on the station grounds, the new 12,000-square-foot campus center serves as a natural hub for activity at the station. But it couldn’t have happened without generous private and public support. The Minnesota Legislature allocated $4.1 million and donors contributed $1.6 million toward the cost of construction. Here’s a look at the return on that investment.

JOHN AND JOYCE TESTER were among the longtime supporters of Itasca who celebrated the campus center’s dedication in September. John Tester, professor emeritus of ecology, spent many summers with his family at the station.

A New Era at Itasca
A sense of community and shared curiosity about the natural world is part and parcel of the Itasca experience. Opportunities for collaboration abound as faculty swap stories about their forays to the field around the OUTDOOR FIREPLACE.

The new campus center expands research and education capacity, but it also offers students and faculty space to reflect. THE ROBERT AND ROBERTA MEGARD THINKING AND WRITING ROOM provides visitors with a place to do just that.

The new campus center’s year-round design, and TECHNOLOGY-ENABLED CLASSROOMS AND LABS mean more opportunities for researchers from the University and beyond to spend time thinking and doing in this living laboratory.

The DARBY AND GERI NELSON AUDITORIUM provides much-needed gathering space for the 500+ students who come to Itasca each summer for Nature of Life, one of the college’s signature program for incoming students.
CBS alums and University medical residents Linah and Eddie Mairura have a shared vision to give back. They moved with their parents to the United States from their native Kenya in 2000 when they were in their teens. They will both complete their residencies in 2016, but the brother and sister are already looking ahead to the greater impact they will be able to make as working physicians. They hope to help fund a hospital in Kenya and return each year as physician volunteers. They also want to give back locally. “We feel really blessed, and it’s not something we take for granted,” Linah says. “We often talk about what we can do as involved alumni because CBS is where we found our footing in this country.”
JON STRONG
B.S. Microbiology, ’09
Pursuing a medical degree at University of Wisconsin-Madison
Jon Strong describes himself as a health professional focused on the intersection of medicine, public health, and humanitarianism. In his final year of medical school, the CBS alum already has a Masters of Public Health from Johns Hopkins under his belt along with international public health research experience in Kenya, the Democratic Republic of Congo and Lebanon. After he finishes his studies at UW-Madison, he plans to pursue a residency in emergency medicine. Eventually, he’d like to put all that experience to work practicing clinical medicine, pursuing research overseas and teaching the next generation of leaders in global health.

TORI COWGER
B.S. Biochemistry, ’12
Pursuing an MPH in epidemiology at Emory University in Atlanta
Tori Cowger discovered her passion for epidemiology while conducting research on voluntary counseling and testing for HIV in Kenya as a CBS undergraduate. The experience provided an education in the root causes of infectious disease. “I learned that while infectious diseases seem to be predominantly biological phenomena, they’re almost entirely socially determined and driven by larger underlying inequalities,” she says. Now, she is pursuing a Masters of Public Health degree and working part-time at the Centers for Disease Control and Prevention focusing on global health research for programs that aim to reduce the burden of infectious diseases in vulnerable populations. “I hope to eventually apply what I’ve learned to conduct research that contributes to the evidence base and helps inform programs to reduce disparities in global health.”

ANH TRAN
B.S. Neuroscience, ’09
Research associate at Daktari Diagnostics
“Health is a human right,” says CBS alum Anh Tran, and she’s committed to helping secure that right for those who suffer from neglected diseases. After completing an M.Phil. in Health and Society at Newcastle University in England, she spent time developing diagnostic tests for mycobacterium tuberculosis and other respiratory pathogens as a training research fellow at the New York State Department of Health. Now she’s working at a medical device start-up company that develops diagnostic tools for resource-poor markets, including a novel method for monitoring CD4 immune cell levels in patients with HIV/AIDS. Ultimately, Tran plans to launch her own start-up.
1) College of Biological Sciences donors, and scholarship and fellowship recipients gathered at McNamara Alumni Center October 23, 2014 for the college’s annual Recognition and Appreciation Dinner. 2) Before the program, attendees read about the college’s donors at the CBS Donor Wall. 3) Dr. Richard Caldecott, founding dean of the college, gave the evening’s keynote. 4) Dr. John S. Anderson with guests at the evening’s reception. 5) Monica Tsang and Nhat Vo, one of more than a dozen recipients of the Monica Tsang and James Weatherbee Merit Scholarship. 6) CBS donors David and Mary Loverless. 7) CBS donor and professor Pat Cleary and Jeanette Cleary. 8) Student speakers Molly and Meghan Lindstrom.
ON THE COVER

Meet just a few of this year’s 144 scholarship recipients. These bright, capable young people embody the ethos of engagement and a drive to discover that defines this curiosity-driven community. Thank you to the donors who provide much-needed financial support. »

GRACE REXROAT
Ecology, Evolution and Behavior
Class of 2016

“Animals are my passion, and education and conservation are my main two focuses. Animals intrigue and fascinate me, and nothing makes me happier than learning about their biology and behavior. My goal is to be a mammalogist, and I am looking for opportunities to pursue my studies even further.”

ANTHONY FLECK
Microbiology
Class of 2015

“I am incredibly curious about how the world works, and I think life is one of the most exciting topics to study. Biology offers the perfect balance of science and application for me.”

MARY FINTA
Biochemistry and Spanish
Class of 2015

“I am fascinated by everything that occurs within the human body and our surrounding environments to sustain life. Studying biology has opened my eyes to the living world, and not a day goes by that I don’t learn something new in one of my biology courses.”

JIA MIKULS
Microbiology
Class of 2017

“I love learning about all different types of life forms, and love finding out about the small details that make every organism, system and environment unique. With science, I can ask and answer new questions every day.”

16 COLLEGE OF BIOLOGICAL SCIENCES
FY14 Fundraising Facts & Figures

Scholarships & fellowships »
CBS awarded 144 scholarships and 23 fellowships in FY 2014. Awards ranged from $500 to $5,000 for scholarships, $1,000 to $11,500 for fellowships and totaled $406,050.

How to make a gift »
Send a check in the enclosed envelope or donate online at www.giving.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 Jeff Spielman at jspielma@umn.edu or 612-624-9460.

Distribution of funds »
$1,677,981 TOTAL FUNDS RAISED FROM PRIVATE DONORS
ACADEMIC PROGRAM SUPPORT
UNDERGRADUATE SCHOLARSHIPS
RESEARCH & FACULTY SUPPORT
CAPITAL IMPROVEMENTS/FACILITIES
GRADUATE FELLOWSHIPS
STUDENT SUPPORT
STRATEGIC INITIATIVES

A GOLDEN OPPORTUNITY
The College of Biological Sciences turns 50 this year. That’s five decades of biology research and teaching, which translates into hundreds of discoveries made and thousands of students prepared to create the biology of tomorrow. As a CBS donor or alum, you are part of this curiosity-driven community. Celebrate the college’s past and invest in its future.
• Contribute $50 for 50 years.
• Up the ante and give $1,000 ... or $5,000!
Give online at z.umn.edu/cbs50
The college gratefully acknowledges the following donors, who have generously provided support for Itasca, Cedar Creek, scholarships and fellowships, research and a variety of initiatives. Every gift makes a difference. »

$75,000 +
Deborah I. Oswald

$50,000 - $74,999
Bonnie L Baskin
Lenore B Danielson
Robert P Elde
Geraldine M and Darby M Nelson

$25,000 - $49,999
FirstGiving
Richard A and Judi Huempfner
Robert O and Roberta A Megard M
Max A and Linda A Quaas

$10,000 - $24,999
Clark R Burbee M
Alan R Flory and Monica M Schultz M
Edith W and Robert Jones
Endowment Fund-Mpls Foundation
Whitney and Betty MacMillan
Howard V O’Connell Jr M

Wayne A and Carol A Fletcher M
Venkateswarlu Pothapragada
WEM Foundation

$5,000 - $9,999
3M Company
Barbara L and Robert R de la Vega M
Denneth C and Joan L Dvergsten M
Themis P and Katherine J Economou M
Kathleen G Fahey M
Charles M Goethe* Estate
Donna B Gunderson-Rogers
Alan B Hooper
Mary C Kemen and Brian C Randall M
Valerian B and Carolyn Kuechle
Mary E and David W Loveless
Philip J Miller
Richard E and Elaine E Phillips
Jean S Phinney
C J Rapp Pittman
John F Schnickel
Schwegman Lundberg and Woessner PA
Gary B Silberstein M
Elizabeth Ann Wasserberger

$1,000 - $4,999
3M Foundation Inc
Timothy G Abbott
Jeffrey B Arnold
Carl V Barnes
Franklin H Barnwell
David A Berlohr M
Christina M and Mark J Bigelow M
Daine S Bradanese
Bristol-Myers Squibb Foundation Inc
Broad Street Family Dental Inc
Joanne J Brooks
Greg and Bridget Buckley
Richard S Caldecott M
Iris D Charvat
Doris J Clevenger
Deanna L Crees M
Waseem Daher
Wendy Dayton
Douglas and Wendy Dayton Foundation
The Dow Chemical Company Foundation
Bruce G Dumke M
Patricia C Dysart
Ecolab Inc
Mark and Mary Einerson M
Adam W Fletcher

Global Adrenaline Inc
David L and Marie K Goblichsch M
Frederick E Goetz
Rosemary H and David F Good
Thomas Hays and Mary Porter
John Heer and Jody Copp M
Robert C and Anita H Hodson M
Allison F Kaptur
Julie Kaptur
Hugh Lewis and Lynn Peterson Lewis
Pamela H Lewis and Family
Louisa Z Li
Francine Mandeville
David J and Esther G Mc Laughlin
Jane C McKellar
John S McKeon
Gail L and Phillip L Minerich M
J Emory Morris
Patrice A Morrow
Cheryl L and George G I Moore
Seward H Mott
Bradly J and Terry L Narr M
Claudia Neuhauser and Maury Bramson
William E Oesterle
David L Peterson M
David S Pratt M
Steven E Pratt
James R and Patricia M Pray M
Clare and Jerome Ritter  
Deanna K and Paul G Siliciano  
Kenneth R Skjegstad  
Ryan Sleevi  
Amel Soliman  
and Sherif H Nabil Tawfic  
Joyce M Stout  
TCS and Starquest Expeditions  
Kipling Thacker and Kevyn K Riley  
Heidi L Thorson  
M  
G David Tilman  
Peter Torgerson  
and Pamela Anderson  
Julie A Warren and Kien T. Nguyen  
Wells Fargo Foundation  
Robin L Wright  
M

$500-$999

Abbott Fund  
Christine M Ambrose and Tom Porter  
Jack M Anderson  
John S and Rebecca H Anderson  
Lynne F Anderson  
Allan Baumgarten and Marilyn  
Levi-Baumgarten  
David D Biesboer  
M  
Biogen Idec Foundation Inc  
Bitterroot Nursery  
CenterPoint Energy  
Vera E Cooke  
Phyllis and Bryce A Cunningham  
Bradley J Dupre  
Timothy L Eaton  
Linda L Eells  
Maxine A Enfield  
Roger H Erickson

$250-$499

C Eugene and Connie J Allen  
Jeffrey J Anderson  
Patrick J Antonelli  
Carolyn W Arndt  
Dale W Bargsten  
La Vonne M and Paul B Batalden  
Marc D Berg  
Judith G Berman  
Gwenda L Brewer  
William Brown and Caroline M Wilmot  
Cindy J Brunner  
Jerry and Susan Cohen  
Jeanne W Collins  
ConEdison Company  
James Cotner Jr and Sehoya Cotner  
Mark I Donnelly and Veta Bonnewell  
William K Durfee  
Mark B Edlund and Leslie M TeWinkel

$100-$249

C Allison and James R Gaasedelen  
Google Inc  
Charles J Heitzig  
Judith A Hessler  
Suzanne E Hill  
James C Underhill Scholarship-Study  
Natural History Fund  
Bruce L Larson  
Bonnie S and John P LeRoy  
Patricia R Lewis  
Melanie O and Jack J Manis  
Network for Good  
David L Nieland  
Michael B and Mary Jane O’Connor  
Fred K Pamer  
Erin A and Donald J Phillips  
Andrea T Rahn  
Peggy J Rinaldi  
Sandra K Rosenberg  
and James E Liston Jr  
Russell and Nina M Rothman  
Lolly J Schiffman  
Jeffrey A Simon and Ann E Rougvie  
Eric P and Andrea M Spandl  
Kathryn Vandenbosch  
Katherine M Walstrom  
Huber R Warner  
Marie Welshinger  
Wei Wu  
Qiang Xiao and Lizhen Gui  
BOLD = Membership in University of Minnesota President’s Club  
M = Membership in the University of Minnesota Alumni Association/Biological Sciences Alumni Society  
* = Deceased  
BIO MAGAZINE 19
Paul C Thompson
Guruvasuthevan Thuduppathy
Joseph R Thurn
Kathryn Timm
Mary K Tinker
Antonia M Turner M
Genevieve M Tvrdek
Robert M Valente M
Cheryl K Vergin M
Robert S Veit M
Kayla Vigen M
Gregory A Viglianti
Joseph S Villa M
Timothy F Vollier
Jill M Vroman
David Vukamanich
Terence C Wagenknecht
Kenneth F Walz
Fen and Rayjohn Wang
Jack K Warren
Brian E Weckwerth M
Lisa Wersal
Michael J Wethern
Susan M Wick M
Mark S and Cheryl Wilke M
Jimmy D Winter
Clifford D Wright M
Lakshmi R Yerragudi
Thomas H Zytkovicz

Amgen Foundation
Janet M and Bruce A Anderson
Joan E Anderson
Lorraine B Anderson M
Bonita K Antonsen M
Michael Arenson
Arlene M Averbeck
Leonard and Joyce Banaszak M
Sherry L Bassett
Joseph T Bauer
Kenneth Beckman
Helene K and Dr William E Berg
Bopaiah A Biddanda
David S Blehert
Robert M Boatz
Karen A Braasch
Terrie L and John E Brandt M
Steven J Brass
Kimberlee K Bright
Jone V Brown
Jamie L Brown
David J Bruck
Bruna Bucciarelli
Buffalo Wild Wings
Gail M Buhl
Kelly R Burke
Steven J Bursian
Bret A and Kate M Busse M
Nancy L Carlson
Bradley E Carter M
Winston Cavert and Carol Witte M
Shaw F Chang
Shin Lin Chen
Rhnoven M Chester-Jones
Karl J Clark
Gretchen K Clevenger
Steven P Commerford M
Jean R Conklin
Carmen K Converse
Judy L Crane
Erin J Dahlquist
Marianne Daly Hasby
Rudolph C Darling
Christopher J Dayger
Zachary L Demorest
Robert F Denison
Shah-Nawaz Mohammed-Iqbal
Doddaw
Terry G Domino M
Elizabeth Jo Donner
Irene J Dorweiler
James L Dougherty
Bruce L Drake
David A Dressel
Duke Energy Foundation
James S Egger
Brittany Eich M
David G Einzig
Aaron Elias
Amanda C Ellefson
Emily L Ellingson M
Megan Elmore
Judy A Enensteine
Erik A Engelbrektson
Adam J Engelhardt
John G Eull M
Holly A Ewing
Alan R Felix
James B and Theresa M Ferrari M
Gerald S Finer
Brian P Finstad
Sally G Fisher
Kelly J Fleming
Claire Foerster
Jesse M Ford
Gail H and Chris D Frethem

BIO MAGAZINE
IBM International Foundation
David Jenson
Esther L and Ross G Johnson
Kimberly D Johnson
Gregg D Jongeward
Just Give.Org
Michael J and Mary E Kallok M
James T Katter
Paul M Kietzmann M
James D Kiley
George A King
David T and Catherine A R Kirkpatrick
Jacqueline M Klein
Charles G Knutson M
Linda J Korhonen-Brula
Eric E Korte
Amy S Kost
Richard V Kowles M
Michael P Kowski
Rodney L Kuehn
Gary F Kupferschmidt M
Dale L LaCroix
Robert K Lammers-Campbell
Johanna W and Paul D Lampe M
Jonathan D Lancaster
Cheryl A Lancot
Anthony L Leblanc
Louie LeBlanc
Stephen C Lee
Joy A Leibman
Carol M and Paul C Letourneau
Jean Marie Lindquist
Stephen R and Heather H Lines M
Amina C Lobban M
Timothy A Lundahl
James D Lux
Daniel O Lynch M
Nadine B Maki
Srey Man
Sarah I Markegard
Judy L Mc Gee M
Tami R McDonald
Daniel P McTarish
Microsoft Corporation
Eric A Miller
Howard A Milstein
Rebecca A Mohn
Daniel R Monson
John Moore and Ruth Silversmith
J William Munger
Kimber L Munson
Steven H Myster
Nardina Nash M
Daryl E Nelson
Elissa M Nelson
Kristen C Nelson
Timothy R Nelson M
Christopher C Nice
Kevin R Nickelson
Kennedy J. O’Brien
Steven M Offer
David J Oftelie
Amy Oganeku
Ryoko Oono
Christine E Ostendorf M
Christopher and Jane Otto
Mary E and Tim Pauza
Indre J Pemberton
Lee D Peters
Rebecca J Peters M
Mark Peterson and Greta A Pratt
Mindy L Peterson
Robert L Pierce M
Melinda L Plantz
Nora S Plesofsky
Bruce A Porisch
Nicole Mary Praska
William J Prem
Larry Puckett
Denise P Quintanilla
William C Ratcliff
Jayantha H Rathnayake
John J Reiners Jr
Susann G Remington
Michael B Robinson
Charles F Rodell
Louise A Rolls-Smith
H Gerrit Rosenthal
Jocelyn A Rowe
Steven D Salt
Carolyn R Schaeffer
Karen K Schlentz M
Virginia Schneider
Janet L and Christopher L Schottel
Laura D Schroeder M
Laura K Schroeder
Daniel S Schultz M
Tina M Seeland M
Sandra H Seilheimer
Laleh R Shambayati
Catherine M Shannon
Ruth Geyer Shaw
Paul J Sheldon
Kristin D Shuldes
Benjamin K Sietsema
Alan M Singer
Rolf C Smeyby
Michelle L Spangler
Oleg A Stanilevskiy
John L Stanton-Geddes M
Donna M Stark
Jeffrey M Stewart
May T Stewart
Naomi E Storsteen
John J and Barbara C Sullivan
Edward B Swain
and Mary E Keirstead M
Paul N Swenson
Mesfin Tadesse
Jean E Takekawa
Anna L Testen
Traci L Testerman
James M Thares
Brittany C Thomas
Malory Thomas
Ami Thompson
Christina M and Chad M Toledo
Timothy J Tripp M
Jeremy M Tupy M
Jean M Underwood
Todd M and Jill M Vannelli
Robert C Venette
Jonathan L Vennerstrom
Scott Q Vidas M
Dominique M Villaume
Christine Mythe T Vo
Margaret M Walker
James Walker and Randi Nordstrom M
Bradley J Ward
Evan J Ward
Mitchell R Watson
Nigel J and Jane M Wattrus M
Paul F Weber
Guang-Jong Jason Wei
Jane I Wenger M
Robin L W Westlake-Storey
Barbara J Whitney
Heather Whittington
Susan L Wichlacz M
Richard L Wildberger
Charlotte E and Donald J Wiley
Terrance and Susan Wolfe
Robert C Wong
Judith L Wulff
Feifei Xue
James A Yolch
Mark the occasion, and make a difference.

The College of Biological Sciences is turning 50. Celebrate the past and invest in the future.

- Contribute $50 to mark 50 years.
- Up the ante and give $1000... or $5,000!

Every gift counts. Make your contribution online at:

z.umn.edu/cbs50