

University of Northern Iowa



BIOLOGY NEWS

2020 Edition

Diversity of life... diversity of opportunities



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GREETINGS FROM THE DEPARTMENT



Dear Alumni and Friends of the UNI Department of Biology,

2020 has undoubtedly been a year to remember! We have missed visiting and making personal connections with one another on campus over the past two semesters. One of the most wonderful things about UNI is the strong relationships students develop with faculty and staff and we've been doing our best to make sure that continues even in the face of Covid restrictions. The Department of Biology faculty and staff want to take this end of year opportunity to reach out to our alumni and friends to wish everyone well and to share some 2020 departmental highlights.

While 2020 started off like any other year, in March, like educators everywhere, we made dramatic changes to our teaching. Faculty cancelled their spring break plans and went to work shifting courses to online delivery. While this unprecedented shift was both sudden and stressful, our students continued to display the amazing resilience and gratitude that has been so typical of UNI students throughout the years.

When we returned to classes in August, our larger lecture sections met online. Our lab and discussion classes were more challenging to adapt, but we did it! Many of our freshman and sophomore labs had to be taught with students spread out in two rooms instead of one or attending in "shifts," with students doing pre-lab and post-lab work online and attending labs in small groups. We created a lot of new online content to help support student learning in these new circumstances. Some of our new online content supplementing our hands-on labs was created through collaboration with a local videographer, UNI alumna Kelsey Hammer Productions.

We are all anxious to get back to normal, but our hard work has been paying off for students. It has been inspiring to watch our creative, dedicated faculty and staff turn distanced education into a high quality, UNI experience for our students.

Our department, our current students, and our recent graduates have a lot to be proud of in the way that they have overcome the challenges brought on by a pandemic.

A huge "THANK YOU!" to our faculty, staff and supportive friends, and an enthusiastic "CONGRATULATIONS!" to our recent graduates. You can learn more about some of our successful December graduates by checking the UNI Department of Biology [Facebook page](#). You can read more about what our current students have been accomplishing in the rest of this newsletter.

I hope you all are staying safe and well. Regards and best wishes for a happy 2021,

Theresa Spradling
Head, Department of Biology

WELCOME: MEET OUR NEW STAFF MEMBERS

The UNI Department of Biology is pleased to announce the hire of two new staff members! **Shelly Frein** joined the department as a full-time secretary in early April of 2020. **Ashley Taylor** joined the department as a part-time secretary in early November 2020.



Everyone, meet Shelly!

Shelly comes to UNI with a variety of previous work experiences such as insurance sales, 911 dispatching, and working for Iowa Vocational Rehabilitation Services to help individuals with disabilities find and keep employment within their communities. Shelly graduated from Iowa State University with a Bachelor's of Science in Biology, so our department is in her wheelhouse!

Shelly has been helping the department with duties such as maintaining the department's schedule of classes, handling registration requests from students, and completing departmental budget items such as purchasing, reconciliation of procards, and month-end reconciliation of accounts ... just to name a few!

Shelly resides in Cedar Falls with her husband, two sons – Ames (6) and Lanning (2), two dogs – Frank and Wallace, a cat – Zola, and a betta fish. She enjoys spending time with family and friends, shopping, and a good cup of coffee!



Everyone, meet Ashley!

Ashley joins us as a secretary splitting her time between the Biology and Physics departments. As a Cedar Falls native who earned her BA and MA degrees from UNI in Secondary Mathematics Education, she feels right at home! She taught for nine years in a local high school before deciding on a career change to allow her to spend more time with her family. She also has secretarial and administrative experience from working at a law office, orthodontics office, and retirement corporation.

Ashley will be supporting the Department of Biology by helping with registration requests, building maintenance and repair requests, collecting and filing departmental documents, setting up and processing student assessments, and any other projects that come up along the way.

Ashley resides in Cedar Falls with her husband, three kids – Rhys (7), Nora (4), and Levi (3), a dog and a cat. Even though free-time can be hard to come by for Ashley, she enjoys being outdoors with her family, watching Disney movies, going for a run, and cross-stitching.



SPOTLIGHT: UNDERGRADUATE RESEARCH

The UNI Department of Biology prides itself on providing meaningful research experiences for our undergraduate students. By the time they graduate, about 40 percent of our students have participated in undergraduate research or another individualized learning opportunity with faculty in the Department of Biology. We had a very successful Summer Undergraduate Research Program (SURP) despite the hardships caused by working through a pandemic. We also continued undergraduate research into the fall 2020 semester. This research would not have been possible without the support of both faculty and the donors that provided the necessary support for our students.

Summer Undergraduate Research Program (Summer 2020)

Natalie Aird worked with faculty mentor Dr. Jerreme Jackson to research “Host-Microbe Interactions in the Lepidopteran Midgut.” Natalie’s research was financially supported over the summer by the College of Humanities, Arts, and Sciences.

Bella Araiza worked with faculty mentor Dr. Mark Myers to research “Assessing the Effectiveness of Radio Telemetry in Tracking *Bombus auricomus* in a Central Iowa Restored Prairie.” Bella’s research was financially supported over the summer by the College of Humanities, Arts, and Sciences and through the fall 2020 semester by the Dr. Gary and Myrna Floyd Undergraduate Research Award.

Nicole Geerdes and **Hailey Holven** worked with faculty mentor Dr. Marek Sliwinski to research “Hunting Novel Archaeal Species in Soil: A comparison of DNA Extraction Methods.” Both students’ research was financially supported over the summer by the College of Humanities, Arts, and Sciences.

Jacey Meier (joined by **Isabella Betzer** through the University Honors Program) worked with faculty mentor Dr. Laura Jackson to research “Sacrificial Seeds’ Impact on Native Seedling Establishment in Prairie Restoration.” Jacey’s research was financially supported over the summer by the College of Humanities, Arts, and Sciences and through the fall 2020 semester by the Dr. Gary and Myrna Floyd Undergraduate Research Award. Isabella’s research was financially supported over the summer by the University Honors Program. Watch Jacey’s and Isabella’s research in action [here](#). Also, check this out on [ScholarWorks!](#)



SPOTLIGHT: UNDERGRADUATE RESEARCH

Summer Undergraduate Research Program (Summer 2020)

Taylor Murray worked with faculty mentor Dr. Ai Wen to research “Insect Community Diversity on Campus Prairies with Different Ages.” Taylor’s research was financially supported over the summer by Dr. Gary and Myrna Floyd. Check this out on [ScholarWorks!](#)

Abigail Weekley worked closely with alumnus and long-term supporter of UNI, Dr. Robert Good, to research “Hypertension Awareness Among University of Northern Iowa Students.” Abigail’s research was financially supported over the summer by Dr. Robert and Brenda Good and through the fall 2020 semester by the Dr. Gary and Myrna Floyd Undergraduate Research Award. Read more about Abigail’s research experience [here](#). Also, check this out on [ScholarWorks!](#)

Spring and Fall 2020 Undergraduate Research

Morganne Borsh has completed multiple semesters of research with Dr. Peter Berendzen. She is supported by the LSAMP program and will complete her research for University Honors in May. Her research is using genome-wide SNP data to understand the population genetic structure of the Black Redhorse (a fish species) in Iowa.

Ashley Campbell worked with faculty mentor Dr. James Demastes to research “The Characterization of the Fragmented Mitochondrial Genome of a Louse, *G. aurei*.” Ashley’s research was financially supported by the Gary and Myrna Floyd Undergraduate Research Award in the spring and the Helscher Undergraduate Research Award and Drs. David and Cathy Swanson Genetics Research Award in the fall.

Spring and Fall 2020 Undergraduate Research

Emily Cornelius worked with faculty mentor Dr. Michael Walter to research “Bacillus bacteriophage Q11 May Have a 5’ Covalently Attached Protein.” Emily’s research was financially supported by the Student Opportunities for Academic Research Award from the College of Humanities, Arts and Sciences.

Samira Haberman worked with faculty mentor Dr. Tilahun Abebe to research “Construction of a VIGS Vector to Silence Expression of Spermidine Synthase.” Samira’s research was financially supported by the Dr. Alan R. Orr Undergraduate Research Award.

Melanie Miller worked with faculty mentor Dr. Marek Sliwinski to research “Testing Undefined Media for the Cultivation of Archaeal Species.” Melanie’s research was financially supported by the Student Opportunities for Academic Research (SOAR) Award from the College of Humanities, Arts and Sciences.

Jennifer Petsche worked with Dr. James Jurgenson in the spring of 2020 using CRISPR-Cas9 to introduce directed mutations of the fungal virulence gene FUM1 into a fungal pathogen of maize. Her work was supported by the Gary and Myrna Floyd Undergraduate Research Award.

Paige Pritts worked with faculty mentor Dr. Tilahun Abebe to research “Construct RNAi Vector to Silence Glutamate Decarboxylase (GAD) in Barley.” Paige’s research was financially supported by the Helscher Undergraduate Research Award and the Dr. Alan R. Orr Undergraduate Research Award.

Pui Yann Sun worked with faculty mentor Dr. Nilda Rodriguez to research “Image Analysis of Lipid Bodies in Macrophages of Male vs. Female Origin.” Pui’s research was financially supported by the Wiens-Cook Undergraduate Research Award and through departmental funds for research supplies.



SPOTLIGHT:
**UNDERGRADUATE
RESEARCH**

WHAT'S NEW IN OUR DEPARTMENT

Carver Charitable Trust

This year, the Department of Biology made use of a generous \$240,000 grant from the Carver Charitable Trust to fund new, state-of-the-art, equipment for genetic analysis and cell culture, including digital PCR. Digital PCR is a new technique that provides ultrasensitive and precise quantification of DNA for applications related to testing genetic disease variants or detection of DNA in environmental samples (for example, river water.)

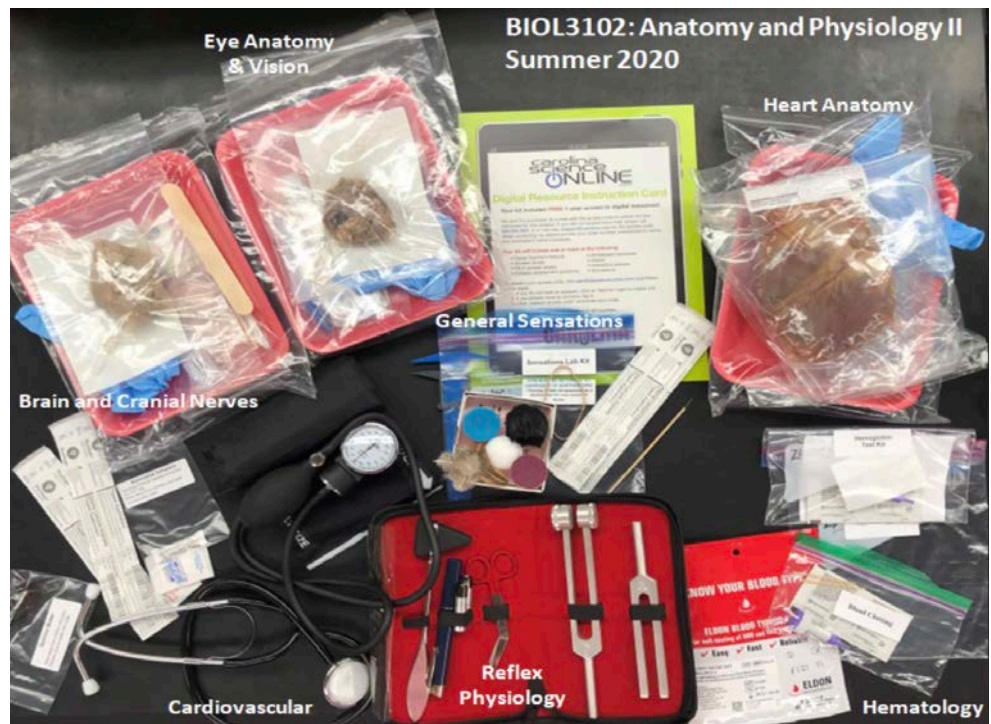
These amazing tools will be used by sophomore, junior, and senior biology majors in their coursework in Genetics, Genomics, and Genetic Technologies in Medicine. Genetic Technologies in Medicine will be taught for the first time beginning January 2021. Undergraduate and graduate researchers will use tools obtained from the Carver Charitable Trust grant as well.

Pre-Med/MCAT

Our department's very own, Dr. Nathan Bird, coordinates the Pre-Medical club on UNI's campus. He has developed a relationship with AptarePrep to provide our students with MCAT preparation software. Nathan periodically reaches out to students who are interested in medicine, advising them on the application process and letting them know the Department of Biology will help them purchase preparation software to help maximize their MCAT scores. This support increases our UNI biology graduates' chances of being accepted to medical school! Alumni donations have made this program possible for our students.

Innovative Labs

Instructors Kim Cline-Brown, Sheree Harper, and Mary McDade modified several laboratory classes to online instruction by preparing take-home lab kits for students. Students really appreciated being able to complete hands-on activities in a world where much instruction has transitioned online. These lab kits were purchased through collection of student lab fees as well as contributions from Continuing Education and Special Programs. Lab kits were distributed on campus with students following a schedule in order to maintain social distancing. A few kits were even shipped to students who could not make it to campus to pick up their items! The image here shows the Anatomy and Physiology II kits that were created last summer. Students received brain, heart, and eye dissection kits, reflex kits, stethoscopes, blood pressure cuffs, and blood-typing kits.



WHAT'S NEW IN OUR DEPARTMENT

Biology Graduate Program

Kudos to the Biology MS program for the recent accomplishments of its students. In 2020, first-year student Alec Glidden's paper "Seed mix design and first year management influence multifunctionality and cost-effectiveness in prairie reconstruction" was published in *Restoration Ecology*. Jon Luiken, current UNI Biology MS student, has taken a job with Iowa State University as a research associate in a zebrafish lab doing gene editing. Recent MS graduate, Kate Madsen, and current MS student, MJ Lashbrook, were admitted to PhD programs at Ohio University and Bowling Green University, respectively. Students in the Biology MS program develop strong research skills, and the program has a high placement rate for students seeking doctoral degrees.

We extend a warm welcome to these new MS students (their advisors in parentheses): Max Pizarro (Dr. Michael Walter), Clari Bruns (Dr. Ai Wen), Jeremy Abels and Rachel McDonnell (Dr. Peter Berendzen), and Anna Shapiro (Dr. Kenneth Elgersma). We anticipate great accomplishments from them.

IINSPIRE LSAMP Conference

One way UNI is actively working to encourage minority inclusion in STEM fields is through partnering with the IINSPIRE LSAMP Conference. The Iowa, Illinois, Nebraska Louis Stokes Alliance for Minority Participation, referred to as IINSPIRE LSAMP, is a Midwest STEM partnership for innovation in research and education. The alliance is committed to broadening the participation of underrepresented minorities in STEM education in the Midwest. In February of 2020, UNI hosted the annual IINSPIRE LSAMP Conference, which brought attendees from around Iowa, and neighboring states, to campus for speaker sessions, and tours of our spaces.



LOOKING FORWARD: UP AND COMING

New year, new classes

The UNI Department of Biology is offering a new course in spring 2021. The course is titled “Genetic Technologies in Medicine”, and it will be taught by Dr. Tilahun Abebe. The course will cover a variety of topics, including the origin of human genetic disorders, screening and diagnosis of genetic disorders and diseases, genomic profiling for precision medicine, therapeutic agents (vaccines and antibodies), gene therapy, gene editing, genetic engineering, ethics, and careers. This course was made possible by funding from the Carver Charitable Trust.

Employment opportunities

The UNI Department of Biology is hiring! We are looking for an addition to our Science Education Department. The successful candidate will be expected to teach intro level courses in biology for majors and/or non-majors as well as science education courses including secondary science teaching methods, inquiry and investigation-based life science for elementary education majors, and graduate level science education. The candidate will be expected to advise biology teaching majors and science education master’s students. The successful candidate is expected to develop an active research program in biology education or science education that engages undergraduates and master’s students. Requirements include a Ph.D. or Ed.D. in biology education or science education. Interested? [Apply here!](#)

SPOTLIGHT: EXCEPTIONAL TEACHING



Alexander Conyers (2010, B.A., Biology Teaching) was nominated for, and received, the Gold Star Award for Outstanding Teaching this year.

Alexander currently teaches 9th-12th grade science at West High School in Waterloo. The Gold Star Award is co-sponsored by the R.J. McElroy Trust and KWWL television, and aims to recognize outstanding teachers in Black Hawk County.



Ai Wen, Assistant Professor of Biology, was featured by the university this year as one of the “Exceptional Women of UNI”.

Ai’s students chose her for this honor in recognition of her outstanding teaching. Ai teaches Organismal Diversity, Life: the Natural World, and Entomology.

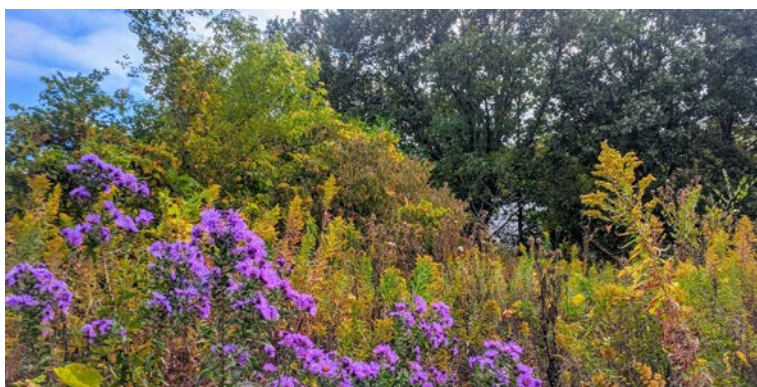
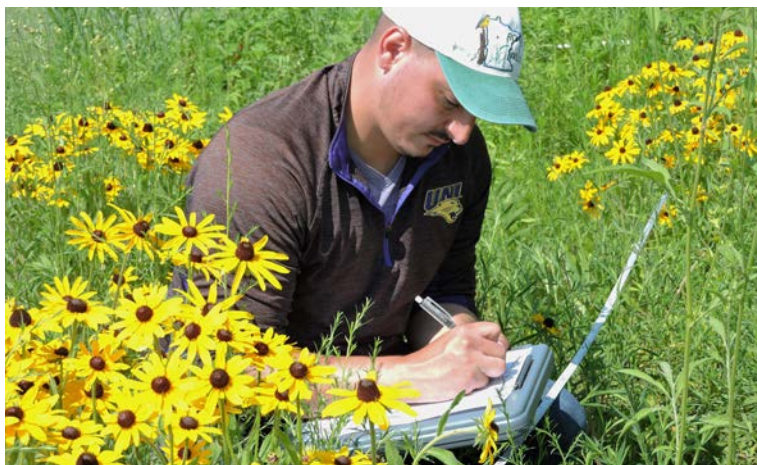
OUTDOORS ON CAMPUS

Enjoying our preserves

This year, perhaps more than any other in recent memory, the campus community has learned to take advantage of good weather and to enjoy time outdoors. While many universities' green spaces are maintained as standard lawns, UNI is unique for also maintaining several extensive natural areas and preserves right on campus for students to enjoy. We saw students taking advantage of these areas especially this fall, when there was a large surge in trail usage.

The preserves were used as an outdoor classroom for laboratories and even a few lectures. This provides all sorts of benefits to students, ranging from the immediate health benefits of increased physical distancing to deeper benefits of relaxation and improved mental health. One student remarked about her class project on Smith Prairie: "An interesting take away is the serenity you get while you are out on the prairie. You can sit back and enjoy the sounds of nature. It was nice walking out on the prairie and feeling a sense of stress relief, which is just another bonus that the prairie has to offer."

Biology Department faculty and staff play an active part in maintaining and promoting our outdoor campus resources. The Department of Biology Preserves Committee coordinates planning and maintenance in the University Preserves System. Botanical Center staff and students spent nearly 300 hours this summer maintaining trails, fences, and other infrastructure in the preserves so they are inviting places for students and the public. This is a great way to help our campus community, and the broader community, appreciate and value the biological integrity of our surroundings. We are grateful for the financial gifts that have helped support us in this mission.



OUTDOORS ON CAMPUS

Research on Smith Prairie

Recent agricultural expansion has led to substantial declines in grassland habitats for native pollinators, resulting in widespread pollinator population declines. Knowing more about the movements and spatial ecology of native pollinators is important for developing sound conservation plans.

To help with that problem, Dr. Mark Myers and his student, Bella Araiza, ran a pilot study that explored the feasibility of using radio telemetry to study bumblebee movements. They deployed tiny radio transmitters by attaching them to black and gold bumblebees last summer and fall. They shaved each bee and attached a tiny transmitter with super glue. They released the bees and observed flight and behavior.

Two bees were tracked for up to 9 days after release in and around the Daryl Smith Prairie. The researchers documented frequent 100 to 200 m flights over a 6 ha area, including forays outside of the Daryl Smith Biological Preserve into neighboring residential yards and gardens.



Contactless Plant Sale

The Botanical Center held their popular annual plant sale in a really untraditional, but safe and fun way this year. To protect the public and Center staff, plants were offered in premade boxes by category, including colorful annuals, succulent houseplants, “unique houseplants,” and herbs. There was wonderful support, and the plant sale quickly sold out.



2020 NEWS IN REVIEW



Many of our alumni fondly remember Steve the Alligator. Our more recent alumni also remember Wally, our newest alligator. In response to a piece in the [UNI news](#) about the alligators of UNI, biology alum **Steve Hummel** reminded us that our department has a long history with alligators. It seems that our first alligator lived in the Botanical Center beginning in about 1909. Take a look at this [historical piece](#) for some great photos of the Center in its early years.



Biology alumna **Andrea Austin** was in the news this year for her work in the fight against the coronavirus, treating patients at Los Angeles County+USC Medical Center in California.

Read the original article in The Washington Post [here](#).



Catherine Yeoman, a student in the UNI Department of Biology, has kicked off a unique college experience that's brought her around the country – studying bottlenose dolphins in Florida and rehabilitating baby seals in Cape Cod. Now, she's bringing her passion for marine biology back to the UNI campus.

Read more about Catherine's unique experiences [here](#).



Biology alum and former Panther football player **Blake Thomas** was featured in the UNI News this year. Blake is currently attending graduate school in Nevada, where he is studying epidemiology. Studying pandemics in the midst of a pandemic has been an interesting experience for Thomas, and seeing the long-term repercussions from COVID-19 over the next several years will be a large part of his studies and his work in the field.

Read the original article [here](#).

THANK YOU TO OUR DONORS

Newly Established Awards and Scholarships

The UNI Department of Biology wishes to thank the donors of newly established awards and scholarships added over the course of the last year.

Helscher Undergraduate Research Award

Thank you to Charles and Dawn Helscher for creating the Helscher Undergraduate Research Award. This fund will award undergraduate research stipends and purchase supplies required for the students' research projects.

Janet K. Dunn Scholarship

Thank you to Janet K. Dunn for making the Janet K. Dunn Scholarship possible. This scholarship is for senior biology students who have been accepted into an accredited school of physical therapy.

Wiens-Cook Biomedical Undergraduate Research Award

Thank you to Darrell Wiens and Arlene Cook for establishing the Wiens-Cook Biomedical Undergraduate Research Award. This award will support students who are interested in biomedical research, primarily students completing research projects in cellular or developmental biology or physiology.

William F. Porter Biology Scholarship

Thank you to Barbara Voorhees Gray for making the William F. Porter Biology Scholarship possible. This scholarship is for senior biology students, with a GPA of 3.5 or higher, who plan to attend graduate school.

ALUMNI INFORMATION REQUEST

Let us know what you have been up to! You can email us at: theresa.spradling@uni.edu

Contact info:

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University of Northern Iowa

DEPARTMENT OF BIOLOGY

Diversity of life... diversity of opportunities

Would you like to support a Biology student and/or the Biology Department?

If so, please print and fill out the form below. Form may be returned to:

UNI Foundation Financial Services
121 Commons
Cedar Falls, IA 50614-0239

If you would like to start your own scholarship, contact Cassie Luze: cassie.luze@uni.edu / 319-273-6360

Name _____

Address _____

City _____ State _____ Zip _____

Email _____ Preferred Phone _____

☐ Please check if new address, phone or email

I/we would like to support the following fund(s):

\$_____ Biology Undergraduate Research Fund, providing support for students doing undergraduate research (21-222596)

\$_____ Biology Department Fund, supporting purchases needed for student and faculty research (21-221607)

\$_____ Biological Preserves Fund, in support of the campus preserves system (21-220162)

Online.....Go to the online pledge form at foundation.uni.edu/give. You will need to enter the specific name(s) of the Biology projects in the "Other" box.

Matching Gifts.... My (or my spouse's) company, _____ (name) will match my gift. Please contact your HR office for details and the matching gift form to be submitted with your payment.

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(Credit Card information will not be kept on file.)

Please charge my: Visa / MasterCard / Discover / American Express (please circle one)

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