Bio Buzz

Denison University Department of Biology

November 2016

Click here for more!

There's a Buzz on Campus!

Bee Hotel Campus Art Project– there are wooden structures on A-quad. Lots of them! They are student projects from **Micaela Vivero's** Mixed Media Sculpture class that are based on cities described in Italo Calvino's 'Invisible Cities'.

These sculptures are also designed to provide nesting sites for non-aggressive mason bees (*Osmia. spp.*). These bees will lay their eggs in the cavities on the sculptures and are being counted by **Dr. Andy McCall's** Plant Reproductive Class this fall.

Mason bees are very gentle and females will only sting if you touch them or corner them. The bees are great native pollinators and may provide wildflowers extra pollination in the face of honeybee declines.

A Pedagogical Practice Project sponsored by the Center for Learning and Teaching.

A fresh spin on **Air Bee n' Bee** !!

Notes from the Chair

Hello Biology Folks! This is my first note as Chair of the Biology Department, and I wanted to say that I am excited to update you about the goings-on in the Biology Department.

First, I would like to share some big news. Our Bioreserve is **50 years old this year**! We are thrilled to have it, so we plan to throw a celebration. We will keep you posted on the details.

Second, **Dr. Jeff Thompson** informed you of our curriculum change. All core courses have been running since last spring, and responses from students have been positive so we are excited things are moving along nicely.

Finally, we have a new face in the department. **Dr. Angela Zhou**, a cell biologist, is here for the 2016-2017 academic year. She is teaching our new Molecular Biology & Unicellular Life core course as well as a 300-level course entitled Cancer Biology. Additionally, we have added a new support staff member. **Hannah Roodhouse,** a 2016 Denison graduate and biology major, was hired as the Biological Laboratory Specialist. This is a two-year position supported by the Presidential Fellows Program. More on each of them is included in this newsletter. As for returning faces, we are happy to have **Drs. Jessica Rettig and Lina Yoo** back with us after both being on leave.

We hope you enjoy the *BioBuzz* news!

~Chris Weingart, chair

Urban Forestry Conference

The morning session of the Ohio Urban Forestry conference was led by three speakers. Dr. Joan Maloof spoke about the need to protect old growth forests in urban settings, and her efforts to establish the Old Growth Forest Network. Dr. Francesca Peduto Hand spoke about emerging pathogens on urban and forest trees, specifically the oak wilt and elm yellows diseases. Steve Cothrel, Superintendent of Parks & Forestry for the city of Upper Arlington, spoke about his efforts to take management of urban treescapes beyond the basics of safety and aesthetics. The afternoon included sessions on invasive plants by **Alistair Reynolds** of the Ohio Division of Forestry, bee habitable sculptures constructed by Denison students under the supervision of Denison professors **Micaela Viverao** (*Studio Art*) and **Andy McCall** (*Biology*), and a tree tour of the Denison campus led by Denison professor **Warren Hauk** (*Biology*).

Biology 2016-2017:

Front row: Jenny Etz, Lina Yoo, Visiting Professor Angela Zhou, Ayana Hinton, Lab Specialist Hannah Roodhouse.

Row 2: Chris Weingart, Tom Schultz, Jessica Rettig, Heather Rhodes, Eric Liebl

Last Row: Warren Hauk, Geoff Smith, Whitney Stocker, Visiting Professor PJ Torres, Andy McCall, Rebecca Homan

(not shown, Jeff Thompson, Clare Jen, Laura Romano)

Welcome Angela!

Visiting Professor Angela Zhou

B.S. in Life Sciences from Fudan University, Shanghai, China, 2002

Ph.D. in Molecular Pharmacology and Toxicology from University of Southern California, Los Angeles, CA 2006

Postdoctoral Research Fellow in Cell Biology from Johns Hopkins Medical School, Baltimore, MD 2006-2009

Postdoctoral Research Fellow in Cancer Biology from Harvard Medical School/Dana Farber Cancer Institute, Boston, MA 2009-2011

Teaching Biology at Denison: Molecular Biology and Unicellular Life, Cancer Biology

Research: Dr. Zhou is interested in studying how cytoskeleton networks coordinate to achieve the dramatic shape change during cytokinesis, which is a process that a mother cell divides into two daughter cells. Dr. Zhou is interested in this cellular event, because cytokinesis is closely related to cancer development. If the cell fails cytokinesis, it may develop into cancer cells. At the same time, small molecules that can inhibit cytokinesis may also be potential anti-cancer drugs.

Microtubules are a type of cytoskeleton. During mitosis and cytokinesis, microtubules provide numerous functions, including capturing and separating the chromosome and delivering the cues that coordinate cell shape changes. During her postdoc training, she found 14-3-3, a novel cytokinesis related gene, was able to facilitate cytokinesis by stabilizing microtubules and regulates the cell cortical tension. In her current research, she is interested in discovering the more unique roles of 14-3-3 in the regulation of cytokinesis. Dr. Zhou uses *Dictyostelium* cells and many cancer cell lines as research models for her study. And congrats to her new paper which was published on the first day she joined Denison, by *Acta Pharmacologica Sinica*, a **Nature Publishing Group** journal.

IMMUNOLOGY/GENETICS NEWS

The effectiveness and ease of a genome editing technique called CRISPR/Cas9 have made it explode in popularity in cell and molecular research labs around the world. This fall, students in both the Immunology and Genetics classes have been using CRISPR/Cas9 in the laboratory. **Lina Yoo's** Immunology class is utilizing this technique to address a novel research question regarding the process by which immune cells are enabled to access sites of infection. Students are "knocking out" gene function to determine if those genes are necessary for immune cell adhesion. This project allows students to generate new knowledge while investigating how the immune system works. **Eric Liebl's** Genetics students are also doing a novel CRISPR/Cas9 experiment, but rather than trying to make a null allele of a specific gene as Immunology is doing, they are actually making a specific DNA edit. From the E. coli genome groups of students chose a random target gene, and using an on-line bioinformatics tool they identified good Cas9 target

CRISPR cont. pg 4

The Synapse

"The goal is to connect across disciplines and inspire collaboration while also promoting general science education."

Katie Darrah '17 & Allison Murphy '17

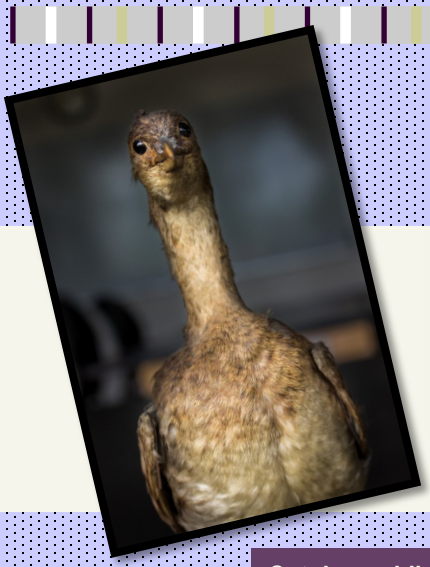
Katie Darrah '17 (biology) and **Linnea Wethekam '17** (biochem) started a collaborative, student-written and published magazine in conjunction with Oberlin College. ***The Synapse*** is already in existence at Oberlin, and the students there would like to expand the publication to the Ohio 5.

As a student-version of *Scientific American*, student-written articles on any science or math-related topic of their choosing, are matched up between campuses with copy editors and illustrators. Coordinating with Oberlin since January, Darrah and Wethekam have established *The Synapse* as a DU campus organization. Since the beginning of the semester, **Allison Murphy '17** (biology) has been the managing editor on Denison's end.

http://www.thesynapsemagazine.org/#intro

Out of the Cabinet

Ivy Distler



October exhibit at the Mulberry Intermedia eXperience (MIX) Lab

Chris Weingart, Ivy Distler '18 & Ron Abram, Studio Art

Ivy Distler '18 , Biology/Studio Art double major

Without use the specimen sit in ranks inciting more discomfort and fear than interest. The initial impetus for photographing specimen was an attempt to make the grotesque appealing, drawing a viewer into the beauty of a photograph all the while the subject is a specimen. The off-putting nature of bones, skulls could soon be translated into intrigue through a photograph. Instead of focusing on the "creepy" value of a skull the photographs spoke to the existence of death in the life sciences, the beauty in natural structures, the art that is specimen collection. Specimen with intricately detailed tags and specimen still unidentified now had a time and space to exist again. The narratives throughout my studio summer center on the power of the photo-graph, and in turn the photographer to restore a once hidden subject's existence. The specimen in place behind cabinet doors is nonexistent in a

Cabinet cont. pg 4

Hannah Roodhouse '16

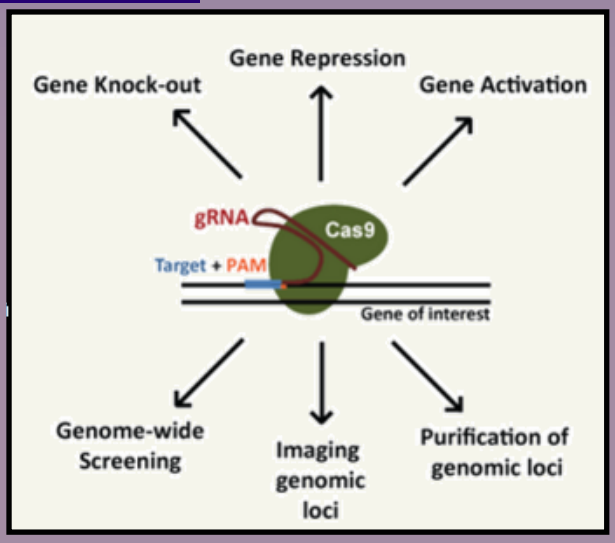
This spring I joined the biology department as a lab specialist as part of the Presidential Fellows Program. This program is made possible and funded in part by the Sherman Fairchild Foundation and is a small component of President Weinberg's strategic plan to advance Denison academically by capitalizing on the skills of recent graduates on campus. This job has given me a great opportunity to get some experience while I take time off before I head to graduate school. The department has been truly welcoming for the duration of my time and I could not have asked for a better first job experience.

In accepting this position I had no idea how much more there was to learn about Denison. Even after studying and working in the biology department for four years it seems like everyday I discover something new about the inner workings of Denison. One of the most exciting part of my job is working with the organisms that we are using in the new "Multicellular Life" course. From slime mold to crayfish, I am having lots of fun exploring these fascinating organisms as a I prepare the labs for this course. I am eager to see what awaits in the coming months!

Have you joined our Facebook group?? ***Denison Biology Alumni & Faculty***

If you wish to be removed from the Newsletter mailing list please let us know at biology@denison.edu

CRISPR cont. from 2



sites within that gene. They then designed DNA to both generate appropriate guide-RNA and a long (60 base-pair) sequence that contained their desired DNA edit to be used as a repair template. By popping the three elements (Cas9, gRNA, repair template) into cells, their goal is to 1) cut the genome at the specified place and 2) at high frequency repair it using the repair template. These exciting projects allow students to do actual gene editing in the undergraduate lab, while also learning current skills and techniques that will serve them should they seek future positions in biomedical research.

Cabinet cont from pg 2.

sense that in order to exist you must be recognized, thought of, spoken for. Even if the specimen are removed only for the time it takes to photograph in that moment they are held, and given purpose again. When the specimen is given a function they once again exist, and that time and space is remembered through every viewing of the photograph.

"The specimen in place behind cabinet doors is nonexistent in a sense that in order to exist you must be recognized, thought of, spoken for."

~ I.Distler '18