



# BIOGEEK: The Northwestern College Biology Departmental Newsletter

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Northwestern College (NWC)

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## NWC Biology Launches SEA-PHAGES

"So, how is nerd camp going?" Thus, read a text from my daughter, Andrea, received at the SEA-PHAGES Discovery workshop this past July. In fact, "nerd camp" was going just great.

In the last newsletter, we announced that NWC biology was accepted as part of cohort 9 in the SEA-PHAGES project of Howard Hughes Medical Institute. Amid the excitement of our acceptance was the reality that we had a significant amount of work to do to make this project a special experience for our students. That work began with "nerd camp," the workshop where in one week, along with other faculty from cohort 9, we learned the procedures and protocols for effective phage hunting. We began our own hunt with the collection of soil samples from the campus of University of Maryland Balti-

more County and the discovery of a bacteriophage contained in that soil. And, to the extent that our fellow hunters were faculty from other institutions around the nation, it was in fact a "nerd camp."

Out of the workshop we discovered two bacteriophages and named them Neos5 (Noordewier) and PhageTurner (Tolsma). In the end, both phages were adopted by us from those isolated from other members of our cohort; a minor disappointment that our soil samples did not yield phage in the time allowed. Still, we call Neos5 and PhageTurner our own. The real outcome of the workshop was the refinement of our proposal to introduce to NWC students the excitement of real world scientific discovery. Phage discovery will begin in this fall semester in General

Biology. Then, in Microbiology, students will discover, purify and characterize their own phages. All NWC phages discovered will be preserved in the project's phage bank and genomes of two of the phages (each year) will be completely sequenced. These sequences will be used for part two of the project, Bioinformatics, to be the focus of NWC's Genetics course.

As for phage discovery, bioinformatics techniques and procedures need to be learned, so "nerd camp" part two awaits Drs. Furlong and Tolsma in December. After that workshop and prior to the introduction of Bioinformatics in our fall Genetics course, eight students will be directed in Honors Research by Dr. Tolsma, annotating an adopted phage genome from the project's library of sequences.

SEA-PHAGES is underway!

## Special Points of Interest:

- \* Public launch of Discover Campaign.
- \* Student/faculty research
- \* Internships
- \* Faculty and student honors
- \* Three NWC alumni in UNMC PA program

## NWC Biology Profs Publish in *Perspectives*

The May/June issue of *Perspectives: A Journal of Reformed Thought* focused on Science and Faith. Essays by three Northwestern College Biology Professors were included in the issue. Dr. Laurie Furlong's essay "For I am Convinced" shares her personal journey as a Christian and a scientist. Dr. Byron

Noordewier explored our calling to discover God in creation in an essay entitled "Let Us Behold." Dr. Sara Tolsma, co-editor of *Perspectives*, introduced the issue with her essay, "Integrating Science and Faith." Colleagues James Mead and Jason Lief in the NWC religion department also published essays in

this issue. Read it at <http://perspectivesjournal.org/blog/category/issues/2016/mayjune/>.

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## What do Professors do during the Summer?

**Elizabeth Heeg** went to the National Association of Advisors for the Health Professions (NAAHP) conference in Minneapolis, MN to learn more about advising pre-health professionals and to build relationships with admission directors. She also worked on a software program for MCAT prep. In her free time she camped and swam with her family.



**Sara Tolsma** attended the SEA-PHAGES Symposium and faculty retreat in Washington, D.C., Phage Camp (no, not Nerd Camp!) with **Byron Noordewier** in Baltimore, MD,

and took a short course in Environmental Genomics at Mount Desert Island Biological Labs in Salisbury Cove, ME. She also continued a research project on NWC's campus with a student and took in a few Royals games in Kansas City with her husband.

**Laurie Furlong** backpacked 300 miles across northern Spain with her husband.

Although they were happy to complete their pilgrimage on the Camino de Santiago, they already miss their packs, snacking



on Spanish cheese and hearing sound of gravel crunching under their boots.

**Tyrone Genade** spent much of his summer in the laboratory at NWC doing research with a student. He also spent time with his family in the U.S. and in South Africa and he gave a talk at the American Killifish Convention in Denver.

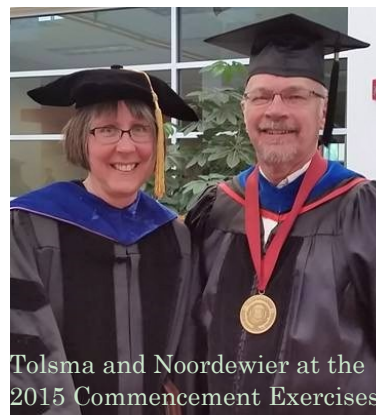
**Todd Tracy** wrote test bank questions for a Pearson environmental science textbook, taught at a Science Station in the Black Hills, graded AP exams, and spent time with his kids.

**Ralph Davis** and his family went to the Badlands and Black Hills for a summer vacation. He also attended the Center for Brain and Behavior Research sponsored 2016 Research Symposium at the University of South Dakota.

## NWC Biology Faculty Recognized

Dr. Byron Noordewier was a finalist for the 2016 Teaching Excellence Award. Teaching Excellence Award finalists are selected from faculty members who are nominated by students. Students nominations for Dr. Noordewier praised him for his clarity, rigor, depth of knowledge, and care for students.

Dr. Sara Tolsma was appointed by President Christy to the Northwestern College Endowed Professorship. This is a rotating professorship and is for a 5-year period beginning July 1, 2016. The professorship provides additional funding for faculty development, scholarship, and research.



Tolsma and Noordewier at the 2015 Commencement Exercises

## Public Phase of Discover Campaign Launches

The biology department spent many hours with architects through the spring and summer of 2016. We were making decisions about drawers, cupboards, benches, locations of equipment, whether benches needed natural gas, vacuum, and/or forced air.



The public phase of the campaign to raise money for our new building launched at the end of September with 75% of the building funds already raised or pledged. We will break ground in the spring if fundraising goes as planned.

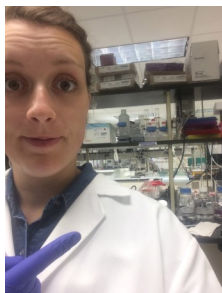
In the new building we will have space for classes to engage in research, for students to learn, study, do independent research, and share their ideas. Faculty and students in the departments of biology, chemis-



try, and nursing will have additional opportunities for collaboration. Watch for continued updates and pray for this project as we plan, raise money, and dream big for our future!



## Summer Internships



Molly Cunard participated in a Carlson internship this summer. Molly worked in the Safety Pharmacology department of AbbVie®, in North Chicago, IL, a global pharmaceutical research company. She joined a study examining the cardiac affects of compounds using human-induced pluripotent stem cell-derived cardiomyocytes (hi-PSC). Molly was studying how the field potential in the cells was affected by drugs.

At the end of the summer, Molly presented her research project. She also got to



explore Chicago, live near Lake Michigan, and meet cool people!

Bethany Muyskens, also a Carlson intern, interned for the Genetic Counselors at Sanford in Sioux Falls. She sat in on appointments and learned about genetic disorders ranging from Down Syndrome to Huntington Disease. Bethany shadowed doctors in medical genetics, pediatric neurology, pediatric cardiology, pathology, and pediatric electrophysiology. Her favorite type of genetic counseling was oncology where she learned about hereditary cancers and the implications they have for family members. Her summer highlights were attending a genetic conference and working with children in the Sanford Children's Castle.

Joseph Tolsma's internship at the Au Sable Institute for Environmental Studies took him to Michigan where he spent the

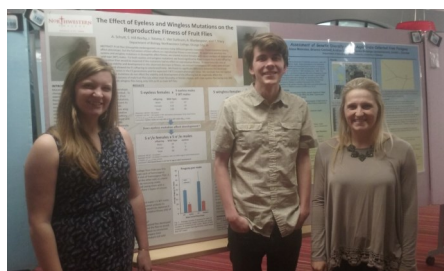
summer working with Fred VanDyke (former NWC prof). His research was focused on abandoned oil well pad reforestation. They investigated forest management strategies that return these sites to productive forest and learned about the natural history of Michigan and current issues facing conservation. He also took classes focused on developing writing, presentation, and statistics. His highlight was the challenge to think creatively from a Christian perspective in order to solve complex problems.



## Students Present Research at Iowa Academy of Sciences

In April, NWC biology students presented their General Biology research projects at the Iowa Academy of Science annual conference at Grand View University in Des Moines. Alison Schutt ('18), Skyler Hill-Norby ('18), Calvin Van Surksum ('18), and Austin Blankespoor ('18) studied the reproductive fitness of two mutant strains of *Drosophila melanogaster*. The group was assisted and advised by

Joseph Tolsma ('17). By giving wild type flies a choice of mates and then allowing their offspring to interbreed,

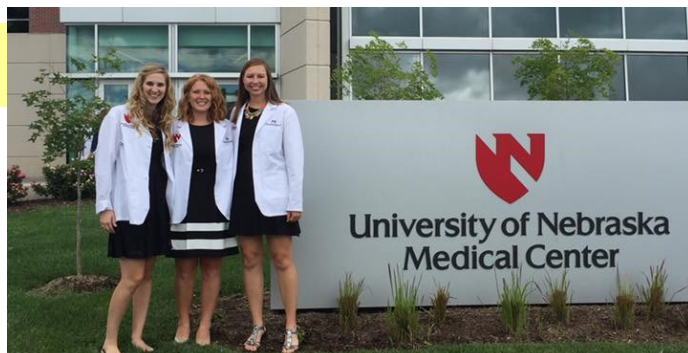


the group found that eyeless flies were only 36% as fit as wild type flies and that wingless flies were only 32% as fit as wild type flies. This is the 10<sup>th</sup> year that Northwestern College students have presented at the conference, and the second time that a first-year student research project has culminated in a presentation at the conference.

## Alumni Feature

Northwestern College is well represented in this fall's first year physician's assistant class at the University of Nebraska. Josie Clark ('16), Arianne Gesell ('16), and Kellie Goedkin ('15) started as first-year P.A. students at UNMC in August. When asked how the first weeks have been, Arianne says, "We have taken our first tests in every

class. It has been a lot of work so far and many hours of studying, but I have really enjoyed learning a about clinical applications and seeing how it all fits together. I rapidly built on the foundation of knowledge I have from my time at Northwestern. It was awesome coming into the program already being friends with two of my classmates and I



think that has helped make the transition a little easier."

Watch for great things from these talented women!

**"Northwestern definitely equipped me with the tools I need to succeed in PA school and as a future clinician."**  
Kellie Goedkin ('15)

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### REFLECTION

Fall is busy. Schools are back in full swing along with school, church, and community activities. High school seniors add the extra stress of college search and college seniors of making career decisions. With so much activity, it's easy to forget to be still and to listen for God. Remember Elijah. When the LORD showed Himself to Elijah, God was not in the wind, earthquake, or fire. Elijah heard a gentle whisper. During this busy time of year and with big decisions to be made, remember to take time to listen for God's gentle whisper.

—Randy VanPeursem, NWC Science Center Director

### The Mission of the Department of Biology

The mission of the Department of Biology of Northwestern College is to provide students with an understanding of the complexities of life that encompasses all levels of biological organization. These levels range from the molecules of life to living organisms, from molecular interactions within cells to cellular and other interactions within organisms, to interactions of organisms with one another and their environment. To gain this understanding, students will be introduced to classical and modern approaches to biological inquiry. Students will thus gain an appreciation for the basis of our current understanding of biology and will be prepared to apply experimental inquiry to solve problems in biology.

This mission will be carried out within the context of a Christian liberal arts education in which God is recognized and honored as Creator, Christ is acknowledged as Lord over all and Redeemer of creation, and we are called to be stewards of creation. The Department of Biology strives for its students to engage in honest and open investigation while being faithful to their Lord and Savior. Thus, the comprehensive integration of faith, learning and living espoused by Northwestern College shall be reflected in the life of the faculty and students of the Department of Biology.

## 2016 Biology Graduates

Twenty-one biology majors walked across the stage at the 2016 Northwestern College Commencement Exercises to receive their diplomas. Our 2016 graduates are starting new jobs, doing research, teaching overseas, working in hospitals, and more. They are first year medical students, graduate students, physician's assistant students, and physical therapy students. They are making an impact at the University of South Dakota, University of Nebraska, University of Iowa, Des Moines, Texas, Mississippi, Honduras, and more. We are always impressed as we watch our graduates transition into the next chapter of their lives, knowing the amazing potential they have to pursue God's redeeming work in our world. Good luck 2016 biology graduates! We are excited to see what is in store for your

bright futures and consider working with you over the past four years, as you discovered your calling, a true privilege!

"Learn how to learn well and learn to become open-minded and non-judgmental towards others." Nate Huyser '16

