

# Southwestern University

## DEPARTMENT OF BIOLOGY

# B I O S C O P E



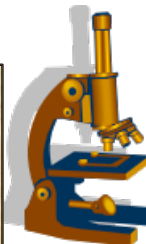
The Biology Department faculty pictured (from bottom left to right): Dr. Erika Borden, Dr. Stacie Brown, Dr. Maria Todd, Dr. Airon Wills, Dr. Max Taub, Dr. Romi Burks (Department Chair), Dr. Maria Cuevas, Dr. Ben Pierce, Dr. Martin Gonzalez (Department Chair), Christy Schaller, Dr. Karen Wheeler, Dr. Hayley Gillespie

The Biology Department faculty participated in their annual summer retreat in August. We spent a day talking about how to boost student success in our courses and what changes have been happening with inquiry-based learning in our curriculum. Exciting times in the Department!

Last Spring, The Biology Faculty enjoyed wishing our seniors congratulations and farewell with our annual picnic. We enjoy getting to know our students both in and out of the classroom and certainly get invested in our students' futures. Always exciting to see where their Southwestern experience takes them. For 2016-2017, we would like to offer some more opportunities for social time with our faculty so stay tuned for announcements.



Join our FB group! And visit us on our webpage  
<https://www.facebook.com/groups/SUBIOLOGISTS>  
<http://www.southwestern.edu/departments/biology/>



# MESSAGE FROM THE DEPARTMENT CHAIR:

Welcome to the 2016-2017 Academic Year!

On behalf of the Biology Department, we welcome you to an exciting new year, whether this is your first or your last, we hope that you will make the most of your time in our Department. The faculty and staff within the Biology Department pride ourselves on prioritizing student success and working closely with our students to maximize their undergraduate experience. We encourage you to get involved in the Department! So many ways exist from simply visiting with professors in office hours to doing research with a faculty member. Some students work as laboratory assistants, mentor elementary school students in SMaRT (see more on pg. 5), and /or participate in Beta Beta Beta. For our first year students, we strongly encourage you to engage in bolstering your study skills through BETA sessions (see more on pg. 5). The teaching styles of our faculty vary a bit but we all seek to embrace student-driven education where we teach students to learn through inquiry-based instruction. Such classroom environments might be a little different than your experience but we encourage you to embrace new learning styles as education research shows active learning to boost student success. Good luck with the semester and feel free to contact us with any questions or concerns.



Dr. Martín Gonzalez,  
Interim Chair, Fall 2016

[gonzale2@southwestern.edu](mailto:gonzale2@southwestern.edu)  
512-863-1621, Room#217



Dr. Romi Burks,  
(Department Chair, January 2017 - May 2019)

[burksr@southwestern.edu](mailto:burksr@southwestern.edu)  
512-863-1280, Room#141  
On Sabbatical Fall 2017

## CONGRATULATIONS!!



-**Dr. Todd** earned a promotion to Full Professor based on her excellent record in teaching, success in collaborative research on cancer & dedicated service to Southwestern.



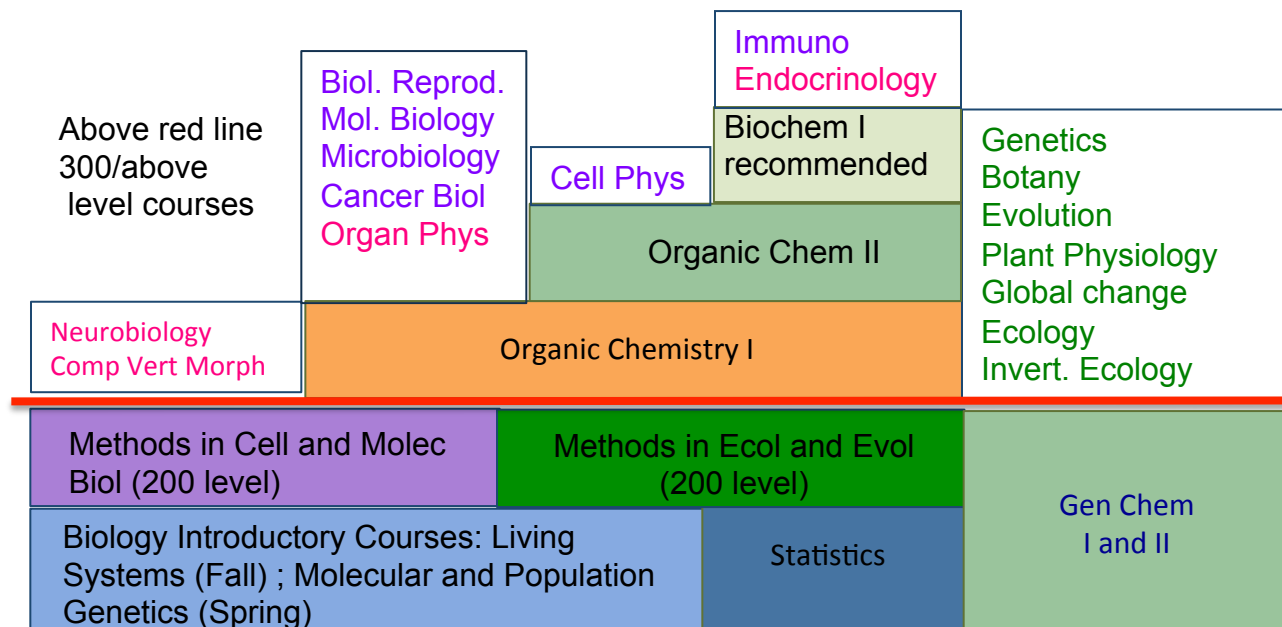
Ask Dr. Burks about  
what's happening in  
apple snail research



# Majoring in Biology:

## Biology Curriculum (BA = 5 UL courses; BS = 6 UL)

### Gen Ed + Stats + Chemistry + Biology + Physics/Calc (BS)



● Cellular and Molecular Biology

● Ecology and Evolutionary Biology

● Other areas

## Where are your professors?

LAST NAME	FIRST NAME	EMAIL (@SU)	EXT	ROOM	LAST NAME	FIRST NAME	EMAIL (@SU)	EXT	ROOM
Borden	Erika	bordene	1627	218	Gonzalez	Martin	gonzale2	1621	217
Brown	Stacie	brown22	1776	216	Pierce	Ben	pierceb	1974	240
Burks	Romi	burksr	1280	141	Taub	Max	taubd	1583	140
Cuevas	Maria	cuevasm	1698	241	Todd	Maria	toddm	1983	143
Gillespie	Hayley	gillesph	1260	205	Wills	Airon	willsa	1728	143

## Check Office Hours. Stop by. Email.



# Take a look at our new space!

**First Year Lab-#161**



**Student Interaction  
Area-2<sup>nd</sup> floor**



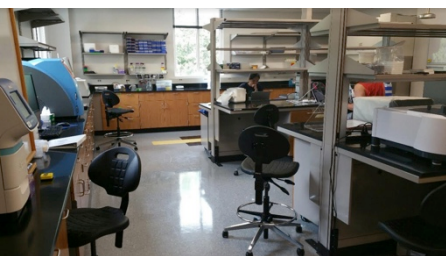
**Collaborative  
Learning Center  
#260**



**Shared Research  
Lab-#262**



**Cell Culture  
Room-#263**



**Molecular Bio  
Center-#267**



# Beta Beta Beta

The Biological Honors Society, *Beta-Beta-Beta*, commits to engaging students in the appreciation of biology study, scientific research and the importance of biological issues. At Southwestern University, *BBB* informs students interested in a medical career about the admissions process. This year they also have plans to host information sessions throughout the year for *BBB* members interested in going on to graduate school!

## 2015 - 2016 *BBB* officers:

President: Abby Toppings

Vice-President: Myra Butrvienpant

Treasurer: Mac Light

Secretary: Mariana Gainza-Perez

Volunteer Coordinator: SEARCHING

Med School Chair: SEARCHING

[topinsa@southwestern.edu](mailto:topinsa@southwestern.edu)

[butrviem@southwestern.edu](mailto:butrviem@southwestern.edu)

[lightp@southwestern.edu](mailto:lightp@southwestern.edu)

[gainzapm@southwestern.edu](mailto:gainzapm@southwestern.edu)

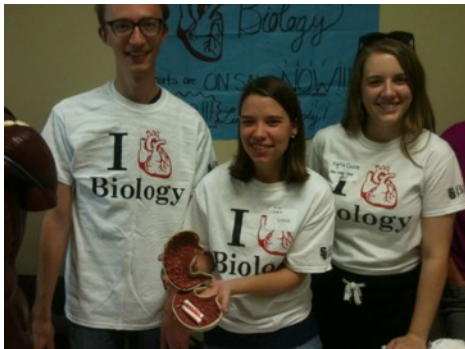
*BBB* Advisor: Dr. Martín Gonzalez

[gonzale2@southwestern.edu](mailto:gonzale2@southwestern.edu)

# Student Groups



Anyone interested in Biology, including first year students, can join *βββ* as an associate member. Membership can be upgraded to "full" as students progress in their studies of biology. For more information visit the national *βββ* website: <http://www.tri-beta.org/aboutbbb.html>



## SMArT Begins the 20<sup>th</sup> (!) semester at SU!! Recruiting Students Now!

Thanks to a generous grant from the WD Kelly Foundation, SMArTeams now represents an endowed Civic Engagement Opportunity geared towards science majors.

SMArTeams (i.e. Science and Math Achiever Teams) pairs SU student mentors with 3<sup>rd</sup> - 5<sup>th</sup> graders from a Georgetown ISD partner school. Led by fabulous **Biology Junior Claire Schuman**, students come and check out SU on Mondays from 5-6 pm and explore a project of inquiry with their SU mentor. More info can be found on the webpage of the Office of Civic Engagement. Or, if you are interested in checking out the program, just email Claire Schuman ([schumanc@southwestern.edu](mailto:schumanc@southwestern.edu))

Interest Meeting for Mentors is Tuesday, September 6<sup>th</sup> from 5-6pm

SMArT Directors include: Dr. Romi Burks, Christy Schaller and Dr. Sarah Brackman



# RESEARCH

## Main Research Interests of our faculty:

- **Dr. Romi Burks:** Aquatic & Molecular Ecology – Diversity, distribution and ecology of apple snails
- **Dr. Maria Cuevas and Dr. Maria Todd:** Tight junction protein deregulation in endometrial cancer
- **Dr. Martin Gonzalez & Dr. Stacie Brown**—Molecular Microbiology - post translational regulation of error prone polymerases
- **Dr. Ben Pierce:** Ecology, evolution and genetics of amphibians
- **Dr. Max Taub:** Patterns and mechanisms of Human Genetics
- **Dr. Airon Wills:** Epigenetic regulation of embryonic development in zebrafish



**Get involved! interested in participating in a faculty research program?  
Just stop by our offices and inquire about any opportunities in our labs.**



# PUBLICATIONS

(\*Denotes student co-authorship)



- **Dr. Max Taub and Joshua Page (SU 2015),** "Molecular Signatures of Natural Selection for Polymorphic Genes of the Human Dopaminergic and Serotonergic Systems: A Review". *Journal Frontiers in Psychology*.
- Professor of Biology **Romi Burks** co-authored a paper about developing oral communication skills in undergraduates in the July 2016 issue of *The Journal of College Science Teaching* with colleagues from the Center for Biodiversity and Conservation at the American Museum of Natural History and additional faculty from participating institutions. The paper titled ["Think Before \(and After\) You Speak: Practice and Self-Reflection Bolster Oral Communication Skills"](#) includes data collected from two years of student presentations and assessments conducted as part of a first year biology course in Biodiversity. The study revealed that self-reflection on the part of the student and intentionality on the part of the professor boosts skill acquisition and performance without loss of content. Such gains can readily occur within a semester when students get the opportunity to practice oral communication skills, much like revising written essays.



Dr. Erika Borden as a Visiting Assistant Professor

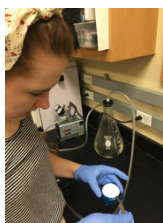
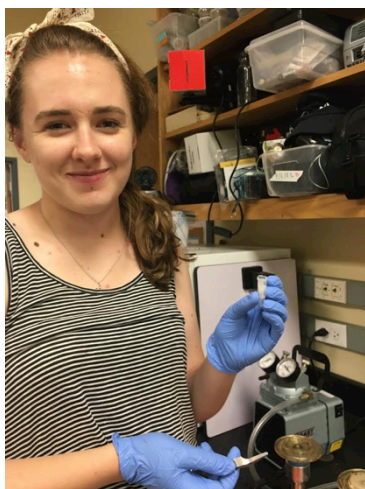
# WELCOME BACK!!



Dr. Hayley Gillespie as an Adjunct instructor of Biology

# SCOPE NEWS!

*(Summer Collaborative Opportunities And Experiences)*



**SCOPE** student Madison Granier spent her summer working on a new molecular project that investigates the "ecology of eDNA" with the help of SU alumni Dr. Matthew Barnes '06, now a tenure-track professor at Texas Tech University. Environmental DNA (eDNA) includes the bulk material left in the habitat that can be filtered and the DNA extracted for amplification using quantitative PCR. Support from HHMI and the Keck Foundation has made this new line of research possible. Granier and Dr. Burks also spent August 6-11th learning more about eDNA at the Ecological Society of America meeting in Fort Lauderdale, FL.

## SU Students Investigate Possible Factors of Endometrial and Breast Cancer Progression



*Elliot Hershberg, Class of 2018 (left), and Sid Pradeep, Class of 2017 (right).*

Credit: Southwestern University

Complete article:

<http://www.southwestern.edu/live/news/11444-students-investigate-possible-factors-of>

**SCOPE** participants study how a disruption in cell-to-cell connections could potentially lead to tumor metastasis.

Endometrial and breast cancer are two of the most common cancers in the United States, and tumor metastasis accounts for thousands of deaths every year. Southwestern students Elliot Hershberg, Class of 2018, and Sid Pradeep, Class of 2017, are engaged in a Summer Collaborative Opportunities and Experiences (SCOPE) project working alongside Professor of Biology Maria Todd, Ph.D., looking at what potentially causes cancer to spread throughout the body. "We also take an active part in all of the data analysis that we get from this, which is really neat because I know a lot of peers who I went to high school with, who are biology majors, pre-med track—and have not had an opportunity to take part in this kind of research, let alone get into the analysis part, so it's really a unique experience," says Pradeep.

"Both Elliot and Sid are passionate about molecular biology and curious as to the mechanisms that underlie critical cellular processes," says Todd. "This summer, they are investigating how the disruption of one of these processes—the formation and maintenance of cell-to-cell connections—may contribute to the development of endometrial and breast cancer." "What we're really trying to accomplish this summer is developing techniques in the lab to manage the level of suppression of particular *tight junction* genes, so we can do experiments with different ranges of expression levels," says Hershberg. "We're playing with one gene (at a time) and seeing what happens at varying levels of that, and how it affects these cancer cells that we're growing."



# What Some of Your Biology Faculty Did During Their Summer “Work-cation”

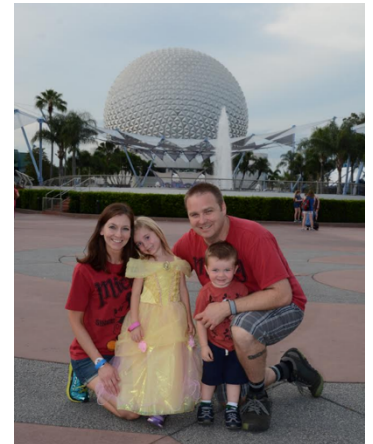


**Dr. Maria Cuevas** was busy this summer getting her courses ready for the London semester. In addition she developed four active learning modules for her classes. Students in the London program will learn about the National Health System of England among other things. They will visit the Flemming Museum, and the Wellcome Museum in addition to visiting the Medicine Now and Medicine Man exhibitions.

She is also did some traveling in Spain.



**Dr. Staci Brown** spent an enjoyable summer with her family, taking trips to Disney World, South Padre, and Oklahoma. In July, she attended an undergraduate educator conference and is looking forward to the fall semester where her class will be participating in the national PARE project (Prevalence of Antibiotic Resistant microbes in the Environment). She will also continue co-writing her microbiology lab manual.



**Dr. Ben Pierce** spent the summer completing the 6th edition of his genetics textbook, Genetic: A Conceptual Approach. In July, he attended the Allied Genetics Conference in Orlando, FL, where he participated in workshops focused on teaching genetics. He spent a week in Dallas taking care of his new twin grandchildren and a week in northern New Mexico hiking, fly fishing, and relaxing.



# More Summer Fun!



**Dr. Romi Burks and Madison Granier** attended the Ecological Society of America meetings to learn more about eDNA for their collaborative project with alumni Dr. Matt Barnes '06. Pictured here are Dr. Burks, Dr. Barnes and their shared Ph.D. advisor Dr. David Lodge along with Madison and Sasha Soto, a Master's Student of Dr. Barnes.

Also - **Dr. Burks** spent some time exploring the fabulousness of Italy. She visited Bologna, Verona, Vicenza, Ferrara, Padova, Venice & Florence.



Upon completion of SCOPE, **Dr. Maria Todd** and her family spent 5 weeks visiting family in the UK. This involved traveling from one end of England (County Durham in the north east) to the other (Devon in the southwest) with stops in London and Buckinghamshire in between!



Dr. Todd, her husband Sean and son Aiden at Windsor Castle

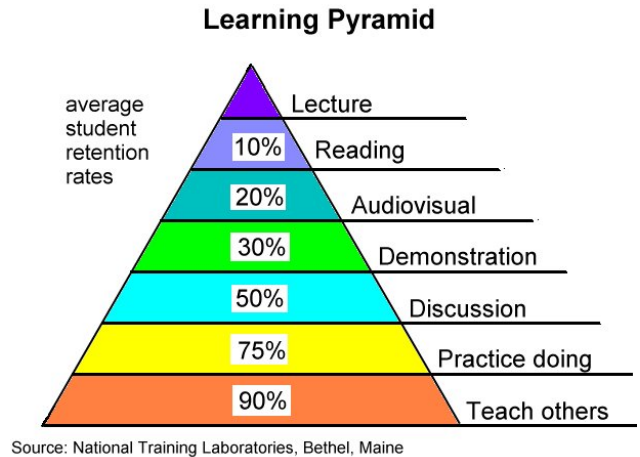


Dr. Todd and son Aiden at the Hogwarts Castle at Harry Potter World

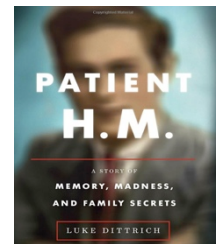
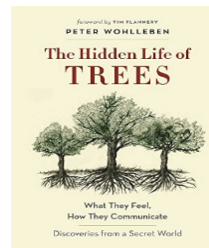
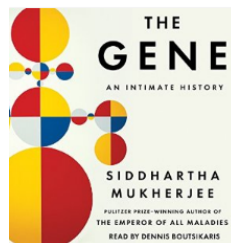
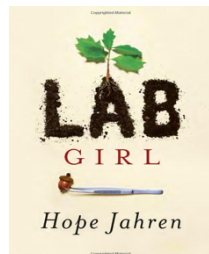
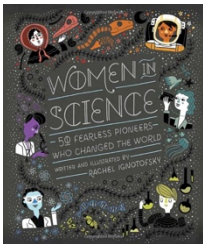


# Nuggets of Wisdom!

1. Go to class
2. Visit office hours
3. Study during the day
4. Read actively (take notes)
5. Push yourself outside comfort zone
6. Make friends and study groups
7. Write down all syllabi dates on your calendar
8. Get at least 6 hours of sleep a night
9. Check your email at least once a day
10. Ask questions



## 2016 BOOK LIST - READ FOR FUN IN ADDITION TO YOUR TEXTBOOKS



Link to Biology Writing Guide:

<http://www.southwestern.edu/live/files/4637-biology-department-writing-guide>

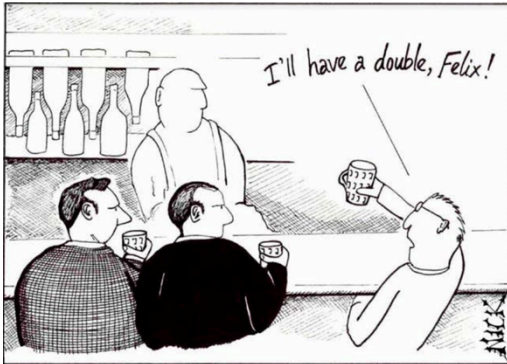
# WELCOME BACK!!



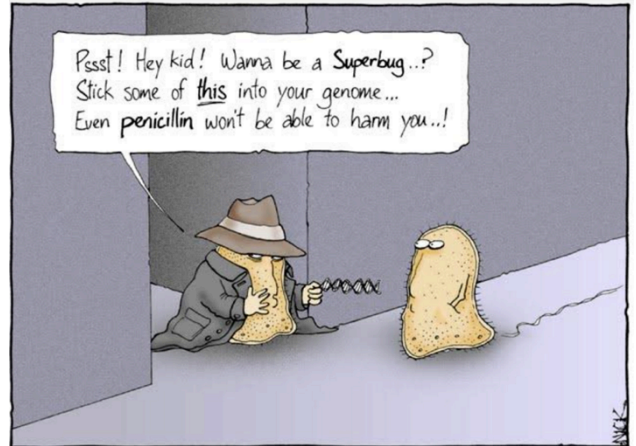
Part Time Assistant Professor  
of Biology



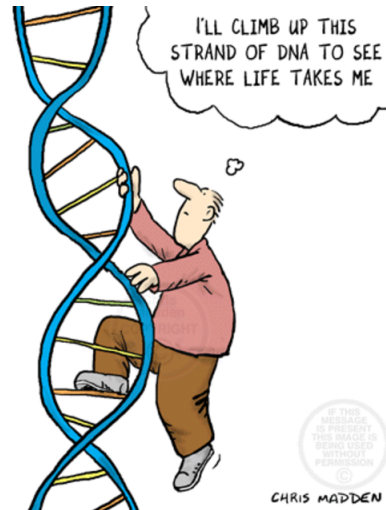
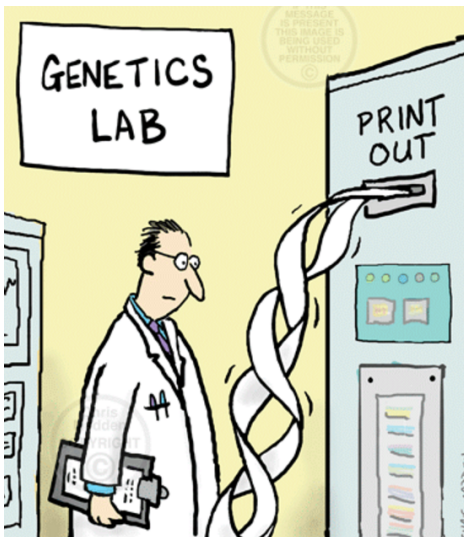
# Genetics



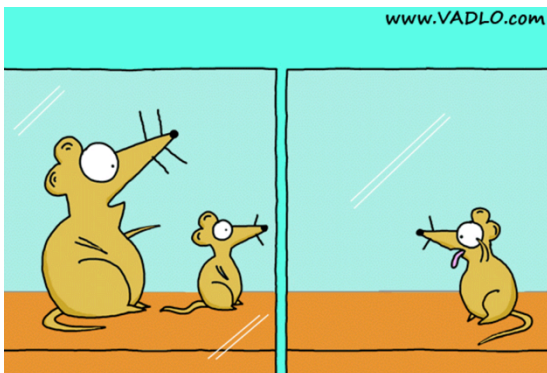
Cambridge, 1953. Shortly before discovering the structure of DNA, Watson and Crick, depressed by their lack of progress, visit the local pub.



It was on a short-cut through the hospital kitchens that Albert was first approached by a member of the Antibiotic Resistance.



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CHRIS MADDEN



"Don't play with him, he is Wild Type."



**If you would like to contribute materials and/or be an editor for BioScope, please contact Christy Schaller, Rm#214, ext 1544**