

Rare Salamander Found!



Just in time for Halloween, **Dr. Liebgold** & his students **Isaiah Williams** and **Payton Hughes** found this rare orange and black Mud Salamander (*Pseudotriton montanus*) at an undisclosed location.

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Human Coronaviruses: A Brief History Leading up to SARS-CoV-2 and COVID-19

Coronaviruses encompass a large family of viruses that can infect a wide variety of avian and mammalian species, including humans. The first human coronaviruses, OC43 and 229E, were isolated from patients with mild respiratory disease in the 1960's. Since then, two other human coronaviruses associated with mild to moderate upper respiratory symptoms have been identified, NL63 and HKU-1. It's been estimated that approximately 15 – 30% of common colds are caused by these four viruses (Su, 2016).

In 2003 a new human coronavirus emerged in China that was responsible for a highly contagious lower respiratory atypical pneumonia with a mortality rate of over 10%. This virus became known as Severe Acute Respiratory Syndrome coronavirus (SARS-CoV). Where did this new virus come from? Virologists have recognized that bats serve as a major reservoir for a number of different viruses. Studies from China have indicated that bats harbor a wider array of coronaviruses than any other avian or mammalian species (Donaldson et. al., 2010). It's also known that the success and survivability of coronaviruses can be explained, in part, by their ability to jump from one species to another (Graham and Baric, 2010).

Evidence indicates that SARS-CoV originated in bats, moved in to civet cats and finally jumped to man in the live animal markets of Guangdong Province, China (Li et.al., 2006). The SARS-CoV outbreak of 2003 was eventually contained but not before over 900 of the 8000 infected patients died. The spread of this virus was limited due to a key characteristic of the virus and disease. Typically, this virus was spread after patients had severe symptoms that required hospitalization. There was little to no asymptomatic spread and symptoms were often severe enough to require hospitalization. Therefore, infected individuals could be quickly identified and isolated.

In 2012, another deadly human coronavirus, more deadly than SARS-CoV, was identified in Saudi Arabia and Jordan. This virus, with a mortality rate of over 30%, is now known as Middle East Respiratory Syndrome coronavirus (MERS-CoV). The animal reservoir for this virus appears to be dromedary camels. Humans cases of MERS have been traced to direct contact with infected camels or very close contact with other infected humans,

i.e. shared households. Like other human coronaviruses, genetic analysis indicates that the origin of MERS-CoV can be linked to bats, specifically African bats, but the virus appears to have jumped into camels several decades ago. Serological evidence indicates that camel blood dating back to 1983 has tested positive for antibodies against MERS-CoV (Corman et al., 2014). This virus is still causing human infections and so far there have been over 800 deaths from 2500 reported cases of MERS-CoV coronavirus. Fortunately, this virus has been contained in its spread due to the fact that it is not easily transmitted human to human.

A genetic analysis of the virus responsible for COVID-19, SARS-CoV-2, shows that the likely origin of this virus is also bats (Boni et al., 2020). It's still unclear if this virus went directly from bats to humans or if there was an animal intermediate. Like the other serious human coronaviruses, SARS-CoV-2 causes both an upper and lower respiratory infection. The current mortality rate is approximately 2.5 – 3%. It's also clear that in most cases serious symptoms of this disease develop after the virus load in the patient begins to drop. These severe symptoms result from what is known as a “cytokine storm” or more simply stated, an overly aggressive response by your immune cells (Yuki et al., 2020). SARS-CoV-2 has resulted in a global pandemic because, unlike SARS-CoV or MERS-CoV, it is easily transmitted person-to-person. Asymptomatic individuals can shed and transmit the virus to others, and individuals that become symptomatic can transmit the virus up to 2 days prior to developing symptoms (Buitago-Garcia et al., 2020). Therefore, it's difficult to identify possible virus carriers without frequent and sustained testing for the presence of the virus. It's true that children, teenagers, and young adults are less likely to die from this infection, but death is still a possible outcome (In the U.S. alone, over 400 individuals less than 25 years of age have died from COVID-19). Children, teenagers and young adults are also just as likely as older adults to catch and spread the virus (Boehmer et al., 2020). Because SARS-CoV-2 is easily transmitted to others it is critically important that all individuals follow the public health guidelines of social distancing, mask wearing, and frequent washing of hands. We need to protect ourselves, but we also need to respect and protect others!

Mark F. Frana, Professor, Department of Biological Sciences,

B.S. University of Iowa, 1976

Microbiology

Ph.D. University of Kansas, 1981

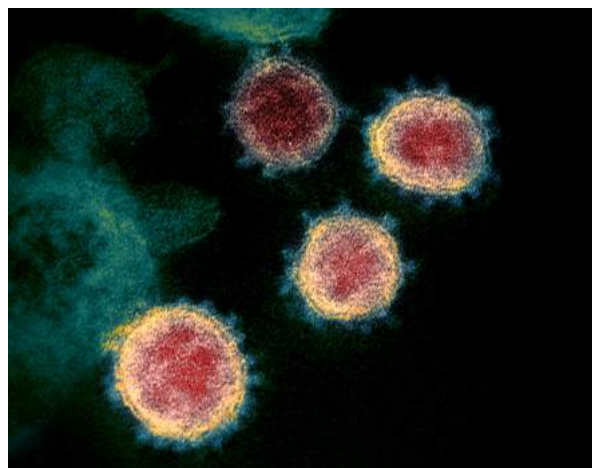
Microbiology with an emphasis in Virology



In 1981 I joined a coronavirus research lab as a postdoctoral research associate at the Uniformed Services University of the Health Sciences (Military Medical School) in Bethesda, MD. I continued in that position until 1985 and returned to that lab during the summers through 1990 after assuming my first university faculty position. At that time the coronavirus research community was relatively small and we were still working on some of the basic features of the virus including the role of various viral proteins in virus replication. The model virus for research studies at that time was Mouse Hepatitis Virus. In 1985 we published a paper that outlined the role of host cell enzymes in the cleavage of the spike protein (initially called E2) which then resulted in cell fusion helping to explain how these viruses could enter host cells through fusion between the virus envelope and the plasma membrane (Frana et.al., 1985). I joined the faculty of the Biology Department at SU in the fall of 1988 and over the years have taught courses in Introductory Biology, Microbiology, Cell Biology and Virology.

References

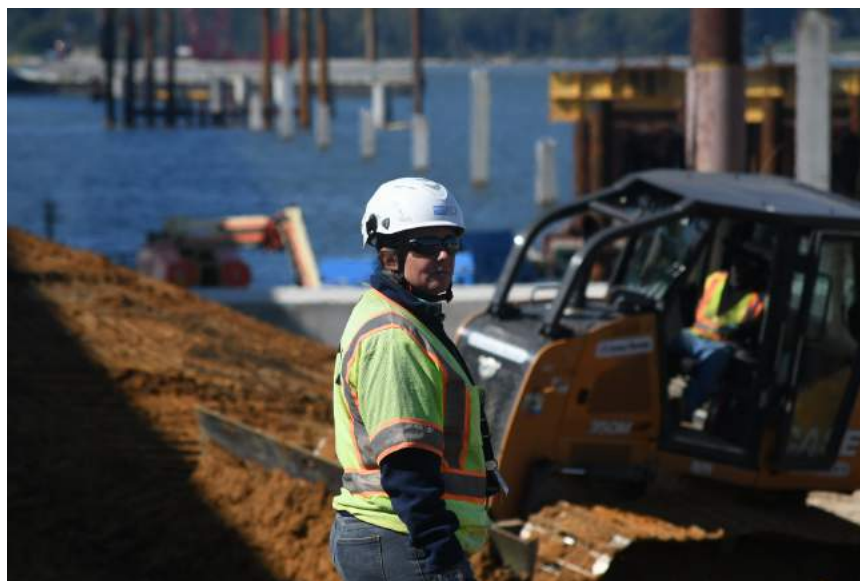
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Biology Alumni

Lee Ann Janney



I graduated from Salisbury's dual degree Biology and Environmental/Marine Science Program in December of 2006. At first, I moved from small environmental job to small environmental job: surveying living shorelines for Maryland Resource Conservation and Development, creating a visitor guide to common plants and animals on Assateague Island for Coastal Bays Program and directing nature camps at Pemberton Historic Park. I started my career at JMT, a civil engineering firm, in 2009 as an environmental scientist in planning. The majority of my work included wetland and forest stand delineations, permit procurement and mitigation

inspection in Maryland, Washington D.C., Delaware and Pennsylvania. Working in planning and development allowed me to branch out into other aspects of civil engineering including drafting, design, survey and GIS. I began to cultivate an understanding of constructability and environmental design. Later on, I acted as the environmental inspector for the \$390 million DDOT 11th Street Bridge Project in Washington D.C., which at the time was the largest DDOT undertaking in history. This project changed my career from office design to construction management where I felt I could have the most impact on projects.



I left JMT after four years and started working for KCI Technologies, where I continue to build my career in construction management. I have worked on projects for Maryland State Highway Administration and Maryland Transportation Authority. Notable projects include MD-29 Slope stabilization at Paint Branch, I-95 Stemmers Run Mitigation, US-301 TMDL Bioretention Facility Project and I-895 Replacement over the Patapsco Flats. Currently I work in a management position as Lead Environmental Inspector on the \$463 million Harry Nice/ Thomas “Mac” Middleton Bridge Replacement Project where I am involved in daily operations of the project, including sediment control inspection, plan review, permit enforcement and occasionally wildlife rescue. I have the challenge of keeping construction activities within environmental permit constraints and advocating for reduced impacts while working with contractors to stay on schedule and on budget. Often these four items clash in fantastic fashion. However, when they work together, projects protect environmental resources, and improve state infrastructure at reduce costs with the added benefit of, little by little, changing the industry. I have had the privilege of bringing more environmental awareness to all of my projects and passed on my passion for the environment to my colleagues. Every day I am out in the elements, on the water, in the mud, in the action and having an impact. I would not have it any other way.



Eaqan Chaudhry



Currently, I have begun a program at SUNY-ESF where the lab I have joined is studying the stress physiology of the imperiled New England Cottontail (*Sylvilagus transitionalis*). Since I've started my project, I've been focusing on reviewing literature related to the field of environmental endocrinology, and will soon begin working with samples in the lab. Once I complete this program, I am hoping to find a job where I am able to combine the two things, I am most passionate about: research and teaching.

Eaqan Chaudhry is a recent MS in Applied Biology graduate. No pictures of him with rabbits yet, unless this snapper just ate one!

Hannah Small



Hannah Small (recent MS in Applied Biology graduate) just started a great (permanent) job with Delaware Wildlands as Land Steward of their New Castle County properties.

See More info here:

<https://www.facebook.com/DelawareWildLands/photos/a.10150306908316665/10158712194771665/?type=3&theater>

Navin Vijayanagan



Recent BS graduate Navin Vijayanagan co-authored the following paper which was published in the journal Virology: Host gene expression modulated by Zika virus infection of human-293 cells.

<https://doi.org/10.1016/j.virol.2020.09.007>

Our Students

New Graduate Students



Growing up, **Olivia Hamilton** knew little about the careers of scientists outside of NASA and depraved comic book villains. It was not a viable option - let alone a consideration - for me until much later. I have a bit of an odd job resume ranging from hospitals to funeral homes, but my commitment to biology has remained an integral part of my life ever since I brought home my first taxidermy specimen as a child. When I began working on research projects at SU as an undergrad, however, my career goals were confirmed. I went from working with bats to zooarchaeology until I ended up in the **Taylor-Hunter** lab working with Panamanian túngara frogs. Standing in the heart of a tropical rainforest after all my years of watching nature documentaries was a surreal experience; one that I hope to never forget. Having been fascinated with ecology and evolution for as long as I can remember, I seized the opportunity to continue my academic journey. Pursuing my Master's degree with research questions of my own is the next exciting step in a (hopefully) long career in biology.



I'm **Emily Mattheu** and I am in my first year of my Master's Degree program here at Salisbury University. Before attending SU, I graduated Cum Laude from the University of North Carolina in Wilmington with my Bachelor of Science in Biology. During my time at SU I will be conducting research with **Dr. Philip Anderson**, on the bacterial and fungal phylogeny and taxonomy of Jack Pine Seeds. This research could help us create new agricultural applications if we can identify the microbes that are controlling or inhibiting seed germination. When I'm not in the lab, I enjoy off-roading in my Jeep Wrangler and catching some waves in Ocean City!



Stephanie Miller will be examining the regulation of Acetyl-CoA & CO₂ assimilation in *Rhodobacter sphaeroides* with Dr. Michael Carter.

I received a Bachelor of Science in biology and a Bachelor of Arts in literature from Salisbury University, so my interests are extremely varied. In the realm of biology, I am interested in microbiology, genetics and genetic engineering, and evolutionary biology. Outside of biology, my interests include creative writing, reading, and baking. Some of my favorite franchises include Marvel, Star Wars, and Harry Potter.



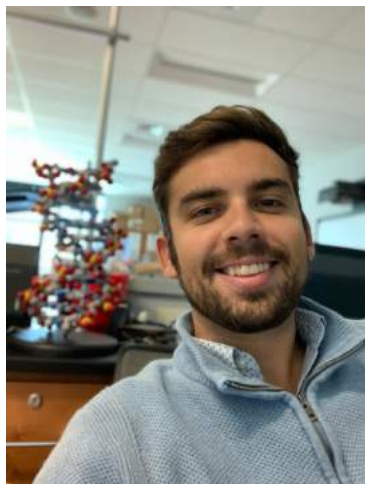
My name is **Sheridan Sargent** and I am originally from Germantown, MD. I am continuing my education at Salisbury university after receiving dual B.S. and B.A. degrees in biology and psychology. I am currently continuing and expanding upon my undergraduate research on peripheral nerve regeneration with **Dr. Jessica Clark**. I am really passionate about my research, as I hope that it will contribute to treatments for diabetic peripheral neuropathy in the future! Upon receiving my master's at SU, I plan to enter into a neuroscience Ph.D. program.



My name is **Jessica Strange**, but I go by Jesci, or just Strange. I am a non-traditional student who decided to become a doctor at the age of 28 while working as an ophthalmic assistant. I began my academic career at Wor-Wic to ensure I could handle balancing a work/school schedule. I would go on to serve as the Maryland president for the Phi Theta Kappa honor society. I would also have my daughter 2 1/2 weeks before graduation and still graduate as scheduled, with honors.

I completed my undergraduate here at Salisbury where I have never felt more welcomed. I would start working with **Dr. Jennifer Nyland** and fall in love with research and primary literature analysis. I loved the research and learning from her so much I asked if I could work with her for another two years as a graduate student. I have never been happier with a decision. My classmates, teachers, and the supporting staff here have really helped me through my journey as a non-traditional, pre-med student with an infant, and now toddler.

The Defense Rests – The Verdict, Graduation!



This past June, **Anthony LaBarck** successfully defended his Masters' thesis *Microbial diversity among landscapes in a managed arboretum: Salisbury University Arboretum*.

Anthony is currently teaching biology for the Laurel School District in Delaware.



Lantana camara (common lantana) at Salisbury University.

SU Biology Students met CRISPR-CAS Nobel Laureates in 2015



2015 Gruber Genetics Prize



Emmanuelle Charpentier



Jennifer Doudna

The Nobel Prize in Chemistry 2020

"for the development of a method for genome editing."



© Nobel Media. Ill. Niklas Elmehed.
Emmanuelle Charpentier
Prize share: 1/2



© Nobel Media. Ill. Niklas Elmehed.
Jennifer A. Doudna
Prize share: 1/2

Students in Contemporary Genetics (BIOL440, F15) met this year's Chemistry Nobel Laureates at the American Society of Human Genetics (ASHG) conference in Baltimore, MD (Oct., 2015).

Pictured top, left to right: Michael Robben, Brittney Lozzi, Dr. P. Erickson, Andrew Baskerville, April DeMell, Joe Perucci, Rachel Keuls, and Andrea Korell.



Trifoliate oranges (*Poncirus trifoliata*) growing in the Salisbury University Arboretum. Fruits can be used for marmalade & plants may provide an ornamental protective hedge. Note the large spines!

Our Faculty

Dr. Samuel Geleta: An unexpected way of ending a 40-year college teaching career!



I am not running away from teaching, advising, and/or research because of COVID. I planned my retirement way before the COVID pandemic hit the rest of the world and eventually reached our shores in the USA. This forced my spring 2020, Introduction to plant biology class, to move online after the spring break. The move brought my one-on-one/ face-to-face lecture and lab interaction to an abrupt end. What an unexpected way of ending a 40-year career!

I am officially retiring on December 31, 2020 after serving Salisbury University for 23 Years. My wife Dr. Nomsa Geleta and I joined Salisbury University (then Salisbury State University) on August 15, 1997.

Nomsa joined the Seidel School of Education and I joined the Henson School of Science, Biology Department. When I joined SU, the Department of Biology was housed for years in a temporary metal building until the current state of the art Henson Science building was completed. Salisbury University campus was not the beautiful campus we see today. During that time, the Delmarva Peninsula was also facing a massive fish kill resulting from water pollution.

My professional journey includes: serving as an assistant professor at Chadron State University, Nebraska; Postdoctoral position at Oklahoma State University (my PhD Alma-mater); and Lecturer at Addis Ababa University, Haramaya College of Agriculture (my BSc and MSc Alma-Mater).

During my tenure at Salisbury University, I enjoyed teaching, advising, and mentoring research students. I primarily taught Concept and Methods: Introductory Biology and Introduction to Plant Biology (botany) courses, where I met students at the beginning of their college level education in the areas of biological sciences. I had a privilege of watching and witnessing these students as they grow physically, mentally, and academically. I have observed hundreds if not thousands of them graduate and pursue their careers in various fields of biological sciences. These students include three of my own children, children of Salisbury University faculty and the Salisbury community at large. Over the years, I have also witnessed the growth in the number and success of minority and international students at Salisbury University which contributes to fulfilling the aspiration of Salisbury University to be a Maryland University of National and international distinction. Over the years I have also cherished teaching nonmajors general Biology course and interdisciplinary course in Soil Water and the Environment. I advised hundreds of undergraduate students and supervised graduate and undergraduate research. I remember and value many hard working, smart and committed student lab assistants who, for many years, made my life and the life of my colleagues manageable by doing the routine day-to-day functioning of the multi section Biology 210 laboratories. Most importantly, although these students made our teaching lives easier, almost all of them moved on to be successful in pursuing their career ambitions in the area of biological sciences.

I am grateful for the Henry C. Welcome grant from the Maryland's Higher Education Commission which supported my professional development. The Welcome grant inspired me to securing external and internal grants to support my research interest in the areas of my expertise of soil and plant nutrient management for economic and environmental benefits. The grants from Maryland Industrial Partners (MIPS) and the Maryland Department of Natural Resources (DNR), Maryland Department of Environment (MDE) and Maryland Grain Producers Association supported research of interest to the State of Maryland and local communities because of its intent to improve the soil quality and reduce nutrient runoff into the Chesapeake Bay water. These grants helped me to develop my research lab and sponsor undergraduate and graduate students.

I have enjoyed, over many years, the opportunity of mentoring and supporting many students to successfully complete their studies at Salisbury University and advance into the work force or pursue higher education leading to degrees in environmental sciences, medicine, pharmacy, or PhD programs. My students made numerous research presentations at local, national and international conferences in collaboration with colleagues in the school of science and other Maryland institutions. Research collaborations with the University of Maryland, Lower Eastern Shore Research and Education Center (LESREC), and farmers in the area were key to my ability to conduct soil and environmental science research while at SU.

As I change my status from Professor to "Emeritus Professor", I will miss the joy and opportunities of collaborating and serving with colleagues at departmental, school, and university level committees. I am indebted to my colleagues who I served with on numerous University level committees such as Faculty Development, Faculty Welfare, and Membership and Election Committees. The privilege to serve as the 2017/18 Faculty Senate President gave me the opportunity to know and bear witness to the dedication and commitment of faculty across campus to making this a campus a true "University of National Distinction".

I will miss participating in initiatives such as Faculty Friday Socials which provide an opportunity for new, senior, local and international faculty across campus to meet and engage socially and professionally. I valued and will be missing the routine coffee break and brainstorming research and teaching with Dr. Chris Briand. Departmental Christmas and the Henson School End of the year celebrations organized by Ms. Sandy Ramses and Ms. Lisa Ball will also be missed. I am grateful for having known the hardworking and dedicated SU staff across campus who work day in and day out to keep Salisbury University run smoothly and safely. In particular, I will miss the professionalism of the Henson Housekeeping staff and Henson School Office Administrative staff who make the Henson School a wonderful place to work.

Nomsa and I have settled in the Atlanta Metro area and can be reached via sxgeleta@gmail.com.



Publications

Prof **Philip Anderson**, his student **Robert Phillips** (Class of 2018), and their collaborators at Vanderbilt University and Case Western Reserve University published a research article in the peer-reviewed journal *Molecular Cancer Therapeutics* entitled "Identification of genes required for enzalutamide resistance in castration-resistant prostate cancer cells in vitro". The topic of the research centered on how to improve health outcomes for late-stage prostate cancer patients whose tumors recur after treatment with Xtandi, which is an FDA-approved drug that is used to treat patients with advanced prostate cancer. Xtandi definitely lengthens life in these patients, but the tumor usually finds a way to overcome the drug, and then comes back in a lethal form. Our research focused on how tumor cells manipulate control of the genetic material in the cell in order to overcome Xtandi. We discovered that the tumor cells rely on the expression of three human genes in order to survive in the presence of Xtandi. When we reduced the expression of those three genes, the tumor cells had a hard time surviving in the presence of Xtandi. In the future, drugs that reduce the expression of these three genes could improve recurrence-free survival in advanced prostate cancer patients.

<https://doi.org/10.1101/2020.03.27.011825>

Cooper KM, **Auerbach AJ**, Bader JD, Beadles-Bohling AS, Brashears JA, Cline E, Eddy SL, Elliott DB, Farley E, Fuselier L, Heather Heinz HM, Irving M, Josek T, Lane AK, Lo SM, Maloy J, Nugent M, Offerdahl E, Palacios-Moreno J, Ramos J, Reid JW, Sparks RA, Waring AL, Wilton M, Gormally C & Brownell SE. 2020. Fourteen recommendations to create a more Inclusive environment for LGBTQ+ individuals in academic biology. *Life Sciences Education* 19.

<https://doi.org/10.1187/cbe.20-04-006>

Individuals who identify as lesbian, gay, bisexual, transgender, queer, and otherwise nonstraight and/or non-cisgender (LGBTQ+) have often not felt welcome or represented in the biology community. Additionally, biology can present unique challenges for LGBTQ+ students because of the relationship between certain biology topics and their LGBTQ+ identities. Currently, there is no centralized set of guidelines to make biology learning environments more inclusive for LGBTQ+ individuals. Rooted in prior literature and the collective expertise of the authors who identify as members and allies of the LGBTQ+ community, we present a set of actionable recommendations to help biologists, biology educators, and biology education researchers be more inclusive of individuals with LGBTQ+ identities. These recommendations are intended to increase awareness of LGBTQ+ identities and spark conversations about transforming biology learning spaces and the broader academic biology community to become more inclusive of LGBTQ+ individuals.

Baskerville A¹, Donahue J, Gillaspay G & **Erickson FL**. 2020. Identification of a WD-repeat protein that binds and activates the deubiquitinase UBP3 from *Arabidopsis thaliana*. *BIOS* 91(2): 90-99.

Roose JJ¹, **Stribling JM**, Owens MS & Cornwell JC. 2020. The development of denitrification and of the denitrifying community in a newly-created freshwater wetland. *Wetlands* 40: 1005-1016.

<https://doi.org/10.1007/s13157-020-01279-4>

¹Graduate students

The Bestiary!



Sandy Ramses with Simba (left) and Bella (right). Beauty & the Beast!



Dr. Nyland and her husband Andy spent the summer building a chicken coop. Jenn raised the chicks in her office using warming lights until they were big enough to go outside and the coop was ready!



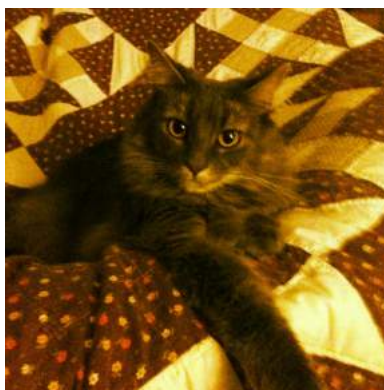
My old goat, Limbo. He's not my favorite of the goats & chickens, but happened to be noshing corn husks on the porch.

Dr. Kim Quillin

Dr. Anna Jo Auerbach



Sunshine (orange tabby, she's a female and they are more rare than male orange tabbies! This is because the "ginger gene" is on the X chromosome so females need two copies to be ginger instead of just one copy like male cats.



Sir Poodles Noodles McDoodles
AKA Pops



Puddin' Devereaux

Dr. Chelsea Burns



Tabbyfish is the beta, the neon tetras
are simply The Neons!



Pixal



Sophie

Jocelyn Bunting's friend Kona!



BIOL 105-703 Biology and Society: The History of Spice



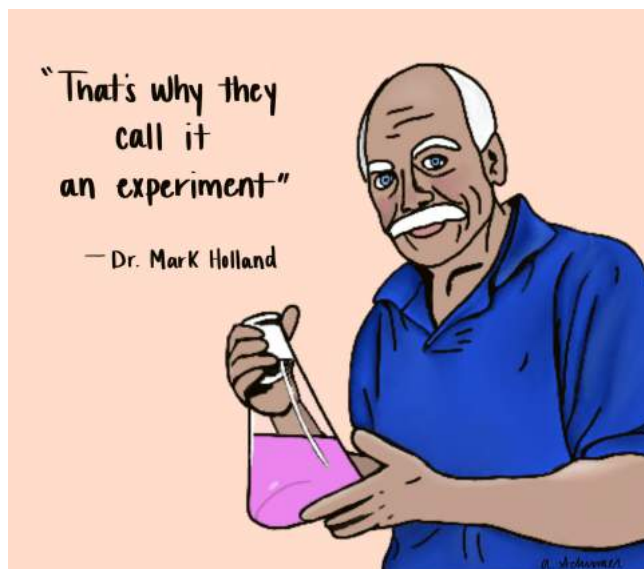
Looking for a fun non-lab gen ed for Winter 2021?

Ms. Gunther is offering BIOL 105-703 Biology and Society: The History of Spice. The course is completely on-line. The class is a GenEd IV B non-lab science worth three credits.

The class is divided into three subject areas - history of the spice trade, case studies on pepper and vanilla, and the environmental impact of the spice industry. Material is presented in modules that contain readings, PowerPoints, and a quiz. Writing assignments include two articles or recipe reviews, a paper on a spice of the students choosing and a creation of a brochure on the spice they did the paper on. Only **six spaces** left - register today!

If you have any further questions, please email mrgunther@salisbury.edu

Sad News – Dr. Mark Holland’s Passing



Artwork by Biology student Audrey Shirmer, who worked with Dr. Holland on the Hemp Project.



It is with great sadness that we announce the death of Dr. Mark Holland. He will be greatly missed by his students, colleagues and friends. More information is available at

<https://www.hollowayfh.com/obituaries/Mark-A-Holland?obId=18806193#/obituaryInfo>

Alumni Connection



SU BIOLOGY ALUMNI

Stay Connected !

We want to hear from you! Please let us know where you are living and what you are doing! We would love to hear from you. In the future we plan to have an Alumni Connection section in our newsletter.

Send information to: Sandra Ramses, Program Management Specialist
SHRAMSES@SALISBURY.EDU



\$ 3490 was donated to Biology on Salisbury Giving Day! A total of 34 gifts were received. This money is greatly appreciated & will be used to fund student travel.

Your Editor



Send any contributions to **Dr. Chris Briand**
chbriand@salisbury.edu

Lemur Conservation Network



Help conserve Madagascar's endangered primates.

Located 250 miles off the east coast of Africa is the island of Madagascar, the 4th largest island in the world, and the only habitat for all wild lemurs in the world.



How to Help

<https://www.lemurconservationnetwork.org/how-to-help/>