Where is the Beauty in Hatin’ on Your Sista? Penetrating the Color Complex in the African-American Community
Thamar Whidney Theodore, Senior, Communication
Mentor: Ralina Joseph, Communication

This study analyzes the color complex which is defined as psychological fixation about color and features that lead African-Americans to discriminate against each other. There is a lack of dialogue around how history has turned African-American women to focus towards hurting each other through colorism - skin color biases. This research asks how issues of colorism within the African-American community lead to concerns of self-acceptance and perception of beauty among young African-American women. I expect to find evidence of the effects of the color complex and determine how young Black women perceive beauty in order to frame their identity. The findings will fill a gap in existing research by challenging the work of earlier researchers, who have looked at the existence of colorism among African-American women today and look farther into how this issue has been and is affecting their perception of beauty in relation to the acceptance of themselves.

Disability Advocacy: A Cross Cultural Rhetorical/Discourse Analysis
Riley Ilyse (Riley) Taitingfong, Senior, Communication
Mentor: Ralina Joseph, Communication

The inequalities and marginalization of people with disabilities is an issue with global scope. Environmental influences and socially derived assumptions shape the way disability is defined and experienced cross-culturally. Statistics shed light on significant disparities throughout various countries. According to United Nations Enable (2006), 10% of people in the world have some type of disability. Of this entire population of people with disabilities, 80% live in developing countries. Further, out of the estimated 200 countries in the world, only 45 have disability-specific laws such as anti-discrimination. In this research, I examined the driving factors behind this disparity through a cross-cultural comparison of disability advocacy efforts. In particular, I looked to countries that have experienced shifts in policy that directly influenced people with disabilities. I identified disability advocacy taking place in South Africa in a post-apartheid context, Ukraine in a post-soviet context, and the US in post-ADA context (Americans with Disabilities Act). Through rhetorical/discourse analysis of the imagery and language used on nongovernmental groups’ websites, I examined how shifting power dynamics have situated people with disabilities in South Africa, Ukraine, and the US and how these patterns manifested in online communications.

Re-Imagining Identities: Racial and Ethnic Discourses within Seattle’s Habesha Community
Azeb Madebo, Senior, Communication, Anthropology
Mary Gates Scholar, McNair Scholar
Mentor: Ralina Joseph, Communication

My research explores the means by which identities of “non-white” Habesha (Ethiopian and Eritrean) immigrants are negotiated through the use of media, community spaces, collectivism, and activism. As “black” immigrant subjects who do not have a longstanding historical past in the United States, Habesha face the challenges of having to re-construct and negotiate their identities within binary, black/white, American racial landscapes. To explore the ways in which ethnic-based collectivism and activism challenge stereotypical portrayals of Habeshaness and blackness which are typically cemented through media, I focus on unpacking mediated representations of Hana Alemu Williams, her death, trial, and subsequent support from the Ethiopian Community of Seat-
tle (ECS). In short, Hana Alemu Williams was an Ethiopian child who died in 2011 from abuse, severe malnutrition, and cruelty at the hands of her white adoptive family in Sedro-Woolley Washington. Through close readings of mediated texts: news paper articles, television news broadcastings, blogs, and interviews of people from the ECS who were used as news “experts”, I will critically analyze the moments in which Habesha immigrants challenge narratives of race and identity in the American context. I hypothesize that Habesha immigrants sometimes assimilate into American constructions of race while at other moments creating counter-narratives of hybridity or exclusive ethnic-based identities like Habeshanness, or maintaining purely national identities as Ethiopian and Eritrean immigrants, in an effort to defer perceived racial stereotypes and oppression that arise with identifying as simply black or African American. Furthermore, I discuss potential steps that can be taken by Ethiopian and Eritrean immigrant communities to address these harmful and limited understandings of race and racism in America. This research enriches the existing academic literature by creating a more nuanced understanding of the Seattle Habesha community’s racial discourses in their efforts to re-imagine Habesha identities.

**POSTER SESSION 2**

**MGH 241, Easel 152**

1:00 PM to 2:30 PM

**A Stable and Reproducible Electrospun SERS Substrate for DNA Detection**

Alexandra (Alex) Tillman, Senior, Bioen: Nanoscience & Molecular Engr

Mary Gates Scholar, UW Honors Program

Mentor: Kim A. Woodrow, Bioengineering

Mentor: Joseph Phan, Bioengineering

Diagnosing infectious disease in the developing world continues to be a challenge due to the lack of infrastructure and resources needed to conduct state-of-the-art methods of nucleic acid detection. Surface enhanced Raman spectroscopy (SERS) is a potential alternative to current point-of-care (POC) nucleic acid tests because it could offer similar sensitivity. However, current SERS substrates that possess the reproducibility and stability needed for translation to POC applications are too expensive. Electrospinning gold nanorods (AuNR) into polymeric nanofibers was employed as a method to reduce the cost, improve reproducibility and lengthen shelf life of SERS substrates for POC applications. Electrospinning also offers a facile method of aligning anisotropic metallic nanoparticles, which can improve SERS sensitivity over non-aligned particles. AuNR size and dimension was varied alongside fiber diameter to optimize SERS enhancement. For the detection of target nucleic acid (or oligonucleotide), a sandwich-like design was used: Oligonucleotides comple-

**SESSION 2J**

**NEW SCIENCE FROM A TO Z**

Session Moderator: John Berg, Chemical Engineering

271 MGH

3:30 PM to 5:00 PM

*Note: Titles in order of presentation.

**An Efficient Algorithm for Multi-Layer PCB Bus Escape Routing**

Benjamin David (Benjamin) Blumberg, Senior, Computer Engineering, Industrial Engineering

UW Honors Program

Mentor: Zelda Zabinsky, Industrial & Systems Engineering

Mentor: Joseph Heim, Industrial & Systems Engineering

Multi-layer circuit boards are expensive; each additional layer significantly increases their production cost, however multiple layers are commonly necessary to avoid routing conflicts. Due to the large number and high density of pins on some components, a design issue is determining the minimum number of layers required to resolve all routing conflicts. Some buses must be assigned to consecutive layers, which add further complexity to the routing problem. We propose an improvement to an algorithm based on branch-and-bound for designing an optimal layer assignment for printed circuit board (PCB) bus escape routing. We use concepts from vehicle routing and scheduling algorithms to efficiently traverse the branch-and-bound tree. Our algorithm is guaranteed to provide a feasible layer assignment for each bus with the minimum number of layers.
POSTER SESSION 3
Commons East, Easel 83
2:30 PM to 4:00 PM

Investigating the Role of Type VI Amidase Effectors in Shaping Polymicrobial Communities
Michael Alexander (Max) Ferrin, Senior, Biology (Molecular, Cellular & Developmental)
Mary Gates Scholar
Mentor: Seemay Chou, Microbiology
Mentor: Joseph Mougous, Microbiology

The type VI secretion system (T6SS) is a molecular export pathway that is widely conserved in Gram-negative bacteria. It mediates interbacterial competition by translocating antibacterial effector proteins from the donor bacterial cell to a neighboring bacterial cell in a contact-dependent manner. The T6 amidase effectors (Taes) are a superfamily of lytic enzymes that degrade the bacterial cell wall by cleaving amide bonds in the peptidoglycan (PG) layer. Taes also have cognate T6 amidase immunity proteins (Tais), which prevent interspecies intoxication by binding and inhibiting Taes in the periplasm. We hypothesize that this pathway can be exploited for an antibacterial strategy. Specifically, we aim to engineer a P. aeruginosa strain that harbors a novel Tae/Tai pair that can escape recognition by native Tai proteins and predict that this strain will be able to outcompete its wild-type counterpart through the T6 pathway. Towards this end, our group previously generated a mutant library of Tae from P. aeruginosa and screened for variants that escape inhibition by Tai (Tsi1) in E. coli. I am currently experimentally validating several potential escape variants (Tae*) identified by this screen by testing Tae* toxicity in the presence of Tsi1 in an in vitro bacterial lysis assay. I will also measure potential changes in in vitro Tai1-binding affinity by isothermal titration calorimetry (ITC).

POSTER SESSION 3
Commons East, Easel 75
2:30 PM to 4:00 PM

Investigating the Prevalence of the Type VI Secretion Dependent Neighbor Sensing in Bacteria
Elena Ines (Elena) Montauti, Junior, Biology (Molecular, Cellular & Developmental)
Mary Gates Scholar, UW Honors Program
Mentor: Joseph Mougous, Microbiology
Mentor: Michele LeRoux, MCB/Microbiology

Pathways by which bacteria interact likely have a large effect on the bacterial communities that are present in the lungs of cystic fibrosis (CF) patients. CF is a genetic disorder that leads to an inability to clear out viscus secretions in the lungs, allowing bacteria to thrive. Pseudomonas aeruginosa (P. aeruginosa) is one of the most detrimental opportunistic pathogens infecting CF patients. The genome of P. aeruginosa encodes the type VI secretion system (T6SS), a toxin delivery system widely found in Gram-negative bacteria. P. aeruginosa outcompetes other organisms using the T6SS. Interestingly, P. aeruginosa targets more efficiently when the other organism has an active T6SS as well, suggesting that P. aeruginosa has a mechanism for sensing the activity of the T6SS in other organisms. The goal of this project is to find if this phenomenon is unique only to P. aeruginosa and whether it is dependent on the organism it is targeting. Another laboratory found that the threonine phosphorylation pathway (TPP), which is known to regulate the T6SS activity in P. aeruginosa, is required for T6SS-sensing. The TPP is only found in a subset of organisms with a T6SS, and I am characterizing which of these organisms exhibit this neighbor sensing behaviour. I hypothesize that this phenomenon is found in the group of organisms that have a TPP. Burkholderia cenocepacia, another bacterial species with a T6SS, is lacking the TPP, and I have found that it does not have T6SS-sensing ability. This suggests that not all T6SS positive organisms exhibit the sensing phenomenon. Additionally, I am investigating whether P. aeruginosa T6SS-sensing occurs with all recipient species. Since the T6SS is conserved among many Gram-negative bacteria, it is important to determine how widespread T6SS-sensing is, ultimately allowing us to better understand targeting among microbes in CF and other polymicrobial infections.

POSTER SESSION 4
Commons East, Easel 50
4:00 PM to 6:00 PM

Phylogeography of West African Agama Lizards
Michael Joseph (Michael) Miller, Senior, Biology (Molecular, Cellular & Developmental)
Mentor: Michael Miller

Phylogeography is the study of the geographic and spatiotemporal distributions of populations, and it is an important tool for investigating the evolutionary history of species. Determining when and where species originated, merged, or moved is critical in understanding the factors that generate biodiversity. Novel Bayesian phylogeographic methods provide a useful tool for obtaining accurate estimates of these important population dynamic parameters. West Africa is a global biodiversity hotspot with a high number of endemic species, and Agama lizards are a diverse and prominent member of this distinctive ecoregion. To investigate the phylogeography of Agama lizards, I constructed phylogenetic trees from over 300 unique samples of Agama lizards from 20 countries using Bayesian phylogeographic inference. Molecular genetic data from a quickly evolving gene (16S rRNA) provided suffi-
cient variation for estimating the divergences between distinct populations. Visualization of the phylogeographic history for the populations was conducted with Google Earth. This group of species is predicted to have originated in the central part of West Africa (i.e., Cameroon, Nigeria, and Equatorial Guinea). At least five distinctive species formed across the region from that one ancestral population, and one paraphyletic group requires further investigation. Outlining the history of species formation in subtropical West Africa, with an emphasis on when and where populations divided, moved, and reconnected, serves to show the benefits of phylogeographic studies as they can reveal patterns that are otherwise too difficult to detect using other approaches. These studies also serve as tools in providing information for the detection of distinct species.