

WEDNESDAY, FEBRUARY 22

#5 Symposium: The Legacies of the Japanese Empire

February 22 — LSU 324

Morning Session: 10:45 a.m. – 12:15 p.m.

Research Mentor: Kerry Shannon (History)

Priscilla Avitia

Japanese Women and their Roles in Shinto and Shrines in Post-World War II Japan

By the 1940s, the Japanese Imperial State and Shinto were two sides of the same coin until it was officially disestablished from the Japanese State after their surrender in World War II. Historically, Shinto scholars have written about the history between Japan and Shinto or the history of the mechanics of the Shinto shrine. In both instances, women are regularly left out of the discourse, although women have been a part of maintaining Shinto shrines and maintaining Shinto itself, not to mention the mythology of the religion. The end of World War II set off a significant series of political and social changes. The emperor had lost his divine status, Shinto was no longer an official part of the state, and new laws and organizations were put in place to move Japan forward into a new era. Article 79 of the 1945 Jinja Honcho... charter stated that any qualified male over the age of twenty-five could become head priest, so without saying it, women were allowed to be priests. The following year, the new Japanese Constitution of a series of laws that were implemented in 1946 from the New Constitution of Japan that provided all Japanese people equality under the law. So, legally, gender discrimination had been eliminated, but in reality, women were forced to use their gendered roles to carve out a spot for themselves both in Shinto shrines and in the rest of Japan. My research will cover the topic of Japanese women in Shinto and their roles within shrines in postwar Japan. Additionally, how this study also acts as a way to better understand women's position in postwar Japan.

Francisco Sanchez

Pro Wrestling, Propaganda, and the Zainichi

The topic I am proposing to write for my final paper will be about puroresu's first megastar, Rikidozan. Not simply about the great life and career of Rikidozan, but rather his image as propaganda for both the Japanese and North Korean regimes. Rikidozan was the first great Japanese hero following Japan's defeat and subsequent occupation by Western forces, while North Korea reclaimed him as an ethnic North Korean hero. North Korea had been using Rikidozan as an idol for North Koreans, writing *I Am A Korean*, a propagandized biography. Rikidozan's status as a hero was also used during World Championship Wrestling's *Collision in Korea*, which would end up solidifying the power of new ruler Kim Jong Il. My research plan will be to finish and take notes on *I Am A Korean*, as one of my main sources, alongside reading more about Rikidozan's impact as a Japanese hero, instead of just recounting his numerous matches. I will also take an extensive look at North Korean propaganda as a whole in order to frame the status of Rikidozan as a hero. I will also be focusing on the treatment of the zainichi Koreans in Japan. I

will contrast their negative treatment by the Japanese public to the adoration and love given to Rikidozan. I will also make connections to Rikidozan and Japanese propaganda by including a section on Godzilla, as the original monster film was meant to serve as Japanese propaganda.

Gabriela Isidro

Japanese in Mexico: A Misunderstood History

This project will examine the Japanese experience in Mexico during the years of 1897 thru 1945. During this time, Asian immigrants to the United States were heavily discriminated against by discriminatory laws such as the exclusion act, which was passed to limit the number of people that moved to the United States while in Mexico the president welcomed Japanese immigrants to the country with open arms because he saw Japanese as hard workers who had more advanced agricultural techniques that would help the economy. This attitude toward Japanese migrants would remain positive until World War II began and the Mexican government stripped the citizenship from Japanese Mexicans and began to remove them from their towns and cities to prisons and internment camps. My research will bring more attention to the fact that there are many Mexicans who are of Japanese descent and have been there since the 19th century. There is a misconception that the migration of Asian people to Mexico is a recent phenomenon. To support my research, I will read articles and books that are relevant to this subject and show the contributions of Japanese people during important historical events that happened in Mexico.

Sylvia Duvenary

Mobile Suit Gundam 0079 and Trauma

The Mobile Suit Gundam franchise is a behemoth in Japan. The now cross-media science fiction franchise was started in 1979 by Tomino Yoshiyuki and centers around space wars in the near future. These conflicts feature large, weaponized robots called "gundams", which are controlled by humans. The first entry in the series, Mobile Suit Gundam 0079 and the subsequent films retelling the events in the show have a strong correlation to Japan's war experience between 1937 and 1945, known as the Asia-Pacific War. However, a close watching reveals underlying themes that set Gundam apart from other fictionalized interpretations of war, which reflect the variety of post-war narratives within Japan. Historians have analyzed numerous entries in the Gundam series and their connections to Japan's war narratives, the war itself, as well as the political atmosphere of the 1970s. In contrast, this research specifically focuses on Mobile Suit Gundam 0079 by performing a thorough examination of the show and its creators, while also making larger comparisons with contemporaneous works. Such an approach historicizes the depictions of survival and trauma and contextualizes the show within Japan's postwar narratives.

Carlos Heredia-Pantoja

Japanese Assimilation Methods in Education: Colonial Korea 1905-1945

The research I shall present is the assimilation methods used by the Japanese in colonial Korea. Education was essential for the youth to assimilate into Japanese society. Since the Choson era, Koreans have always valued education as it was not accessible to everyone, as the aristocratic yangban were most likely to obtain an education. The Eulsa Treaty paved the way for the Japanese to implement "an effective and accessible education" for all Koreans. The school system was implemented to efface Korea's national and cultural identity within the Korean peninsula and create a generational and social divide.

THURSDAY, FEBRUARY 23

#22 Marine Natural Products: Medicines from the Sea

Undergraduate Symposium

February 23 — LSU 324

Afternoon Session: 1:00 – 2:30 p.m.

Research Mentors: Erin McCauley and Kari Pederson (Chemistry and Biochemistry)

Shaz Sutherland

Maximizing Biosynthesis of Secondary Metabolites from Marine-Derived Fungi for Biological Screening

Natural products are secondary metabolites produced by living organisms. These small molecule chemical entities have played an important role in traditional medicine for thousands of years and are an essential part of the current therapeutic arsenal for modern medicine. Presently, < 60% of all approved pharmaceuticals are either natural products, derivatives of natural products, or their pharmacophore was inspired from natural product scaffolds. The success of natural products and their derivatives as therapeutic agents is largely due to their structural diversity and the fact that they have evolved over centuries to interact with specific biological targets. Natural products from various biological sources have proven to be an excellent resource for bioactive pharmaceuticals with a wide range of applications, however the most successful by far has been the advancement of fungal natural products. When Fleming first discovered penicillin from the fungi *Penicillium* in 1929 he began what was known as the 'Golden Age' of natural product drug discovery. The objective of this research was to build a large library of structurally diverse secondary metabolites from marine-derived fungi to be screened for cytotoxic or antibiotic activity. This was achieved by growing 100 different taxonomic fungal strains under multiple different types of culture conditions. The changed in media components, oxygen levels, and temperature allowed for different biosynthetic gene clusters to be up-regulated or down-regulated, resulting in different secondary metabolites being produced from one single fungal strain. All of the secondary metabolites produced were loaded into 96-well screening plates and run in various biological assays. Then metabolites that had the desired biological activity were purified and structurally elucidated using mass spectrometry and NMR spectroscopy.

Ana Ponce

Identification of Fungal Natural Products that Exhibit Cytotoxic Activity Towards a Brain Cancer Cell Line

The National Institute of Health Surveillance, Epidemiology, and End Results (SEER) Program estimates there was a total of 25,050 new cases of brain cancer diagnosed in the US in 2022 and an estimated 18,280 deaths. The overall goal of this research is to identify secondary metabolites from marine-derived fungi that exhibit cytotoxicity activity towards a brain cancer (U87) cell line. Secondary metabolites (aka natural products) are compounds produced by living organisms. These small molecule chemical entities have played an important role in traditional medicine for thousands of years and are an essential part of the current therapeutic arsenal for modern medicine. Presently, ~65% of all approved pharmaceuticals are either natural products or derivatives thereof. The success of natural products and their derivatives as therapeutic agents is largely due to their structural diversity and the fact that they have evolved over centuries to interact with specific biological targets. To initiate this research over 100 fungal strains were cultured and the metabolites they produced were extracted. The natural products were screened against a brain cancer (U87) cell line using a sulforhodamine B (SRB) assay cytotoxicity assay. If an extract exhibited activity in the SRB assay, the metabolites present in the extract were purified using high performance liquid chromatography and their structures were determined using mass spectrometry, NMR, and circular dichroism spectroscopy.

Jeffrey Ocampo

Identification of Natural Products that Exhibit Bactericidal or Anti-virulence Activity Against Antibiotic Resistant Gram-Negative Pathogenic Bacteria

A major challenge facing the future of human health is the rise of antibiotic-resistant pathogenic bacteria. In 2017 the World Health Organization (WHO) published a list of 12 pathogens that will pose the greatest threat to human health due to antibiotic resistance. The objective of this research was to identify natural products from marine-derived fungi that have antibiotic activity towards a carbapenem-resistant strain of *Pseudomonas aeruginosa*. This is achieved through two biological screens, the first is a traditional bactericidal minimum inhibitory concentration (MIC) assay and the second is an assay that identifies molecules capable of inhibiting the type three-secretion system (T3SS). The T3SS is a needle like virulence factor used by many Gram-negative pathogens to inject effector proteins directly into the host cell. These effector proteins then subvert the hosts defenses which in turn allow the cell to be infected and the disease to progress. Identifying compounds that do not kill bacteria but that inhibit the T3SS is advantageous for antibiotic drug development on two fronts. First, since the compound is removing the virulence of the bacterial cells not killing the cells, evolutionary selection towards antibiotic resistance should be decreased. Second, since it is predominately only pathogenic bacteria that utilize the T3SS in mammals, an antibiotic that inhibits the T3SS will be less detrimental to commensal bacteria than traditional bactericidal antibiotics. This work was achieved by culturing over 100 fungal strains, extracting the metabolites they produced and analyzing them in the biological screens. For any extract that exhibited the desired activity the metabolites present in the extract were purified via high performance liquid chromatography and their structures were determined using mass spectrometry and NMR spectroscopy.

Sabrina Barata

Identifying Novel Chemical Scaffolds from Marine Derived Fungi using Tandem Mass Spectrometry based Molecular Networking

One of the major challenges in natural products drug discovery, is the redundant purification and structure elucidation of previously identified compounds. To combat this natural product researchers have developed platforms such as the Global Natural Products Social (GNPS) Molecular Networking platform. The GNPS platform is a database where natural product researchers from around the world deposit their liquid chromatography (LC) - tandem mass spectrometry (MS/MS) analysis of the compounds they are working with. This allows other researchers to upload and compare the LC-MS/MS data of the compounds they are working with and look for similarity scores to known secondary metabolites so they can rapidly de-replicate any previously identified compounds. The overall goal of the McCauley Research Group is to identify novel secondary metabolites with pharmaceutically relevant biological activity. Therefore, the overall objective of my independent research project was to probe large amounts of secondary metabolite data generated via LC-MS/MS of fungal extracts that exhibited activity in biological screens to identify those extracts that contained putatively novel chemical structures. Once these extracts were identified the compounds were purified using high-performance LC and their structures were elucidated using high accuracy MS along with 1D and 2D NMR experiments.

Jorge Hernandez Garcia

Natural Product Structure Elucidation using 1D and 2D Nuclear Magnetic Resonance Spectroscopy in Conjunction with Circular Dichroism Spectroscopy

Natural products are metabolites produced by both macro- and micro-organisms that are not directly involved in growth or metabolism and typically confer some sort of evolutionary advantage. The primary goal of the McCauley research group is to identify biologically active natural products with novel structures. The objective of this research project is to use Nuclear Magnetic Resonance (NMR) and Circular Dichroism (CD) Spectroscopy experiments to identify the overall three-dimensional structure of these novel compounds. This includes the base chemical scaffolds, as in what atoms are connected to each other, as well as the overall stereochemical assignments, as in the 3D orientation of the atoms in chemical space. This work was achieved by culturing over 100 fungal strains in various types of media to maximize the metabolites they produced, extracting the metabolites, then screening them in biological assays. Extracts that contained putatively novel chemical scaffolds were identified using tandem mass spectrometry and the compounds were purified from the extracts using high performance liquid chromatography. Once the compounds were purified the following NMR experiments in conjunction with CD experiments were utilized to confirm their structures: ¹H proton, ¹³C carbon, ¹H-¹H COSY, ¹H-¹³C HSQC, ¹H-¹³C HMBC, and ¹H-¹H ROESY. This work led to the identification of a family of novel compounds.

Nathan Williams

Utilizing Global Natural Products Social Molecular Networking to Identify Novel Pyrrolo[4,3,2-de]quinoline compounds from the Marine Sponge, Zyzza fuliginosa

Marine sponges are a reservoir of immense chemical diversity. The marine sponge *Zyzza fuliginosa* is a rich source of families of compounds that contain fused A/B/C tricyclic pyrrolo[4,3,2-de]quinoline moieties. This includes the makaluvamines and damirones, compounds that have been shown to have potent cytotoxicity towards a variety of solid tumor cell lines. The objective of this research was to identify novel pyrrolo[4,3,2-de]quinoline compounds from extracts of *Z. fuliginosa*. To achieve this multiple extracts of *Z. fuliginosa* along with standards of nine makaluvamines, three damirones and two zyzzamines, were analyzed using LC-MS in a tandem (MS/MS) format. The MS/MS data was analyzed using the Global Natural Products Social Molecular Networking platform. Metabolites whose MS 2 fragmentation patterns showed high similarity scores to the makaluvamines and damirones, but that had unique molecular formulas based on high accuracy MS were selected for further investigation. These putatively novel pyrrolo[4,3,2-de]quinoline compounds were purified from the crude *Z. fuliginosa* extracts using HPLC and structurally elucidated using 1D and 2D NMR experiments. This led to the identification of a series of novel pyrrolo[4,3,2-de]quinoline compounds.

Edwin Chavez Santana

Probing of the microbiome of the marine sponge Jaspis splendens for the biosynthetic origin of Jasplakinolide.

The marine sponge *Jaspis splendens* is a common member of the reef communities in the waters around Southeast Asia. This sponge is a source of jasplakinolide, a cytotoxic actin-binding marine natural product. There is a growing body of evidence that suggests natural products isolated from macro-organisms, such as marine sponges, are in fact biosynthesized by associated or symbiotic microorganisms. Due to this evidence and the structural similarity of jasplakinolide to other microbial natural products, such as the condramides and miuraenamides; it is hypothesized that jasplakinolide is biosynthesized by a member of the *Jaspis splendens* microbiome. The objective of this research is to investigate correlations between the relative abundance of jasplakinolide in *J. splendens* extracts to the presence of stable microbial operational taxonomic units (OTUs) in the *J. splendens* microbiome. To achieve this samples of *J. splendens* were collected from multiple locations in Indonesia. For each animal species collected, the specimen was divided in half, with one half being used for metabolomic analysis and the other for genomic analysis. The metabolomic samples were freeze dried and extracted using dichloromethane. The concentration of jasplakinolide in each metabolome was determined using an UHPLC-Orbitrap-MS. The genomic samples were used for microbiome analysis. The total genomic DNA was extracted from each animal and the V4 region of the 16S rRNA genes present in the microbiome were PCR amplified and Illumina sequenced to identify stable OTUs present in all *J. splendens* animals.