



SOUTHWEST COLLEGE OF
NATUROPATHIC MEDICINE
& HEALTH SCIENCES

Research Department Presents:

New Advances in Evidence-Based Botanical Medicine

March 11th, 2021
Southwest College of Naturopathic Medicine
Tempe, AZ

RIC SCALZO
Institute for
Botanical Research

at Southwest College of Naturopathic Medicine



Unlocking the secrets of botanicals at the Ric Scalzo Institute for Botanical Research

Presented by: Bill Chioffi

Contact email: b.chioffi@scnm.edu

A brief lecture description:

Botanical extracts and botanical formulations, present challenges for rigorous scientific testing to understand their actual therapeutic efficacy. To test whether a botanical medicine actually has medicinal benefit, two factors need to be understood: 1) the chemical composition, stability, and consistency across manufacturing batches, and 2) how well it works in the human body in addressing a particular physiologic state or disease and its mechanism of action. In general, there currently exist limited standards and an absence of high-quality scientific research across the multitude of botanical products to authenticate their contents, safety or effectiveness for therapeutic activity.

Detailed chemical analysis of botanical medicines is now possible with mass spectrometry and nuclear magnetic resonance techniques. The complex chemical mixtures present in botanicals can be fully profiled, compounds identified and accurately quantified, and tracked over time to ensure chemical stability of the product.

With modern molecular and cellular biology laboratory methods, the activity and mechanism of action of botanicals can often be confirmed and deciphered using sophisticated laboratory methods. From here, bioassay guided fractionation can be done to identify the specific active constituent(s) present in a particular botanical. This allows the therapeutic claims of a botanical to be supported by evidence-based scientific approaches and botanical standardization to be done on based on biological activity, rather than random marker compounds.

The Ric Scalzo Institute for Botanical Research at SCNM is uniquely positioned to evaluate the efficacy of medicinal botanicals the by unlocking the mechanisms of action and proving the efficacy of numerous medicinal botanicals through scientific exploration, experimental discovery, and cutting-edge innovative techniques. Case in point: In the previously unexplored carnivorous plant, *Sarracenia purpurea*, we identified a mechanism by which it can target cervical carcinoma cells by inhibiting the synthesis of viral oncogenes and subsequently induce p53-dependent apoptosis or cell suicide.

Talk objectives:

- Understand the challenge of properly researching and formulating with botanicals
- Understand the model of Bioassay Guided Characterization, Purification, and Isolation of Natural Products
- Understand the opportunity for the Naturopathic profession to contribute to the advancement of Evidence Based Medicine through this type of research

Statement of relevance to medical practice:

The Ric Scalzo Institute for Botanical Research will advance 21st century botanical medicine through scientific exploration grounded in clinical herbalism's rich tradition. The Institute's analytical, metabolomic and bioassay laboratories will optimize product extraction methodology guided by the molecular biology elucidation of mechanism of action. A clinical trial network completes the Institute's benchtop-to-bedside unique value in bringing new botanical medicines to market.

A brief bio for Bill Chioffi, VP Strategic Partnerships and Business Development-Ric Scalzo Institute for Botanical Research:

Bill Chioffi is an Herbalist with twenty-four years' experience in the production of botanical medicine. This includes all phases of vertically integrated botanical manufacturing of liquid extracts and concentrates, organic farming and processing of vertically integrated raw materials, qualitative and quantitative analysis of finished products and raw materials, international and domestic regulatory and GACP auditing experience, social responsibility/sustainability management and program development, agroforestry and supply chain development planning, political advocacy, clinical research guidance, formulation, new product development and education. He serves on the following boards; United Plant Savers, Sustainable Herbs Project/ABC (advisor), Appalachian Forest Farmers, including past membership on the Executive Committee of The American Herbal Products Association (AHPA) as Vice Chair of the Board of Directors for two terms.

A statement summarizing speaker's qualifications:

Bill Chioffi has been working within the dietary supplements industry for over 20 years and is well versed in current botanical research methodologies and the botanical supply chain. Over the course of his career, he has visited manufacturing sites, analytical labs and farms across every continent.

Notes: _____

_____.

Combating antibiotic resistant bacteria with propolis

Presented by: Daniel Clark and Melissa Bellman

Contact email: d.clark@scnm.edu

A brief lecture description:

Bee propolis, often referred to as 'bee glue', is a sticky substance that Honeybees (*Apis Mellifera* L.) collect from various plant sources. Mainly, propolis consists of resinous materials that are used to seal cracks and holes in their hive. Propolis has been well documented to have broad antimicrobial properties, among others. Additionally, propolis has been characterized to have different properties and antimicrobial activities depending on geographic regions. However, it has yet been investigated, the potential differences in propolis activity against antibacterial resistant strains of bacteria. The goal of our research is to add to the growing body of literature to find an alternative therapy for antibiotic resistant strains of bacteria.

Talk objectives:

- Attendees will learn about propolis and its constituents
- Attendees will learn about the historical uses of propolis
- Attendees will learn about the effectiveness of propolis against antibiotic resistant strains of bacteria

Statement of relevance to medical practice:

According to the WHO, antibiotic resistance in common bacteria strains are increasing to dangerously high levels worldwide. Infections such as pneumonia, tuberculosis, gastroenteritis and others are becoming increasingly difficult to treat leading to the need for alternative treatment options. Identifying the effectiveness of propolis for the treatment of antibiotic resistant bacteria may provide an efficacious alternative treatment option or even prophylaxis to these common conditions.

A brief bio for Daniel Clark:

Daniel Clark earned his Bachelor of Science degree with a specialization in Kinesiology from Laurentian University in Sudbury, Ontario, Canada in 2018. During his time at Laurentian he was involved in multiple research projects which drove him to do his own undergraduate thesis on exogenous ketone salt supplementation and whole-body cooling on exercise metabolism and performance. His passion for healthcare and wellness led him to join the startup company Beekeeper's Naturals in 2016 where he first began to explore the antimicrobial effects of propolis and other bee products. Since joining the SCNM community to pursue his Doctor of Naturopathic Medicine, Daniel has led the Sports Medicine Club as President and assisted in co-founding the activity of propolis against antibiotic resistant bacteria research project. In the future, Daniel hopes to combine his love for regenerative medicine and research in order to add to the scientific community on the use of Naturopathic medicine for the treatment of chronic pain and tissue regeneration.

A statement identifying / summarizing speaker's qualifications:

Daniel Clark has been involved in scientific research for the past 5 years and hopes to continue to contribute to scientific literature throughout his professional career. His research began focusing on developing diagnostic concussion tools during his undergraduate degree which led him to pursue his undergraduate thesis on exogenous ketone salt supplementation and whole-body cooling on exercise metabolism and performance. This passion and drive for research will make him an effective health detective allowing him the opportunity to help endless patients on their wellness journey.

Notes: _____

Echinacea pupurea: The importance of proper extraction methods to combat the common cold

Presented by: Dr. Johanne Gerstel

Contact email: j.gerstel@scnm.edu

A brief lecture description:

Rhinovirus infections are associated with the common cold. Symptomology and complications of rhinovirus infections are often linked to the immune response and the expression of the cytokine, IL-8. Rhinovirus complications may include chronic bronchitis, sinusitis, otitis media and asthma. *Echinacea pupurea* has historically been used as a therapy for rhinovirus infections, but results from clinical studies have been controversial. Many studies conclude that *Echinacea* is an effective therapeutic against the rhinovirus infections, whereas an equal number of reports claim the opposite. The purpose of our study was to investigate the biological activities of *Echinacea* root extracted in both water and ethanol. Results demonstrated a dramatic difference in the antiviral activity between the different root extractions. Ethanol extracts of the root inhibited viral replication by inhibiting viral cellular attachment. In contrast, a water extract of the root led to an enhancement of rhinovirus replication. This enhancement led to an approximate 100-fold increase in virus replication levels and does not appear to be associated with the host antiviral interferon response. Our data suggests that different extraction methods will likely produce significantly different physiological responses to *Echinacea* and could lead to very different outcomes in clinical trials.

Talk objectives:

- Understand the history of *Echinacea* and its controversial use as a therapy for rhinovirus infections.
- Understand the effects of rhinovirus and the immune response that it produces.
- Understand the differences in antiviral activity on rhinovirus between the two root extractions of *Echinacea*.
- Understand the mechanism of inhibition demonstrated by the root ethanol extraction of *Echinacea* on rhinovirus.
- Understand the potential mechanisms of action of the root water extraction of *Echinacea* on rhinovirus.
- Understand the importance of standardizing *Echinacea* extractions for its antiviral use against rhinovirus.

Statement of relevance to medical practice:

Echinacea pupurea has been historically used as a treatment for the common cold although its effectiveness has been controversial due to contrasting clinical study results. Even with this controversy, the transition of consumers to utilize natural products as an over the counter remedy has increased supplement industry sales to millions of dollars a year just in cold and cough remedies alone. Many supplements and over the counter remedies include *Echinacea* as part of their formula but do not specify the method of extraction or the plant part used. This

research will help to standardize the optimal extraction method and plant part used for *Echinacea* in order to address rhinovirus infections.

A brief bio for *Dr. Johanne Gerstel, NMD*:

Dr. Johanne Gerstel, NMD, received her doctorate of Naturopathic Medicine from Southwest College of Naturopathic Medicine (SCNM) in June of 2019. She completed her Bachelor of Science degrees in Biology and Psychology from Arizona State University (ASU) where she performed undergraduate research in the area of neuroscience and the use of various treatments against side effects of recreational drug use. After graduating from ASU, she worked as a health coach and case manager in the behavioral health field. Upon acceptance into SCNM she continued to be involved in multiple research projects but this time in the area of microbiology, botanical medicine, and immunology. She is currently working on completing her Ph.D in the area of Molecular and Cellular Biology at ASU. She also continues to write up publication articles and present at integrative conferences in regards to the research performed at ASU and SCNM. While she is completing her Ph.D, her clinical practice focuses on seeing patients in regards to mental health, counseling, and pain management. Her research continues to be centered on botanical medicine, immunology, and infectious diseases. As a graduate student, adjunct faculty, and naturopathic physician, Dr. Gerstel will continue to provide evidence-based medicine to her patients and community.

A statement summarizing speaker's qualifications:

Dr. Gerstel has been performing research since 2009. She first started in her undergraduate degree at ASU where she was exposed to animal studies in the area of testing proteins and treatments that could potentially reverse the effects of recreational drug use. When she started her Naturopathic degree program at SCNM in 2015, her research focus switched over to botanical medicine, infectious disease agents, and cell culture system models. She continues to expand her research techniques and knowledge of antiviral and antimicrobial botanicals while she is obtaining her PhD at ASU in the field of Molecular and Cellular Biology. She has presented at multiple integrative conferences nationally and is submitting publications to peer-reviewed journals.

Notes: _____

Botanical treatment of canine infections: warts and kennel cough

Presented by: Chelsea Barranco

Contact Email: c.barranco@scnm.edu

A brief lecture description:

This project evaluates the effectiveness of herbal therapy against pathogens that cause canine infections, specifically canine papilloma virus associated warts and kennel cough. Currently, there is limited treatment options for canine papilloma virus (CPV) warts and when untreated, will typically resolve within 3-12 months. This project's findings demonstrate the successful use of a topical botanical formulation for the treatment of canine warts which resolved the infection within 9 days. Kennel cough, caused by *Bordetella bronchiseptica*, is currently treated with the use of antibiotics. It may present as a mild case which can resolve on its own but can also lead to a more serious presentation and cause pneumonia. This project investigates the effectiveness of herbal antibiotics against *Bordetella bronchiseptica*, and may present a more successful treatment protocol that could be explored in the future.

Talk objectives:

- Attendees will learn about assays as the current method to assess antibiotic and antiviral effectiveness
- Attendees will learn about the process of making herbal extractions with historical methods
- Attendees will learn about the herbal actions and pharmacognosy that can be effective in treating CPV warts and Kennel cough

Statement of relevance to medical practice:

Identifying which herbal compounds are effective against the canine papilloma virus and *Bordetella bronchiseptica* (the causative agent of kennel cough) may provide an alternative treatment for canines susceptible to these infections.

A Brief bio for Chelsea Barranco

Chelsea Barranco earned her Bachelor of Science in Biochemistry at Ohio University in May 2013. During her time at OU, she was involved with the Tropical Disease Institute and volunteered in Chagas disease research. Following graduation, she earned her Master of Arts in Latin American Studies at Ohio University in May 2015. She continued to work with the Tropical Disease Institute and conducted field based research and community development in Loja, Ecuador. Chelsea then earned her Master of Science in Public Health in Tropical Medicine at Tulane University in May 2018. During her time in New Orleans, she conducted research in Malaria, specifically with *Plasmodium chabaudi*, under Dr. Ahmed Aly. In October 2018, Chelsea began pursuing a Doctorate of Naturopathic Medicine at Southwest College of Naturopathic Medicine and Health Sciences in Tempe, AZ. She is currently involved in the research department at SCNM. Her research interests include exploring the effectiveness of botanical medicine against

microorganisms. In the future she plans to continue naturopathic research and play a role in new treatment protocols and cures for patients.

A statement identifying / summarizing speaker's qualifications:

Chelsea Barranco has been involved in many areas of scientific research for the past 8 years. She has conducted both laboratory and field based research in the Public Health field. Her strong interests in nature cure and botanical medicine brought her to naturopathic research at SCNM. Her unique experiences can contribute to the field of plant medicine from the perspective of both a Public Health researcher and a physician.

Notes: _____

Are botanicals the answer for COVID-19?

Presented by: Dr. Jeffrey Langland
Contact email: j.langland@scnm.edu

A brief lecture description:

The recent coronavirus disease-19 (COVID-19) pandemic has uniquely challenged the medical research community worldwide due to the absence of any proven therapies. The COVID-19 pandemic, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first identified in December 2019 in Wuhan, China. The World Health Organization declared the outbreak a Public Health Emergency of International Concern in January 2020 and a pandemic in March 2020. Symptoms of COVID-19 are highly variable, ranging from none to severe illness. Current treatments focus on addressing symptoms while work is ongoing to develop therapeutic drugs that inhibit the virus. Traditional herbal medicines find little mention in mainstream discourse of the COVID-19 pandemic. Our work has examined the ability of several traditional botanical extracts to inhibit the replication of SARS-CoV-2 and other coronaviruses. From this we have identified specific botanical extracts that inhibit virus replication with low cytotoxicity which likely target viral replication at different steps in the replication process. These botanicals may provide synergistic formulations that could potentially be developed into therapies to combat this disease.

Talk objectives:

- Understand the current therapies for SARS-CoV-2 infections
- Understand the potential of botanicals as therapies for SARS-CoV-2 infections
- Understand the synergism of botanical therapies

Statement of relevance to medical practice:

Even with the development of vaccines to SARS-CoV-2, the discovery of potential therapeutics to treat patients infected with this virus is paramount. This research supports the potential discovery and efficacy of synergistic botanical formulations to treat COVID-19 infections.

A brief bio for *Dr. Jeffrey Langland, Ph.D.*:

Dr. Jeffrey Langland, Ph.D., received his doctorate degree from Arizona State University in the area of virology in December 1990. His area of interest at that time, and still today, is investigating and understanding the complex cellular defenses and immune responses against microorganisms. After graduating from Arizona State University, he was a post-doctoral fellow at University of California Davis studying oncolytic viruses, followed by a post-doctoral position at the University of Wyoming comparing similarities between plant and human defenses against viruses. In 1995, he returned to Arizona State University as a Research Assistant Professor. In this capacity, he instructed several courses including General Virology and The Biology of AIDS. In August 2007, Dr. Langland became a joint faculty member at Southwest College of Naturopathic Medicine as the instructor for Medical Microbiology, Immunology, and Concepts in Research courses. At SCNM, Dr. Langland mentors students in evidence-based botanical medicine research and training Residents in the preparation of case studies. As a Full Professor and Chair of the Research Department at SCNM, Dr. Langland brings new insight and a cutting-edge approach to research for students and to the field of naturopathic medicine. Dr. Langland

is currently involved in various projects characterizing the activity and mechanism of action of various botanicals towards viruses (including pox, herpes, varicella-zoster, HPV, rhinovirus, zika, ebola), bacteria (including MRSA, lyme disease, antibiotic-resistant strains, plague, and others), immune regulation, and cancer.

A statement summarizing speaker's qualifications:

Dr. Langland has been a research scientist studying viruses and host-virus interactions for over thirty years. He has been studying antiviral and antimicrobial botanicals for the past 13 years. Dr. Langland is highly recognized in the field of naturopathic medicine and in the scientific community. He has nearly 60 publications in peer-reviewed journals and has presented his research at national and international conferences.

Notes: _____

_____.

Protective and preventative effects of Apiaceous plants against neuro- and cardiotoxic agents: a series of in vitro studies

Presented by: Dr. Yalda Shokoohinia
Contact email: y.shokoohinia@scnm.edu

A brief lecture description:

Body cells and tissues are continuously threatened by the damage caused by free radicals and reactive oxygen species (ROS) produced during normal oxygen metabolism or induced by exogenous damage. Some neurodegenerative diseases progressively deteriorate the structure and/or function of neurons (e.g., soma, axon, dendrites) in the central nervous system, eventually leading to cell death. The neurodegenerative processes have a principal role in several neuronal disorders, such as Alzheimer's, Parkinson's, and Huntington's. Some highly effective chemotherapy medications such as cisplatin and doxorubicin associated with neurotoxicity that causes neurodegenerative diseases as well. We have investigated the neuroprotective effects of some Apiaceous plants *in vitro*, and we have identified the bioactive constituents through intensive analytical tools including NMR, mass and UV. We will walk you through these biological and analytical processes in this presentation. We also elaborate how this information can be utilized in naturopathic medicine.

Talk objectives:

- Understand the relation of reactive oxygen species to the neurodegenerative diseases
- Learn about selected neuroprotective from Celery family
- Learn about selected neuroprotective natural products
- Learn about extraction, purification, and analysis of these natural molecules
- Understand the *in vitro* methods used for neuroprotective investigation

Statement of relevance to medical practice:

Celery family is one of the most popular plant families in herbal medicine. This research gives the opportunity to learn more about this family use as protection against neurodegenerative agents. Neurodegenerative agents including some chemotherapeutically drugs produce reactive oxygen species which can damage the neurons gradually and can cause diseases like Alzheimer's, Parkinson's, and Huntington's. This research can help with developing the natural drugs which can be used along with chemical drugs to prevent their side effects or just being used as nutraceuticals to protect against environment neurodegenerative agents.

A brief bio for Dr. Yalda Shokoohinia, PharmD, PhD:

Dr. Shokoohinia is currently a Professor of Pharmacognosy and Phytochemistry at Southwest College of Naturopathic Medicine (SCNM). In addition to teaching Pharmacology and Research to medical students, she also serves as a scientist of the newly established SCNM Botanical Research Institute. Dr. Shokoohinia received her Professional doctorate in Pharmacy, Pharm D, and Ph.D. in Pharmacognosy from Isfahan University of Medical Sciences, Iran in 2005 and 2010, respectively. She also completed fellowships in Phytochemistry (Eastern University of Piedmont, Novara, Italy, 2009) and Medicinal Plants Analysis (University of Mississippi, Oxford,

MS, 2017). Over the last fifteen years, she has served in various research, teaching, Pharmacist, and leadership roles. She was a researcher, faculty member, the chair of the Department of Pharmacognosy & Biotechnology, the head of the School of Pharmacy, the Director of Pharmaceutical Sciences Research center, and the head of Continuous Medical Education. Her research areas are phytochemistry, natural product chemistry, and multidimensional chromatography.

A statement summarizing speaker's qualifications:

Dr. Yalda Shokoohinia has been a researcher and instructor in natural products and pharmaceutical sciences for the last fifteen years. She had discovered over 90 pure constituents, among them, 20 were recorded to be new compounds. She has over sixty publications on natural products and has supervised more than 40 grad theses in Pharmacy and Natural Medicine.

Notes: _____



