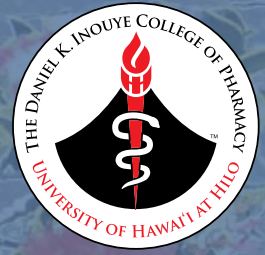


One who mixes ingredients, drugs or medications: a pharmacist

# Kāwili Lā'au

Spring 2014 • Volume 6, Issue 3



Focus on  
Cancer  
Research

**Dean John Pezzuto  
named for national  
research award**



UNIVERSITY  
of HAWAII®  
**HILO**

# Dean's Message



Over the past few years, our College has made tremendous strides. Starting from essentially nothing in 2006, we are now ranked ahead of more than 40 pharmacy programs according to *U.S. News and World Report*. There are many reasons for this ranking, such as our superb professional program, but one key point of differentiation is the depth of our research and scholarship. Why is this important? A high ranking is certainly a desirable attribute, but the significance of involvement with research and scholarship runs much deeper.

When I decided to come to Hawai'i, I knew it wasn't going to be a day at the beach. Often working out of my car, with minimal support, there were constant surprises. But as we grew, we met each one and surpassed all expectations of a fledgling pharmacy school sprouting up in the Pacific Ocean. Our students are top notch; our faculty members are world-renowned. As you will see in this issue, many have successfully competed for national funding, including

the \$14.4 million Pharm2Pharm project, which continues to make inroads throughout our state. Some of our faculty actively promotes Native Hawaiian activities, both culturally and academically. Our international activities are growing. We are a steadfast group of pioneers making the best of whatever resources we can piece together. And that includes developing research that's being attempted unlike anywhere else.

Recently I talked with a woman whose mother and grandmother battled various forms of cancer in the final years of their lives. Between the ravages of the condition itself and the side effects of the treatments, as well as the countless hours of consternation, the disease inserted itself in essentially every aspect of the entire family's existence. How many people do you see in the grocery store, on the street, or in the workplace, who may be affected by the ugly grip of this harsh reality? Each and every year, the number of deaths due to cancer adds up to more than five times the entire population of the State of Hawaii.

Will it ever be possible to eradicate this dreadful disease? As a scientist, I honestly don't know. I believe we can diminish the incidence of cancer through preventative strategies, and I am confident better treatment options will be devised. But one thing is absolutely certain – all of our hope for the future resides in research and scholarship. Right here at the DKICP, I have the honor of knowing and working with some of the most capable researchers on the planet, many of whom you will be able to read about in this issue.

Knowing the depth of their commitment and passion for research not only affirms my own belief that we can alleviate the suffering due to cancer, but also makes receiving the Volwiler Research award such a personally humbling event in my lifetime. After more than 30 years of professional contact with AACP, while developing friendships that have deepened throughout the years, it's nothing short of stunning to be recognized in this way while reminding me of the reason I chose this career.

There is a well-known exchange between Albert Einstein and a student that goes as follows:

"Student: Dr. Einstein, aren't these the same questions as last year's final exam?"

Dr. Einstein: Yes. But this year the answers are different."

That's what it's all about: Enhancing knowledge through research. "If we knew what it was we were doing, it would not be called research, would it?" (Albert Einstein) Faculty members at the DKICP are making history by discovering what will eventually be found in textbooks. They are making the world a better place through research, scholarship and education. Founding the only pharmacy college in the Pacific region will make a difference in the immediate future as well as in the long run.

However, in addition to learning and discovery, the influence of the DKICP runs much deeper than most of us have ever imagined. Heartwarming transformations of an indelible nature have been fostered through the backchannels of our virtual halls. In a unique segment of this issue, several couples who came together while working on their pharmacy degrees here at UH Hilo generously share their stories with us. As Bob Marley wrote, "in this bright future you can't forget your past." I hope they will fondly remember their past as students as well as be a part of our own bright future at DKICP. As we prepare to graduate our fourth class of pharmacists, I hope they will continue to share their stories with us as they carve out their professional lives.

A handwritten signature in black ink, appearing to read 'John M. Pezzuto'. The signature is stylized and fluid.

John M. Pezzuto  
Professor and Dean



## Kāwili Lā'au

Spring 2014 • Volume 6, Issue 3

### Administration

#### John M. Pezzuto

Founding Dean

#### Edward Fisher

Associate Dean for Academic Affairs

#### Carolyn Ma

Co-chair, Pharmacy Practice

#### Patricia Uber

Co-chair, Pharmacy Practice

#### Kenneth R. Morris

Chair, Pharmaceutical Sciences

#### Karen Pellegrin

Director, Strategic Planning and  
Continuing Education

#### Kāwili Lā'au Editor

Maggie Morris

#### Graphic Production

UH Hilo Graphic Services

#### Published by the College of Pharmacy

University of Hawai'i at Hilo  
200 W. Kāwili St. Hilo, Hawai'i  
96720 Phone: 808-933-2909  
Fax: 808-933-2974  
<http://pharmacy.uhh.hawaii.edu>  
[Pharmacy@hawaii.edu](mailto:Pharmacy@hawaii.edu)  
Kāwili Lā'au is the magazine for the only  
College of Pharmacy in the Pacific region,  
the University of Hawai'i at Hilo



UNIVERSITY  
of HAWAII  
**HILO**

# Contents

<b>Cancer Research just one focus in Pezzuto lab</b>	<b>2</b>
<b>AACP honors Dean Pezzuto with top research award</b>	<b>4</b>
<b>Cancer research updates from:</b>	
<b>Dr. Aaron Jacobs</b>	<b>5</b>
<b>Dr. Leng Chee Chang</b>	<b>6</b>
<b>Dr. André Bachmann</b>	<b>7</b>
<b>Dr. Dana-Lynn Koomoa-Lange</b>	<b>8</b>
<b>Dr. Dianqing Sun</b>	<b>9</b>
<b>Dr. Linda Connelly</b>	<b>10</b>
<b>Dr. Mahavir Chougule</b>	<b>10</b>
<b>Dr. Carolyn Ma</b>	<b>11</b>
<b>Dr. Deborah Juarez</b>	<b>12</b>
<b>Dr. Supakit Wongwiwatthananut</b>	<b>13</b>
<b>Seminar Speaker Series</b>	<b>14</b>
<b>On the Garden Isle: Kaua'i</b>	<b>15</b>
<b>On the Gathering Place: Oahu</b>	<b>16</b>
<b>Native Hawaiian activities keep students connected</b>	<b>19</b>
<b>Pharm2Pharm Update</b>	<b>21</b>
<b>Japanese pharmacy students tour Hilo</b>	<b>23</b>
<b>DKICP honors Chancellor Emerita Rose Tseng</b>	<b>24</b>
<b>Students show aloha at regional Phi Delta Chi conference</b>	<b>28</b>

## Regular Features

<b>Alumni Report</b>	<b>27</b>
<b>Student Organizations</b>	<b>28</b>
<b>Faculty Briefs</b>	<b>32</b>
<b>Preceptor Focus</b>	<b>34</b>
<b>Rotation Report</b>	<b>35</b>

**On the cover:** The American Association of Colleges of Pharmacy (AACCP) named Dean John M. Pezzuto to receive the 2014 Volwiler Research Achievement Award for his outstanding research and contributions to the field of natural product drug discovery. This special edition on cancer research at the Daniel K. Inouye College of Pharmacy shows research from other faculty.

# Research Focus: John M. Pezzuto

*[Portions of the following were contributed by Drs. Virginia Roche and Tamara Kondratyuk]*

Many people in the general public who hear the name John Pezzuto may only know of his research that identified the cancer-preventive component of grapes and grape products known as resveratrol. After the research report was published in *Science Magazine* in 1997, many more stories in scientific journals as well as mainstream media focused on the discovery that gave real promise to the fight against cancer. According to the Web of Science Core Collection, his work on resveratrol has been cited more than 3,000 times.

His peers, however, may be more conscious of his mountains of work with natural products. His work has resulted in the publication of more than 500 scholarly articles, four books, the awarding or application for 24 patents, and a host of national and international invited presentations. He has been continuously funded by the National Institutes of Health (NIH) since earning his Ph.D. in 1977.

"Specifically, Dr. Pezzuto and his research collaborators have mined the rich array of therapeutic molecules found in edible and non-edible plants with the goal of identifying lead compounds that can halt the initiation, promotion and progression of neoplastic cellular transformation," said Dr. Victoria F. Roche, professor of pharmacy sciences and senior associate dean at the Creighton University School of Pharmacy and Health Professions. "His ability to lead and inspire interprofessional teams of world class scientists is legendary, and he routinely brings his extensive knowledge of bioassay development to bear to ensure that the mechanism(s) of action of any promising lead compounds are fully elucidated."

Now that Dr. Pezzuto is the Dean of the Daniel K. Inouye College of Pharmacy, he continues to operate research

labs, with Dr. Tamara Kondratyuk leading his group of postdoctoral associates and research collaborators in the Institute for Pacific Island Forestry building in the University of Hawai'i at Hilo Science and Technology Park. The research emphasis in the Pezzuto group continues to be drug discovery, and their success in this area has promoted the creation of an international multidisciplinary team of investigators who concentrate on the discovery and characterization of natural product cancer chemopreventive agents. They conduct tests of natural products procured throughout the world including Brazil, China, India, Italy, Pakistan and Thailand.

"Additional research from his prolific laboratory elucidated the pleiotropic action of betulinic acid, a naturally-occurring pentacyclic triterpenoid," Dr. Roche said. "Of significance to the focus of his research program, betulinic acid was found to selectively induce apoptosis in human melanoma cells, which are notoriously resistant to the cytocidal action of many antineoplastic agents. Several clinical trials to evaluate its therapeutic potential in the treatment and/or prevention of this aggressive and highly fatal cancer are ongoing."

The Pezzuto lab has continued to run ongoing projects related to resveratrol, having produced more than 100 derivatives, some of which have demonstrated better activities than the original compound, and in some cases better than positive controls. Throughout the last seven years, the Pezzuto lab has tested approximately 7,000 fractions and compounds to look for activities that show cancer chemopreventive and anti-cancer potential. Through collaboration with researchers at other universities, such as the University of Illinois at Chicago and Purdue University, they are discovering some of these compounds may also show some effect on disease states other than cancer, such



*Pezzuto labs*



Dr. Tamara Kondratyuk (right), lab manager in the Pezzuto labs, works with Dean Pezzuto.

“He is a conscientious mentor who works effectively across disciplines and instills a lasting dedication to research excellence in everyone,” Dr. Roche said. “Over the course of his academic career, he has established a variety of research centers and programs that have educated over 150 young scientists. Regardless of location, Dr. Pezzuto’s inspirational role-modeling has shaped the scientific vision and

as in Alzheimer’s disease pathology.

The Pezzuto labs actively participate in evaluating the chemopreventive potential of different plant extracts and compounds in collaboration with other college of pharmacy faculty. They are investigating a local plant called the *Physalis peruviana* in the family of Solanaceae, called poha, which has been widely used in a traditional medicine since pre-Columbian times, particularly to treat cancer. They also are looking at the compounds within the Java-Olive plant, found in tropical zones of Europe, Africa, and Asia, which Dr. Kondratyuk said has gained significant scientific interest in recent years mainly due to their structural and biological diversity that includes antitumor, and antimicrobial, and anti-inflammatory activities.

Logically enough, in addition to looking at terrestrial plants, the Hawai’i labs are exploring the unique chemical diversity of marine microorganisms as a potential for improving human health.

“The marine world has not been well investigated in the area of cancer chemoprevention, and we are very optimistic regarding our ability to make rapid breakthrough discoveries in this area,” Dr. Kondratyuk said.

Beyond his personal research, Dr. Pezzuto continues to advocate for research quality through his service on NIH study sections, and as a permanent or ad-hoc reviewer for several national and international granting agencies. In addition, his service on editorial boards of prestigious journals, as well as his role as Editor-in-Chief of the *Pharmaceutical Biology* speaks to the esteem he is accorded by his scientific peers.

disposition of countless individuals, including Ph.D. students, post-doctoral research associates, visiting scholars, Pharm.D. and undergraduate students, and research technicians. His innovative research has the demonstrated potential to not only advance our in-depth understanding of biologically active natural products, but also to save lives.”

**“He is a conscientious mentor who works effectively across disciplines and instills a lasting dedication to research excellence in everyone,” Dr. Roche said.**

---

#### *Postscript*

*At the time of this printing, in addition to the Volwiler Award, Dean Pezzuto was selected by the Cantine Due Palme to be honored with its “Premio Speciale Cantine Due Palme” award. The award is presented by the winery to “eminent personalities who made outstanding contributions in the field of research and culture.” In a message to Dean Pezzuto, Angelo Maci, Presidente, Cantine due Palme, states “Your passion and your love for research constitute a priceless value and you deserve to be appreciated and rewarded.” The ceremony will take place on May 9 in the exclusive Selvarossa Conference Room, located in Puglia, Italy.*

---

# National Pharmacy Organization Awards UH Hilo Pharmacy Dean Top Research Honors



The American Association of Colleges of Pharmacy (AACP) has selected John M. Pezzuto, Dean of the Daniel K. Inouye College of Pharmacy, to receive their top research award.

Pezzuto will receive the 2014 Volwiler Research Achievement Award for his outstanding research and

contributions to the field of natural product drug discovery. The award will be announced in July at the 2014 Annual Meeting in Grapevine, Texas, and will be published in *Academic Pharmacy Now* and on the AACP Web site.

"It is a tremendous honor, and I am very grateful for being recognized by the AACP in this manner," Pezzuto said. "Over the years I have had the privilege of working with many fine colleagues, students, postdocs and visiting scholars. We continue to hope our hard work will make a difference for future generations."

As Founding Dean of the Daniel K. Inouye College of Pharmacy, created in 2007, Pezzuto leads approximately 100 faculty and staff to educate and train students for careers in pharmacy.

After 35 years in academia, he has amassed more than 500 publications, is the co-inventor of several patents, the editor of four books, a member of more than ten editorial boards of international journals, and the editor-in-chief of *Pharmaceutical Biology*. He is widely known for identifying the cancer-prevention aspects of resveratrol, a chemical found in grapes and grape products. Primarily noted for working in the area of natural products, he has been an administrator and researcher in pharmacy and drug discovery.

Pezzuto received his bachelor's degree in chemistry from Rutgers University and Ph.D. in biochemistry from the University of Medicine and Dentistry of New Jersey (now Rutgers University). He was the recipient of a postdoctoral fellowship from the National Cancer Institute and performed two years of postdoctoral work in the Department of Chemistry at Massachusetts Institute of Technology.

"I have been witness to John's work for many years, and have been impressed with the intensity that he displays when pursuing his research," said Lucinda Maine, AACP executive vice president and CEO. "His research is world renowned and has the potential to affect the health of millions not only now but in the future."



The Volwiler Research Achievement Award was established as the research prize in academic pharmacy to honor the late Ernest H. Volwiler, former president and research director of Abbott Laboratories. According to AACP, "the intent of the Award is to recognize annually an individual within the ranks of pharmacy education recognized by his or her peers as one of the leading research workers in a given area of the pharmaceutical and clinical sciences, pharmacy practice and the social and administrative sciences, and for outstanding contributions to the respective disciplines."

Dean Pezzuto joins a highly distinguished group of researchers who have received this award since it was introduced in 1977.

## About AACP

**Founded in 1900, the American Association of Colleges of Pharmacy is a national organization representing the interests of pharmacy education and educators. AACP is comprised of all accredited colleges and schools of pharmacy with pharmacy degree programs, including more than 6,400 faculty, 62,500 students enrolled in professional programs, and 5,100 individuals pursuing graduate study. To learn more about AACP, visit [www.aacp.org](http://www.aacp.org).**



Dr. Lucinda Maine (left) congratulates Nadine So, Class of 2017, at the White Coat Ceremony in Oct. 2013. Dr. Maine was a keynote speaker at the event. (Photo by Robbyn Peck)

## Cancer research updates

# The basis of cancer

By Dr. Aaron Jacobs

There are about 100 trillion individual cells in your body. Not every cell is the same, but rather they have specialized tasks, or “jobs” to carry out. For example, red blood cells carry oxygen throughout your body. Nerve cells carry information like telephone wires. Liver cells remove toxins and fats from your bloodstream. The list of different jobs in your body is long.

How do cells know what to do? Inside every cell there is DNA, which is like an instruction sheet that tells each cell what its specific job is. Normally, the cells in your body do what they are supposed to. But if a cell’s DNA becomes damaged, then things can go very wrong. We call this damage a “mutation.” Like a worker without instructions, the cell quits doing its normal job.

Even worse, damage to the DNA can make these cells make lots of copies of itself. This is what we call cancer. It is a cluster of abnormal cells that replicates uncontrollably. If the cancer forms in a solid tissue, such as the lungs, liver, or breast, then we call the mass of cancer cells a tumor. But if the cancer originates from a blood cell, then we call it a lymphoma, leukemia, or myeloma, depending on the cell type it starts comes from.

There are several reasons that cancer is especially hard to treat. One reason is that cancers often have multiple things that make them different from normal cells. As a cancer cell make lots of copies of itself, not all copies turn out the same. It’s a bit like making a photocopy of a photocopy of a photocopy, and so on. The quality of the copies becomes increasingly poor, and in the case of a tumor made up of many cancer cells, it means that lots and lots of different mutations to the DNA can accumulate. This is bad, because the more different mutations a tumor has, the harder it is to treat.

Another thing that makes cancer hard to treat is that it can spread throughout the body. For example, breast cancer starts with a single abnormal cell in the breast that makes lots of copies of itself and forms a solid tumor. But individual cancer cells can sometimes break away from the original tumor and travel through the bloodstream or lymph system to other places in the body. This breakaway cancer cell can then “stick” in places like the bone or the brain, where it begins to form another tumor. Scientists call this process of cancer spreading “metastasis”. Then, instead of having to treat one tumor, a doctor will have to treat several.

Overall, cancer is one of the most complex diseases and is therefore among the hardest to treat. But scientists,

including those at the DKICP, are working diligently to better understand the devastating disease and to find new and unique ways to fight it.



### In the lab with Dr. Aaron Jacobs

#### *What are you working on?*

My laboratory is interested in: a) how cancer cells multiply in the body, and b) how they respond to chemotherapy. They are different from normal cells in your body because cancer cells multiply rapidly and uncontrollably. Chemotherapy is when drugs are used to kill cancer cells. When chemotherapy is first given to a cancer patient, the tumor (which is a clump of cancer cells) will start to “shrink.” But after a while, the remaining cancer can become resistant to the drug. If this happens, then the tumor will start to grow again. We study a protein called HSF1 that is involved in both of these processes: tumor growth and drug resistance.

#### *Why is it important?*

When a tumor becomes resistant to a particular drug, it will likely stay that way. This reduces the number of “therapeutic options” available for treating the patient. Usually, the drugs that are used first on a patient tend to be the safest and most effective. When a drug is no longer useful on a particular patient, there are not only fewer options available, but they tend to have more serious side effects, or are less guaranteed to work. By discovering how drug resistance operates, we hope to improve the use of our current, front-line agents.

### ***Where will it be applicable?***

The protein that we spend most of our time studying is HSF1, and it is turning out to be very important in several diseases. Cancers that have a lot of this protein are more likely to spread in the body, grow more quickly, and become resistant to chemotherapy. But HSF1 is also involved in Alzheimer's disease, arthritis, and several other age-related ailments.

### ***How can it affect future research?***

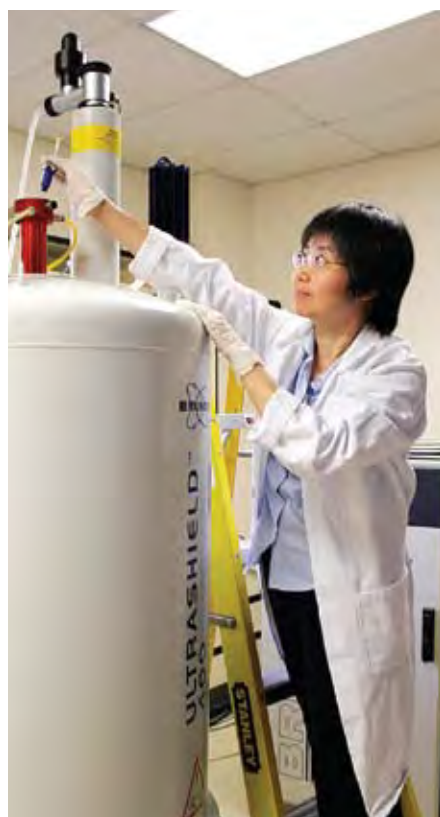
We are looking into how HSF1 is controlled (turned on/turned off in cells.) In doing so, we hope to better understand the differences between diseased and normal cells. We are also looking for new drugs to turn HSF1 "off." Such drugs could be useful in treating the ailments mentioned above, and could also be used to improve the effectiveness of current cancer medicines.

***Dr. Aaron T. Jacobs, assistant professor in the Department of Pharmaceutical Sciences, studies cellular signal transduction and gene expression. His research has been partially funded through the IDEa Networks of Biomedical Research Excellence (INBRE) grant.***

## **In the lab with Dr. Leng Chee Chang**

### ***What are you working on?***

My research interest in the cancer chemoprevention project is focused on the isolation, structure elucidation, and identification of naturally occurring cancer chemoprevention and anticancer agents with low toxicity. Specifically, we are interested in working with medicinal plants from Hawai'i, and edible species. We had worked with *Moringa oleifera* (MO) (Kalamungay). Its leaves and pods are eaten as leafy vegetables by the Filipinos and Asians in Hawai'i. In fact, MO leaf and seed powder are sold in local stores as food and dietary supplements. Additionally, we are working on *Physalis peruviana* (Pp) that showed the highest biological potential in two Cancer Chemoprevention assays. Pp is a rich source of withanolides, and is widely grown in Taiwan, where it is used as a folk medicine for treating cancer. The fruit, popularly known as poha berry in Hawai'i, is eaten fresh or used for jam making.



The overall aim of my study is to evaluate the cancer chemopreventive potential of withanolides from Pp as nuclear factor kappa B (NF- $\kappa$ B) and inducible nitric oxide synthase (iNOS) inhibitors. Our collaborator is Dean John Pezzuto. NF- $\kappa$ B is an important transcriptional factor that regulates numerous physiological processes including cellular proliferation, development, differentiation, immunity, apoptosis, inflammation, and metabolism. The critical role for persistently active NF- $\kappa$ B is evident in many cancers. Aberrant NF- $\kappa$ B activity dysregulates growth and survival, promotes angiogenesis, migration and invasion of tumor cells, and induces tumor immune tolerance. My lab's work is to isolate and determine the structures of these bioactive compounds from the edible source. The structure and absolute stereochemistry of withanolides from Pp and natural bioactive compounds from MO will be determined by Nuclear Magnetic Resonance (NMR), mass spectrometry analyses and X-ray diffraction methods.

### ***Why is it important?***

(a) Plants with ethnopharmacological uses have been a primary source for early drug discovery and chronological experiences with these plants as curative tools have helped to isolate and develop single chemical entities in modern medicine. It can provide novel therapeutic compounds for new drug development as leads for cancer prevention.

(b) It is important to purify the complex mixtures of natural products. The structure-activity relationship of stereo structures of natural products with cancer prevention activities can be determined, the findings is important for optimizing and developing the natural product lead as drug candidates.

(c) A model system for the evaluation of claims of herbal remedies can be developed in terms of cancer chemoprevention, antioxidant, and oxidative stress. This can lead to the potential development of the plant materials in dietary products that are safe for nutrition and will help in promoting and improving the health of people in Hawai'i.

### ***Where will it be applicable?***

The outcome of this research is applicable in: nutraceutical developments and dietary supplements; pure active natural products for drug discovery and development; and in research by the United States Department of Agriculture (USDA).



### **How can it affect future research?**

Studies for preclinical trials could be carried out to evaluate the *in vivo* activity and toxicity of the isolated compounds. Additionally, the identification of bioactive and less cytotoxic natural products in Pp that are edible should promote the use of Pp as a herbal remedy for cancer prevention regimens. The low cost of Pp should increase access to their use as an alternative treatment for cancer prevention in Hawai'i and in the U.S.

*Dr. Leng Chee Chang is an assistant professor in the Department of Pharmaceutical Sciences. She has gained funding from the Biosciences Research Infrastructure Development for Grant Enhancement and Success (BRIDGES) program from the National Institutes of Health (NIH). She also has been the recipient of a seed grant from the University of Hawai'i at Hilo Research Council and has been partially funded by the IDeA Networks of Biomedical Research Excellence (INBRE) grant.*

### **In the lab with Dr. André Bachmann**

#### **What are you working on?**

The Bachmann laboratory is interested in developing drugs for the treatment of neuroblastoma, a deadly cancer that establishes in infants and children and accounts for 12% of all childhood cancer-related deaths. Neuroblastoma is not a typical brain cancer but a nerve tissue cancer that establishes outside of the brain. The primary tumor typically forms in adrenal glands or the abdomen and may spread (metastasize) to other organs in the body. While significant progress has been made over the past 40 years in the treatment of childhood leukemia, the five-year event-free survival rate for high-risk neuroblastoma is still less than 50 percent. Therefore, therapeutic approaches are needed to improve the cure rates while minimizing toxicity. For the past 13 years, our laboratory has focused on the identification of cellular cancer pathways that are activated in neuroblastoma in order to develop new drugs that specifically block neuroblastoma tumor growth and prevent recurrence. We are particularly interested in finding drugs that are effective in patients with a high chance for relapse and/or those resistant to standard chemotherapy.

#### **Why is it important?**

The diagnosis of a child with cancer is inarguably one of the worst situations parents can be confronted with. Fortunately, cancer in children is relatively rare compared to adult cancer, but nevertheless in the United States, every year about 7,000 children are diagnosed with cancer. Of those, approximately 700 children are diagnosed with neuroblastoma. Patients with low- and intermediate-risk neuroblastoma have an overall survival rate of more than 90



percent, while the survival rate for high-risk neuroblastoma patients is only 50 percent and less than 10 percent for patients with recurring disease (relapse). It is therefore important to search for targeted therapies that help patients with high-risk neuroblastoma that present with recurrent disease, especially since there is little interest by the pharmaceutical industry in developing drugs for rare pediatric cancers, with little promise for financial profits.

#### **Where will it be applicable?**

High-risk neuroblastoma is often associated with gene amplification of MYCN, a transcription factor and key prognostic marker that predicts poor outcome. In searching for targeted therapies for MYCN-amplified, high-risk patients, I proposed in 2001 to target ornithine decarboxylase (ODC), which is directly activated by MYCN. In turn, MYCN-activated ODC produces polyamines, which are tumor-promoting molecules and highly elevated in cancer. While the role of ODC had been well established as a target in cancer by that time, it had not been considered a drug target in neuroblastoma. Given the availability of a potent, orally available ODC inhibitor (DFMO, also known as Eflornithine) my lab began to investigate the effect of DFMO in MYCN-amplified neuroblastoma. Importantly, DFMO had been FDA-approved for the treatment of a cancer-unrelated disease called African sleeping sickness (trypanosomiasis) and exhibited a high safety profile with low side-effects, thus making it an ideal drug candidate. Because of these advantageous features, it was clear that if our preclinical work is promising, DFMO could move to clinical trials much more rapidly and at much lower costs than typically associated with new drug development.

Six years later, my lab had performed the preclinical work and two independent studies confirmed our findings that DFMO is a potential candidate for neuroblastoma clinical trials. In 2008, by coincidence I met a parent of a child with neuroblastoma at a conference. He introduced me to his physician, Dr. Giselle Sholler, a pediatric oncologist at the

DeVos Children's Hospital (Grand Rapids, MI). Through the Neuroblastoma and Medulloblastoma Translational Research Consortium (NMTRC) headed by Dr. Sholler, it was decided to move DFMO into the clinical phase and we jointly wrote the first phase I trial study, which was approved by the FDA in 2009. In February 2010 (less than two years after meeting Dr. Sholler), a phase I study with DFMO opened, followed by a DFMO phase II study in 2012 that opened at 14 NMTRC Children's Hospital across the United States, including the Kapiolani Medical Center for Women and Children, in Honolulu (ongoing). In summary, our research has translated from the "bench to bedside" and has had a direct impact on introducing a new (repurposed) medicine for the treatment of children with neuroblastoma, with some promising results to be reported soon.

### ***How can it affect future research?***

Our work with DFMO has directly affected the research of other scientists that now pursue their own investigations with DFMO. In addition, our US-based NMTRC clinical trials have been recognized worldwide and include the enrolment of patients from Europe, Israel, and Australia. The independent "New Approaches to Neuroblastoma Therapy" (NANT) consortium that includes some of the most prestigious children's hospitals in the United States (Children's Hospital of Philadelphia, Children's Hospital of Los Angeles, UCSF Children's Hospital, etc.) has designed their own DFMO trial, which is promising. I am happy to say that our DFMO project has affected research beyond my wildest dreams. What started as a simple idea in 2001 has expanded into international efforts involving basic research scientists and clinicians to use DFMO for the treatment of neuroblastoma. As a PhD scientist, I feel very privileged to be included as an official member of the NMTRC physician team, thereby allowing me to continue to play an active part in the clinical development of DFMO.

***Dr. André Bachmann is an associate professor in the Department of Pharmaceutical Sciences.***

## **In the lab with Dr. Dana-Lynn Koomoa-Lange**

### ***What are you working on?***

My lab is investigating aberrant calcium signaling that are regulated by MYCN, a gene that is amplified in advanced-stage neuroblastoma (NB), and is an indicator of poor prognosis. We also investigate aberrant calcium signaling that regulates drug resistance in NB. We elucidate these pathways and identify potential targets for the development of more effective treatments for advanced stage and drug resistant NB.

In addition, my lab examines the anti-cancer effects of synthesized compounds (analogues and derivatives of known



inhibitors and modulators of specific ion channels), natural products, and Native Hawaiian medicinal plant extracts. We specifically target compounds and extracts that decrease NB cell viability and alters intracellular calcium signaling. Potential compounds and extracts with anti-cancer effects are further investigated by identifying the calcium signaling pathways that are affected, and elucidating the mechanism by which these pathways are regulated

### ***Why is it important?***

Tumors with MYCN gene amplification proliferate more quickly, are more metastatic, and are able to develop resistance to chemotherapeutic drugs. Standard treatments include surgical excision, chemotherapy and radiation. However, treatments are often ineffective and poor results are exacerbated by the development of drug-resistance at later stages of development. Identifying novel targets and screening for more effective drugs (e.g., synthesized compounds, natural products and Native Hawaiian medicinal plant extracts) to treat these cancers may help to increase the overall survival rate and decrease relapse in patients with MYCN amplified, advanced stage NB.

In addition, I hope that the cultural aspect of my research projects will help increase diversity at UH Hilo and DKICP in STEM (science, technology, engineering and math) fields. My research utilizes traditional preparations of Native Hawaiian medicinal plants and compares the anti-cancer effects of these extracts to those prepared using chemical solvents. The plants that we use are endemic and indigenous to Hawai'i. Therefore, we are also working with Kipuka Native Hawaiian Student Center to build and care for a māla (garden) of Hawaiian medicinal plants on campus at the University of Hawai'i at Hilo. This project has attracted at least six Native Hawaiian undergraduate students, has facilitated collaborations between different factions at UH Hilo and Manoa (e.g., DKICP, Dept. of Agriculture, Kipuka, John A. Burns School of Medicine, Dept. of Native Hawaiian Health), and has led to the development of the Pharmaceutical

Sciences 499V course (PHPS-499V) for undergraduate students. Some of my more advanced students are preparing to mentor other Native Hawaiian undergraduate students in cancer research projects during the summer.

#### ***Where will it be applicable?***

In my lab, we hope to identify the proteins that regulate the initial events that lead to NB, as well as proteins that regulate proliferation, metastasis, and drug resistance in NB. We are also examining the effects of synthesized compounds, natural products and Native Hawaiian medicinal plant extracts at each stage of NB development and progression. We hope the research will lead to effective chemo-preventive and anti-cancer treatments for NB.

#### ***How can it affect future research?***

My research projects will potentially identify novel targets for the development of more effective chemotherapeutic drugs for advanced stage and drug resistant NB. My research will lead to the development of novel compounds and extracts that may also be used to screen for activity against other diseases such as Diabetes. Finally, having a cultural aspect to my project may help to engage Native Hawaiians and other under-represented minority undergraduate students in research. I hope that their participation in my research projects will develop their interest in pursuing a career in a STEM field.

***Dr. Dana-Lynn Koomoa-Lange is an assistant professor in the Department of Pharmaceutical Sciences. Dr. Koomoa-Lange has received a K01 career development award from the National Cancer Institute (NCI). Her research also is partially funded through the IDeA Networks of Biomedical Research Excellence (INBRE) grant, and she is the recipient of an Alex's Lemonade Stand Foundation (ALSF) young investigator award.***

## **In the lab with Dr. Dianqing Sun**

#### ***What are you working on?***

In addition to antitubercular and antibacterial research projects, our laboratory is also interested in designing and synthesizing anticancer and cancer chemopreventive agents. In collaboration with Dr. Pezzuto and other colleagues, we are synthesizing novel small molecule and natural product-inspired chemotherapeutic agents based on high-throughput screening hits and emerging natural product leads. Once compounds are produced in our laboratory, they will be submitted to our collaborators' laboratories for biological evaluation against diverse anticancer and cancer preventive targets, such as aromatase, inducible nitric oxide synthase, quinone reductase I, NFkB, etc.

#### ***Why is it important?***

Bacterial infections and cancer are devastating diseases responsible for millions of deaths worldwide every year. In particular, due to the emergence of multidrug resistance, relapse, and severe side effects related to cancer chemotherapy, there is an urgent need for better drugs with improved efficacy and low cytotoxicity against healthy normal cells in order to minimize undesirable systemic toxicity.

#### ***Where will it be applicable?***

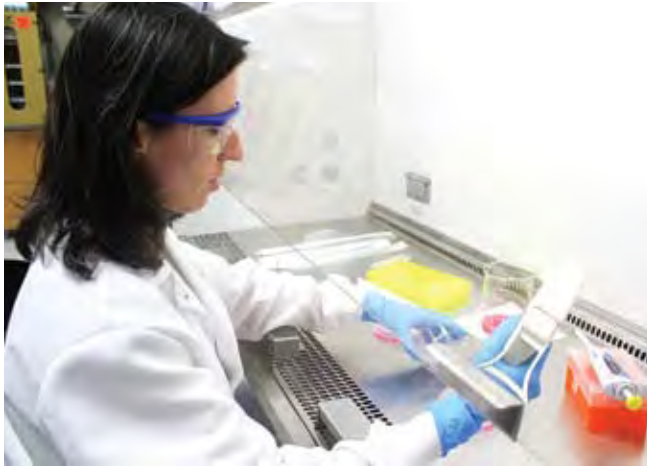
Historically, the majority of antibiotics and many anticancer agents in the clinic have been derived from natural products. By using natural product-inspired and target-driven approaches, these newly synthesized small molecules and/or semisynthetic derivatives may have the potential to prevent and treat various cancers such as breast cancer. In addition, these compounds can serve as invaluable pharmacological tools and molecular probes and provide further "proof of concept" studies in drug discovery and chemical biology.

#### ***How can it affect future research?***

We hope our basic and early stage preclinical research endeavors would produce promising lead compounds suitable for further development, such as in vivo efficacy and safety studies in animal models and ultimately in patients. In the long term, our efforts may have the potential to discover advanced drug candidates with cancer preventive and anticancer therapeutic potential.

***Dr. Dianqing Sun is an assistant professor in the Department of Pharmaceutical Sciences. Dr. Sun's laboratory is currently supported by National Institute of Allergy and Infectious Diseases/National Institutes of Health grant and the LE'AHF Fund of Hawai'i Community Foundation.***





## In the lab with Dr. Linda Connelly

### *What are you working on?*

As they grow, cancer cells can develop the ability to move around the body and grow in other organs – this process is called metastasis. Once metastasis occurs, then cancer becomes much more difficult to treat and the patient is more likely to die from the disease. The focus in my lab is on breast cancer and trying to gain a better understanding of the signaling that leads to metastasis of breast cancer.

### *Why is it important?*

There have been huge advances in breast cancer treatment but there is still a lot that we don't know. In order to come up with new treatments for breast cancer we need to advance our understanding of the biology of the disease. Our studies aim to learn new things about the biology of breast cancer.

### *Where will it be applicable?*

Breast cancer is the most common cancer among women in Hawai'i and the second leading cause of cancer deaths for women both in Hawai'i and nationwide. By advancing our understanding of the biology of breast cancer, we hope to reveal new therapeutic targets for the treatment of breast cancer.

### *How can it affect future research?*

Our research is at the start of the drug discovery process. If our studies show that a particular molecule or protein is a cause of breast cancer metastasis, then we have identified a potential drug target that can be followed up in future studies.

*Dr. Linda Connelly is an assistant professor in the Department of Pharmaceutical Sciences. Her work entitled "Osteoprotegerin in breast cancer cells: role in tumor growth and metastasis" is funded through a grant from the National*

*Cancer Institute (NCI). Her research also has been partially funded through the IDeA Networks of Biomedical Research Excellence (INBRE) grant.*

## In the lab with Dr. Mahavir Chougule

### *What are you working on?*

Our current research is focused on development of multifunctional targeted nanoparticle systems of anticancer drugs and genes for the effective treatment and diagnosis of various cancers including lung cancer. We are designing a new generation of nanoparticles with "magic bullet" platform, which could recognize the location of cancer cells and selectively deliver anticancer drugs and genes to inhibit the cancer growth while sparing normal healthy tissues. We have been delivering anti-cancer drugs, protein inhibitors, or gene using nanoparticle system. We have developed the nanoparticle system using biodegradable and safer polymers such as albumin, gelatin, and chitosan. In addition, we are evaluating the developed multifunctional targeted nanoparticles for their physiochemical properties, efficacy under cancer cells and cancer models.

### *Why is it important?*

Although a large number of anticancer drugs and nanoparticles have been found to have anticancer effect, the application of these therapies has been limited due to high toxicity, short circulating half-life and associated adverse side effects. In order to achieve the targeted delivery of anticancer drugs and genes to cancer cells, we are working on development of targeted nanoparticle systems, which will be selectively delivered to cancer cells while sparing healthy tissues. We believe the targeted delivery of anticancer drugs or genes specifically to cancer tissues using targeted nanoparticles will improve the anticancer efficacy and minimize the associated adverse side effects. The preclinical studies of developed nanoparticles under cell culture and tumor bearing animal models will help to evaluate the efficacy of developed nanoparticles. In addition, the dose and frequency of dosing will also be reduced by increasing the blood circulation half-life, which will increase the patient compliance.

### *Where will it be applicable?*

Our multifunctional targeted nanoparticle systems would be a representative for the next generation of cancer treatment, which might be able to lead to the improved cancer therapy due to their property of selective delivery of anticancer drugs and genes to cancer cells while sparing healthy tissues. By applying this approach, we could engineer the nanoparticles to bypass the multiple clearance mechanisms in human body and

target the cancer cells to inhibit the cancer growth. Our nanotechnology based approaches and preclinical studies would form the framework for future clinical studies of developed nanoparticles for the treatment of lung cancer, mesothelioma, and neuroblastoma.

#### ***How can it affect future research?***

Our research goal is to develop multifunctional targeted nanoparticles that could recognize the cancer cells and selectively deliver the anticancer drugs or gene to inhibit the cancer growth. We believe this type of delivery systems could dramatically increase the therapeutic efficacy for anticancer drugs and genes against various cancers. Our delivery systems are not merely the treatment for various disease, they also serve as diagnosis tools. This means the cost for diagnosis of cancer could be reduced for patient's benefits. For the immediate future, the results obtained from our studies will also help lay the foundation for clinical trials with nanoparticles for treatment of cancer patients.

***Dr. Mahavir Chougule is an assistant professor in the Department of Pharmaceutical Sciences. He was recently awarded a National Institutes of Health (NIH) grant in the amount of \$300,000 for four years for a project entitled "Targeted Combination Therapy for Lung Cancer." He also has been the recipient of Hawai'i Community Foundation (HCF) medical research grant, HCF LE'AHl pulmonary research grant and University of Hawai'i at Hilo Research Council for research's seed grant to investigate the use nanocarriers for the treatment of lung cancer and mesothelioma.***



#### **On the clinical front with Dr. Carolyn Ma**

##### ***What are you working on?***

As a co-principal investigator with researchers at JABSOM and the UH Manoa School of Nursing, my project entitled "Community Engaged HPV Vaccination Research Project" is an inter-professional, multi-campus study that fosters collaborative learning, development and leadership using a team-based science approach.

##### ***Why is it important?***

Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States. HPV is the main cause of cervical cancer with 12,000 newly diagnosed cases and 4,000 deaths annually in the U.S. There are about 15,000 HPV-associated cancers in women that include other types of genital and oropharyngeal cancers that can be prevented by vaccine administration. Adequate cervical cancer screening and HPV vaccination has the potential to reduce cervical cancer deaths worldwide by as much as two-thirds. Vaccine administration before exposure to HPV demonstrates highest prevention, however, vaccination after exposure will be effective. Vaccination rates have remained around 25% since the release of two vaccines (Gardasil and Cervarix). The few data which exists on HPV vaccination rates in the 18-26-year-old group suggest lack of complete coverage in both men and women.

Cervical cancer rates are disproportionately high in Native Hawaiians, Filipinas and Pacific Islanders. In Hawai'i, 73 percent of teenage girls receive the first of the three HPV shot series with 50 percent completing the series. (CDC, 2011; Ratanasiripong, 2012). Through a student peer-designed community-outreach campaign including use of social media on University of Hawai'i Manoa and Hilo campuses, this study aims to: 1) gather information on the most common modalities by which students gain information about HPV and the vaccine; 2) examine current tools and suggest new tools and methods to convey information; and 3) involve peer health professionals to administer vaccines.

### ***Where will it be applicable?***

Information gained from a pre and post study survey and through student held focus groups will add the current knowledge base regarding HPV and the factors that influence their receiving the vaccine. Results of the study will be used to implement additional educational and vaccination recruitment programs at all U of Hawai'i campuses. In addition, information may also help to formulate vaccination campaigns in the younger age groups where the HPV vaccine is recommended before exposure to the virus.

### ***How can it affect future research?***

This pilot study will help to lay the foundation for larger, representative, and rigorous study that will test the effectiveness of peer, social, and mobile technology-based interventions in improving health and reducing disparities in cervical cancer by improving HPV vaccination rates among college aged women, Pacific Islanders and Filipinas. The study furthers the efforts for interprofessional health education collaboration.

***Dr. Carolyn Ma is an associate professor and co-chair of the Department of Pharmacy Practice. Her study is funded as an administrative supplement to the University of Hawai'i's RCMI-BRIDGES, through the National Institute of Minority Health Disparities, National Institutes of Health.***



## **On the clinical front with Dr. Deborah Juarez**

### ***What are you working on?***

I am working on a project understanding e-cigarette

use in youth and young adults. First marketed in China in 2004, electronic nicotine delivery systems (e-cigarettes) are devices, often shaped like cigarettes, that convert the contents of a replaceable cartridge (typically containing pure nicotine mixed with propylene glycol) into a vapor that a user inhales as he or she simulates smoking. The study involves surveying young adults to understand patterns of use (How often do they smoke e-cigarettes? Did they take up e-cigarettes to stop smoking conventional cigarettes? Do they use both?) and to estimate the cost-effectiveness of various policy initiatives that regulate e-cigarettes in some way.

### ***Why is it important***

E-cigarettes are an interesting topic because use is skyrocketing (\$1 billion in sales in US in 2013). Despite high use rates, e-cigarettes have not been rigorously studied and there is a great deal of uncertainty as to their effects on health. One hotly debated issue is the relationship between e-cigarettes and conventional cigarettes. Proponents of e-cigarettes cite studies showing that e-cigarettes are often used to aid efforts to stop smoking conventional cigarettes, which are known to cause cancer and lead to premature death. Others, however, believe the opposite--that e-cigarettes lead to increased use of other tobacco products, particularly among youth as they are sometimes sold in flavors (e.g., bubblegum, chocolate) that may be appealing to children. Potential risks of e-cigarettes, in and of themselves, are also poorly understood. We do not know how much nicotine or other potentially harmful chemicals are being inhaled during use and whether e-cigarette use is associated with both acute and long-term cardiopulmonary as well as other adverse effects.

### ***Where will it be applicable?***

Rates of e-cigarette use in Hilo are thought to be high compared to the rest of Hawai'i, so it is applicable right here in Hilo, but also throughout Hawai'i, the US, and the world where use is increasing dramatically particularly among youth and young adults.

### ***How can it affect future research?***

Our findings have the potential to dramatically advance our understanding of attitudes toward e-cigarettes, patterns of use, and the potential impact of e-cigarette regulation or taxation. The greatest impact will arise from our ability to lay the foundation for a more comprehensive study measuring the efficacy and toxicity of these devices as well as clinical and health outcomes.

***Dr. Deborah Juarez is an associate professor in the Department of Pharmacy Practice. She is funded by National Institutes of Health (NIH) National Center on Minority Health and Health Disparities.***

## On the clinical front with Dr. Supakit Wongwiwatthananukit



### *What are you working on?*

My research interest has engaged on the discovery of an alternative low-cost treatment for the treatment of tobacco dependence. I envision this treatment's use would increase access for insured and uninsured smokers, and could provide an alternative to current but expensive smoking-cessation drugs. I strongly believe the

approach of the drug leads and clinical candidates should be derived from natural products, which have their origin in traditional medicine. Thus, I have pioneered researching *Vernonia cinerea* (VC) to evaluate its efficacy in smoking cessation. This plant is commonly called Little Ironweed in Hawai'i and has been documented and widely used medicinally throughout Thailand, South-East Asia, China, Africa, and Fiji. Based on my preliminary clinical trial results conducted in Thailand, we found this VC plant can be a potential therapy with significant cost savings for the treatment of tobacco addiction. VC was well tolerated with no serious adverse events. To strengthen these initial clinical findings, the active compounds from VC need to be identified, isolated, tested for broader biological activities for cancer chemoprevention, brain and breast cancer treatment, nicotine dependence, and inhibiting the growth of lung cancer cells. Therefore, I have collaborated with colleagues (Drs. Pezzuto, Chang, Guendisch) on the faculty at DKICP UH Hilo, Dr. Yongli Chen from Hawai'i Pacific University, and two colleagues (Drs. Onoomar Poobrasert and Thanapat Songsak) from Silapakorn University and Rangsit University, Thailand. We have been able to identify drug leads and clinical candidates (i.e., sesquiterpene lactones, hirsutinolides), which will ultimately become novel, safe and marketable drugs. The preliminary results have showed these natural product-based drugs/compounds are able to exhibit antitumor, anti-inflammatory, smoking cessation (i.e., inhibiting the interaction between nicotine and its receptors), and cancer chemoprevention activities.

### *Why is it important?*

The results of natural product-based drugs/compounds activities for smoking cessation, cancer treatment & prevention, and inhibiting the growth of lung cancer cells would provide biological, mechanistic, and efficacy data that could be the foundation for advanced pre-clinical drug development and translational opportunity for research. For example, tobacco use disorder is a significant health concern and the chief preventable cause of death in the U.S. The landmark 2014 Surgeon General's Report on The Health Consequences of Smoking - 50 Years of Progress - reaffirms that the burden of smoking-attributable deaths remains at unacceptably high levels and will continue to do so for

decades to come unless urgent action is taken. Mounting evidence has shown that long-term exposure to tobacco smoke is the most common cause of lung cancer, which is now the nation's most common cancer killer among both men and women. In Hawai'i, the estimated annual economic impact of smoking on health care expenditures is more than \$686 million. In the state of Hawai'i, tobacco smoking kills more people than AIDS, murders, suicides, alcohol and drug abuse, car accidents, and fires combined each year. Given the current US economic climate, improving smoking cessation in the State of Hawai'i could be particularly important. Low cost of VC should increase access to its use as an alternative treatment for smoking cessation for both insured and uninsured health covered Hawaiian smokers and may provide an alternative to the purchase of currently approved but expensive smoking cessation drugs. If successful, this could increase smoker utilization, and increase the success rate for breaking the habit of smoking and greatly lower the substantial costs of health care for smokers in Hawai'i and in the US.

### *Where will it be applicable?*

I believe my research would affect the pharmacy profession and demonstrate that we could integrate pharmaceutical discovery with pharmaceutical application to create effective translational research programs and learning opportunities which benefits patients, practitioners, students, and researchers. More importantly, the information from the research would guide an optimization campaign to develop agents as novel therapeutics for smoking cessation, cancer prevention and treatment.

### *How can it affect future research?*

The results will enable an informed decision on how to proceed with future studies (e.g., standardized the active phytochemicals in VC which are responsible for the smoking cessation, cancer treatment and prevention activities, efficacy of its use, development of alternative dosage formulations of VC and supply information for clinical trials) and preliminary data for extramural funding agencies e.g., National Institute of Drug Abuse (NIDA, NIH). For example, our study for smoking cessation would provide essential structure-activity relationships and guide further natural product-led compounds development for smoking cessation. The characterization of electrophysiological and biochemical properties of the nicotinic receptor in lung cancer cells will lay the foundation for further understanding of lung cancer and treatment development. It is my hope that this project would translate research from the laboratory to clinical practice and to improve public health for Hawai'i and the nation.

*Dr. Supakit Wongwiwatthananukit is an associate professor in the Department of Pharmacy Practice. He has been the recipient of Hawai'i Community Foundation (HCF) medical research grant, University of Hawai'i at Hilo Research Council for research's seed grant, and also has been partially funded by the IDeA Networks of Biomedical Research Excellence (INBRE) grant.*

# Faculty Seminar Series

## Dr. Gordon Cragg

Reknowned cancer researcher Dr. Gordon Cragg presented his research seminar entitled “Multidisciplinary and International Collaboration: The Key to Success in Drug Discovery and Development” on the DKICP campus in Hilo on Feb. 12. A guest of Dean Pezzuto, Dr. Cragg was Chief of the Natural Products Branch of the National Cancer Institute for 25 years, retiring in 2004. His major interests lie in the discovery of novel natural product agents for the treatment of cancer and AIDS, and he has won several awards for contributions to the development of taxol. He remains active as a National Institutes of Health Special Volunteer.



*Dr. Gordon Cragg (left) met for a working lunch with PhD students, including Mayuramas “Jan” Sang-ngern, from Thailand who started work on her doctorate in pharmaceutical sciences at DKICP in 2011.*

## Bruce Stouffer

Bruce Stouffer, Director of Analytical and Bioanalytical Development, Bristol-Myers Squibb, presented his research seminar entitled “The Role of Selective Integration in BioPharma Transformation” on campus at DKICP Feb. 11. He manages a group of scientists with responsibilities ranging from contract operations, quality control, and small and large molecule bioanalytical project management. His seminar was sponsored by the student chapter of the American Association of Pharmaceutical Sciences (AAPS).



## Dr. Chennguo (Chris) Xing

Dr. André Bachmann (right), associate professor in pharmaceutical sciences, was the host on DKICP campus March 11 for Dr. Chennguo (Chris) Xing, associate professor of medicinal chemistry at University of Minnesota College of Pharmacy. Dr. Xing presented his research seminar entitled “Medicinal Chemistry Effort in Cancer Treatment, Prevention and Early Detection” in which he talked about a compound in the kava plant that shows signs of preventing tumors in mice. Kava, or `awa, is one of Hawai‘i’s oldest crops. His visit was sponsored by Dr. Helen Turner, head of the EPSCoR project at Chaminade University. Also attending the lecture was Big Island kava grower Ed Johnston and Jonathan Baker from UH Manoa’s Department of Anthropology.





## Kaua'i joins fight against infectious diseases with collaborative program



By Dr. Roy Goo

A joint collaboration between the Daniel K. Inouye College of Pharmacy and Wilcox Memorial Hospital has formed Hawai'i's first interdisciplinary Antimicrobial Stewardship Program (ASP) to help combat infectious diseases on Kaua'i. ASPs are programs designed to improve the utilization of appropriate antibiotics with the goals of improving patient outcomes and lowering healthcare associated costs, as well as slowing the development of antimicrobial resistance.

The management of infectious diseases is a constant arms race. As new antimicrobial agents are developed, bacterial, viral and fungal organisms evolve with new resistance mechanisms that confer immunity to even our best medications. In addition, it is estimated that 50 percent of antibiotics are used inappropriately.

One of the basic principles of infectious diseases is the more antimicrobial agents we use, the faster resistance develops. The practice of infectious diseases is the art of using only what is necessary to cure the infection and nothing more. In recent years multiple strains of bacteria have arisen that are resistant to all currently available antibiotics. With less and less novel antimicrobials in development, it has become imperative that we take all measures possible to slow the development of resistance. The infectious disease society of America (IDSA) and the Center for Disease Control (CDC), both heavily advocate for the implementation of ASPs.

As medication experts, pharmacists are uniquely qualified to help drive ASPs. Here in Hawai'i, the College of Pharmacy has played an integral role in the development

of these programs across the state. With support from Wilcox Memorial Hospital's inpatient pharmacy department and the hospital's Infectious Disease Physician Dr. Jimmy Yoon, the students play a valuable role of screening for patients who are on high cost or high risk antimicrobials. They then use their pharmacologic knowledge to assess the appropriateness of the antimicrobial regimen for each patient and present their recommendations to the entire infectious disease team, who makes changes to optimize therapy.

"The CDC strongly recommends that hospitals perform some form of Antimicrobial Stewardship and it is likely that it will become mandated by the Center for Medicare/Medicaid Services (CMS) in a couple of years," Dr. Yoon said. "At Wilcox Memorial Hospital we like to be ahead of the curve. Right now we are lucky that we have very few resistant bacteria but we want to keep it that way and there is a clear correlation between bacterial resistance and increased morbidity and mortality as well as health care costs. The drug pipeline for Antimicrobial agents is dry so we need to save the agents that we have. My anticipation is that for pharmacists this is going to be a huge area for growth and most hospitals have pharmacists on their antimicrobial stewardship teams."

Recognizing the importance of training pharmacists to fill this growing need, Dr. Yoon often spends the afternoon having discussions with the students and testing them on their drug knowledge. Students consult with members of Wilcox Memorial Hospital's Radiology staff, who also graciously volunteer their time to go over chest X-rays and other imaging studies pointing out abnormalities that serve as possible indications of infection while experienced pharmacy staff members review optimal dosing strategies, ensuring that students are well prepared for future positions in the field of infectious diseases.

The results of this program have been overwhelmingly positive with preliminary data demonstrating a decrease in length of stay as well as a decrease in intravenous antimicrobial utilization. This positive experience has led to other collaborative programs at Straub Clinic and Hospital and Pali Momi Medical Center (PMMC) on the island of Oahu. Dr. Melissa Yoneda, a DKICP alumni from the Class of 2013, is currently representing the College at PMMC where she has helped to establish a pharmacy-driven ASP, in collaboration with the PMMC pharmacy, nursing and physician staff.

The release of an ASP module and guidance statement from the CDC indicates that ASPs will likely become a

*continued on page 16*



At Wilcox Hospital are (center) Dr. Jimmy Yoon, DO (ID specialist at Wilcox), and (from left) fourth-year student pharmacists Cindy Mai, Romelynne Lamosao, Shadi Obeidi and Kenneth Navarrete.

requirement across the United States. Certain states such as California have already made it mandatory that hospitals that enjoy Medicare reimbursement have an established ASP in place.

The efforts of the Daniel K. Inouye College of Pharmacy has put Hawai'i on track with being compliant with this future requirement keeping Hawai'i on the cutting edge of medical care and ensuring the best care for Hawai'i's residents and visitors.

*Dr. Roy Goo is an assistant professor in the Department of Pharmacy Practice, based on the island of Kaua'i.*

# O'AHU

## Student pharmacists contribute to medication training for the ages

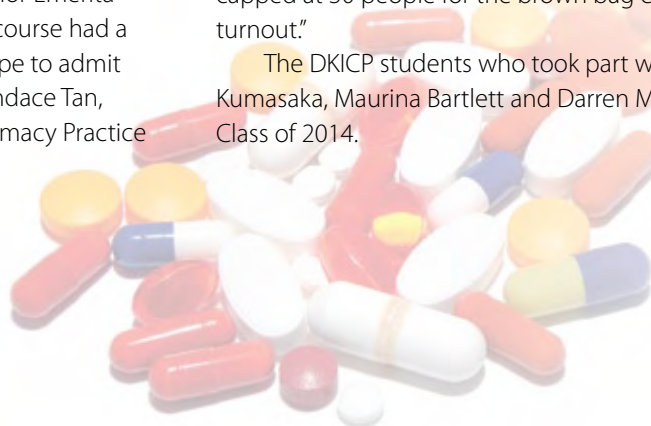
Fourth-year student pharmacists took part in a "Mini Medical School," that was aimed at helping about 100 people learn more about healthy aging on Feb. 15.

The event was offered this year for the first time. Sponsored by the John A. Burns School of Medicine (JABSOM) and created by UH Manoa Chancellor Emerita and Professor Virginia Hinshaw, the six-week course had a restricted application process. Developers hope to admit a wider audience in upcoming years, said Candace Tan, assistant professor in the Department of Pharmacy Practice

who supervised the pharmacy students.

"Our students used their training to conduct brown bag medication reviews after a talk on medication use in the elderly from Dr. Shari Kogan, the Medical Director of Geriatric Services at The Queen's Medical Center," Dr. Tan said. "We capped at 30 people for the brown bag event, and had 100% turnout."

The DKICP students who took part were Yan Lin, Audrey Kumasaka, Maurina Bartlett and Darren Mok, all from the Class of 2014.



# Student pharmacists reach out to community with Medication Safety Event

By Brianne Gustilo, Jaymie Kanda, and Sharon Lum

Dr. Eryn Kishimoto arranged for a group of student pharmacists from the Class of 2014 who are on Oahu for their fourth year rotations to present a Medication Safety Event with the Waipahu Senior Citizen Club on March 12. They presented important counseling points on the treatments for diabetes, cholesterol, blood pressure, osteoporosis, blood clots, and pain, as well as information on natural medicines and vaccines.

The event drew almost 30 participants. "It was very successful and the seniors found it really helpful. They inquired if we would be able to do more medication safety talks for other senior citizen clubs," said DKICP student Sharon Lum.

Eight student pharmacists also participated in a brown bag event where they reviewed the drugs with each senior

that brought medications with them. "I asked why they are taking the drugs and many did not know," student Brianne Gustilo said. "They knew only that their doctor told them to take them."

Explanations of what the drugs are for, the possible side effects, and the possible interactions from taking different kinds of drugs at the same time were given. The student pharmacists also clarified how to store individual drugs and how to watch for expiration dates. Not only did they emphasize the importance of taking medications correctly, but also of maintaining a healthy lifestyle.

"As student pharmacists, by going out into the local community, the experience provides great teachable moments for us," student Jaymie Kanda said. "But, more importantly, the outreach provides an opportunity for DKICP students to educate seniors, many of which have numerous questions and concerns about their medications."

Former DKICP student and current HPH/UHH DKICP PGY 1 Pharmacy Resident, Dr. Shanele Shimabuku states, "It went well. The seniors were very interested in learning about their medications."

Fourth-year pharmacy student, Jennifer Ota, said she received a thank you note from one of the seniors that she helped that day. "I feel very touched and appreciated," exclaims Ota. "It was really nice of her to send me a thank you. I definitely want to do this again!"

*Fourth-year student pharmacists Darren Mok, Jack Fernandez (DKICP Alumnus), Brianne Gustilo, Lara Berger, Amanda Nicolas, Jaymie Kanda, Scott Kamimura (Creighton), Shanele Shimabuku (DKICP Alumnus, PGY1 Resident), Sharon Lum, and Jennifer Ota spent time with the Waipahu Senior Citizen Club to give a presentation on prescription and OTC medication safety. The students also provided a brown bag session for the seniors.*



# Faculty, students meet with UH Manoa pre-pharmacy group

By Brianne Gustilo, Jaymie Kanda, and Sharon Lum

Assistant professors of the Daniel K. Inouye College of Pharmacy, Dr. Eryn Kishimoto and Dr. Cherie Chu, along with their fourth-year student pharmacists were asked to be guest speakers for the UH Manoa Pre-Pharmacy Association on Oahu. Pre-pharmacy students were eager to listen and learn about each speaker's individual journey to become part of the DKICP family.

The fourth-year students described their transition from high school to undergraduate to pharmacy school. While Kanda shared her more traditional journey to get to pharmacy school (i.e. four years of undergraduate and then applying), Nicolas spoke about completing two years of undergraduate prerequisites and then applying for DKICP. The pre-pharmacy students felt an especially strong bond with Brianne Gustilo, who had been a previous member of the UH Manoa Pre-Pharmacy Association and went on to attend DKICP.

The fourth-year students described their personal experiences with the college, which included involvement in extracurricular clubs, committees, organizations, and fraternities. They also shared about their opportunities to do internships with local pharmacies and their experiential rotations. Although the fourth-year students pointed out the increased demands of becoming a professional



(From left) Dr. Shanele Shimabuku, Hawaii Pacific Health/DKICP PGY1 Resident, DKICP Class of 2013, and student pharmacist Jaymie Kanda (Class of 2014) talk with Prepharmacy students at UH Manoa Cynthia Li and Michel Chon.

student compared to being an undergraduate student, they emphasized how rewarding a career in pharmacy is.

After the presentation, the floor was opened for questions, which included topics such as DKICP classes to the school itself to Hilo life. Students and professors were able to share personal study habits, Big Island favorites, and memorable experiences.



DKICP students and faculty speak to Pre-Pharmacy Association at UH Manoa.

# Activities demonstrate commitment to promoting diversity

**A**s chair of UH Hilo's Chancellor's Diversity Committee, Dr. Dana-Lynn Koomoa-Lange, assistant professor in Pharmaceutical Sciences, is an active mentor to Native Hawaiian students not only in DKICP but throughout the state.

Last semester, she helped some of pre-pharmacy and DKICP PharmD students present their summer work (clinic and research) for Ke Ola Mau, a health career pathways program that supports native Hawaiian students. Recently, she and other faculty, staff and students from UH Hilo, including our pre-pharmacy and DKICP students, participated in a community bridging program with students and teachers in Miloli'i and Waimea, and they joined cultural resource specialists in a traditional sunset ceremony at Hapai'ali'i Hei'au in Keauhou.

This semester, Dr. Koomoa-Lange and her husband, Ingo, who is a DKICP post-doctoral associate, were invited to join Gail Makuakane-Lundin from the Chancellor's office, to participate in the Miloli'i Opelu and La Elima Celebration. They took several DKICP students to celebrate the closing of the opelu season and honor the 1868 tsunami that hit the tiny fishing village of Miloli'i. The tsunami lifted the Hau'oli Kamanao Church off the ground and moved it intact to its current location. The event is commemorated by the touching mele, "La'Elima," which all the participants sang at the end of the festivities.

"These are the types of events that give not only cultural awareness but a sense of togetherness and unity to our students," Dr. Koomoa-Lange said. "It's been a humbling experience to see the students I've worked with become mentors themselves. With our rigorous curriculum, I'm impressed that they take the time to help others throughout the state live the dream that they themselves are accomplishing."

For example, DKICP is a regular host to another program for gifted Native Hawaiian children called Na Pua No'eau. Student pharmacists joined pre-pharmacy students recently to conduct a Super Enrichment Saturday program to demonstrate science-related activities intended to engage K-12 students.



PhD student Nathan Sunada (left) and prepharmacy student Trace Kaimana Kalei present information at La Puko'o.



Ke Ola Mau

Na Pua No'eau also funded a trip to Moloka'i Feb. 27-28 when two PharmD and two PhD students from DKICP gave presentations at the Moloka'i Future FEST. The four Native Hawaiian students spoke to students at Moloka'i High School and at the Moloka'i Intermediate School.

The student pharmacists were Jairus Mahoe and Kimberly Victorine, who gave presentations on Pharmacy Practice. The two PhD students were Micah Glasgow and Nathan Sunada, who gave presentations on Pharmaceutical Sciences.

In addition to educating younger, but very potential pharmacy students, Dr. Koomoa-Lange accompanied some of her students to the state capitol to participate in La Puko'a, an event that was organized by Representative Faye Hanohano to educate our legislators about Native Hawaiian programs at DKICP.

"We were very well received by our elected officials, who indicated they understand the value of encouraging and educating our keiki," Dr. Koomoa-Lange said. "Hopefully we have opened the door for continued dialogue."



Miloli'i Opelu and La Elima Celebration

# MOLOKA'I

## Moloka'i, as seen through the eyes of PharmD candidate Jairus Mahoe, Class of 2016



As I felt the 12-passenger propeller plane take off from the tarmac at Honolulu International Airport, I knew I would be in for an unforgettable experience. The thought of speaking to high school and middle school students as an advocate of health care has never crossed my mind, especially traveling to the

beautiful island of Moloka'i to do so.

Giving back to community is something everyone should do. We are all on this Earth together and need each other to survive and thrive. It was a privilege to be able to speak on behalf of the field of pharmacy and share my passion with our future generation. I knew I would have a lot to share, but I also knew that I would have a lot to learn and experience.

The students were filled with excitement and joy throughout our presentations. To be able to connect with and indulge their curiosity about their future was more rewarding than any presentation I have previously given. It would be misleading to say that it wasn't difficult to captivate their attention with talk of sciences and subjects pertaining to school when many students would like a break from the typical college spiel, but they embraced the idea of something new. To see the excitement in their faces when they answered a question, or to see their smiles and laughs when they could relate to something I said, it was truly an amazing experience.

Moloka'i Drugs is the only pharmacy on the island and we were able to meet with one of the pharmacists, Jon Mikami, who so graciously took us in and showed us around the pharmacy. To many of the students, this is the only pharmacy they have experienced, with many not ever hearing of or having been to a CVS Longs Drugs, Walgreens, or any chain retail store. But this did not stop them from



asking questions or showing interest in an unfamiliar field. With a fellow classmate of mine, Kimberly Victorine, I shared our backgrounds with the students, both of us being of Hawaiian descent and being born and raised on the Big Island of Hawai'i. Being able to communicate using Hawaiian words and familiar terms engaged the students.

In reality, a majority of the students will not go into pharmacy. Most will probably not even go into a healthcare related field. And that doesn't matter to me. My goal was to share my experiences and my passion, and ultimately educate, inspire, and encourage. If something I have said or done made a difference to just one student, even after all the hours talking and presenting, it would've still been worth every second.

## Moloka'i, as seen through the eyes of DKICP PhD candidate, Micah Glasgow

Today's children are tomorrow's future. Investing time and energy into the next generation will ensure a brighter future for all. Through the Ke Ola Mau program, in collaboration with DKICP, we were given the opportunity to speak with local Intermediate and High school students on the island of Moloka'i. We discussed current research goals of DKICP and the necessary steps to undertake to become a future researcher or PharmD student.

We engaged their minds with hands-on activities focusing on the difference between targeted vs. non-targeted drug delivery systems and its importance in cancer therapy. The activities initiated many unique questions from the students who, at the end of each session, showed a great deal of interest in both nanoparticles and the school of pharmacy.

Upon completion of each session we were thanked for the laughs and smiles with many students now choosing a path in the medical field. The knowledge and ideas we instilled in each student made our short trip a huge success and I hope to one day meet them again either at UH Hilo or at the DKICP.



## EXPERT BLOG: Provider status for pharmacists — one way or another

By Nathan Ludvigson  
Director, Government Business Development, Emdeon

*Emdeon is a provider of revenue and payment cycle management and clinical information exchange solutions, connecting payers, providers, and patients in the U.S. healthcare system. As Director of Business Development with Pharmacy Services for Emdeon, Nathan Ludvigson directs policy and business development for Pharmacy Services related to electronic prescribing, Health Information Exchange (HIE), Medication Therapy Management (MTM), Prescription Monitoring Programs (PMP), Durable Medical Equipment, Prosthetics, Orthotics, and Supplies (DMEPOS), and other pharmacy services areas. He also identifies, analyzes and makes recommendations regarding key legislative issues and regulatory matters impacting the pharmacy industry as needed with the pharmacy services executive team.*

*Reprinted from the Drug Store News newsletter, Feb. 17, 2014 with permission*

You may have heard the good news: through proactive involvement from pharmacists all across the state, California recently passed a law (SB 493 in October, 2013) declaring that pharmacists are healthcare providers who have the authority to provide healthcare services within the state. The law creates a new category of pharmacists by statute, for those who meet the criteria, and as a result creates new opportunities for pharmacists to engage with others more traditionally understood as healthcare providers (physicians, hospitals, clinics and health plans) to assist patients in managing chronic conditions.

All of us understand at some level the significance of what happened in California. But as is often the case, such a law creates a new series of questions. Will this action in California springboard other states to pass similar laws in 2014 and beyond? When will reimbursement opportunities for pharmacists as providers follow the statutes defining them as such? Will the Office of the National Coordinator (ONC) follow suit in later stages of Meaningful Use and

recognize pharmacists with provider status? And will reimbursement opportunities follow in later stages of Meaningful Use for pharmacists as a result? These questions are difficult to answer and certainly more difficult to put a timeline on as to when they may happen.

Even if we don't have the answers to the questions above right now, are there other ways in which we can see pharmacists gaining a greater foothold with provider status across the country? What about seeing examples of reimbursement model changes for pharmacists acting as providers?

As we know, health reform's "grand experiment" is underway as a result of passage of the Affordable Care Act. And although pharmacists aren't mentioned specifically as a provider participant within many of the Pioneer ACO models today, this doesn't mean pharmacists won't be permitted to integrate in the future or to create a plan for participation in these ACO models. Moreover, this doesn't preclude pharmacists from the opportunity to be involved with other care coordination models sponsored by the CMS Innovation Center Award Program.

For example, there is a specific model in Hawai'i that by design integrates outpatient pharmacists with the inpatient healthcare team (including hospital pharmacists). The model is titled, "Pharm2Pharm" and provides a new context for the community pharmacist to participate as a provider. The goal of the project is to reduce annual medication-related hospitalizations and emergency department visit rates and total cost of care among the elderly and others at risk in rural Hawai'i.

This model works by creating a formal hospital pharmacist-to-community pharmacist collaboration. It is designed to address gaps in care among patients at risk as they transition from a hospital to a community setting. In other words, the patient is formally "handed off" to the certified community pharmacist by the hospital pharmacist at discharge to perform similar services in the outpatient setting (medication reconciliation, patient counseling, proactive PCP collaboration) as were performed in the hospital setting. According to information provided by

*continued on page 22*



the program, Pharm2Pharm pays community pharmacists \$695 per patient enrolled per year on the assumption that there will be ROI to CMS (the award also funds the hospital pharmacists).

It seems the industry as whole will likely continue pushing for formal pharmacist provider status changes at the federal and state level via statute. We all know healthcare is

changing. It makes financial sense for all the providers across the spectrum to continue experimenting with ways in which they may work together to help improve patient outcomes and reduce costs. Ignoring any provider in the new healthcare continuum may ultimately be counterproductive in obtaining the ultimate trifecta: better outcomes, reduced costs and increased reimbursements.

## HMC credits Pharm2Pharm for award from accrediting body

Hilo Medical Center received the "Gold Seal for Approval" in late January and was recommended by the accrediting body for "Best Practices" for its Pharm2Pharm partnership with the Daniel K. Inouye College of Pharmacy. HMC also received a "Best Practice" recommendation for work on its Antibiotic Stewardship Project, according to HMC Pharmacist-in-Charge Nelson Nako, who was one of DKICP's first Preceptors of the Year.

*Hilo Medical Center CEO Howard Ainsley (center) recently met with Karen Pellegrin (far left), DKICP director of strategic planning and continuing/distance education and a team of Pharm2Pharm consultants at HMC.*



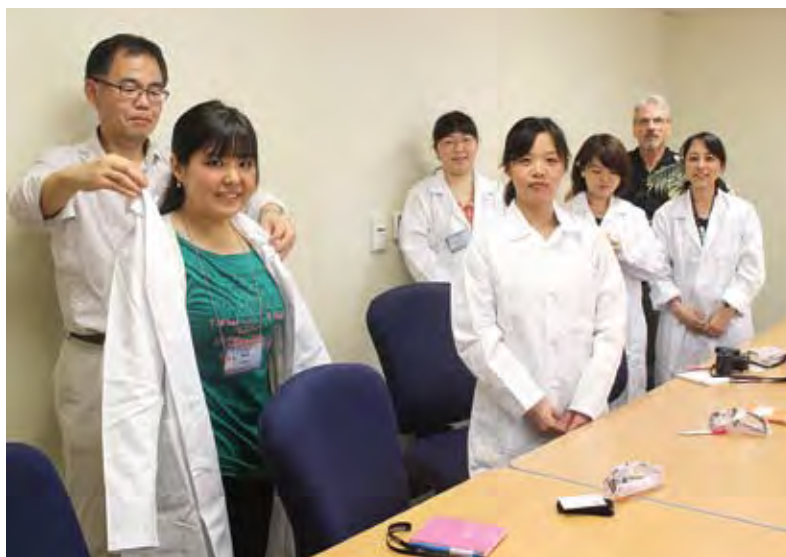


# DKICP welcomes pharmacy students from Japan

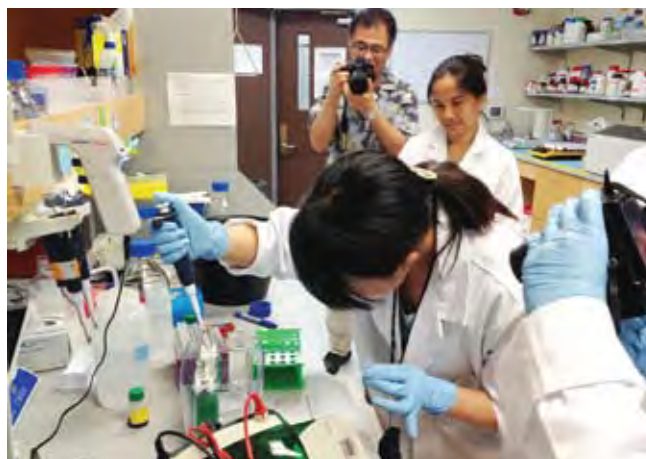
Five pharmacy students and their faculty sponsor from Matsuyama University in Japan visited UH Hilo from Feb. 23 to March 8 and were treated to an overview of the Daniel K. Inouye College of Pharmacy. UH Hilo has a Memorandum of Understanding (MOU) with Matsuyama, and the program was part of the Hawaiian EDventure program, sponsored by the UH Hilo Conference Center.

At an opening dinner, they had a chance for a personal visit with Dean John Pezzuto, Associate Dean Edward Fisher and Pharmaceutical Sciences Chair Ken Morris. Matsuyama faculty adviser Dr. Takumi Yamaguchi attended with students Miyoko Nakamura, Hitomi Semba, Kana Ninomiya, Yuki Morita, Tamiko Watanabe.

The Japanese students are in their third year of a six-year program in pharmaceutical sciences, where according to their website, “many students become researchers in universities, enterprises or research institutes.” The DKICP PharmD program ends with a four-year professional degree that prepares students to enter the field of pharmacy practice. Dr. Fisher began the educational component of the program with a lecture on the state of PharmD education in the U.S.



Dr. Takumi Yamaguchi (left) from Matsuyama University helps a student with a white coat that was presented to all visitors by DKICP's Dr. Ken Morris (second from right).



Students from Matsuyama University had opportunities to work in DKICP labs. (Photo by Dr. André Bachmann).

Throughout the two-week program, the students spent time with many faculty and staff. Dr. Morris presented the visitors with white lab coats and gave an overview of research at DKICP. They were given hands-on experience in the labs with pharmaceutical sciences faculty that included Drs. André Bachmann, Leng Chee Chang, Dana-Lynn Koomoa-Lange and Dianqing Sun.

Dr. Forrest Batz, assistant professor, gave the students an introduction to the Department of Pharmacy Practice that included a discussion on Hawaiian traditional medicine with a meeting with local healer, Uncle Kimo Awai.

The students also were taken to Hilo Medical Center, accompanied by Dr. James Hall from Pharmacy Practice and Mina Pharmacy, accompanied by Asst. Clinical Education Coordinator Ms. Jennifer Aguiar. They were given a lecture and tour of student labs with faculty member Mrs. Mimi Pezzuto and met with many third-year students with Mr.

Daryl Masanda, interim director of student services. Dr. Victoria Rupp from Pharmacy Practice gave them a lecture on applied pharmaceutical care activity.

The students were able to enjoy many aspects of Hawaiian life through the Hawaiian EDventure program, such as tours of Rainbow Falls, King Kamehameha Statue, Naha Stone, Coconut Island and Liliuokalani Park. The tours fit in the concept of the EDventure Program, said the Conference Center's Sharay Uemura.

“Adding the educational component is our specialty and is what makes us entirely different from the standard tour companies,” Uemura said. “We believe that in order to receive the most benefit from what our island has to offer, the educational component is necessary.

Although our programs may visit a lot of the same locations as a regular tour company, the educational component is deeply intertwined. It has not been challenging to incorporate education because our island is

*continued on page 24*

so enriched with science and culture that it overflows with education.”

Dr. Yamaguchi was pleased with the overall experience and hopes to return next year with a new group of pharmacy students. In addition, Dr. Lara Gomez, the Director of Clinical Education, is developing clinical rotation sites in Japan that will broaden the experience of DKICP student pharmacists.

*Hawaiian EDventure is Hawaii’s premier experiential, educational and cultural travel study program and proudly touts the recognition of being honored as a “Best Practice” program in Hawaii and internationally. An integrated, and holistic,*

*approach to learning includes a blending of science, art, history, environment, recreation and cultural learning components.*

*Dr. Forrest Batz, Department of Pharmacy Practice, shows visitors from Matsuyama University research posters on display at DKICP campus.*



## Chancellor Emerita Rose Tseng surprised with gift

Dean John Pezzuto presented Chancellor Emerita Rose Tseng, who also is a professor at DKICP, with an official portrait to commemorate her service to the University of Hawaii at Hilo. The oil-on-canvas portrait was created by award-winning artist, Linus Chao, who has studied, exhibited, and taught art from China and Tokyo to New York and Canada. Encased with an antique gold-leaf frame with her name and years as chancellor engraved on a plaque at the bottom, the artist said he used several photos he had taken throughout the years as a reference. Dr. Tseng was UH Hilo Chancellor from 1998-2010, and has taught leadership courses in pharmacy, and is also the Director of International Relationships.

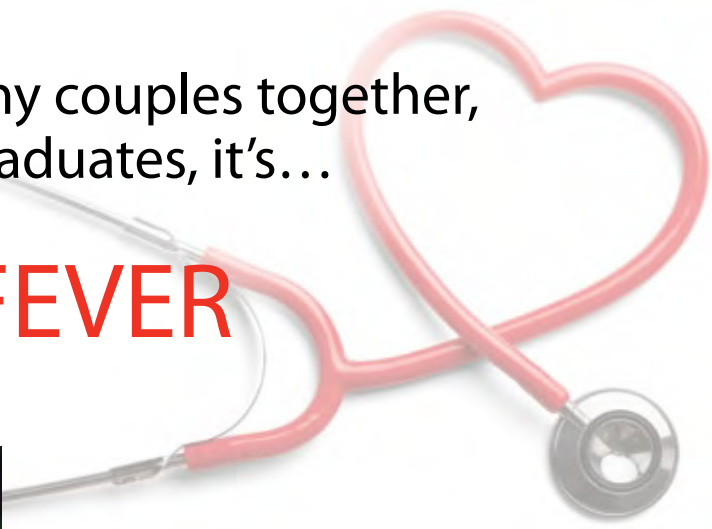


*Linus Chao*



Spring Fever brings many couples together, but for several DKICP graduates, it's...

# PHARMACY FEVER



## Garret and Tess (Hand) Blankenship

We met during the first few days of orientation when we were placed into the same advisory group. We started hanging out at first by studying together with the same friends. We both enjoyed taking study breaks and going hiking or spending time at the beach (when it wasn't raining).

Our friendship quickly grew into something more. We both took advantage of being in Hawaii for pharmacy school so we spent our time between studying for exams traveling around the islands and seeing everything we could.

We were married on Kaua'i during the last year of pharmacy school. We had a daughter, Adelynn in 2011 and a son Liam this past January. Garret signed on with the Navy during pharmacy school and is now a clinical pharmacist in Groton, Connecticut. The Navy has given him many great opportunities he might not have had outside of it. He has his own patient appointments and is able to prescribe a limited number of medications. He works on diabetes management, hypertension, hyperlipdeimia, pain management and many other chronic disease states. We are currently planning our next move with the Navy in September 2014.

*continued on page 26*

## Lawrence Chan and Irene Chaisri

Striving to achieve our goals, Lawrence and I met each other during pharmacy school at the University of Hawai'i DKICP in 2008. We sat at opposite ends of the classroom and often passed one another with a simple smile for a greeting. Our paths often crossed but our conversations were always short. We were complete opposites. But this changed when we started spending more time together along with mutual friends. It was then we got to know one another a little better and realized our differences were not as extreme. We had similar aspirations, similar goals and became a couple in 2010. We are engaged to be married in 2015

After graduation in 2012, we moved to Northern California. Both Lawrence and I work at Walgreens. I work in Fremont and Lawrence in San Mateo. Both of us are very thankful for our education at the College of Pharmacy, we were well prepared and have become successful in our careers as pharmacists.



### Paul Brian and Danita Dee (Henley) Narciso

We first met in first year during lab class. I was late to class and Paul invited me to join his group at his lab table. Paul and I were friends first and shared a lot of common interests (sports, outdoor activities, and of course pharmacy). We were not sure about our future until fourth-year pharmacy-school rotations. We were deciding where we would complete our rotations (which meant traveling for us both). We came to the decision that we would travel but remain a couple. It was a point in our lives where we would have either gone our separate ways or committed to a future together. We chose the latter.

We graduated with the class in 2012 and got married August 16, 2012. We had a baby girl April 29, 2013 (Maya Elizabeth Narciso). Paul works for Kappa Pharmacy, an independent pharmacy that is part of the Lihue Pharmacy Group on Kaua'i. I work for the MSCP program for the Daniel K. Inouye College of Pharmacy.



### Jason and Roxanne (Sewake) Okazaki

When we first met, Jason was a P2 and I was a P1. We met at a class gathering outside of school. Jason used to play his guitar at our class hangouts, and I was drawn to his music and would attempt to sing-along to the songs he played. We immediately felt that we connected in many ways, and as time progressed, we continued to learn new things from each other and grew stronger together as a couple.

After Jason's graduation and a year of being engaged, we were married on August 17, 2013. Our ceremony took place at the Paradise Cove Crystal Chapel in Ko Olina, and our reception was held at the Hale Koa Hotel, on Oahu. It was a beautiful day, and everything turned out better than we could have imagined. We were grateful to celebrate our marriage in the company of our many

friends from pharmacy school, including Chelsie Won who was my maid of honor, and Jaymie Kanda, who was my bridesmaid. Tracey Niimi at TN Photography had taken all of our beautiful wedding and engagement photos.

Our newlywed life has been great, and we have been living on Oahu as I complete my P4 rotation. Jason is currently working as a pharmacist for Walgreens, and I recently got hired at Costco. In addition to being a pharmacist, I also plan on starting a wedding business in the near future.

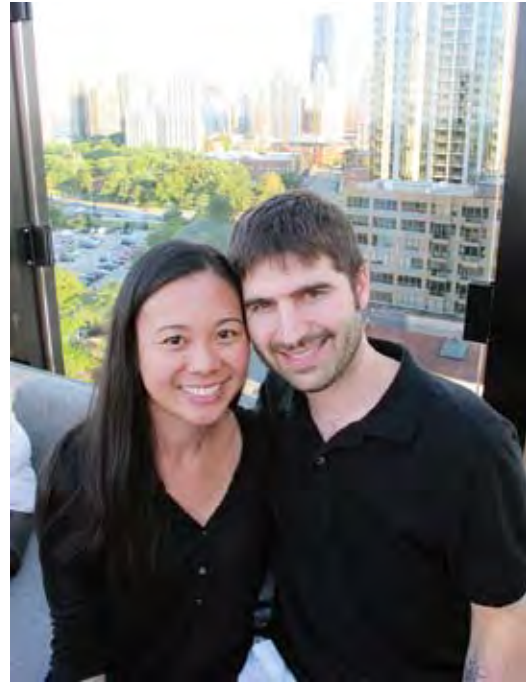
We are grateful for the many opportunities that pharmacy school has given us. We have gained much knowledge in becoming a successful pharmacist, made many long-lasting friendships, and have ultimately been blessed with the opportunity we had to meet our lifetime partner.



## Curtis and Adrienne (Au) Start

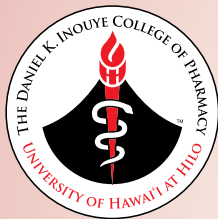
Curtis and I were both part of the inaugural class of 2011 at the University of Hawai'i at Hilo College of Pharmacy. Being the only pharmacy class on the island at the time made us a very tight-knit group from the beginning. Throughout pharmacy school, Curtis and I remained active in community events, student government, and were founding officers of the Gamma Theta chapter of the Phi Delta Chi professional pharmacy fraternity. Our extracurricular involvement and passion for the profession of pharmacy were definite factors in bringing us closer together. After graduation, Curtis worked as a staff pharmacist for Walgreens and I was a PGY-1 pharmacy practice resident at the Edward Hines, Jr. VA Hospital in the Chicagoland area. We got married on March 3, 2012, in Honolulu, with some of our close pharmacy school classmates in attendance.

We currently live in Ann Arbor, Michigan, with our golden retriever, Xena. Curtis now works for Henry Ford Hospital as a staff pharmacist of an ambulatory care satellite pharmacy. I work as an inpatient clinical pharmacist at the VA Ann Arbor Healthcare System. We are happy to announce that we are expecting our first child, a daughter, in July.



## Alumni Report

By Dr. Benjamin Cloud  
Class of 2011



“After graduating from DKICP with a strong pharmacy base, I served as PGY-1 resident at Heartland Regional Medical Center in St. Joseph, Missouri to further my knowledge and confidence as a pharmacist. I was fortunate enough to expand my pharmacy knowledge and grew to love all aspects of the pharmacy profession. My favorite field in pharmacy is the Emergency Room, which I was introduced to with a rotation at Queens Medical Center on Oahu. I love the fast pace with emotional highs and lows. It is a great location for pharmacist to show how smart and well equipped we are to the other medical professions.

After my residency I joined the Indian Health Service as a Clinical Pharmacist stationed in San Carlos, AZ on the Apache reservation. I was over

inpatient services and given freedom to expand pharmacy direct patient care services by creating a flu clinic, anticoagulation clinic, and asthma clinic. I was also able to show the value of a pharmacist by expanding pharmacy services into the emergency department aiding direct patient care and creating protocols to better patient care and save money. I am currently stationed in White Cloud, Kansas serving as the Chief Executive Officer and Chief of pharmacy services for the White Cloud Indian Health Station. It has given me the opportunity to be involved in all aspects of health care and develop personal relationships with the local Indian tribes. Since leaving DKICP I have added a new addition to my greatest accomplishment, my family. I have a son named Nixon Joseph Cloud. As with all my kids, my pride and joy. My next goal is to find a way back to my 'ohana in Hawai'i and continue enjoying life. Hang loose!”

# Phi Delta Chi leads Pacific regional conference in Honolulu

By: Bryan Huynh, Jill Villarosa, LaTasha Riddick, and Janine Masri

On February 21-23, the Gamma Theta Chapter of Phi Delta Chi at the Daniel K. Inouye College of Pharmacy had the honor of hosting the 2014 Pacific Regional Conference of the Professional Pharmacy Fraternity. Every two years, a chapter in cycle is given the privilege to host this prestigious business and leadership conference. In attendance were more than 140 student and professional members from the University of Southern California, University of the Pacific, Oregon State University, Pacific University, California Northstate University, and Washington State University. This three-day seminar provided professional development, networking, and leadership enrichment.

Conference planning began in 2012, when members of Phi Delta Chi collectively worked to secure funding and develop plans to effectively encourage organization members from across the country to make the extensive trip to the islands for the 2014 conference. Member LaTasha Riddick (Class of 2015) led these efforts as committee chair, working closely with the executive board of the Gamma Theta Chapter to secure venues, invite speakers, schedule events, and oversee the planning committee.

Promotions included some unique and creative works led by member Madison Karr (Class of 2015) and her team. Seven months before the conference, Gamma Theta members who attended the 69th Grand Council in Omaha, NE handed out 400 custom-made leis with “Save the Date” cards containing QR codes linking attendees to the chapter’s website and registration page. Needless to say, a little bit of the Aloha Spirit was seen in Omaha that day, with floral leis adorning so many smiling Phi Delta Chi members. This was followed by a beautiful hula performance at the session’s close, formally inviting everyone to come visit Hawai`i for the next conference in 2014. Subsequent promotions included three promotional videos that were directed, filmed, and edited by Gamma Theta members. Personalized invitations were physically mailed out to each chapter in the Pacific Region.

The DKICP faculty Drs. Aaron Jacobs and Forrest Batz, along with recent DKICP pharmacy graduates Drs. Reece Uyeno, Matthew Sasaki, and Margaret Kang, facilitated educational workshops at the 2014 Pacific Regional Conference. Hawai`i chapter brothers participated in



LaTasha Riddick took the podium at the Phi Delta Chi regional conference in Honolulu. (Photo by Tyler DeNardo, Class of 2017)



*DKICP student pharmacists from Phi Delta Chi demonstrated Hawaiian aloha with a hula at the conference.*

committee work developing policies for the National Phi Delta Chi organization.

The conference closed with an elaborate banquet dinner, completed with an inspirational talk from the University of Hawai'i's own Dr. Luoluo Hong and a Hawaiian translation of Phi Delta Chi's Reflection on Brotherhood by member Nick Ferreira (Class of 2017). The vision of sharing the Aloha Spirit came full circle with an encore presentation of hula choreographed by Class of 2016 Student Pharmacist, Shanon Makanui. At the conclusion of the conference, members were able to enjoy the Hawaiian sun and warm waters at Ala Moana Beach Park.

The Pacific Regional Conference included hundreds of hours of planning with efforts from Brothers at Gamma Theta and other Pacific Region chapters, as well as faculty and staff from specific departments in the University of Hawai'i at Hilo. Special thanks to Tracey Niimi, UH Hilo Campus Fee Board, UH Hilo Graphics Department, Ala Moana Hotel, Phi

Delta Chi Grand and Regional Officers, workshop facilitators, Dr. Luoluo Hong, Gamma Theta Regional Conference Committee, donors, supporters, all of the Pacific Regional Conference attendees, and to Dean John Pezzuto.

Dean John Pezzuto had voiced the importance of students attending conferences, and continually supports these efforts through his commitment to providing an ongoing Leadership Enrichment Fund to the DKICP students. His contribution of nearly \$12,000 to Phi Delta Chi students to attend the Pacific Regional Conference allowed more than 140 future pharmacists to connect with current pharmacy leaders from across the country.

The 2014 Pacific Regional Conference in Hawai'i exceeded beyond the expectations of everyone involved, and having visitors from across the sea made these efforts well worth everyone's time and energy. The Gamma Theta chapter was honored to be able to successfully share the meaning of Ohana to their guests, just as they experience everyday back home in Hilo with everyone at the DKICP.

In the words of LaTasha Riddick, Regional Conference Chair, "It was a great privilege to plan and execute Gamma Theta chapter's first Pacific Regional Conference. Planning a conference is hard work, but extremely rewarding and worth the time and effort; especially with the unwavering support and commitment of fellow Brothers. This was an experience that all of us shared and will never forget."

*continued on page 30*

**"It was a great privilege to plan and execute Gamma Theta chapter's first Pacific Regional Conference. Planning a conference is hard work, but extremely rewarding and worth the time and effort; especially with the unwavering support and commitment of fellow Brothers. This was an experience that all of us shared and will never forget."**

Attending the conference were: (front row): DKICP faculty Drs. Forrest Batz, Linda Connelly and Aaron Jacobs; (back row from left): Jack Goldsberry (Class of 2014), Janine Masri (Class of 2014), Jin Bae Pak (Class of 2015), and Andy Le (Class of 2014).

Student pharmacists from the Gamma Theta Chapter of Phi Delta Chi at the Daniel K. Inouye College of Pharmacy at UH Hilo have been planning to host the 2014 Pacific Regional Conference of the Professional Pharmacy Fraternity since 2012. More than 140 student and professional members from the West coast participated in this three-day seminar, which provided professional development, networking, and leadership enrichment. (All photos by Tyler DeNardo (Class of 2017).







## APhA recognizes student pharmacist Jed Sana with award for patient interaction

The American Pharmacists Association (APhA) named Jed Sana, DKICP student pharmacist from the Class of 2014, an awardee in the 2014 Pharmacy Today One to One Patient Counseling Recognition Program.

The award was announced at the group's annual meeting, APhA2014, in Orlando on March 29. APhA stated they were giving the award to "pharmacists and student pharmacists who step out from behind the pharmacy counter to interact with patients – those whose superior communication skills have resulted in improved outcomes for their patients."

"Jed has been a leader in his class since he started pharmacy training, so I'm happy he's getting this national recognition," said Mrs. Mimi Pezzuto, on faculty at DKICP. "He volunteered many long hours working with the community while maintaining good grades, and has truly been a role model for many other students."

In his words, Jed says:

"I am an avid supporter of student pharmacists getting as much face time with patients as possible, as well as pharmacists living up to the standard of being one of

the most accessible health care professionals. This award represents the use of medication expertise, interpersonal relationships, and the passion to serve others to make an impact on the community; and I am proud to be recognized for such an achievement.

However, I cannot accept it alone, as this really is an accomplishment of the entire Pacific Island Mobile Screening Clinic (PIMSC) team. Fond memories come to mind when I reminisce about all the hard work contributed by faculty advisors, team officers and volunteers, and a multitude of community supporters. Whether it was constructing makeshift clipboards at 1 am, driving miles and miles along the Big Island coast, or dancing the electric slide at a rural health fair, PIMSC spent countless hours creating opportunities to improve the lives and health of hard-to-reach populations.

My hope is that PIMSC builds on its momentum to expand its services and that it remains an avenue for pharmacy students to not only solidify screening procedures but, more importantly, learn about altruism and selflessness."

The PIMSC project took top honors last year when the American Association of College of Pharmacy (AACCP) recognized the students for their community service awards.

## Pharmacy students host 5th annual blood drive

By Ericson Ganotisi, Student Pharmacist, Class of 2015

Student pharmacists from the Daniel K. Inouye College of Pharmacy (DKICP) sponsored a blood drive Jan. 22 in Campus Center 301 on the UH Hilo main campus. This is the fifth annual blood drive sponsored by student pharmacists at UH Hilo. According to statistics from the Blood Bank of Hawai'i, about 200 donors are needed every day to meet the needs of Hawai'i's patients with up to 60% of people in Hawai'i needing blood sometime in their lives. However, only two percent donate.

"This is a very important community service that we are pleased to continue as it exemplifies our responsibility as healthcare professionals in promoting public health," said Ericson Ganotisi, a third-year student pharmacist at the DKICP.

This year, 101 pints of blood was donated, exceeding the goal of 90. Basic donor requirements include: be at least 18 years old, be in good health, weigh at least 110 pounds, and skin should be free of piercings, tattoos, or other punctures (professionally-done ear piercings are acceptable)



Third-year student pharmacists Krista Kido and Edwina Leung, "practice what they preach" at the blood drive.

for one year. A detailed list of eligibility requirements may be found at [www.bbh.org](http://www.bbh.org).

"We encourage everyone to donate to a worthy cause. This is a relatively easy way to make a huge impact in

the lives of people and it only takes one hour," said third-year student pharmacist, Tracy Ng. "A total of 126 appointments were booked this year and we are extremely thankful for the community's continued support."

The drive was a collaboration between the Blood Bank of Hawai'i and several DKICP student organizations including the National Community Pharmacists Association (NCPA), Kappa Psi Pharmaceutical Fraternity, Inc., Academy of Managed Care Pharmacy (AMCP), and the American Pharmacist Association Academy of Student Pharmacists (APhA-ASP).

# Kappa Psi helps Habitat for Humanity

[Kappa Psi Pharmaceutical Fraternity volunteered with Habitat for Humanity in Kona March 8-9. In the words of Tiffany Khan, from the Class of 2015, this is how they became a part of this community effort.]

When Kappa Psi Pharmaceutical Fraternity was in the process of getting chartered, we began looking for community service events. Having heard about Habitat for Humanity, I reached out to them. Last year April, we helped paint a newly built home in Waimea. We wanted to continue our efforts and give back to the community so once again Kappa Psi and Habitat for Humanity collaborated and we were able to make this possible for another family in Kailua Kona.

Part of Hawaiian culture, 'ohana means family which emphasizes that they are bound together and members must remember one another. The concept of 'ohana has motivated Kappa Psi Epsilon Psi to extend helping hands to families who are less fortunate, and on March 8th, 25 brothers offered their aid in the Habitat for Humanity, a nonprofit organization with a mission to build and repair houses all over the world using volunteer labor and donations.

At the break of dawn, the brothers made the 80-mile road trip to a family's home in Kailua-Kona, Hawaii. The one story, newly built home was in need of a fresh paint coat. With the collaboration of a construction crew, we grabbed a long-stick roller paintbrush or a hand paintbrush and painted the exterior and garage of the house. The homeowners were

touched with the chapter's hard work and returned their appreciation with generous home-cooked Hawaiian meals. The family now lives in a home in which wears a beautiful coat of light brown paint with fresh borders and trimmings.

Through this community service event, we believe that Epsilon Psi was able to promote the pharmacy profession by helping those around us. Improving quality of life improves overall health and shows pharmacists are interested in more than the medication aspect of pharmacy; we are treating the whole person. By interacting with members of the community we are better able to understand them which can help us in treating them. Getting involved in the community helps us as future pharmacists become more accessible and gives the community a reason to get past the intimidation of the white coat, so they feel more comfortable approaching us as future healthcare providers.

We plan to continue our efforts with Habitat for Humanity to help build/paint homes with them either once a semester or once a year from here on out.



## Faculty Briefs

**Julie Adrian, DVM**, assistant professor, Department of Pharmacy Practice, is the lead author on an article entitled "Development of the Veterinary Medicine Rotation Component of the Introductory Pharmacy Practice Experiences Curriculum" in the spring edition of *Currents in Pharmacy Teaching and Learning* along with co-authors **Lara H Gomez** and **Supakit Wongwiwatthananukit**.



**André Bachmann**, associate professor, Department of Pharmaceutical Sciences, was issued a United States Patent (US 8,597,904) on December 3, 2013 entitled "Pharmaceutical Compositions for the Treatment of Conditions Responsive to Proteasome

Inhibition." Bachmann is lead author of the patent that was initially filed through the University of Hawaii Office of Technology Transfer and Economic Development (UH-OTTED) and also includes co-inventors Robert Dudler from the University of Zurich in Switzerland and Michael Groll of the Technical University Munich in Germany.

**Leng Chee Chang**, assistant professor, Department of Pharmaceutical Sciences, published an article entitled "Bioactive sesquiterpene lactones and other compounds isolated from *Vernonia cinerea*" along with co-authors **Ui Joung Youn**, Gabriella Miklossy, Xingyun Chai,



**Supakit Wongwiwatthananukit**, Onoomar Toyama, Thanapat Songsak and James Turkson in the journal *Fitoterapia*. She also was lead author in an article entitled "Herbicidin Congeners, Undecose Nucleosides from an Organic Extract of *Streptomyces* sp. L-9-10" with co-authors Xingyun Chai, **Ui Joung**

**Youn, Dianqing Sun**, Jingqiu Dai, Philip Williams, **Tamara P. Kondratyuk**, Robert P. Borris, Julian Davies, Ivan G. Villanueva and **John M. Pezzuto**, published in the *Journal of Natural Products*.



**Mahavir Chougule**, assistant professor, Department of Pharmaceutical Sciences, published: 1) "Formulation Development and Evaluation of Hybrid Nanocarrier for Cancer Therapy: Taguchi orthogonal Array Based Design" with co-author Tekade RK, in *BioMed Res Inter.*; 2) "Efficacy of Aerosolized Celecoxib Encapsulated Nanostructured Lipid Carrier in Non-small Cell Lung Cancer in combination with Docetaxel" with co-authors Patel AR, Ian T, Patlolla RR, Guangdi W, Singh M. in *Pharm Res.* and 3) "STAT-6 siRNA Encapsulated Nanocarriers: Formulation, Characterization, and Ex-vivo Proof of Concept using an Adenocarcinomic Cell Line" with co-authors Youngren SR, Tekade RK, Gustilo B, Hoffmann PR in *BioMed Res Inter.*

**Linda Connelly**, assistant professor, Department of Pharmaceutical Sciences, presented a poster of her research along with post-doctoral associate **Michael Weichhaus** entitled "Regulation of osteoprotegerin expression in breast cancer cells by nuclear factor-kappaB" at the Annual Meeting of the American Association for Cancer Research April 5-9 in San Diego. She also presented a poster there along with **Aaron Jacobs**, assistant professor in pharmaceutical sciences and PhD student **Nalini Yadav** entitled "Investigating the role of the adipocyte-macrophage interaction in breast cancer metastasis."



**Roy Goo**, assistant professor in the Department of Pharmacy Practice, has been appointed Senior Clinical Pharmacist for the Pharm2Pharm project. In this role, he serves as a clinical resource to participating pharmacists state-wide, and as clinical pharmacist expert in the project's training sessions. He also is part of the Pharm2Pharm continuing education training faculty, helping to train current as well as new consulting pharmacists.

**Aaron Jacobs**, assistant professor, Department of Pharmaceutical Sciences, presented a poster of his research along with research technician **Christina Wales** entitled "Heat shock-mediated suppression of ODC protein expression



in colorectal cancer cells" at the Annual Meeting of the American Association for Cancer Research April 5-9 in San Diego. He also presented another poster with John Cusick, assistant professor at California Northstate University entitled "HIC (MDFIC) is a protein that interacts and colocalizes with the RELT family of TNFRs."



**Carolyn Ma**, co-chair and associate professor and **Supakit Wongwiwatthananukit**, associate professor, Department of Pharmacy Practice, presented a research poster on "Factors Influencing Consumers to Purchase Over-the-Counter Drugs in American Samoa" at the 2014 American Pharmacists Association (APhA) Annual Meeting & Exposition in March. The primary author is third-year student pharmacist **Francine Amoa**.



**Dianqing Sun**, assistant professor, Department of Pharmaceutical Sciences, coauthored: 1) "Synthesis and antibacterial evaluation of anziaic acid and analogues as topoisomerase I inhibitors" in *MedChemComm* with H Lin, T Annamalai, P Bansod, and Y-C Tse-Dinh; 2) "Inhibitory effect of a callophycin A derivative on iNOS expression via inhibition of Akt in lipopolysaccharide-stimulated raw 264.7 cells" in *Journal of Natural Products* with **E-J Park**, L Shen, and **JM Pezzuto**; and 3) "Spectinamides: a new class of semisynthetic anti-tuberculosis agents that overcome native drug efflux" in *Nature Medicine* with RE Lee, JG Hurdle, J Liu, DF Bruhn, T Matt, MS Scherman, PK Vaddady, Z Zheng, J Qi, R Akbergenov, S Das, DB Madhura, C Rath, A Trivedi, C Villellas, RB Lee, Rakesh, SL Waidyarachchi, MR McNeil, JA Ainsa, HI Boshoff, M Gonzalez-Juarrero, B Meibohm, EC Böttger, and AJ Lenaerts.



**Patricia Uber**, co-chair and professor, Department of Pharmacy Practice, was an invited speaker at the 34th Annual International Society for Heart and Lung Transplantation in San Diego April 9 and gave a talk entitled "Immunosuppression: Induction and Maintenance" in the ISHLT Academy: Core Competencies in Nursing, Health Science, and Allied Health. She was also invited to speak about "Progression of PAH: Where Do We Go From Here" in the "A Lifecycle Journey in Pulmonary Hypertension" at the same conference on April 11.

# Pre-Pharmacy Program reaches out to Hilo students

By Dr. Linda Connelly and Susannah Welch

In January and February 2014, the Pre-Pharmacy Program visited high schools in Hilo to inform students about the academic pathway to obtain a PharmD degree and the career of pharmacy. Thirty DKICP student volunteers joined professor Linda Connelly and Susannah Welch, Pre-Pharmacy advisor, to deliver workshops in health pathways classes at both Waiakea High School and Hilo High School. All of the PharmD students who assisted with the high school presentations are Phi Delta Chi (PDC) Gamma Theta Chapter members. Anissa Marzuki, who serves on the PDC Community Service Committee, spoke about the organization's community involvement, "As an organization, Phi Delta Chi is committed to service. Being a part of the Hilo community allows close contact with residents, including the students who are part of the pre-pharmacy organization at UH Hilo and those that attend area high schools. Part of the community service endeavor entails educating others about the field of pharmacy and health."

During the school visits, high school students worked in small groups with the PharmD students to complete hands-on activities related to pharmacy. Afterwards, the high school

students had the opportunity to ask questions and PharmD students shared their educational and work experiences. Jessica Bergner is a Health and Physical Education teacher at Waiakea High School and her classes participated in the workshops; after the visit she commented "I had a number of students today tell me that they really enjoyed the presentation, 'quiz', and just the fact that they got to talk story with actual UH students."

In addition, the high school students received information about the Pre-Pharmacy Program and the academic pathway from high school to pharmacy school. Overall, the team from DKICP met with more than 200 high school students in grades ten through twelve. Kimberly Ann Victorine, a second-year student pharmacist and graduate of Hilo High School, reflected on the visit, "I really enjoyed being able to return to my alma mater and to speak with the students about pharmacy. When I was their age I never even thought of pharmacy. I think that it's great they are being introduced to different careers in the health industry."

The high school presentations were part of ongoing outreach efforts by the Pre-Pharmacy Program to educate the local community about the career of pharmacy and the option to pursue a degree in pharmacy at the DKICP.



Student pharmacists who participated in high school outreach with the Pre-Pharmacy Program included Daryl Sakado, Kevin Flores, Nicholas Ferreira, Leilani Isozaki, Moani-Lehua Hagiwara, and Melissa Iida.

## Preceptor Focus:

### Dr. Shawn Scarlett, PharmD, BCOP

Dr. Shawn Scarlett is an oncology clinical pharmacist at The Queen's Medical Center (QMC) in Honolulu, and serves as a preceptor to fourth-year student pharmacists as well as pharmacy residents there.

Born and raised in Hawai'i, Dr. Scarlett received his bachelor's degree in pharmacy in 2000 from Oregon State University and his PharmD from the University of Kansas through the non-traditional track in 2007. He also became board certified in oncology (BCOP) the same year.

He completed a PGY1 residency at The Queen's Medical Center (QMC) in 2000-2001, and stayed on staff, floating various shifts. He became the primary cardiology pharmacist, but then moved to oncology, which is where he says he wanted to be all along.

In his words:

"I became interested in oncology when I was a

student and did an oncology rotation at Oregon Health Sciences University. I found that there are so many ways to help people especially in the biggest challenge of their life.

I enjoy working with students and residents and helping them to learn and grow. The biggest question that students should be asking is 'why?' Why are we using this drug? Why not another drug? Is it better? Safer? I encourage students to keep asking questions, because then they will continue to grow. There are always opportunities to grow and learn, especially in oncology where the field is always changing. I enjoy seeing the growth in students from start to finish. My job as a preceptor is to help them learn and make sure they are challenged. If I am not challenging them, then I am letting them down as a preceptor."

# Rotation Report: Amanda Wendel, Class of 2014



It's not every rotation you have to clear customs for, but that was just the start of the adventure when heading to our distance learning site for APPE Hospital Rotation at the Lyndon Baines Johnson Tropical Medicine Center in Pago Pago, American Samoa. My time here is only about half done as I write this, the adventure will continue, but here's some of the story so far.

Week 1: I departed from Hilo to Honolulu, then continued on to Pago Pago the following night. I've been in some small airports before, but Tafuna was by far the smallest. We got off the plane via a staircase in the middle of the tarmac and walked to the terminal, a single story building with, as far as I could see, a single gate. We were herded into the customs lines where we turned in our forms. I thought that was customs. Nope, that was just one of three inspections. After the second one, we got our luggage and had to go through a third inspection of everything we were carrying.

Once cleared to enter the territory, we waited for our preceptor to pick us up. She is one of three pharmacists in the entire territory. She arrived and we loaded our luggage into the back of her truck and set out for Faga'alu, the village where the hospital is. Things aren't that far apart here, but the entire island has a speed limit of 25 mph, so it still takes a while to get places. As it was well after 11 pm local time, we couldn't see much of the island or the hospital when we first arrived, but we were shown to the apartment we'd be living in on the grounds, given some bottled water to cover us until we could get to a store with instructions not to drink the tap water, and directions to the pharmacy in the morning.

Our first few days were getting to know the layout of the hospital and meeting the staff, both pharmacy and hospital. Both of us are on medical rotations, so we are working in the wards a lot while here. The hospital is an H shape in a really deep, green, jungle valley. One of the long arms houses Pediatrics, Medical and Pharmacy. The other houses Surgical, more Medical, ER and the cafeteria. The short arm in the middle has the ICU, Maternity and the nursery and some offices. On either side of the main hospital are outpatient clinics. LBJ is the only hospital in the territory and most of the outpatient care as well. There are a few outpatient clinics on

the outer islands and on this island, but most of the care is at LBJ, which is nice as we have every record at our fingertips all on the same computer system.

Being there are so few pharmacists, we picked up patients to track from any ward we cared to look at. We watch the ICU pretty closely, but other than that, it was up to us what we wanted to learn. A lot of the pharmacy runs on tech check tech, as it is impossible for a pharmacist to check every outpatient and inpatient prescription here. LBJ is also the only pharmacy in the territory, so literally everything for the entire territory comes through LBJ and its three pharmacists.

One of my first patients included a woman from Germany with heart failure and pneumonia. She could only speak German and the medications she brought with her were all in German. I have a German heritage, so I know say a few words of German, I knew my numbers and could determine doses of her medications from what her daughter was trying to tell us. I'd hold up one medication at a time (everything she had was unit dose with only names printed in German, no strengths or directions) and the daughter would tell me the number and morning, evening or both. Between my really bad German, her really bad English, and a few emails back to Dr. Guendisch in Hilo, we got it all down. Eventually, one of the dialysis nurses whose German was far and away better than mine served as translator.

Another patient was a child with amebic dysentery. Remember that warning we got about not drinking the tap water? This is why. The territory is working on better water supply, but even locals will come into the hospital sick from the water. This was an interesting case, as his clinical picture was improving faster than he was feeling, so there was more investigating than usual.

One other patient I followed was a woman with elephantitis due to filariasis. I had never seen anything like this on the mainland or in Hawai'i and had to do a lot

*continued on page 36*



*DKICP student pharmacists have the opportunity to complete their fourth-year Advanced Pharmacy Practice Experiences (APPE) rotations at the Lyndon Baines Johnson Tropical Medicine Center in Pago Pago, American Samoa.*

of research into it to determine proper treatment. In her case, the original infection was over 3 years ago, this was a cellulitis flare due to the continued destruction of the lymph system in her leg.

Week 2: Since this is our last block before graduation, we've been given a lot of freedom to troll through the wards, picking up cases. When we find something we want to learn more about, we pick up the patient and do a more thorough review of the records. If we find something of concern, a dosing error or duplicate therapy, we make a plan, then present the case in an abbreviated SOAP format to one of the two pharmacists we report to. They either work with us to change our plan, or agree with it and send us out to the wards to talk to the doctors or nurses to implement it.

The doctors and nurses here are so welcoming and friendly to students; they always take the time to hear us out, explain their thinking and hear our thoughts. They are also very outnumbered by the patients. By the second week, I took Pediatrics and Medical as my unofficial turf. Peds is pretty good, their census was about eight patients to four doctors. Medical is another story, their census was about 22 patients to three doctors. I've been working with a lot of pneumonia patients and am working up a presentation to try to get LBJ to implement using the CURB-65 scores in pneumonia assessment. Sometimes at a hospital with limited resources like LBJ, not everything in the guidelines can be implemented. For example, the CT scanner was down for nearly 3 weeks and the Xray has been down all week with hopes that the part to fix it will be on the Friday night flight from Honolulu. Makes it hard to follow the stroke or pneumonia guidelines when we can't get scans or chest xrays. Our formulary is very limited, so we don't have the options larger hospitals have.

This week, I have made three antibiotic interventions of duplicate therapy, two on pneumonia cases and one on a pyelonephritis case. I think I'm starting to get a reputation as the one to forever stop Rocephin and Levaquin from being used as dual therapy. I also picked up a patient who needed an antibiotic changed when the lab cultures came back. That went fine, it was her potassium that gave me and her physician a bit of run-around. She was admitted with a potassium in the normal range, 4.2 mEq/L, but was started on supplementation as she wasn't eating. The next day she was down to 3.6 mEq/L while on the supplementation. I was thinking of a dose change when the lab on the third day came back at 6.0 mEq/L and the physician stopped the supplement. The strange part was, when he rechecked the level 5 hours later without giving Kayexelate to reverse it, her level was at 3.0 mEq/L. It was rechecked again 5 hours after that and was still at 3.0 mEq/L. That was when I suggested restarting it, but watching closely to see if that 6.0 was a lab error, or if it was something we were doing. I spent hours combing records, talking to nurses, trying to find anything that might change the potassium levels at all much less that drastically.

Week 3: This week brought some interesting cases. One I just followed peripherally was a leptospirosis case, the other case I took on was a respiratory tuberculosis. As we still have no x-ray, she is still listed as suspected tuberculosis, however, after a positive PPD of 40x40 mm and symptoms of hemoptysis, we initiated the four drug TB protocol. I've been continually assessing drug-drug interactions for this patient as the TB protocol isn't used that often.

I also moved a bit from following specific patients to covering specific goals in the medical and surgical wards. Due to a national shortage of IV fluids, I started going over each record to see if we could change any IVs to oral meds, then checking with the doctors to see if they agreed. While doing that I also was continuing to check appropriateness of antibiotic choices for both wards. I'm getting a lot of practice with antibiotics and my Sanford's Guide is getting a work out!

The doctors are starting to ask us more questions and consults as well. It is good experience to work it with them in the wards, then go back to the pharmacy to get the official agreement from our preceptors. I have also gotten more experience in sterile compounding, mixing IVs and checking hand mixed TPN solutions. I might be able to mix one myself next week.

It's not all work out here, though. Our preceptor wants to make sure that while we are here, we get a chance to see and experience the island. In the three weeks we've been here, we've walked the sea walk, (a beautiful paved sidewalk right on the edge of the island) for a few miles, done some shopping, and went to two of the market days, First Friday and Third Friday. In the plans are a trip to the National Park of American Samoa, Fagatele Bay National Marine Sanctuary, and reservations are made for Fiafia Night (traditional Samoan dance and food). We're also going to be teaching pharmacology to nursing students at the American Samoa Community College near the end of our block. The pharmacy staff has made sure we have tried some Samoan foods while we're here, bringing treats in for us. I'm not entirely sure all of what I've eaten, but I know I've had taro, breadfruit, octopus, fish in coconut milk and Samoan fried pancakes (fried balls, not flat like what I'm used to as a pancake) that they have shared with us or told us to find and try. We've also had a great time trying different cookies, drinks, and snacks from New Zealand, Australia, Fiji, and the Philippines not found, or at least easily, in Hawai'i.

At the time of this writing, we still have another three weeks to go here and time is flying by. I've really enjoyed my experience out here and am very glad I chose this site. It may be about as far from Minnesota as I can get, but I'm learning a lot that I can take with me back to the Midwest. With my other hospital rotation, acute care at The Queen's Medical Center, I'm getting quite the spectrum of hospital pharmacy compared to LBJ Tropical Medicine Center. I'm looking forward to the weeks to come and am very grateful to have the opportunity to come here on rotations.

## **Kāwili Lā'au**

The Daniel K. Inouye College of Pharmacy  
University of Hawai'i at Hilo  
200 W. Kāwili St.  
Hilo, HI 96720

Nonprofit Organization  
U.S. Postage PAID  
Hilo, HI  
Permit No. 20