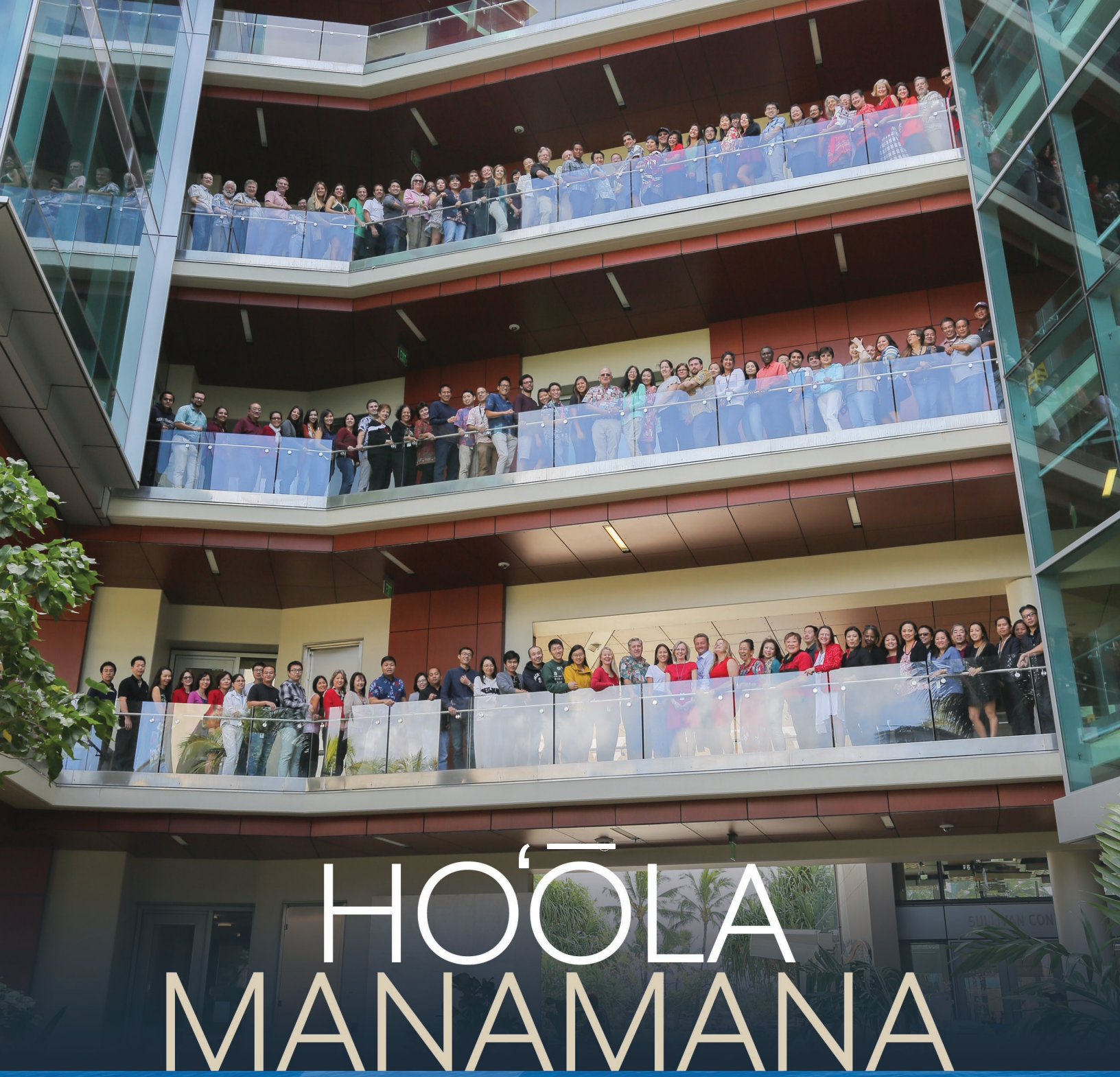

HOʻŌLA MANAMANA

Diversity | Health | Knowledge

ANNUAL REPORT | 2017

UNIVERSITY OF HAWAIʻI
CANCER CENTER

NCI Cancer Center
A Cancer Center Designated by the National Cancer Institute

TABLE OF CONTENTS

Randall F. Holcombe

University of Hawai'i Cancer Center

Randall F. Holcombe, MD, MBA
Director

Ho'ōla Manamana

The UH Cancer Center fosters diversity, health and knowledge through our mission to reduce the burden of cancer through research, education, patient care and community outreach with an emphasis on the unique, ethnic, cultural and environmental characteristics of Hawai'i and the Pacific.

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Cover photo: UH Cancer Center researchers, faculty, administrators and staff at the Cancer Center in Kaka'ako, Hawai'i.

DIRECTOR'S MESSAGE

At the University of Hawai'i Cancer Center, our researchers have been laser-focused on our mission: to reduce the burden of cancer through research, education, patient care and community outreach with an emphasis on the unique ethnic, cultural and environmental characteristics of Hawai'i and the Pacific.

This has been accomplished through seminal advances in basic cancer biology, population sciences and epidemiology, and cancer prevention research. UH Cancer Center faculty had more than 242 published manuscripts this past year, some in the most prestigious journals in the world. 2017 was also a banner year for Cancer Center members, bringing more than $40 million in grant funding to the University of Hawai'i. This speaks to the high quality of research being done right here in Hawai'i.

Several faculty received national recognition, and their research advances have included:

- demonstration of the mechanism of carcinogenesis involved in the BAP1 cancer syndrome,
- risks of e-cigarettes in leading to future tobacco product addiction,
- contributions of coffee to reduction in death from chronic diseases including cancer,
- signaling pathways involved in metastases,
- insights into liver cancer development, and
- approaches to cancer control and prevention across the Pacific.

The Cancer Center also provides an infrastructure to facilitate access to clinical trials for nearly two-thirds of the cancer patients in Hawai'i. In conjunction with our clinical partners at The Queen's Health Systems, Hawai'i Pacific Health, Kuakini Health System and the vast majority of private oncology practitioners in Hawai'i, the UH Cancer Center offers more than 100 clinical trials. The trials include those designed for cancer treatment, cancer diagnosis, cancer prevention and control, and improvement of quality of life. More than 2,000 patients were enrolled on a UH Cancer Center clinical trial this past year!!! A significant number of these trials are designed specifically for populations in Hawai'i with cancer mortality disparities in an effort to reduce the burden of cancer for these groups.

The Cancer Center faculty continues to be involved in education of high school, undergraduate and graduate students and post-doctoral fellows. The Summer Internship Program is an example of how the Cancer Center interfaces with the community and provides opportunities for Hawai'i's young, future scientists to become involved in, and excited by, cancer research.

Over the next year, our plans include expansion of our clinical trials capabilities to bring even more novel research opportunities to our patients, and expansion of our already superb research programs in cancer biology, ethnic diversity and cancer health disparities, and cancer prevention.

This report outlines some of this past year's accomplishments, and highlights many of our exceptional faculty. I hope it conveys how the University of Hawai'i Cancer Center provides unparalleled cancer research for the benefit of the people of Hawai'i and across the Pacific.

Mahalo!!

Randall F. Holcombe, MD, MBA

Randall F. Holcombe, MD, MBA
Director

SINCE THE PROGRAM BEGAN IN 2004 MORE THAN 800 FIRST-YEAR MEDICAL STUDENTS HAVE BEEN INTRODUCED TO CLINICAL TRIALS.

JANA WIELAND

UH CANCER CENTER CLINICAL TRIALS SHADOWING PROGRAM

As a cancer survivor, I had the unique experience of witnessing the medical profession from the perspective of a patient. I saw that my local oncologist not only possessed expertise in his field, but also knew how to address my overall well-being. It is this combination of scientific expertise, deep empathy, dedication and professionalism that I want to emulate throughout my medical career.

Since September 2017, I have been engaged in the Clinical Trials Shadowing Program at the UH Cancer Center as a first-year John A. Burns School of Medicine student. I was excited to learn more about the clinical trial process and the regulatory side of cancer protocols. Throughout my first rotation at the UH Cancer Center, I learned about the investigator-initiated clinical trial process as well as the regulatory side of initiating and integrating clinical trials. I look forward to the next unit at Tripler Army Medical Center, where I will shadow an oncologist to directly see patients participating in trials.

My experiences with undergraduate research and the UH Cancer Center program have cemented my passion for scientific investigation. It is a very rewarding feeling to know that my small contribution to cancer research could have an impact on the lives of individuals affected by cancer. I have the opportunity to engage with many research active physicians, and I hope to follow in their footsteps by leaving my own mark on translational research.

> "I AM ETERNALLY GRATEFUL FOR THE MORE THAN 200 PEDIATRIC PATIENTS THAT ENROLLED IN A CLINICAL TRIAL THAT ENABLED ME TO RECEIVE A LESS TOXIC CHEMOTHERAPY REGIMEN." - JANA WIELAND

Clinical Trials Shadowing Program

- Year-long community health elective for first-year medical students at the John A. Burns School of Medicine
- Opportunity to learn from UH Cancer Center National Cancer Institute's Community Oncology Research Program physicians who are conducting clinical trials

HAWAIʻI CANCER DATA

OVERVIEW OF CANCER IN HAWAIʻI:

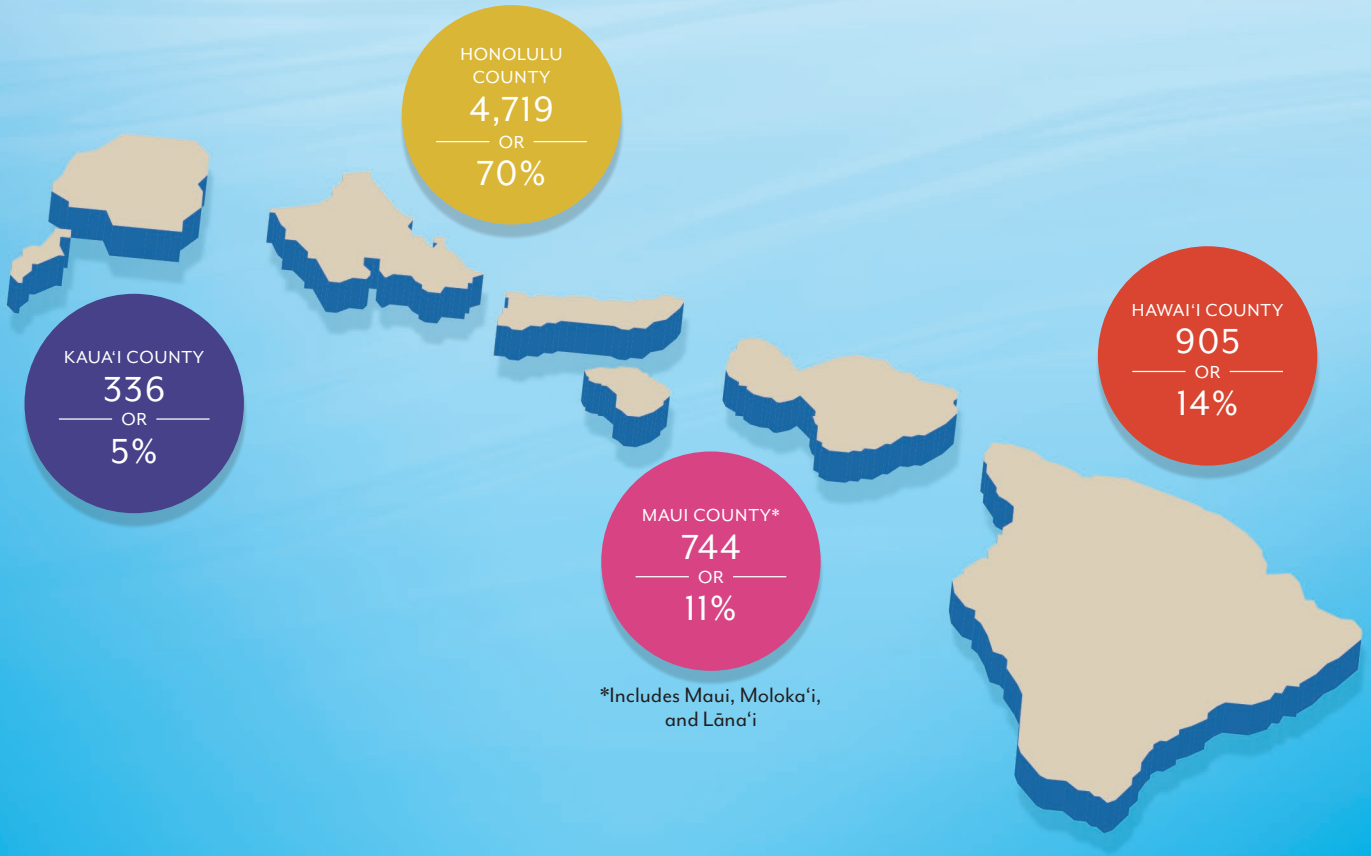
EACH YEAR, APPROXIMATELY

6,700

HAWAIʻI RESIDENTS ARE DIAGNOSED WITH INVASIVE CANCER

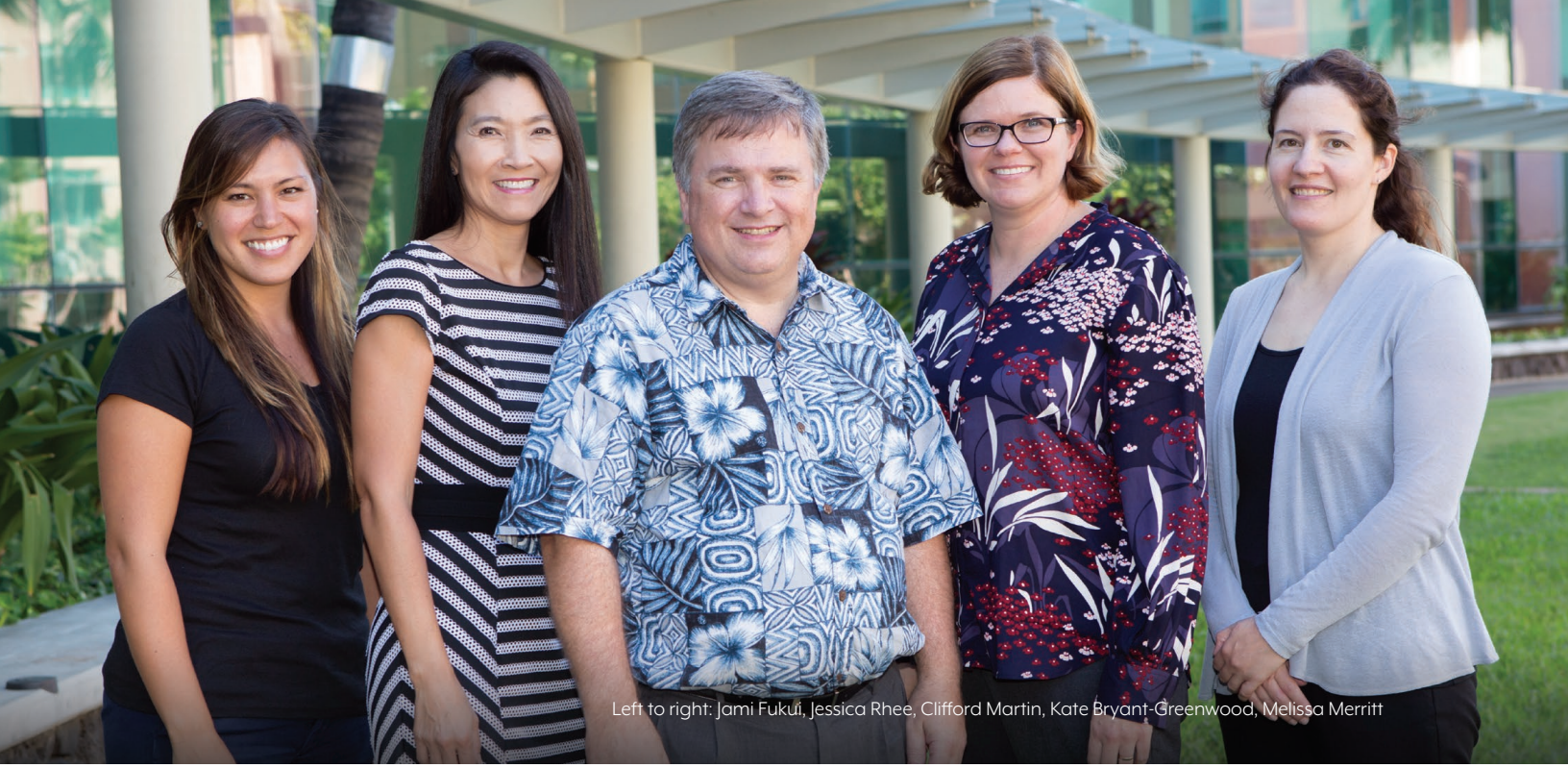
- In 2017 there were more than **58,000** Hawaiʻi residents living with cancer.
- More than **2,200** Hawaiʻi residents die of cancer each year.
- Cancer is the **second** leading cause of death (after cardiovascular disease) in Hawaiʻi.

AVERAGE ANNUAL NUMBER OF NEWLY DIAGNOSED CANCER CASES BY COUNTY, 2009 - 2013



*Includes Maui, Molokaʻi, and Lānaʻi

Hawaiʻi Tumor Registry



Left to right: Jami Fukui, Jessica Rhee, Clifford Martin, Kate Bryant-Greenwood, Melissa Merritt

NEW FACULTY AND LEADERSHIP RECRUITMENTS

Clifford Martin, MBA, joined the UH Cancer Center as the associate director for administration in July 2017. Martin oversees the management of the Cancer Center including budgetary oversight, grants management, human resources, public relations, facilities, information technology, research infrastructure in clinical trials and shared resources. He serves as the lead administrator for the very competitive P30 Cancer Center Support Grant, which awards the National Cancer Institute designation.

Melissa Merritt, PhD, joined the UH Cancer Center in October 2017. Her research focuses on evaluating risk factors for women's cancers, specifically gynecological (ovarian and endometrial) cancers by utilizing epidemiological studies. Her goal is to develop better prevention strategies.

Jessica Rhee, MD, MS, is an associate researcher and Clinical Trials Office medical director. Her clinical practice focuses on breast cancer, especially in women at high risk. She strives to improve the health and well-being of breast cancer survivors. Rhee began clinical practice at The Queen's Medical Center in early 2018.

Jami Fukui, MD, is an assistant researcher. She has interests in breast cancer research, developing clinical trials protocols, and providing the best cancer care to the residents of Hawai'i. Previously, Fukui was the chief hematology/oncology fellow at Mount Sinai Hospital in New York City. Since October 2017, she has been seeing patients at Kapi'olani Medical Center for Women and Children.

Kate Bryant-Greenwood, JD, MA, as the Clinical Trials Office manager, provides operational management and oversite of the clinical research staff. Bryant-Greenwood was previously the cancer care delivery research/oncology quality coordinator at The Queen's Medical Center, where she improved collaboration, communication and inefficiencies.

Left to right (back row): Lenora Loo, Gertraud Maskarinec, Loic Le Marchand, Yurii Shvetsov, Carol Boushey, Herbert Yu, Gordon Okimoto (front row): Brenda Hernandez, Unhee Lim, Lynne Wilkens, Lana Garmire, Song Yi Park

CANCER EPIDEMIOLOGY

A COMPONENT OF POPULATION SCIENCES IN THE PACIFIC PROGRAM

Cancer Epidemiology conducts population research to understand the racial/ethnic differences in cancer incidence and mortality, and identify the causes of cancer in Hawai'i and the Pacific.

BREAST CANCER DISCOVERY COULD IMPROVE TREATMENTS

ZHANWEI WANG | YI SHEN | LENORA LOO
PEIWEN FEI | WEIMIN CHU | WEI JIA | HERBERT YU

Herbert Yu, MD, PhD, co-leader of the Population Sciences in the Pacific Program and his team, recently discovered a molecule called 'long coding RNA in breast cancer associated with disease outcome'.

"Many breast cancer patients are diagnosed with estrogen receptor positive tumors, and these patients are often treated with surgery followed by Tamoxifen, an anti-estrogen drug," said Yu. "The drug is quite effective in stopping tumor growth in most patients, but some develop drug resistance that leads to relapse."

"THE DISCOVERED MOLECULE IN BREAST CANCER MAY HELP TO PREDICT TREATMENT EFFECTS AND DEVELOP STRATEGIES TO OVERCOME DRUG RESISTANCE." - HERBERT YU

ONE OF THE LARGEST STUDIES OF ITS KIND, AND THE MOST ETHNICALLY DIVERSE.

Loic Le Marchand, principal investigator of the Multiethnic Cohort Study, checks on the liquid nitrogen freezer containing blood samples from participants.

MULTIETHNIC COHORT STUDY OF LIFESTYLE, DIET AND CANCER (MEC)

The MEC Study is a prospective epidemiological study in which 215,000 Hawai'i and Los Angeles residents, age 45-75 at recruitment in 1993-1996, completed a questionnaire about their dietary habits and lifestyle.

The cohort is comprised of men and women primarily of Japanese, Native Hawaiian, African American, Latino and Caucasian origin.

The participants are being followed for occurrence of cancer, other chronic diseases and death.

The MEC Study is being conducted to find the best approach to achieving a health-promoting diet, and decreasing cancer risk in Hawai'i and across the nation.

The MEC Study is jointly conducted by the UH Cancer Center and the Keck School of Medicine at the University of Southern California in Los Angeles.

COFFEE MAY HELP YOU LIVE LONGER

Published in Annals of Internal Medicine

SONG YI PARK | NEAL FREEDMAN | CHRISTOPHER HAIMAN | LOIC LE MARCHAND | LYNNE WILKENS | VERONICA SETIAWAN

Drinking coffee was associated with a reduced risk of death in the 24-year long Multiethnic Cohort Study conducted at the UH Cancer Center. Coffee drinkers had a reduced risk of death from heart disease, cancer, diabetes, stroke, kidney and respiratory disease.

- **One cup** a day was associated with a **12 percent** decrease in risk of death overall, and **two to three cups** with an **18 percent** decrease.

"As in other states, coffee is one of the most popular beverages in Hawai'i, the only state in the U.S. where coffee is grown commercially. Although this study does not show causation or point to what chemicals in coffee may have a protective effect, it is clear that coffee can be incorporated into a healthy diet and lifestyle," said Song-Yi Park, PhD, first author of the study and epidemiologist in the Center's Cancer Population Sciences in the Pacific Program.

- The health benefit was seen regardless of whether coffee was caffeinated or decaffeinated, suggesting that the beneficial effect comes from the coffee itself, not caffeine.

The study analyzed data from 185,855 participants, and confirmed the associations in populations—African Americans, Japanese Americans, Native Hawaiians and Latinos—who have different lifestyles and disease susceptibilities.

APP DESIGNED TO STUDY BEST WAY TO REDUCE ABDOMINAL FAT

CAROL BOUSHEY | KEVIN CASSELL | LOIC LE MARCHAND
UNHEE LIM | YURII SHVETSOV | LYNNE WILKENS

UH Cancer Center researchers created a phone app as part of a study to research if specific changes in dietary habits, along with daily exercise, can reduce the amount of fat inside the abdomen.

- Abdominal fat increases the risk of a number of chronic diseases, such as diabetes, heart disease, and certain cancers, including those of the colon, liver, pancreas and breast.

The phone app was used to take images of the food participants ate. Eligible participants were randomized to one of two diets and given access to a dietitian.

"JAPANESE, CHINESE AND KOREAN MEN AND WOMEN TEND TO HAVE HIGH AMOUNTS OF ABDOMINAL FAT, AND THIS TYPE OF FAT IS MORE DANGEROUS THAN OTHERS IN TERMS OF CERTAIN DISEASES AND CANCERS,"
said Loic Le Marchand, MD, PhD, epidemiologist in the Cancer Center's Population Sciences in the Pacific Program. "There have been major changes in the amount of fat in the abdomen in participants we have observed so far."

DIET RELATED TO LOWER RISK OF COLORECTAL CANCER

Published in Gastroenterology

SONG YI PARK | CAROL BOUSHEY | LYNNE WILKENS
CHRISTOPHER HAIMAN | LOIC LE MARCHAND

A high-quality diet was found to be related to a lower risk of colorectal cancer as well as other chronic diseases by UH Cancer Center researchers using data from the Multiethnic Cohort Study.

- Researchers assessed the diet by scores computed for four key diet quality indexes, which measure compliance with dietary guidelines that have been issued to the U.S. population.

After an average follow-up of 16 years, participants with the highest scores for any of the four indexes experienced a lower risk of colorectal cancer, compared with those with the lowest scores.

COLORECTAL CANCER IS THE **THIRD MOST** FREQUENTLY DIAGNOSED CANCER IN HAWAI'I.

- Foods to eat more of include, fruits, vegetables, whole grains, nuts and legumes (higher score for higher intake).
- Foods to eat less of include, red and processed meats, alcohol, refined grains, sodium and sugar-sweetened beverages (e.g., sodas) (higher score for lower intake).

Left to right (back row): Adrian Franke, Marcus Tius, Ping Fan, Vera Schwarzler, Lorenzo Bisgen, Jiaming Xue, Lorenzo Carparelli, Pietro Bertino, Randall Holcombe (middle row): Wen-Ming Chu, Haining Yang, Michelle Matter, Ryuji Yamamoto, Brien Haun, Michael Minaai, Masaki Nasu, Wong Seok Yang, Hideki Furuya, Joe Ramos (front row): Ronghui Xu, Chi Ma, Yasutaka Takinishi, Sandra Pastorino, Jasmine Chen, Keisuke Goto, Natalija Glibetic, James Turkson

CANCER BIOLOGY

The program conducts basic cancer research for important discoveries that positively impact cancer incidence and mortality in Hawai'i and the Pacific. Reflecting our geographical location, Cancer Biology has a major emphasis on research of natural products from local endemic species for discoveries that have the potential for clinical application.

BAP1 CANCER SYNDROME

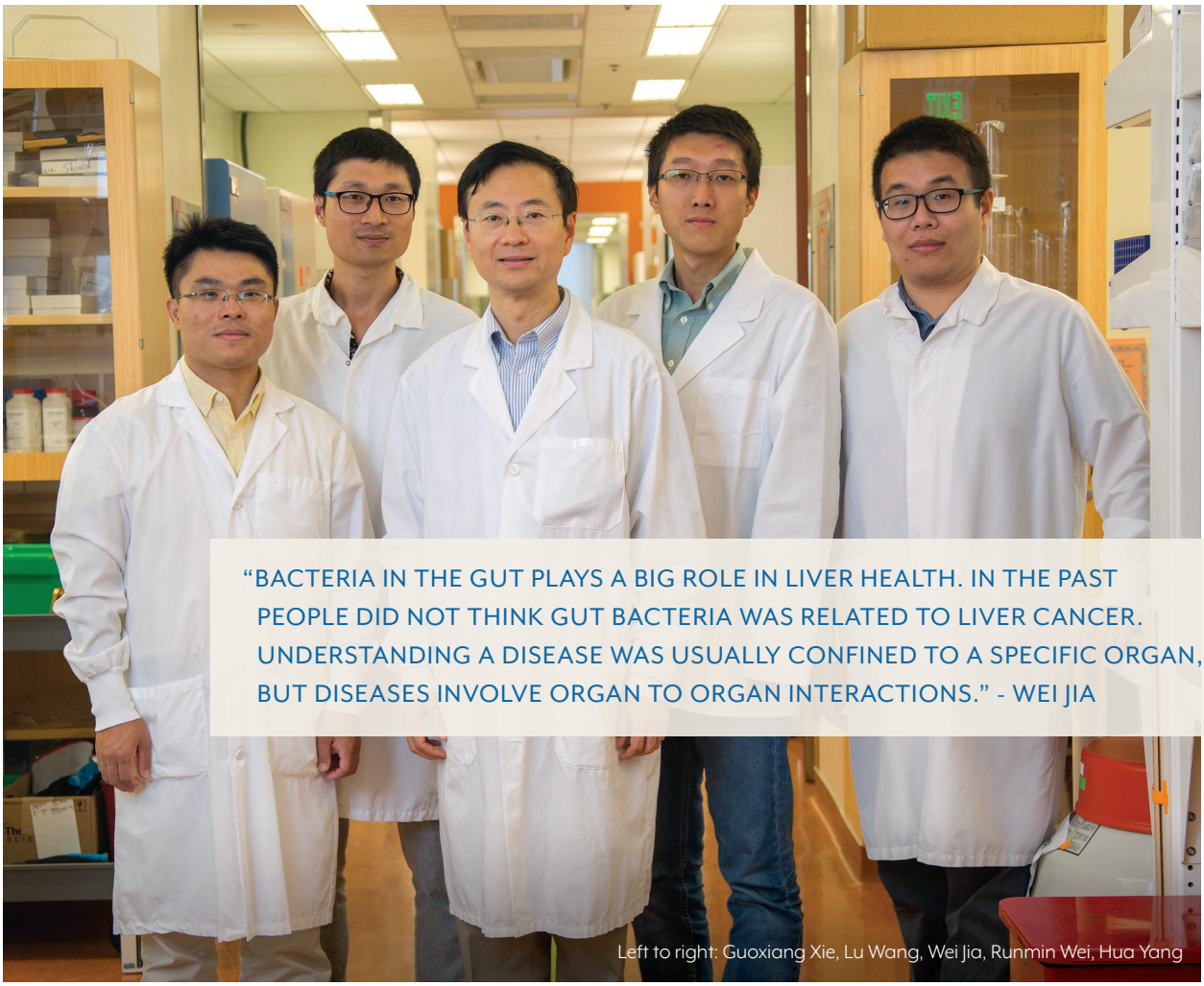
Published in Nature

ANGELA BONONI | DAVID LARSON | KAITLYN VERBRUGGEN | MIKA TANJI | LAURA PELLEGRINI | VALENTINA SIGNORATO
FEDERICA OLIVETTO | SANDRA PASTORINO | MASAKI NASU | ANDREA NAPOLITANO | GIOVANNI GAUDINO | PAUL MORRIS
GREG SAKAMOTO | HAINING YANG | MICHELE CARBONE

Michele Carbone, MD, PhD, and his team, discovered why people carrying mutations of a gene (BAP1) are much more susceptible to asbestos, sunlight and other environmental carcinogens.

- Cancer cells with a BAP1 gene mutation are resistant to chemotherapy.
- About 20 percent of all cancers have BAP1 mutations.
- The BAP1 gene regulates a channel (IP3R3) inside cells that moves calcium. When the BAP1 gene is mutated or damaged, calcium levels inside the cells decrease. The decrease of calcium makes cells more likely to become malignant when exposed to environmental carcinogens.

Angela Bononi



"BACTERIA IN THE GUT PLAYS A BIG ROLE IN LIVER HEALTH. IN THE PAST PEOPLE DID NOT THINK GUT BACTERIA WAS RELATED TO LIVER CANCER. UNDERSTANDING A DISEASE WAS USUALLY CONFINED TO A SPECIFIC ORGAN, BUT DISEASES INVOLVE ORGAN TO ORGAN INTERACTIONS." - WEI JIA

Left to right: Guoxiang Xie, Lu Wang, Wei Jia, Runmin Wei, Hua Yang

BACTERIA IN THE GUT

Wei Jia, PhD, associate director of Shared Resources, and his lab team continue to conduct studies on mechanisms underlying the development of liver fibrosis and liver cancer that involve the gut flora and bile acid interactions.

- Jia's team found that gut bacteria interact with the liver through a number of small molecule metabolites. When the interactions go wrong, the bacteria produce more toxic metabolites causing damage to the liver.
- Jia is an expert in the field of metabolomics, which examines how the body's metabolites can indicate disease. Metabolites are substances made or used when the body breaks down food, drugs or chemicals, or its own tissues according to the National Cancer Institute.

IN HAWAI'I

LIVER CANCER IS ONE OF THE LEADING CAUSES

OF CANCER DEATH IN MEN.

Ironweed plant

HAWAIʻI PLANT FOR CANCER TREATMENT

JAMES TURKSON | MARCUS TIUS | LENG CHEE CHANG | DIANQING SUN | JOEL KAWAKAMI | YUAN CHEN | JANN SARKARIA

The National Cancer Institute awarded a five-year $3 million grant to James Turkson, PhD, director of the Cancer Biology Program, to study how natural compounds in ironweed plant extract can be used to treat breast and brain cancers.

Ironweed plant extract used in study from Hawaiʻi Island and Thailand

"THE VAST NATURAL RESOURCES OF HAWAIʻI GIVE OUR RESEARCHERS A RARE OPPORTUNITY TO MAKE SCIENTIFIC DISCOVERIES OF UNIQUE AND SIGNIFICANT PROPORTIONS IN TREATING CANCER," SAID RANDALL HOLCOMBE, MD, MBA, UH CANCER CENTER DIRECTOR.

Turkson, along with collaborators, published a study showing that the natural compounds from the ironweed plant were effective in killing breast and brain cancer cells and blocked the development and growth of these cancers in the laboratory. In recognition of these preliminary findings, the funds were granted to continue and expand the study.

"IT WOULD BE LIFE CHANGING FOR CANCER PATIENTS IF IRONWEED EXTRACT COULD HELP FIGHT AGGRESSIVE TYPES OF BREAST AND BRAIN CANCERS. SINCE THE COMPOUNDS ARE FOUND IN THE PLANT, THEY ARE LESS TOXIC THAN TRADITIONAL FORMS OF TREATMENT SUCH AS CHEMOTHERAPY WHEN DEVELOPED AS DRUGS," SAID TURKSON.

James Turkson

Breast and Brain Cancer in Hawaiʻi

An average of **125 women** die from **breast cancer** each year in Hawaiʻi.

On average **41 people** in Hawaiʻi die each year from **brain cancer**.

Joe W. Ramos

WHY CANCER CELLS MOVE

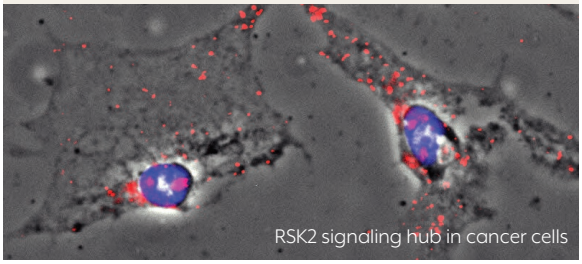
Published in Proceedings of the National Academy of Sciences

GENG-XIAN SHI | WON SEOK YANG | LING JIN | MICHELLE L. MATTER | JOE W. RAMOS

Joe W. Ramos, PhD, deputy director of the UH Cancer Center, and collaborators identified how some cancer cells are made to move during metastasis. The research provides a better understanding of how cancer spreads and may create new opportunities for cancer drug development.

- Researchers focused on investigating how oncogenes and related signals lead to dysregulation of normal processes within the cell and activate highly mobile and invasive cancer cell behavior.
- Ramos' team defined a mechanism in which the oncogenes turn on a protein called RSK2 that is required for cancer cells to move.
- The RSK2 protein forms a signaling hub that includes proteins called LARG and RhoA. Turning on the signaling hub activates the movement of the cancer cells.

THE RESULTS SIGNIFICANTLY ADVANCE UNDERSTANDING OF HOW CANCER CELLS ARE MADE TO MOVE DURING METASTASIS AND MAY PROVIDE MORE PRECISE TARGETS FOR DRUGS TO STOP CANCER METASTASIS IN PATIENTS WHERE THERE ARE ONCOGENIC MUTATIONS.



RSK2 signaling hub in cancer cells

GLOBAL COLLABORATIONS

22
COUNTRIES

MORE THAN
35
U.S. STATES AND TERRITORIES


CANADA
UNITED STATES OF AMERICA
MEXICO
PUERTO RICO
CHILE
156
UNIVERSITIES AND INSTITUTIONS

Left to right (back row): Mark Willingham, Simone Schmid, Leslie Welsh, Tony Lam, Kevin Cassel, Randall Holcombe, Thomas Wills, Ian Pagano (front row): Crissy Terawaki Kawamoto, Gabriela Layi, Lana Sue Ka'opua, Erin Bantum, Angela Sy, Stephanie Rania, Hazvinei Murasiranwa, Srue Wakuk, Carol Thompson, Maria Sgro

CANCER PREVENTION IN THE PACIFIC

A COMPONENT OF POPULATION SCIENCES IN THE PACIFIC PROGRAM

Cancer Prevention in the Pacific studies intervention strategies to prevent cancer and improve the survival and life quality of cancer patients in Hawai'i and the Pacific.

E-CIGS DRIVE TOBACCO USE

Published in JAMA Pediatrics

IAN PAGANO | REBECCA SCHWEITZER | THOMAS WILLS

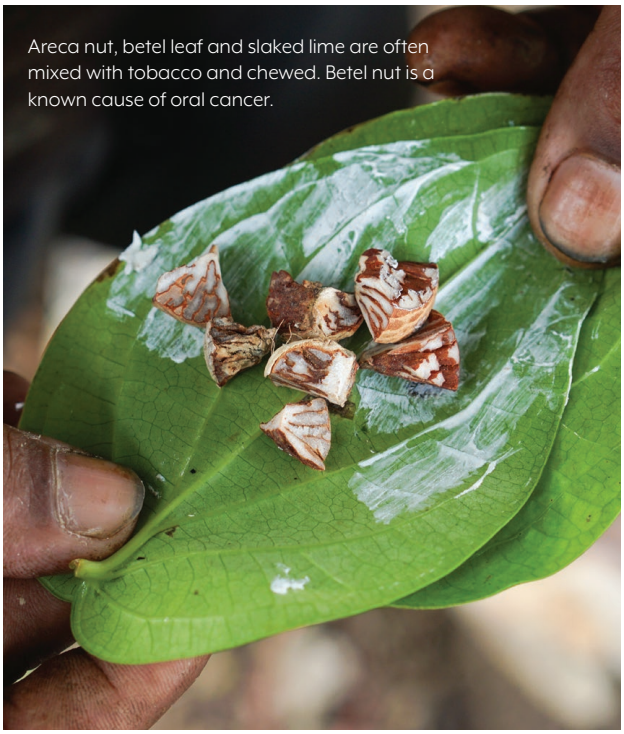
A comprehensive review of nine e-cigarette studies conducted across the United States indicated that teenagers and young adults who used e-cigarettes, but had never smoked tobacco cigarettes before, were more likely to smoke the "real" thing a year later.

- Teens were more than three times more likely to smoke tobacco cigarettes, and young adults were more than four times more likely.

The research was conducted by Thomas Wills, PhD, co-leader of the Population Sciences in the Pacific Program and six other collaborators. The study showed that the same finding has been confirmed in studies of adolescents and young adults in California, Pennsylvania and Virginia, as well as in representative national samples of respondents all over the U.S.

THE LEADING CAUSE OF CANCER DEATH IN MEN AND WOMEN IS

LUNG & BRONCHUS



Areca nut, betel leaf and slaked lime are often mixed with tobacco and chewed. Betel nut is a known cause of oral cancer.

A betel nut is the fruit of the areca palm.

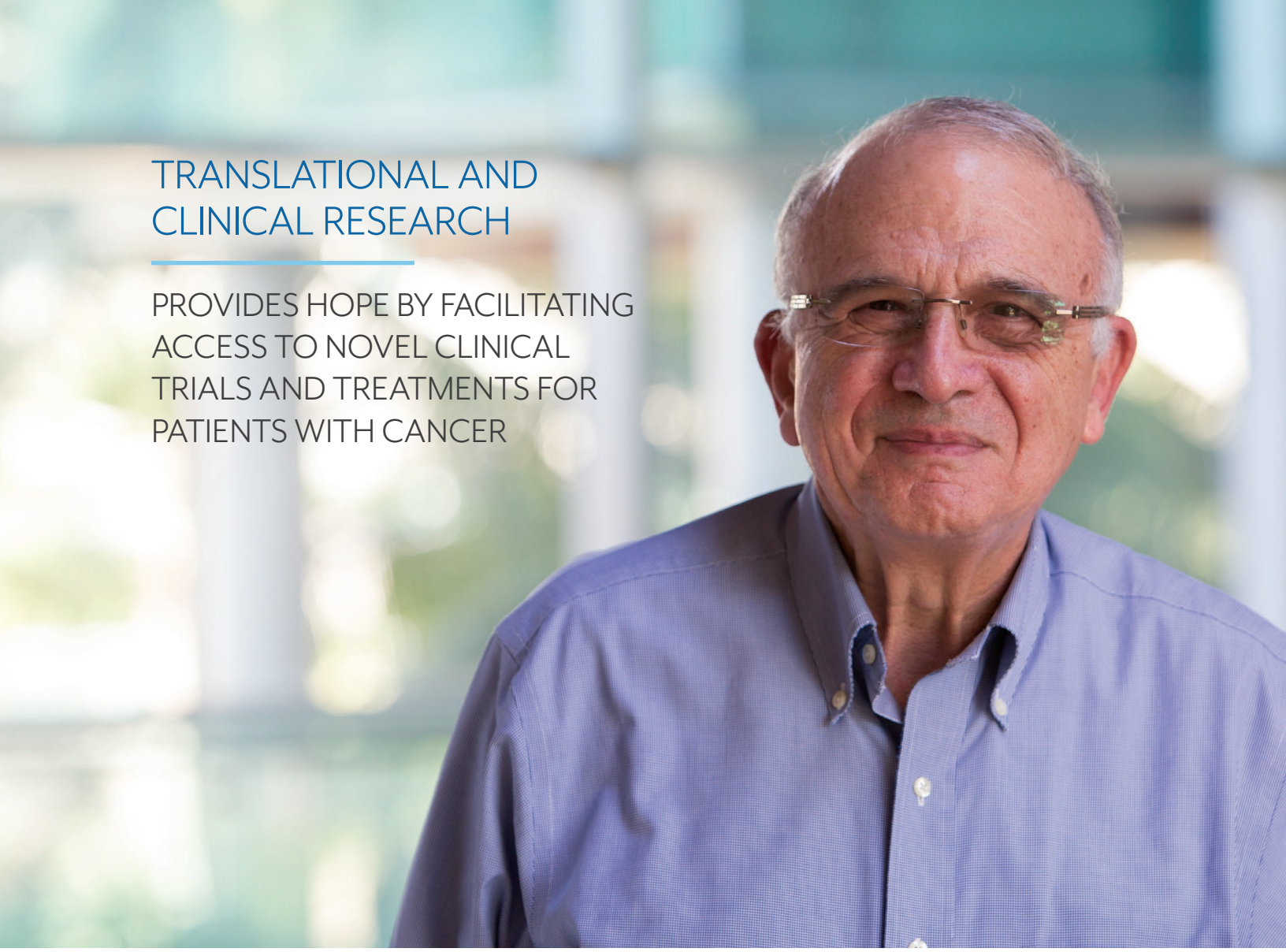
CANCER DISPARITIES IN THE PACIFIC ISLANDS

CAROL BOUSHEY | LEE BUENCONSEJO-LUM | KEVIN CASSEL | BRENDA HERNANDEZ | THADDEUS HERZOG
HYE-RYEON LEE | GERTRAUD MASKARINEC | NEAL PALAFOX | REINHOLD PENNER | PALLAV POKHREL
CARL-WILHELM VOGEL | DAVID WARD | LYNNE WILKENS

The U54 partnership between the University of Guam (UOG) and the UH Cancer Center aims to grow cancer research capacity at the UOG, develop cancer health disparities research at the UH Cancer Center, raise awareness of cancer and cancer prevention in Guam, Hawai'i and the U.S. Associated Pacific Island Jurisdictions, and increase the number of cancer and biomedical science researchers of Pacific Island ancestry in the U.S.

- Partnership results included landmark tobacco control legislation in Guam resulting in decreased tobacco use and increased tobacco taxes.
- The U54 has cultivated interest in cancer research among underrepresented minority students. Thirty Pacific Island students have been trained in cancer research (23 MS, seven PhD), including two graduates who became UOG faculty members.
- More than 75 publications, 100 abstracts and 14 grant awards have resulted from the U54.
- Fourteen jointly-conducted projects addressed research questions important to Guam, Hawai'i and the U.S. Associated Pacific Island Jurisdictions. The majority of the projects have explored questions related to betel nut use and carcinogenesis, from natural products chemistry to epidemiology and behavioral science.

AMERICANS OF PACIFIC ISLAND ANCESTRY ARE UNDERREPRESENTED AMONG CANCER RESEARCHERS AND HEALTH PROFESSIONALS. RESEARCH DESIGNED AND CONDUCTED BY, FOR AND WITH PACIFIC ISLANDERS IS CRITICAL TO REDUCE CANCER HEALTH DISPARITIES AND EFFECTIVELY DELIVER CANCER HEALTH ADVANCES IN HAWAI'I, GUAM AND THE U.S. ASSOCIATED PACIFIC ISLANDS.



TRANSLATIONAL AND CLINICAL RESEARCH

PROVIDES HOPE BY FACILITATING ACCESS TO NOVEL CLINICAL TRIALS AND TREATMENTS FOR PATIENTS WITH CANCER

DEDICATED PHYSICIAN HONORED

JEFFREY BERENBERG, MD
Co-Medical Director of Translational and Clinical Research

2016 - PRESENT

NCORP Health Care Disparities Working Group
The UH Cancer Center is one of only 12 minority and underserved community sites in the National Cancer Institute's Community Oncology Research Program (NCORP). The NCORP is a national NCI-supported network that brings cancer prevention clinical trials and cancer care delivery research to people in their communities.

2017

Mastership for Extraordinary Service from the American College of Physicians (MACP)
Berenberg was recognized for his decades of service and advocacy in Hawai'i. He was awarded the organization's highest level of recognition. Berenberg is only the fifth physician from Hawai'i to receive the honor. The first MACP was awarded in 1923.

Election to the Alliance for Clinical Trials Oncology Board of Directors

DETECTING BLADDER CANCER EARLY

Published in Journal of Translational Medicine

YOSHIKO SHIMIZU | KAZUE TSUKIKAWA
HIDEKI FURUYA | CHARLES ROSSER

A non-invasive bladder cancer detection test was developed by Charles Rosser, MD, MBA, director of Translational and Clinical Research and his colleagues. The test showed a strong overall performance when used on participants in Japan.

"The development of non-invasive tests that can accurately detect and monitor bladder cancer is clinically urgent," said Rosser. "With the prolonged and invasive nature of follow-up and treatment strategies, bladder cancer is one of the most expensive malignancies to manage."

The test results confirmed the presence of bladder cancer when evaluating samples with the chosen panel of biomarkers. The results reinforced the potential use of the biomarkers for detection of the disease.


Charles Rosser

BLADDER CANCER IN HAWAI'I

5TH	9TH	228
MOST COMMON CANCER	MOST DEADLY CANCER IN MEN	PEOPLE ARE DIAGNOSED EACH YEAR


Hideki Furuya

ENZYME DISCOVERY IN COLON AND BREAST CANCERS

Published in Journal of Translational Medicine and Carcinogenesis

HIDEKI FURUYA | PAULETTE M. TAMASHIRO
YOSHIKO SHIMIZU | KAYOKO IINO | RAFAEL PERES

Hideki Furuya, PhD, and collaborators found that the enzyme (sphingosine kinase 1), which produces an inflammatory lipid, plays an important role in colon and breast cancers. Specifically, the most recent study found that sphingosine kinase 1 activates the immune cell (macrophage) to induce inflammation leading to colon cancer. The findings can potentially lead to an innovative immunotherapy for cancers in the near future.


"I TRULY BELIEVE THAT PARTICIPATING IN THE CLINICAL TRIAL SAVED MY LIFE, AND IT LET ME LIVE TO SEE MY CHILDREN GROW UP AND LIVE A FULL AND HAPPY LIFE. I'M GRATEFUL THAT I HAD THE OPPORTUNITY TO PARTICIPATE IN SOMETHING SO IMPORTANT, AND LIFE-SAVING. I THANK MY LUCKY STARS EVERY SINGLE DAY." - DAWN KOBAYASHI

CANCER SURVIVOR ADVOCATES FOR CLINICAL TRIALS

Dawn Kobayashi began having severe stomach pains in 2002. Two years later the pains became unbearable, leading her to visit the emergency room where she received devastating news.

"You have stage 3 colon cancer."

Kobayashi said, "I was shocked, I was only 44 years old. I didn't have a family history of cancer. My kids were seven and 10 years old at the time. We just moved back to Hawai'i from Japan, and my sons were about to enter a new school."

Kobayashi was given a 50 percent chance to survive. She feels lucky her Hawai'i oncologist suggested a UH Cancer Center clinical trial for which she qualified to participate.

Kobayashi is now an advocate for clinical trials. She shared her story at the 2017 Helping Enhance Research in Oncology (HERO) Appreciation Event honoring UH Cancer Center clinical trial participants. She also recently joined the Cancer Center's Patient Advocacy Committee.

UH CANCER CENTER'S PATIENT ADVOCACY COMMITTEE (PAC)

PAC is dedicated to empowering cancer patients in Hawai'i with knowledge and understanding of clinical trials.

The vision of the PAC is to:

- educate and increase public awareness of clinical trials as a treatment option,
- encourage the people of Hawai'i to participate in clinical trials and to have that discussion with their medical support team, and
- assist the UH Cancer Center in promoting the clinical trials that address the broad diversities of Hawai'i's people.

PAC members with UH Cancer Center support members.

NATIONAL AND INTERNATIONAL RECOGNITION

AWARDS

Gertraud Maskarinec, MD, PhD
2017
Fulbright Global Awardee
A $20,000 award to conduct research on the relation of obesity, type 2 diabetes, and breast cancer in Caucasian and Asian women.

UH CANCER CENTER HISTORICAL TIMELINE

1971

The UH Cancer Center was established as part of the UH Pacific Biomedical Research Center.

1981

UH Board of Regents establishes the UH Cancer Center as a free-standing organized research institute.

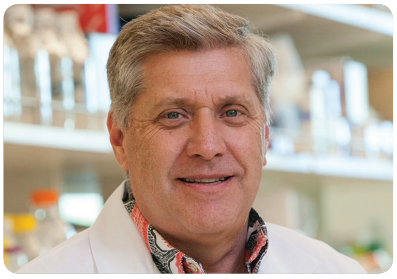
UNIVERSITY OF HAWAI'I CANCER CENTER

The Cancer Center becomes a member of the first of several national cancer cooperative study groups, which enables patients from Hawai'i to participate in cancer clinical trials.

HONORS

Jared Acoba, MD
2016-present
NCI Gastrointestinal Cancer Steering Committee

Carol Boushey, PhD, MPH, RD
2017
National Academy of Sciences Expert Panels
Process to update the dietary guidelines for Americans



Randall Holcombe, MD, MBA
2015-2018
Chair, Physician's Clinical Leadership Initiative, Association of American Cancer Institutes

Loic Le Marchand, MD, PhD
2017
Clarivate Analytics highly cited list

2015, 2016
Thomson Reuters "World's Most Influential Scientific Minds"

Carl-Wilhelm Vogel, MD
London, 2016
Overseas Fellow of the Royal Society of Medicine

Thomas Wills, PhD
2018
U.S. State Department Consultant
Tobacco control policy in America

2017
National Academy of Sciences Expert Panels
E-cigarettes and public health

1996-present

The UH Cancer Center receives NCI-Designation (P30 Cancer Center Support Grant). In 2018, the Center is one of only 70 research institutions designated by the National Cancer Institute.

NCI Cancer Center
A Cancer Center Designated by the National Cancer Institute

2010

The Hawai'i Cancer Consortium is established, which allows the UH Cancer Center to provide a clinical trials infrastructure facilitating access for more than two-thirds of the cancer patients in the state, with oversight of trials at The Queen's Health Systems, Hawai'i Pacific Health, Kuakini Health System and numerous private practices in the State.

2013

The grand opening of the UH Cancer Center in Kaka'ako occurs on February 12.

" I WANTED TO EXPERIENCE A RESEARCH ENVIRONMENT FIRST-HAND TO GET A BETTER UNDERSTANDING OF WHAT ACTUALLY HAPPENS WHEN PLANNING AND EXECUTING RESEARCH. I WAS ALSO REALLY INTERESTED IN THE FACT THAT A LOT OF WHAT THE CANCER CENTER IS DOING IS FOCUSED ON THE PACIFIC, SO IT'S NEAT TO SEE THE COMMUNITY-FOCUSED ASPECT OF RESEARCH AS WELL."
- LAUREN MURAOKA

University of Hawai'i at Mānoa
Summer research project
E-cigarette advertising and use among young adults

COMMUNITY CORNER

SUMMER INTERNSHIP CULTIVATES FUTURE RESEARCHERS

Nineteen high school and undergraduate students conducted research at the UH Cancer Center in summer 2017.

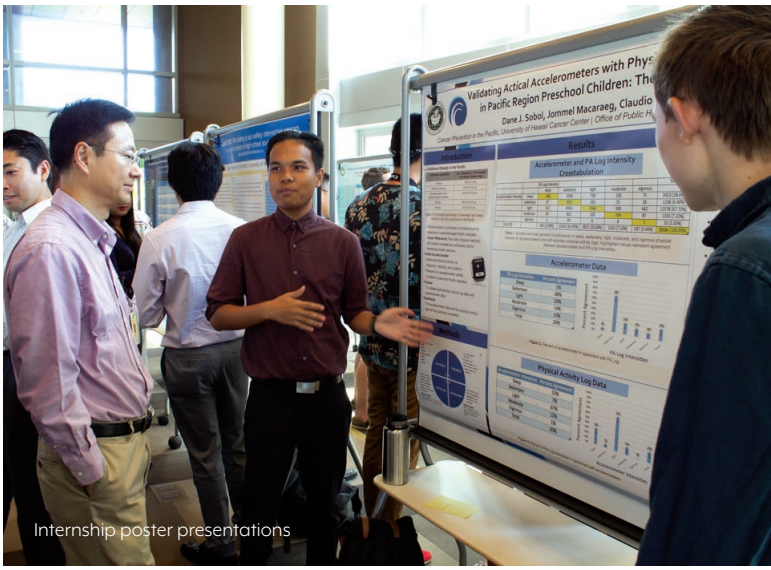
The summer interns were selected through a highly competitive process. Each student was paired with a mentor, who had a similar research interest either in population- or laboratory-based research. The students completed independent research projects and provided a poster presentation of their findings at the end of their internship.

A 2017 follow-up of 72 interns showed:

- 73 percent obtained an undergraduate degree in a science field;
- 5 percent completed a medical degree;
- 5 percent finished graduate school in a research-oriented field;
- 34 percent are enrolled in an undergraduate science program;
- 13 percent are enrolled in a master's program; and
- 23 percent are enrolled in a medical school.

The Center's internship program was supported in part by the National Cancer Institute Cancer Center Support Grant (CCSG) Continuing Umbrella of Research Experiences (CURE) Supplement, an endowment from the Meiji Yasuda Life Insurance Company and the Friends of the UH Cancer Center.

2017 Summer interns



Internship poster presentations

IMPROVING COLORECTAL SCREENING AMONG HAWAIIAN KĀNE

No Ke Ola Pono o Nā Kāne (for the good health of Hawaiian men) or the Kāne Initiative, a community-based project, seeks to improve the health and well-being of Native Hawaiian men by conducting kūkākūkā (discussion) sessions in the community. These sessions, modeled after the cultural tradition of the hale mua (men's house), are led by trained kāne facilitators.

The Kāne Initiative, with support from the Hawai'i Medical Service Association Foundation, developed a module to facilitate discussions about na'au (colorectal) health, and Fecal Immunochemical Tests were provided to kāne over age 50. Accomplishments of this community-based research project include:

- trained 17 kāne facilitators;
- conducted 18 Na'au Health sessions;
- 175 kāne over age 50 attended Na'au Health sessions; and
- 70 percent of the kāne were screened either through the Kāne Initiative or their physician.

Community partners include Ke Ola Mamo and the Native Hawaiian Health Care Systems, Lili'uokalani Trust, 'Ahahui o nā Kauka (Association of Native Hawaiian Physicians), Hawai'i State Department of Health Comprehensive Cancer Control Program and American Cancer Society.

IN ADDITION TO THE HIGHEST DEATH RATES FOR ALL CANCERS, HAWAIIAN KĀNE HAVE THE HIGHEST MORTALITY RATE, AND THE HIGHEST PROPORTION OF LATE STAGE COLON AND RECTAL CANCERS (59 PERCENT) IN HAWAI'I. REGULAR SCREENING FOR PRECANCEROUS LESIONS CAN PREVENT 90 PERCENT OF COLON CANCERS.

Kāne facilitators

CANCER IN HAWAI'I'S RACIAL AND ETHNIC POPULATIONS:

OVERALL CANCER INCIDENCE WAS HIGHEST FOR

WHITE MEN & NATIVE HAWAIIAN WOMEN

- Overall cancer mortality was highest for Native Hawaiian men and women.
- Stomach cancer incidence was highest for Japanese and Native Hawaiian men and Japanese women.
- Thyroid cancer incidence was highest for Filipino men and women.

GRANTS

22 YEARS OF CONTINUED NATIONAL CANCER INSTITUTE DESIGNATION

2017

57 PRINCIPAL INVESTIGATORS

119 RESEARCH PROJECTS

$41,000,000 AWARDED TOTAL GRANT FUNDS

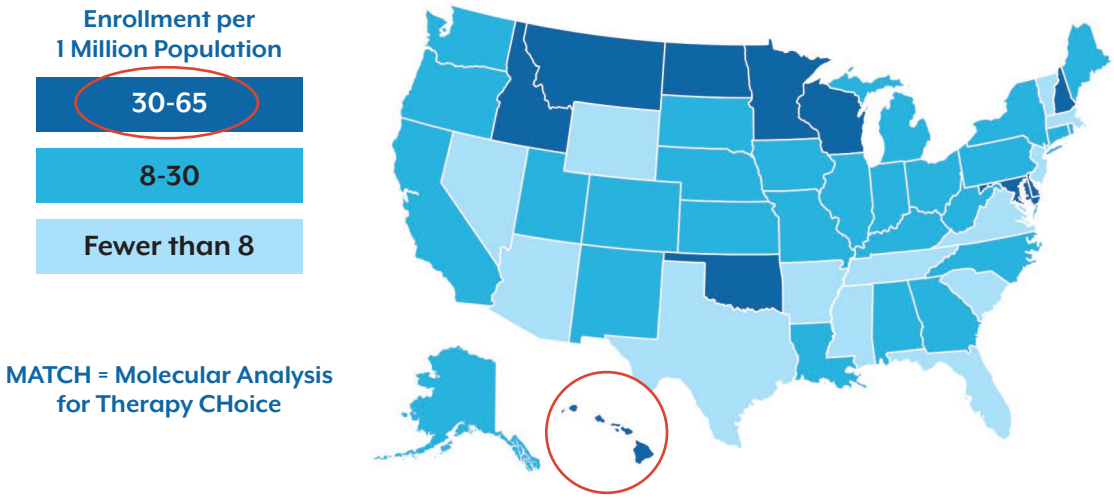
Left to right (back row): Munirih Taafaki, Kate Bryant-Greenwood, Thomas Syverson, Janos Molnar, Robert Schuetz, Diana Kucmeroski, Oleg Ivanets, Deidre Romines (middle row): Cheryl Vernon, James Tom, Dorothy Coleman, Emily Hui, Amy Horst, Jessica Rhee (front row): Isobel Webster, Tim Coughlin, Emelie Chang, Vannida Phommachanh, Heather Fillerup, Caitlin Melvin, Virginia McMahon

CLINICAL TRIALS OFFICE

The Clinical Trials Office is a central office that provides infrastructure and operational support for cancer clinical trials at the UH Cancer Center and Hawai'i Cancer Consortium, which at any given time has approximately 100 cancer clinical trials.

NCI "MATCH" CANCER TREATMENT TRIAL:

State by State Enrollment



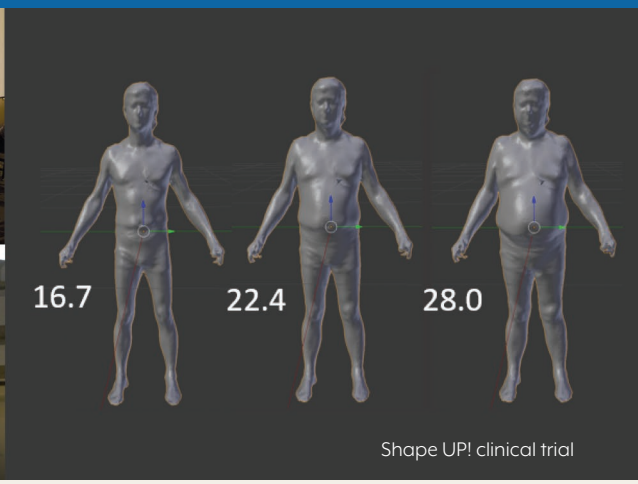
National Cancer Institute-Molecular Analysis for Therapy Choice (NCI-MATCH Trial) is a precision medicine cancer treatment clinical trial. In this trial, patients are assigned to receive treatment based on the genetic changes found in their tumors through genomic sequencing and other tests according to the NCI. **The UH Cancer Center was one of the top sites of enrollment for the trial across the nation.**

PATIENTS ENROLLED ON TRIALS IN THE LAST SIX YEARS


YOCAS clinical trial


2017 Helping Enhance Research in Oncology Appreciation Event


Hula clinical trial



Shape UP! clinical trial

666 INTERVENTIONAL THERAPEUTIC TRIALS

10,708

NON-INTERVENTIONAL EPIDEMIOLOGY, OBSERVATIONAL AND OUTCOME STUDIES

13,183 TOTAL PATIENTS ENROLLED ON TRIALS

FIGHTING CANCER THROUGH CLINICAL TRIALS

It's scary for anyone to be diagnosed with cancer. Darla Mariboho had the unfortunate experience to be faced with cancer twice in 12 years. Both times the discovery of her cancers were incidental findings while being medically examined for other physical complaints.

In 2005, Mariboho started having difficulty walking, explaining that it felt as though her leg would readily pop out of her hip joint. While undergoing neurological evaluation for her leg, a cancerous lump was found in her right breast. She was treated first with a mastectomy, and then participated in a UH Cancer Center coordinated clinical trial to be further treated with chemotherapy to kill any remaining cancer cells.

Mariboho stated, "I felt honored to be asked to participate. I believe that not only would I benefit, but it would also help in providing the best possible treatment options for future patients facing the same battle that I was determined to win."

Early in 2017, Mariboho had an unrelenting dry coughing spell that resulted in pain, and what she thought might be a fractured rib. A scan revealed a mass in her right lung that turned out to be Stage 3 non-small cell lung cancer, a common type found among tobacco users. After completing treatment, Mariboho participated in a clinical trial with immunotherapy through the UH Cancer Center.

"I would highly recommend that other patients choose to participate in a clinical trial. There are many reasons, but most importantly, you are carefully monitored by your oncologist, and participation means improving treatment and cancer prevention for the future," said Mariboho.

20 BY 25

ONE STEP CLOSER

TODAY'S "STANDARD" TREATMENT
WAS A CLINICAL TRIAL 5-10 YEARS AGO.
TODAY'S CLINICAL TRIAL WILL BE
STANDARD CARE 5-10 YEARS FROM NOW.

OVERALL GOAL

ENSURE THAT THE PEOPLE OF HAWAIʻI RECEIVE THE HIGHEST LEVEL OF CANCER CARE

BACKGROUND

- Clinical trials provide the highest level of quality of care for patients with cancer.
- The mortality rate from cancer is falling, in large part due to cancer research that has, through clinical trials, led to new and better methods of cancer prevention, detection and treatment.
- Children with cancer are enrolled onto clinical trials at a rate of 70-75 percent across the U.S.
- Only two percent of adults with cancer in the U.S. enroll on clinical trials.

CLINICAL TRIALS PROVIDE THE HIGHEST QUALITY OF CARE FOR CANCER PATIENTS

- Clinical trials provide closer supervision and monitoring than standard care.
- Patients always receive equal to or better than the standard of care.
- Patients have access to novel drugs, or new drug combinations, that may improve the response to treatment, increase the chance of cure and prolong survival.

WHY DO SO FEW ADULTS WITH CANCER PARTICIPATE IN CLINICAL TRIALS?

- There is lack of awareness as to the value of clinical trials.
- Patients have medical concerns that they will receive less effective treatment than standard care.
- There is the fear of cancer, of the unknown and of dying.
- There are financial concerns about cost and insurance coverage.
- The lack of education and engagement of, and incentives for, oncology providers.

HAWAIʻI WILL BE THE ONLY STATE IN THE U.S. TO ACHIEVE THIS HIGH PROPORTION OF ENROLLMENT TO CLINICAL TRIALS.

20BY25

Initiative focused on:

- community education about cancer clinical trials,
- engagement and training of oncology providers, and
- encouraging enrollment to cancer clinical trials.

ACHIEVE ENROLLMENT TO CANCER CLINICAL TRIALS OF 20 PERCENT OF ALL INDIVIDUALS WITH NEWLY DIAGNOSED AND RELAPSED CANCERS EACH YEAR BY 2025.

- There are ~6,500 new cancer cases each year in Hawaiʻi.
- The goal is to enroll 1,300 patients per year onto a cancer clinical trial.
- At least one-fourth of these enrollments should be to treatment-based trials. Others may be to cancer prevention, supportive care, diagnostic and cancer healthcare delivery trials.

THE UNIVERSITY OF HAWAI'I CANCER CENTER'S MISSION IS TO REDUCE THE BURDEN OF CANCER THROUGH RESEARCH, EDUCATION, PATIENT CARE AND COMMUNITY OUTREACH WITH AN EMPHASIS ON THE UNIQUE ETHNIC, CULTURAL AND ENVIRONMENTAL CHARACTERISTICS OF HAWAI'I AND THE PACIFIC.

UNIVERSITY OF HAWAI'I
CANCER CENTER

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NCI Cancer Center
A Cancer Center Designated by the National Cancer Institute