News from the University of Arizona Cancer Center

Our mission is to prevent and to cure cancer.

January 2018
UA Cancer Center Receives $2M Grant to Investigate Benefits, Harms of Selenium Supplementation

With a $2 million grant from the National Cancer Institute, University of Arizona Cancer Center researchers will delve deeper into the intriguing results from a clinical trial investigating the benefits and harms of selenium supplementation.

Using data and blood samples that have already been collected from study participants, the team seeks to unravel the mystery of why some participants experienced a reduction in recurrence of colon polyps, while older participants may have seen a slight increase in diabetes risk.

The UA Cancer Center's Elizabeth T. Jacobs, PhD, professor and director of the UA Mel and Enid Zuckerman College of Public Health's epidemiology program, is the principal investigator for this project, which will be funded through June 2022.

"Given the popularity of dietary supplements, it's important that the public have reliable information about their safety in order to make the best decisions for their health," said Andrew Kraft, MD, director of the UA Cancer Center. "Dr. Jacobs' study will go a long way toward clarifying questions surrounding the benefits and drawbacks of selenium supplementation."

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Three UA Cancer Center Researchers Receive American Cancer Society Institutional Research Grants

UA Cancer Center member **Tracy Crane, PhD**, received a special interest grant for a project titled "Improving adherence to ACS guidelines on nutrition and physical activity through integrated symptom management in Latinas with cancer and their informal caregivers." Latina cancer survivors experience high symptom burden after cancer diagnosis and during treatment. Symptom burden lingers into the post-treatment period and hinders the adoption of healthy lifestyle choices. Her pilot study tests a 12-week telephone intervention that promotes symptom management and the adoption of healthy lifestyle choices that reduce symptom burden and recurrence risk in Latina cancer survivors, and improve overall health in survivors and their caregivers.

Additionally, UA Cancer Center member **Hina Arif Tiwari, MD, DNB**, received a basic science grant for a project titled "Transforming Prostate Cancer Care: Development of novel non-invasive mpMRI and MRdUSg prostate biopsy techniques for detection of early prostate carcinoma expressing aggressive histological and molecular features." The project will bring together a coalition of technical, radiology, urology, pathology and cell biology experts. The results will help develop and validate the methodology for use of quantitative mpMRI as an adjunct to tissue biopsy, using sophisticated molecular biomarkers for determining prostate cancer aggressiveness. The objective is to provide novel, accurate classification of patients with early aggressive disease, to promote a precision curative intervention for those who will benefit, and to avoid excessive treatment for those with indolent disease.

UA Cancer Center member **Koenraad Van Doorslaer, PhD**, also received a basic science grant. His project is titled "Dissecting the role of anatomical tissue origin on HPV-induced cancer." Oncogenic strains of human papillomavirus (HPV) cause 5 percent of cancer worldwide, including cervical cancer and head and neck cancer. Dr. Van Doorslaer will investigate how evolution of viral phenotypes associated with fitness and anatomical niche adaptation eventually result in cancer. Specifically, given that HPV-16 causes the majority of non-cervical HPV-associated cancers, he hopes to determine the role of anatomical tissue origin on the oncogenic potential of evolutionarily related viruses. The project will provide insights into why some HPV types are more oncogenic than others, uncovering valuable clues for patient screening and therapeutic interventions.
NCI Grant Will Support UA Cancer Center Research into Lung Cancer Stigma

Two University of Arizona Cancer Center researchers have received a grant to spearhead a study to reduce stigma felt by lung cancer patients.

Heidi Hamann, PhD, UA associate professor of psychology and family and community medicine, and Linda Garland, MD, director of the UA Clinical Lung Cancer Program and associate professor of medicine, will test the effectiveness of a short-term intervention among lung cancer patients who report feeling a high level of stigma. The treatment is designed to equip recipients with coping tools to overcome the self-blame and guilt often associated with the stigma surrounding lung cancer.

Because of the strong association between smoking and lung cancer, stigma surrounding lung cancer is shaped by the idea that the disease is "self-inflicted," which can lead to feelings of guilt, self-blame and shame among patients, as well as judgment from others.

Drs. Hamann and Garland's project, "An innovative approach to reduce lung cancer stigma," is supported by a $100,000 National Cancer Institute Cancer Center Support Grant as part of its Basic/Clinical Partnerships to Promote Translational Research.

Dr. Cynthia Miranti Appointed as a Program Leader for Cancer Biology

Cynthia Miranti, PhD, will serve as co-leader of the Cancer Biology Program along with Nathan Ellis, PhD, who has been serving as the program leader.

The goal of the Cancer Biology Program is to identify etiologic mechanisms underlying cancer initiation and progression. The research done in the Cancer Biology Program has one primary focus: to discover and understand how cancer works...
at the most fundamental levels in order to devise approaches to cure and prevent it.

Last year, Dr. Miranti relocated her lab to the UA Cancer Center to increase collaboration with other cancer researchers. Her goal is to build collaborative mechanism-based research focus areas that show the greatest promise in impacting human health.

Dr. Miranti obtained a doctorate in biochemistry from Harvard Medical School and has previously taught at Van Andel Research Institute in Grand Rapids, Michigan. She is a recipient of the 2017 UA Cancer Center HERO Award.

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**Nam Lee Joins UA Cancer Center**

In October, we welcomed a new member to our ranks: **Nam Y. Lee, PhD.** She is an associate professor in the departments of Pharmacology and Chemistry & Biochemistry, with previous positions held at the Ohio State University and Duke University. Her doctorate in biophysical chemistry was obtained from the University of Iowa. Her research focuses on understanding how TGF-beta signaling controls a wide spectrum of molecular and cellular effects, ranging from proliferation to differentiation and cell motility.

Please join us in welcoming Dr. Lee, and keep reading to get to know her a little better!

**What are your impressions of Arizona so far?**

I am enjoying the scenic environment and especially the fall weather. I’ve spent most of my life in the Midwest, where it’s hot and humid in the summers and cold in the winters. So I’m very much looking forward to my first winter experience in Arizona.

**How do you describe your research?**

My research interests are pretty broad, but when it comes to cancer my primary interest is on understanding how tumors form new blood vessels. There are many mechanisms contributing to the formation of tumor vessels, of course, but we focus on endoglin, a mostly vascular-specific protein that is used as a specific marker of tumor vessels. Given that endoglin-targeted therapies are currently in clinical trials, it's important to learn more about the mechanism of action, and perhaps more importantly, be able to predict how different types of tumors can evade or develop resistance to endoglin-targeted therapies.
What are your hopes for the future of cancer research?

Like many cancer researchers, I hope to make some tangible progress in at least one specific type of cancer. For me, it's pancreatic cancer. Unlike most solid tumors where endoglin is critical for angiogenesis, its role in pancreatic cancer is unclear. In fact, our research so far suggests that it has potent anti-angiogenic effects for reasons that are unknown. For me, this is rather interesting since pancreatic cancer is one of the few tumor types that have reduced angiogenesis and overall vascularity -- and the mechanisms for this phenomenon are also poorly understood. Nevertheless, I think understanding this process is important since tumor vascularization plays a key role in metastasis but also in efficient drug delivery.

Protul Shrikant Joins UA Cancer Center

October also saw the addition of Protul Shrikant, PhD, to UACC's roster. His work has resulted in the application of IL-21 in the treatment of renal cell carcinoma and melanoma. He has also conducted cancer trials using rapamycin to block mTORC1 activity and promote CD8+ T cell memory responses in ovarian, breast and prostate cancer. He describes his work as a bridge between basic science and medicine -- not just "bench to bedside" but also "bedside to bench," as he listens to his clinical colleagues about what questions need to be answered at the bench to fulfill unmet needs at the bedside.

We talked to Dr. Shrikant to learn more about his background and philosophy. Please join us in welcoming him to UACC!

Are you new to Tucson?

Yes! I was pretty surprised at how little traffic issues there are. It's got enough cultural diversity and eclectic opportunities, so I don't feel like I'm out of the city. It's a city with a small-town feel. I came from just down the street, Scottsdale. I was originally from New York. I moved to Mayo and then from Mayo I got recruited here. I was brought up in Mumbai, India, an island with 20 million people on it. It's tropical, hot and humid, so it's different from here.

What do you hope to accomplish at the UA Cancer Center?

There's a lot of activity across the campus -- in the Immunobiology Department, in the Nanomaterials Department, within the Biophysics Department -- that needs to be brought together on a common platform to translate into effective new options for cancer patients right here. We need to create the ability of these
people to talk to one another in a common language on a common platform on a regular basis, so that we truly leverage all the strengths on this campus. I think there's tremendous potential. There's incredibly good science on the campus, and there's a lot of clinics. We need to bridge the two. We can make significant contributions not only to knowledge and science, but to health.

**What are your hopes for the future of cancer research?**

My personal belief is that we need to tailor therapies to make cancer patients' life a higher quality and longer, and not necessarily seek cures as the endpoint. There are a lot of chronic disease states, such as diabetes and herpes, that we live with and we can have a decent quality of life. That's what I think the future will be, that we will learn to live with cancer happily ever after. And not die of cancer, but die of old age.

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**UA Cancer Center Website: Request for Comments**

We are always trying to improve our web presence to make the experience more user-friendly and informative for patients, potential patients, health care providers, scientists, researchers, and members of the general public.

If there are aspects of the current website that you think can be improved or changed, please contact **Cody Cassidy**, ccassidy@uacc.arizona.edu.

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**Scenes from the 2017 Melanoma Walk**

On Saturday, Nov. 4, the Skin Cancer Institute held its eighth annual Melanoma Walk. Nearly 300 participants came together to walk three laps around the UA Mall. The first lap was walked to honor those lost to melanoma, the
The second lap was to celebrate those living with melanoma, and the third lap represented hope for the future.

Thirty-nine people were screened for skin cancer -- with eight possible basal or squamous cell carcinomas detected, and two potential melanomas detected. These visitors were referred for follow-up care.

In total, we raised around $54,000 to fight melanoma at the UA Cancer Center. Thanks to our participants, volunteers, staff and sponsors!
Shared Resources

SHARED RESOURCE HIGHLIGHT: Bioinformatics
Bioinformatics involves the analysis of high-throughput sequence and molecular data for study of cancer genomes. The Bioinformatics Shared Resource (BISR) provides comprehensive analysis of genomic and proteomic data to UACC members in support of their research. This contribution can result in short- or long-term projects, ranging from one day to many months, depending on the nature and extent of the support required.

The Shared Resource provides all levels of support from experimental design to analysis and publication of these data and development of grant applications. BISR staff works with researchers to select the data analysis approach that would help answer the research question. The resource assists in providing information about cancer data resources and utilization of bioinformatics pipelines and analytical tools for research projects. BISR also provides cohort identification in public clinically annotated molecular data for hypothesis generation. The goal is to provide assistance with data analysis that will lead to testable hypotheses and fundamentally important discoveries in cancer research.

The BISR specializes in the biological interpretation of data that may lead to a new understanding of cancer biology and the discovery of new diagnostic markers, risk genetic markers and drug targets. The staff is well prepared to perform all of these types of analysis.

The Bioinformatics Shared Resource at the University of Arizona provides support in the following areas:

- Analysis of genome data (e.g., gene expression, non-coding RNAs, CGH, next-generation sequence analysis), proteomics, and other types of molecular data sets of cancer cells and tissues
- Analysis of cancer molecular and clinical annotated datasets from public resources. NIH-TCGA (Cancer Genome Atlas project), Cosmic (Catalogue of Somatic Mutations in Cancer), CCLE (Cancer Cell Line Encyclopedia), NIH LINCS project (Library of Network-based Cellular Signatures), NCBI GEO datasets and any other public resource.
- Application of a broad range of statistical and computational approaches for integrative analysis of molecular data with clinical parameters and correlating molecular profiles to patient attributes and outcome.
- Support for pathway analysis, data visualization, systems biology analysis, analysis of genetic vulnerabilities for drug targeting and predictive patterns for outcome.
- Assist in generation of preliminary data for development of grant applications and supporting bioinformatics data for publications.
- Bioinformatics support for Cancer Center projects and other Shared Resources in the form of molecular databases, genome databases and data-sharing tools.

Who We Are
The Bioinformatics Shared Resource was founded in 2002 to provide bioinformatics, genomics and proteomics support to the University of Arizona Cancer Center researchers so they can fully utilize the power of the Human Genome Project in their research. The Shared Resource collects, stores and makes available a variety of molecular and genetic data on cancer genomes. It uses established computational tools but also develops new tools as needed for analysis of all genome-related data. A
variety of computer-related services for informatics support of research projects also is provided. Through these various levels of support, the Bioinformatics Shared Resource provides an integrated approach that assists researchers in their quest for new biological information about cancer cells and tissues and thus aids in finding new drug targets and preventive methods.

**Interaction with Cancer Center Members**
The service offered is expertise in data analysis and management. If staff can assist a cancer researcher on a temporary consulting basis, then the Shared Resource will charge for the time spent on a project. The Shared Resource staff welcomes the opportunity to participate in laboratory meetings, research discussions, and writing papers and grant applications. Staff can perform a free preliminary data analysis to support the feasibility of an application and also can add experience and expertise in data management and analysis, thereby helping to increase the fundability of many research grant applications.

**Expertise**
Areas of expertise include both computational biology -- biological sequence analysis, protein structure analysis, genome analysis, advanced computational analysis of large data sets such as gene expression, single nucleotide polymorphism (SNPs), and proteomics data and basic biological studies -- population and molecular genetics, molecular and cell biology, biochemistry and evolutionary biology. The goal is to provide assistance with data analysis that will lead to testable hypotheses and fundamentally important discoveries in cancer research. Staff specializes in the biological interpretation of data, leading to a new understanding of cancer biology, and the discovery of new diagnostic markers, risk genetic markers (haplotypes), patterns in data and drug targets. The staff is well prepared to perform all of these types of analysis.

**FUTURE ROLE FOR THE BIOINFORMATICS SHARED RESOURCE AS A RESOURCE FOR CANCER GENOME AND POPULATION GENETIC DATA**
The Bioinformatics Shared Resource will continue to aid University of Arizona Cancer Center investigators with access to genome and proteome data, data analysis, and integration of large data sets data with clinical and biological information for specific research projects. It will keep abreast of new data sets, analytical tools and generate new computational tools and methods, as needed.

[Read more about the Bioinformatics Shared Resource here.](#)
Shared Resources to Enhance Research Efforts

The University of Arizona Cancer Center supports eight Shared Resources funded by the Cancer Center Support Grant and two other resources funded by other sources, intended to provide access to technology that enhances the research productivity of the Cancer Center and provides a basis for scientific interaction and consultation, as well as access to services that facilitate the research and strengthen the administrative and organizational cohesion of the center.

The University of Arizona Cancer Center Shared Resources:

- Analytical Chemistry
- Behavioral Measurement and Interventions
- Bioinformatics
- Biostatistics
- Cancer Imaging
- Experimental Mouse
- Flow Cytometry
- Genomics
- Proteomics
- Tissue Acquisition and Cellular/Molecular Analysis

National Conversation

- **New York Times: "Birth Control and Breast Cancer: Putting the Risk in Perspective":** A recent study linking modern hormonal contraception to a small increase in breast cancer risk was alarming to many women. A physician at the Indiana University School of Medicine argues that this risk is one variable among many that must be evaluated holistically.

- **Forbes: "California Amplifies The Cancer Scare From Cellphones":** There is no convincing evidence that cellphone use increases the risk of cancer, but nevertheless, the California Department of Public Health issued guidance on reducing exposure to radiofrequency electromagnetic fields from cellphones.

- **Nature: "China to roll back regulations for traditional medicine despite safety concerns":** Traditional Chinese medicines may no longer be required to pass safety and efficacy trials in China. Scientists fear plans to abandon clinical trials of centuries-old remedies will put people at risk. Cancers of the liver and urinary tract have been linked to aristolochic acid, an ingredient widely used in traditional remedies.

- **New York Times: "When Cancer Strikes Twice":** Researchers found that, depending on cancer type and age, the risk of developing a second unrelated
cancer ranged from 3.5 to 36.9 percent. They hope to change the common practice of excluding former cancer patients from clinical trials when they develop another cancer.

Call for Collaborations

This section is intended to provide a platform for UACC Members to propose collaborative efforts with each other. Any and all ideas are welcome. Contact Cody Cassidy with your proposal to be posted here.

Share Your Stories and Ideas

Please send news items, announcements, calls for collaboration, upcoming events, comments, and anything else that you can think of to Cody Cassidy, ccassidy@uacc.arizona.edu.

Visit the UACC Website