

YES! Newsletter

Youth Enjoy Science

April 2022 Newsletter Volume 8

University of Nebraska Medical Center, Munroe-Meyer Institute, Eppley Institute and College of Public Health

Cancer Resources.

The YES program offers cancer curriculum resources, including e-learning modules, cancer vocabulary tools and comic books. **Access these at:** [https://www.unmc.edu/eppley/education-outreach/Cancer Education Resources.html](https://www.unmc.edu/eppley/education-outreach/Cancer_Education_Resources.html)

The American Indian Cancer Foundation offers dozens of resources, including brochures, posters, infographics, toolkits, webinar recordings and banners, available to download or order at no cost. All resources are culturally tailored and can be written in a tribe's native language. **Access these at:** <https://americanindiancancer.org/resources/>

Newsletter Committee:

Regina Idoate
Joyce Solheim
Misty Pocwierz-Gaines
Aislinn Rookwood
Liliana Bronner
Maurice Godfrey

Cancer Treatment Centers in Omaha, NE

Fred & Pamela Buffett Cancer Center

505 S 45th St.
Omaha NE 68105

402.559.5600



The Fred & Pamela Buffett Cancer Center scientists are increasingly identifying the drivers behind cancer and creating precise therapies that improve outcomes. By harnessing the most advanced biomedical and technological tools available and through the use of genomics and other new diagnostic tools, they are employing precision medicine to customize therapies and care for each cancer patient. While all forms of cancer are treated at the Fred & Pamela Buffett Cancer Center, because of their prevalence in society and the center's potential to have a significant impact in their treatment, their focus is on: Breast Cancer and Other Women's Cancers, Head and Neck Cancers, Leukemia and Lymphoma, Lung Cancer, Pancreatic and Gastrointestinal Cancers, and Prostate Cancer.

Methodist Estabrook Cancer Center

8303 Dodge St,
Omaha, NE 68114

402.354.5890



Methodist Estabrook Cancer Center understands the fear and emotional distress that a diagnosis of cancer can evoke. They are here to help patients and their loved ones through the entire health care journey from diagnosis through treatment and recovery. They specialize in care for: Breast Cancer, Cancer Care, Cancer Nutrition Counseling, Cancer Rehabilitation, Cancer Treatment, Clinical Trials, Gynecologic Oncology, Head and Neck Oncology Hereditary Cancer Risk Program, Lung and Thoracic Oncology, Radiation Oncology, Skin Cancer and Surgical Oncology.

American Indian/Alaska Native Cancer Resources

The American Indian Cancer Foundation

<https://www.americanindiancancer.org/>

This foundation is a national nonprofit organization that strives to reduce the burden of cancer in AIANs through community-based programs.

Keep it Sacred National Native Network

<https://keepitsacred.itcni.org/>

This national network of tribes, tribal organizations, and tribal health programs works to reduce tobacco use and cancer disparities among AIANs across the United States by disseminating culturally tailored informative resources to organizations that serve AIANs.

Partnership for Native American Cancer Prevention

<https://nartc.fcm.arizona.edu/partnership-native-american-cancer-prevention-nacp>

The Partnership for Native American Cancer Prevention is a collaboration between Northern Arizona University and the University of Arizona Cancer Center. Through research, education, and community outreach, the NACP seeks to reduce the cancer burden of AIANs living in the Southwestern US

National Breast and Cervical Cancer Early Detection Program

<https://www.cdc.gov/cancer/nbccedp/index.htm>

This CDC program provides access to screening and diagnostic services for low-income, uninsured, and underserved women. The program has partnerships with 13 AIAN organizations and tribes.

Black Hills Center for American Indian Health – Southwest Navajo Tobacco Education Prevention Project

<https://www.bhcaih.org/sntep>

This program's primary goal is to improve the health of Navajo people through education on the importance of commercial tobacco prevention, cessation, and policies while respecting the use of ceremonial tobacco.

Northern Plains Tribal Tobacco Technical Assistance Center

<https://health.gpcthb.org/nptttac/>

Working collaboratively with national and state tobacco prevention programs and the South Dakota QuitLine, this Center provides technical assistance, education and training.

Tribal Comprehensive Cancer Control programs

https://www.cdc.gov/cancer/ncccp/ccc_plans.htm

These programs address the cancer burden for a specific tribal group and provide culturally appropriate education, resources, and support to assist tribal health providers in preventing and treating cancer.

The Colorectal Cancer Control Program

This program awards health systems serving high-need populations with funding to improve access to evidence-based interventions that increase colorectal cancer screening. The program partners with the Alaska Native Tribal Health Consortium and the Inter-Tribal Council of Michigan.

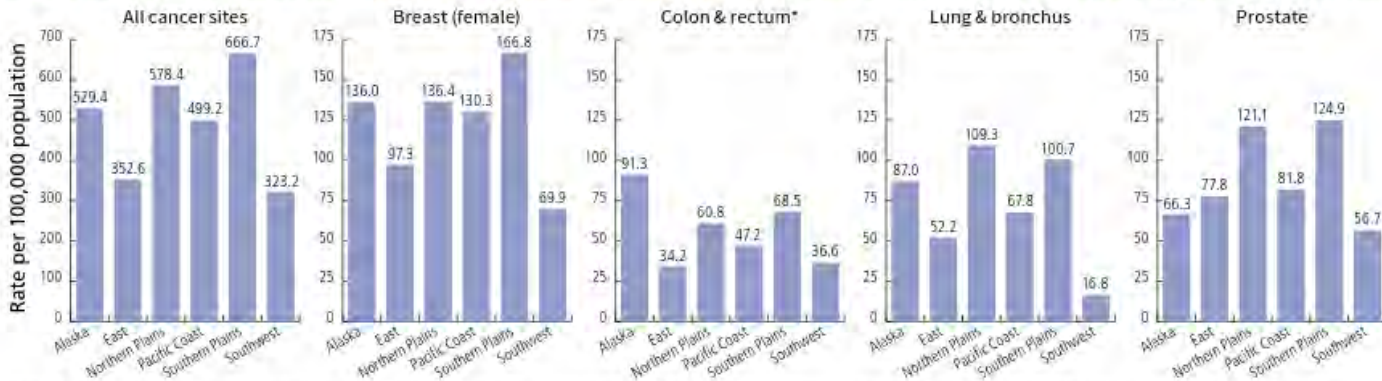
Tribal Tobacco Control Programs

These programs seek to improve the health of AIANs through education on the importance of commercial tobacco use prevention, providing access to cessation tools, and promoting prevention policies while respecting the use of ceremonial tobacco

AI/AN Cancer Incidence Rates by Region

Cancer Facts & Figures 2022 by the American Cancer Society. See below:

Figure S2. Incidence Rates for Selected Cancers among American Indians and Alaska Natives by PRCDA Region, US, 2014-2018



PRCDA: Purchased/Referred Care Delivery Area. All rates are age-adjusted to the 2000 US standard population and are adjusted for delays in reporting. Rates exclude persons of Hispanic ethnicity. *Excludes appendix. NOTE: The vertical scale varies across graphs to optimize the display of data.

Source: NAACCR, 2021.

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“AIAN men and women are vulnerable to cancer disparities due to long-standing inequalities in SES, education, and access to care. This population not only has a higher burden of major cancer risk factors (e.g., cigarette smoking, obesity, and cancer-causing infections) compared to Whites, but are also more likely to be diagnosed at a later stage and receive substandard treatment. Many of these disparities could be reduced by increasing access to high-quality cancer prevention, early detection, and treatment.”

American Cancer Society
Cancer Facts & Figures 2022

Table S2. Comparison of Cancer Incidence Rates in American Indians and Alaska Natives (AIAN) in PRCDA counties with Whites Nationally, US, 2014-2018

Cancer Site		AIAN	White	RR
All sites	Total	488.3	477.9	1.02*
	Male	515.0	514.2	1.00
	Female	473.3	454.0	1.04*
Breast	Female	119.1	134.7	0.88*
	Total	52.4	36.7	1.43*
Colon & rectum†	Male	59.4	42.2	1.41*
	Female	46.7	31.8	1.47*
Esophagus	Total	5.5	5.1	1.09
	Male	9.5	8.8	1.09
	Female	2.3	1.9	1.22
Kidney & renal pelvis	Total	31.6	17.7	1.79*
	Male	41.7	24.0	1.73*
	Female	23.4	12.1	1.93*
Liver & intrahepatic bile duct	Total	19.1	7.4	2.59*
	Male	27.9	11.2	2.49*
	Female	11.8	4.0	2.93*
Lung & bronchus	Total	66.4	62.5	1.06*
	Male	73.0	70.0	1.04*
	Female	61.5	56.8	1.08*
Oral cavity & pharynx	Total	12.8	13.5	0.95
	Male	19.6	20.5	0.96
	Female	7.0	7.2	0.98
Pancreas	Total	14.4	13.2	1.09*
	Male	16.7	15.3	1.09
	Female	12.6	11.4	1.10
Prostate	Male	89.1	104.9	0.85*
	Total	10.3	5.3	1.92*
Stomach	Male	13.4	7.5	1.78*
	Female	7.9	3.5	2.24*
	Total	11.5	7.4	1.56*

PRCDA: Purchased/Referred Care Delivery Area; RR: incidence rate ratio. All rates are per 100,000 non-Hispanic persons, age-adjusted to the 2000 US standard population, and adjusted for delays in reporting. Rate ratios represent the unrounded incidence rate in AIANs living in PRCDA counties divided by the unrounded incidence rates in Whites nationally. *The rate in AIANs is statistically significantly different from that in Whites (p<0.05). †Excludes appendix.

Source: NAACCR, 2021.

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**University of Nebraska
Medical Center
Buffett Cancer Center
YES! Mentors**

Dr. Joyce Solheim

studies cancer immunology. Her laboratory is investigating the molecular mechanisms by which cancer cells indicate to immune cells that they are abnormal, and thereby provide immune cell attack. Her group is also engaged in translational projects developing chemokine immunotherapy approaches for cancer treatment. Dr. Solheim is currently mentoring four YES interns.



FRED & PAMELA

BUFFETT
CANCER CENTER



EPPLEY INSTITUTE
FOR RESEARCH IN CANCER



Misty Pocwierz-Gaines, is a YES! Coordinator. She studies biomedical student development. She mentored YES cancer research intern Promise Moore-Saufley.

Buffett Cancer Center YES! Mentor Highlight



Allie



Gabi



Catherine

Alaina (Allie) Larson's research in Dr. Joyce Solheim's laboratory in the UNMC Eppley Institute is on analyzing beneficial effects of chemotherapy drugs beyond their direct cancer cell-killing ability, specifically investigating how they can be used to increase the immune response against pancreatic cancer cells.

Gabrielle (Gabi) Brumfield's research in Dr. Joyce Solheim's laboratory in the UNMC Eppley Institute is to study interactions between the immune system and pediatric cancer with a focus on improving the anti-cancer immune response against the cancer.

Catherine Johnson's research in Dr. Leah Cook's laboratory in the UNMC Department of Pathology and Microbiology is on understanding the interactions between bone-metastatic prostate cancer cells and mesenchymal stem cells and neutrophils in the tumor microenvironment, with a special emphasis on the role of the chemokine CXCL8.

Allie, Gabi, and Catherine have been leaders among the UNMC Cancer Research Program graduate students in mentoring YES interns. During this spring, these three graduate students, along with Nick Mullen, Megan Wackel, Christabelle Rajesh, and Dianna Huisman have been engaging in discussions with the YES interns about a variety of cancer-related topics, including "Immune Cell Receptors", "Antibodies in Cancer Diagnosis", "Radiation Oncology", "Cancer Metabolism", "Use of Bioinformatics in Cancer Research", "Skin Cancer", "Cancer Stem Cells", "Lung Cancer", "Prostate Cancer", and "Anti-Cancer Drugs". Dr. Joyce Solheim (who is one of the YES Program Principal Investigators) also meets with the YES interns regularly to discuss cancer research specifically in the context of Native American perspectives and populations.

YES! IResearch Club – Soils & Heavy Metals

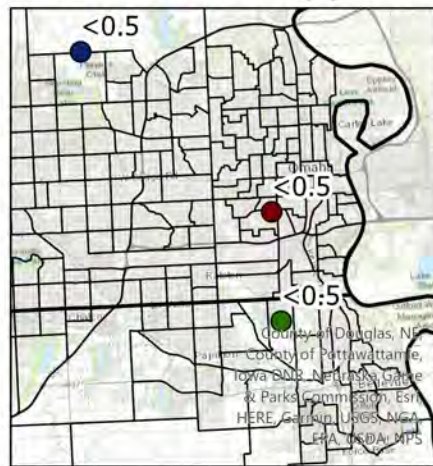
In the 2021-22, the YES program is in the third year of its partnership with Tracy Hartman-Bradley (Alutiiq, Aleut) and the Native Indigenous Centered education (NICE) program. This schoolyear, middle school students participating in the YES Indigenous Research (IResearch) Club have been learning about heavy metals, such as Arsenic, Cadmium, Lead, and Chromium, and how exposure to these metals in our soil can increase our risk of chronic disease like cancer and other neurological diseases. Arsenic exposure is associated with lung, bladder, kidney, liver and skin cancers. Cadmium exposure is associated with lung, prostate, kidney, and pancreatic cancers, while Chromium, specifically Chromium (VI), is associated with lung cancer. Lead, while not a cancer-causing agent, damages the brain and nervous

system. Students collected soil core samples at three different areas across the Omaha metropolitan area and learned about pathways of exposure (inhalation, ingestion and absorption). These samples were sent to the Midwest Laboratories, a large regional lab located in Omaha. Students have been meeting in-schools to learn about how samples are processed and analyzed by Midwest Laboratories. Students are now preparing for an out-of-school field trip on Friday, April 29th at the Metropolitan Community College (MCC), South Omaha campus. At this field trip, they will discuss the results of their sampling, play a hand game, and learn about various health professions programs and academic opportunities available to them at MCC, the Boys and Girls Club, and through Bluebird Cultural Initiative.

Arsenic in ppm



Cadmium in ppm

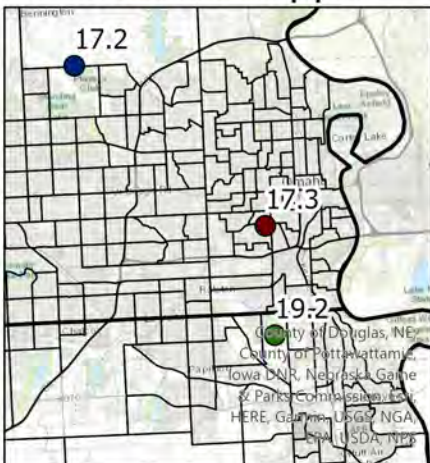


Concentration of Heavy Metals in soil samples in the Omaha metro

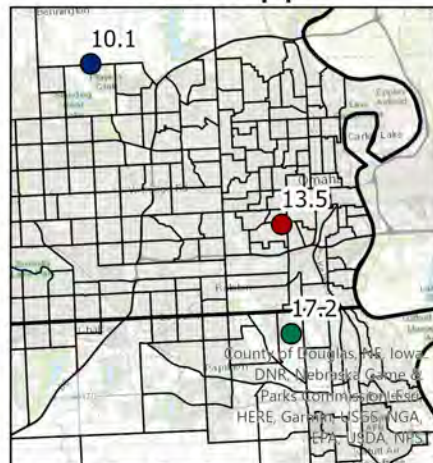
Sample Number

- 1
- 2
- 3

Chromium in ppm



Lead in ppm



EPA Regulatory Limits

Arsenic	20 ppm
Cadmium	2.5 ppm
Chromium	-
Lead	400 ppm



0 2.5 5 10 Miles

Source: Census tract data is from the US Census Bureau, TIGER/Line Files for 2021 (<https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-line-file.2021.html>). Heavy metal concentrations for Arsenic, Chromium, Cadmium, and Lead in ppm are from the YES IResearch Club project in 2022. Created by A. Rookwood.

YES Outstanding Research & Creative Activity Award Winner – Rudy Smith, Jr.

Rudy Smith Jr., Navajo Nation/Acoma Pueblo, is an undergraduate student in Psychology and pre-med at Arizona State University. Rudy is a YES Cancer Research Intern in Dr. Shalini Sharma's lab at the University of Arizona Cancer Center where he works with a team to study the role of RNA splicing mutations in myeloid malignancies. Rudy collaborates with his mentor, graduate students and lab technicians in the Sharma lab to study the role of bone marrow microenvironment in the splicing factor mutation associated phenotypes during differentiation of human CD34+ hematopoietic stem and progenitor cells. Rudy's focus is on examining the impact of hypoxia on expression of erythroid differentiation markers including CD117, CD71, and CD235a. He uses leukemic cell lines K562 and TF1a and various biochemical techniques such as immunoblotting and flow cytometry to study the effect of low oxygen, which is characteristic of bone marrow, on expression of surface markers. In addition, Rudy assists with several lab tasks including preparation of cell culture media and maintenance of cell lines.

In addition to his work with Dr. Sharma in biomedical sciences at UA, Rudy has also worked with Dr. Regina Idoate in public health, contributing as a co-investigator on a study at the University of Nebraska Medical Center. He is a co-author of A Walk in Two Worlds: An Indigenous Health Research Mentorship Model Developed from the Experiences of Mentors and Mentees in a Cancer Research Education Program Aimed at Increasing Representation of American Indians/Alaska Natives in Cancer Research and Healthcare Professions which is under review. The primary purpose of this study was to examine mentor and mentee experiences of participation in Youth Enjoy Science research education internships to learn from their stories. In his role as a Co-Investigator on this project, Rudy made critical contributions to data analysis and manuscript writing. Rudy is an exceptional communicator, both in writing and in conversation. He is dependable, conscientious and dedicated to his work and studies. Rudy is also a humble and thoughtful collaborator. We are proud that Rudy Smith Jr. represents the YES program.



“It is moments like these that prompt me to look back at my long venture into and within higher education, and to see just how far this kid from the Navajo reservation has come. This is in large part thanks to the direction and kindness of my mentors who share their light in an otherwise unexplored frontier for a first-generation Native college student such as I.” - Rudy

University of Arizona YES! MENTORS

Dr. Karen Hastings, is a physician-scientist who studies antigen presentation and regulation of T cell responses to skin cancer.



Dr. Shalini Sharma studies the role of RNA splicing mutations in myeloid malignancies. She currently works with YES cancer research intern, Rudy Smith.



Dr. Amelia Gallitano studies EGR3, a transcription factor that has been implicated in cancer.



**Medicine
Phoenix**

YES! Mentor Highlight Meet Dr. Taben Hale



Dr. Taben Hale

The Hale lab investigates the mechanisms involved in the pathological remodeling of the heart, vasculature and erectile tissue that underlie heart failure and sexual dysfunction. In addition, they are examining the role that prenatal stress plays in predisposing individuals to cardiovascular disease and sexual dysfunction in adulthood. The long-term goal of their work is to develop novel therapeutic strategies for the treatment of these two conditions.

Dr. Hale's Research Interests:

Cardiovascular Pharmacology, Hypertension, Cardiovascular Diseases, Sexual Dysfunction

Describe your research in 25 words or less.

We investigate mechanisms that reduce the risk of pathological cardiac remodeling. Our YES intern (Kristiann Ferreira) studies this in the context of anthracycline chemotherapy-induced cardiac injury..

Best advice for YES cancer researcher interns?

Be persistent. Grants are rarely funded on first submission, papers are rarely accepted without changes, experiments rarely go smoothly the first time. Persistence is one of the most important qualities for a long, successful research career.

Why did you choose to become a YES mentor?

Mentoring is my favorite part of my job. I love the enthusiasm that students bring, and I really enjoy working with them to foster a love of discovery. I also think that it is critical to increase opportunities to build a more diverse workforce in science and medicine, so the mission of the YES program was one that really resonated with me.

What do you like to do outside the lab?

I love spending time with my family (husband and two daughters – 9 and 5 years old). We enjoy spending time outdoors hiking and playing soccer. I'm a big sports fan, so love watching hockey, basketball, and soccer.

What is a common misconception about research?

I think there is a misconception that scientists work alone in a lab and that it is an isolated experience. But this could not be further from the truth. Research is highly collaborative. I work closely with many other scientists and that not only makes the experience more enjoyable, but it also leads to much greater discovery as each person brings their own expertise to a project.

American Indian and Alaska Native Understandings of Cancer through Poetry

The YES program is developing poetry-based cancer education resource materials. We are requesting poetry submissions that share perspectives, experiences, and knowledge about cancer from persons who identify as American Indian and Alaska Native (AI/AN).

See example below.

Dreamworld

Mariah Abney

The rain falls soft against my office window
It's been a gloomy two days

Perfect for writing

To the other side of me past two doors I can hear the rain
through a sound machine

Ironic how we can listen to the rain anytime we want now
Anything to keep a baby sound asleep in the dreamworld.

I stop and begin to think of a perfect dreamworld.

What would that look like?

What would that feel like?

I take a deep breath in as I wonder,

What smells would be in the air?

I exhale, as I imagine there's no diseases, especially no cancers!

A chill rushes into the room to remind me I'm not in this dreamworld
It settles and lingers

Hoping I'd give up on my vision of the perfect dreamworld

I don't, instead I ponder about how I can bring the dreamworld here

So many questions race to the front of my mind

An overwhelming sense of urgency fills my entire being

The air becomes thick

My shoulders become heavy

How am I to help?

How am I to be the one to help?

How am I to help the ones who have already heard the word

"CANCER"?

Poetry about cancer across the cancer control continuum (cancer etiology, prevention, detection, diagnosis, treatment, survivorship, and palliative care) in any format will be accepted. All poetry submissions will be considered for inclusion in YES curriculum materials and analyzed as part of an arts-based research project to better understand the lived experience of cancer through the perspectives of AI/ANs.

Submissions will be accepted through May 31, 2022. The first 20 writers to submit a poem about cancer will be compensated \$25 in the form of a gift card.

Submit to Mariah Abney, YES Cancer Research Intern & Poet at Mariah.Abney@unmc.edu



SHPEP - YES! WISH Summer Program at UNMC

If you or someone you know are a Native American high school student that is currently enrolled in 10th, 11th, or 12th grade and interested in pursuing a health science career, this is a great opportunity for you!

The goal of the FREE Summer Health Professions Education Program (SHPEP), Youth Enjoy Science (YES) Weeklong Institute for Students in High School (WISH) is to strengthen the career development of Native American students underrepresented in the health professions and improve their access to information and resources that can prepare them for college success in a health-science field with a focus on cancer-related careers. This program will be offered in-person and full-time (e.g., for 8 hours per day) for one week from Sun, June 26- Sat, July 2, 2022 at the University of Nebraska Medical Center in Omaha, Nebraska. The program will take place at the University of Nebraska Medical Center Campus. Students will be provided free overnight lodging at Scott Residence Hall at the University of Nebraska at Omaha. Meals and transportation will be provided.

Question? Contact aislinn.rookwood@unmc.edu

Website: <https://www.unmc.edu/eppley/education-outreach/high-school.html>



Details:

- June 26 – July 2, 2022
- In-person, full-time
- Flexible asynchronous and synchronous sessions
- Exposure to various different health professions through
- Networking with health professions students and faculty

To apply, complete the following:

- Online [SHPEP YES WISH APPLICATION](https://rebrand.ly/SHPEYW22) (<https://rebrand.ly/SHPEYW22>)



- [SHPEP YES WISH PERMISSION FORM](#) and send to aislinn.rookwood@unmc.edu
- Have any teacher complete the [SHPEP YES WISH RECOMMENDATION](#) and send to aislinn.rookwood@unmc.edu



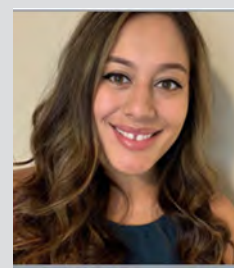


AMERICAN INDIAN SCIENCE AND ENGINEERING SOCIETY

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Join AISES Today!

AISES supports K-12, undergrad and graduate students in STEM and Healthcare studies through mentorship, scholarships & community building events.

Member Benefits!

Career Development
Academic Networks
Professional Networks
Awesome Mentors

Events
Leadership Summit
Virtual Science Fair
Conferences



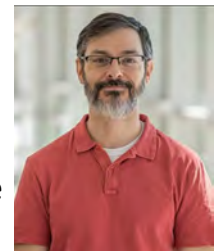
Access
Job Boards
Internships
Scholarships
Awards

Subscriptions
Winds of Change Magazine
Annual College Guide

Contact AISES:

<https://www.aises.org/membership>

Omaha Student Advisor: Scot Ouellette
scot.ouellette@unmc.edu



Nebraska AISES Program Partners



Bluebird Cultural Initiative





Youth Enjoy Science Cancer Research Internship

If you are a Native American undergraduate student and you are interested in pursuing a health science career, this opportunity is for YOU!

Join a cancer research laboratory at the University of Arizona College of Medicine Phoenix for hands-on training in research. Multiple opportunities and projects are available including in skin cancer, muscle toxicity of cancer drugs, breast cancer, blood cancer, and regulation of gene expression. You will work with a medical school faculty member and medical and graduate students to learn about research and prepare yourself for a health science career.

More information about the YES! Program can be found at <https://www.unmc.edu/eppley/education-outreach/index.html>

Contact khasting@arizona.edu

Details:

- Paid training opportunity \$12.80/hour
- Location: University of Arizona College of Medicine Phoenix campus, 425 N. 5th St.
- Multiple opportunities in cancer research



Internship Eligibility Requirements:

- Native American heritage
- Undergraduate student
- Interest in a health profession and/or research career

To apply, email
Dr. Karen Hastings:

khasting@arizona.edu



THE UNIVERSITY OF ARIZONA
Cancer Center



Contact Information:



UNMC College of Public Health

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Fred & Pamela Buffett Cancer Center

Misty Pocwierz-Gaines
Educational Program Coordinator
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UA Cancer Center

Dr. Karen Hastings
Associate Professor
602-827--2002
khasting@email.arizona.edu

Upcoming Events

NIH SciEd 2022 Conference

Washington DC

Tuesday May 31 – Friday, June 3, 2022 in person

YES! Teacher Workshop: Teaching about HPV and Cervical Cancer using STEM and Indigenous Pedagogy

Hybrid: University of Nebraska Medical Center & Online

Tuesday, June 28 –Wednesday, June 29, 2022 in person

Summer Health Professions Education Program (SHPEP), Youth Enjoy Science (YES) Weeklong Institute for Students in High School (WISH)

University of Nebraska Medical Center &

University of Nebraska Omaha – Scott Residence Hall

Sunday, June 26 –Saturday, July 2, 2022 in person

11th annual Powwow for Hope™

Dancing for Life, Love and Hope

Virtual community healing and fundraising event

August 2022, dates TBD

Announcements

Join the American Indian Cancer Foundation's

Virtual Cancer Support Circle

These virtual support group meetings are for Indigenous cancer survivors, caregivers, and family members who have been affected by cancer. The support group offers a safe space to meet others who are experiencing similar challenges to build a circle for all to share our journey together. Please contact: health@aicaf.org

