J

UAMS | Winthrop P. Rockefeller Cancer Institute

NCI Fund Semiannual Legislative Report

June 1, 2023 – November 30, 2023

TABLE OF CONTENTS

Executive Summary

In 2019, the Arkansas General Assembly passed Senate Bill 151, creating the University of Arkansas for Medical Sciences (UAMS) National Cancer Institute Designation Trust Fund. A semiannual report of the use of funds from the trust fund is required pursuant to Act 181 of 2019. To date, this report provides information regarding the balance of the fund, administrative costs paid for from the fund, and total revenue received by the fund. A detailed description of the steps taken and the progress made toward achieving status as a National Cancer Institute-designated cancer center are covered in this report as well, including faculty recruitment efforts, research funding and grant activity, philanthropic fundraising, infrastructure and cancer care network expansion, clinical trials, and community outreach programs. This period's report also includes information regarding the Cancer Research Training and Education program, pilot funding opportunities, research program internal funding opportunities, and shared resources.

Background

According to the American Cancer Society, more than 18,600 Arkansans will be diagnosed with cancer in 2023, and an estimated 6,340 people will die of the disease.[1] Arkansas has a high rate of cancer diagnoses in four types of cancers: lung and bronchus (2,950), breast (2,510), prostate (2,500), and colon and rectal (1,630). Although cancer mortality rates in Arkansas have decreased between 2010 and 2021, the state currently ranks 6th highest in the nation with regards to cancer-related deaths.[2] Cancer is the second-leading cause of death in Arkansas and could become the leading cause of death within the next decade, surpassing cardiovascular disease, based on the diagnosis trends in the state.

Earning NCI designation for our cancer center will allow UAMS to provide cancer patients throughout the state of Arkansas with specialty cancer care close to home as well as providing access to cutting-edge clinical trials while expanding our work on cancer prevention, early detection, and cancer research.

[1] American Cancer Society. *Cancer Facts & Figures 2023*. American Cancer Society, 2023, www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2023/2023-cancer-facts-and-figures.pdf.

[2] Centers for Disease Control and Prevention. *Cancer Mortality by State*. CDC/National Center for Health Statistics, 28 Feb 2022, https://www.cdc.gov/nchs/pressroom/sosmap/cancer_mortality/cancer.htm.

NCI Designation Overview

The National Cancer Institute (NCI) recognizes designated cancer centers for their exceptional leadership in clinical, laboratory, and translational research. NCI-designated cancer centers represent the top 2% of cancer centers in the United States.

In 1971, President Richard Nixon signed the National Cancer Act of 1971 authorizing the National Cancer Program to provide additional funding to establish 15 new cancer centers. These new cancer centers were charged with conducting clinical research, training, and demonstration of advanced diagnostic and treatment methods for cancer. Today, the NCI supports a network of 72 NCI-designated cancer centers in 36 states and the District of Columbia, including 56 Comprehensive Cancer Centers, nine Cancer Centers, and seven Basic Laboratory Cancer Centers (**Figure 1**). More than 60 NCI-designated cancer centers are affiliated with university medical centers.

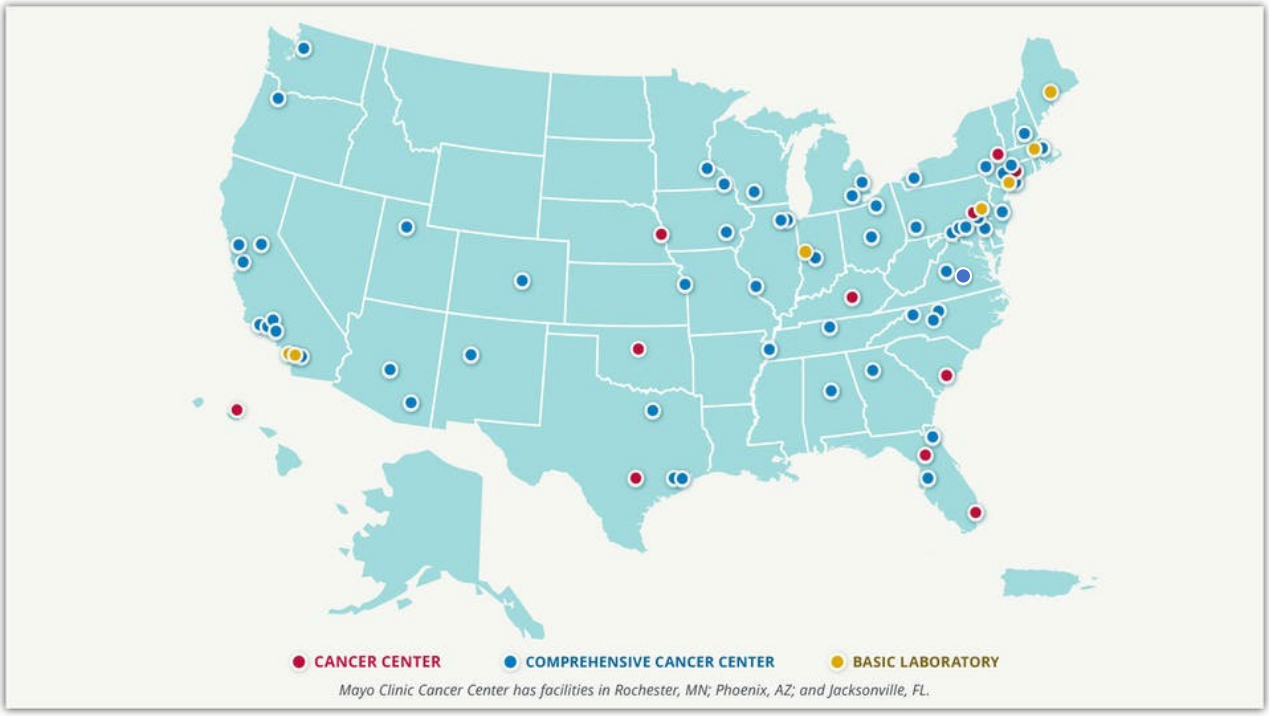


Figure 1. NCI Designated Cancer Centers. There are currently 72 NCI-designated cancer centers across 36 states and the District of Columbia.

NCI-designated cancer centers are recognized for their scientific leadership in laboratory and clinical research, in addition to serving their communities and the broader public by integrating training and education for biomedical researchers and health care professionals. NCI-designated cancer centers dedicate significant resources toward developing research programs, faculty, and facilities that will lead to better and innovative approaches to cancer prevention, diagnosis, and treatment. NCI supports the research infrastructure for cancer centers to advance scientific goals and foster cancer programs that draw together investigators from different disciplines.

Impact of Cancer Centers on Cancer Care

When the U.S. Senate approved to increase the number of comprehensive cancer centers in 1975, their goal was to geographically distribute these centers in order to provide an estimated 80% of the U.S. population with access to cancer care within a reasonable driving distance. Cancer centers serve their local communities with programs and services tailored to their unique needs and populations. As a result, these centers disseminate evidence-based findings to their own communities, and these programs and services can be translated to benefit similar populations around the country.

There are no NCI-designated centers in Arkansas, Louisiana, or Mississippi. The nearest NCI-designated centers providing adult cancer care are located in Dallas, Oklahoma City, Kansas City, St. Louis, and Nashville. These centers are all ~300+ miles (5+ hours drive) away from Central Arkansas and are not a feasible cancer care solution for most Arkansans (**Figure 2**).

Stephenson Cancer Center in Oklahoma City, Oklahoma; Sylvester Comprehensive Cancer Center in Miami, Florida; and the University of Florida Health Cancer Center in Gainesville, Florida; earned NCI designation for the first time in 2018, 2019, and 2023, respectively. Additionally, the University of Kansas Cancer Center in Kansas City, Kansas; Massey Cancer Center in Richmond, Virginia; and Markey Cancer Center in Lexington, Kentucky; most recently received "Comprehensive" status in 2022 and 2023.

The NCI Cancer Centers Program continues to value the geographic distribution of its cancer centers and patient access to research-driven, cutting-edge care. The NCI recognizes that there is a great need and opportunity for Arkansas to have an NCI-designated cancer center, and it stands ready to support the Winthrop P. Rockefeller Cancer Institute on its journey toward designation.

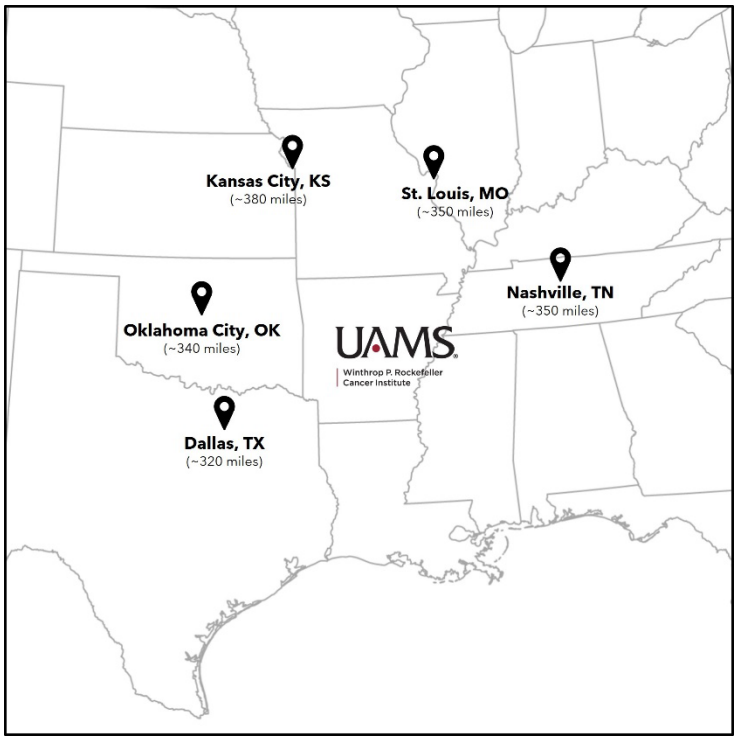


Figure 2. Closest NCI-Designated Centers to Arkansas.

Value of NCI Designation

NCI designation is an enormous asset for any state and benefits include the following:

1. Direct monetary support from NCI will support cancer research that benefits Arkansans. While many cancer centers conduct research, the Winthrop P. Rockefeller Cancer Institute is the only academic institution in the Arkansas focused on improving cancer outcomes. In fact, NCI requires its designated cancer centers to define their research portfolio based on what will make a difference in cancer prevention, awareness, treatment, survival, and quality of life in the population they serve.

2. Indirect monetary gains include a projected $70 million economic impact on the state of Arkansas annually. Further growth following NCI designation is expected to increase that impact value. (Source: Arkansas Center for Health Improvement, 2018)
3. Becoming a member of the NCI Cancer Centers Program will give Arkansas a seat at the table to drive national strategic planning for cancer research toward opportunities that will benefit all Arkansans.
4. Arkansans will have access to clinical trials and new cancer treatments that are only available to NCI-designated cancer centers.
    a. Access to grant funding opportunities that are only available to NCI-designated cancer centers
    b. Access to cutting-edge clinical trials and investigational drugs that are only available to NCI-designated cancer centers
5. Cancer researchers at the Winthrop P. Rockefeller Cancer Institute will have access to cancer research grants that are only available to NCI-designated cancer centers. This provides the opportunity to increase the amount of cancer research designed to benefit Arkansans by ~60%.

The opportunity to partner with an NCI-designated cancer center will attract biotechnology and pharmaceutical companies to Arkansas. It is estimated that designation could lead to the establishment of a biotechnology park in Arkansas along with offices and headquarters for many pharmaceutical companies.

Process to Attain NCI Designation

NCI designation is attained through strategic recruitment of cancer researchers and establishment of a sophisticated cancer research infrastructure prescribed by the NCI in its P30 Cancer Center Support Grant (CCSG) (https://grants.nih.gov/grants/guide/pa-files/PAR-21-321.html).

Our estimated cost to attain NCI designation is $250 million. This cost is in line with recent successful NCI designation efforts. Oklahoma's Stephenson Cancer Center became the 70th NCI-designated cancer center on May 2, 2018, stating it took 12 years and $400 million to become designated. Twenty-nine percent of the $400 million came from the state, predominantly through a statewide tobacco tax, according to Stephenson Cancer Center Director, Robert Mannel, MD.[3] The Sylvester Comprehensive Cancer Center in Miami, Florida, reported that it spent $250 million over five years to become the country's 71st NCI-designated cancer center on July 29, 2019. Sylvester's director, Stephen Nimer, MD, said that the state of Florida contributed a little over $16 million per year during that time to support their efforts to achieve NCI designation.[4] On June 20, the University of Florida Health Cancer Center announced receiving designation from NCI after spending approximately $330 million over an eight-year period from 2014 to 2022. According to Jonathan Licht, MD, director of the UF Health Cancer Center, the state of Florida contributed approximately $12 million per year after the Florida National Cancer Institute Cancer Centers Act was signed into law in 2014[5].

Cancer centers seeking NCI designation undergo review by an External Advisory Board (EAB) to ensure that NCI's standards for a designated center are being met. These EAB meetings are critical to keep a cancer center on track for designation and result in a formal report about the cancer center being filed with NCI. Once an EAB has determined that a cancer center is ready to apply for NCI Designation, the cancer center must meet with NCI and get their approval to apply.

[3] *The Cancer Letter*. 2 May 2018, Vol. 44, No. 18, https://cancerletter.com/conversation-with-the-cancer-letter/20180504_3/
[4] *The Cancer Letter*. 29 July 2019, Vol. 45, No. 31, https://cancerletter.com/the-cancer-letter/20190729_1/
[5] *The Cancer Letter*. 23 June 2023, Vol. 49, No. 25, https://cancerletter.com/the-cancer-letter/20230623_1/

Once NCI approves a center to apply for NCI designation, the center submits its CCSG to NCI according to the timeline set by NCI. Preparation of a CCSG generally takes two years and is often begun well before NCI approves a center to apply for designation. Following submission of the grant, the cancer center will host a site visit from NCI and leaders from other cancer centers to review the cancer center.

Both the written grant and site visit comprise the scores that determine if a cancer center becomes NCI-designated. After NCI designation is attained, it must be renewed every five years with the submission of another CCSG and site visit. This ensures that the standards set forth by NCI for a designated cancer center continue to be upheld.

Expected Timeline

The Winthrop P. Rockefeller Cancer Institute is targeting submission of its CCSG application as soon as possible (**Figure 3**). Several critical factors influence this timeline: 1) how quickly strategic cancer research recruitments can be made, 2) achieving approximately 250 patient accruals on clinical trial (NCI requirement), 3) establishing a statewide community outreach and engagement effort including cancer research relevant to the state of Arkansas, and 4) ultimately a timeline set by NCI for submitting the CCSG application.

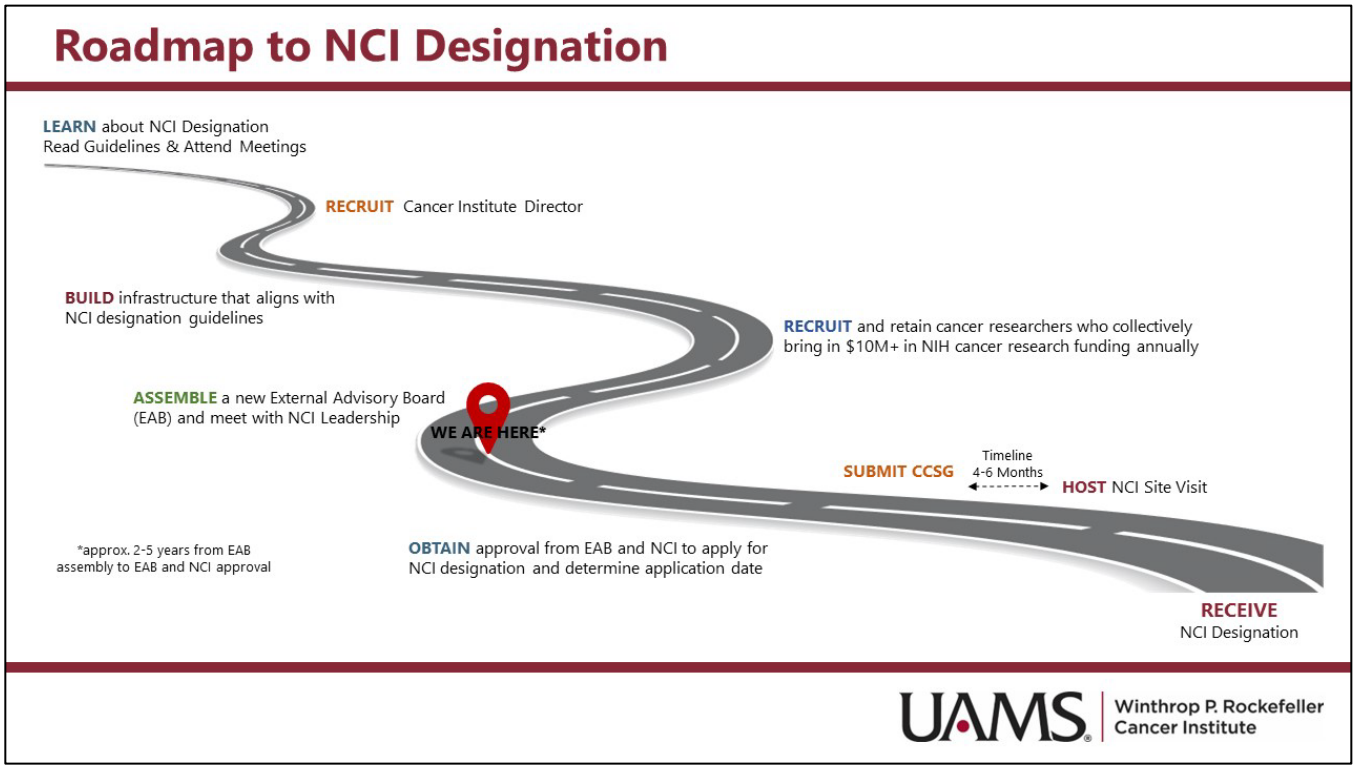


Figure 3. Roadmap to NCI Designation.

State Funds to Support NCI Designation

The Winthrop P. Rockefeller Cancer Institute continues to diligently use the state funds provided by Senate Bill 151 to support NCI designation efforts. **Table 1** shows our actual expense to date and forecasts current confirmed commitments in future years. **Table 2** provides an accounting of the trust fund for the current reporting period of June 1, 2023 – November 30, 2023. Details on the expense breakdown can be found in **Appendix A**.

Table 1. State Funds – NCI Designation.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Total
	FY20 (Actual Expense)	FY21 (Actual Expense)	FY22	FY23	FY24	FY25	FY26	FY27	FY28	Total
Actual Expense	$1,929,339	$4,822,056	$15,821,985	$45,733,591						$68,306,970
Encumbered Expense (current confirmed commitments)					$45,733,591	$32,519,458	$29,415,522	$13,697,926	$9,571,978	$130,938,476
Total Actual Expense Plus Encumbered Expenses										$199,245,446
Total Revenue Received to Trust Fund to Date										$197,980,287

Table 2. Trust Fund Reporting Period: June 1, 2023 to November 30, 2023.

Beginning Balance (June 1, 2023)	$36,293,815.12
Total Transfers In	$125,525,867.98
Special Revenue: Cigarette Paper Tax	$836,795.45
**Processing Charges by DF&A on Special Revenue	($25,940.67)
Net Revenue Received	$162,630,537.88

Expense:

**Workers Comp Charged direct by DF&A	($12,739.19)
Expense Draws Posted for Period (6/01/2023 – 11/30/2023)	($10,262,116.52)
Ending Balance (November 30, 2023)	$152,355,682.17
Expense Draws for November Not Yet Posted to AASIS	($4,761,634.60)
Adjustment for funds drawn for Radiation Oncology Center expensed in this period	$954,880.49
Adjusted Ending Balance	$148,548,928.06

**Department of Finance and Administration adjustments

Progress Toward Achieving NCI Designation June 1, 2023 – Nov. 30, 2023

Large-Scale Recruitment of Cancer Researchers

The Winthrop P. Rockefeller Cancer Institute continues to see recruitment activities from the global ads that were placed in high-impact journals during previous resporting periods. In addition, we have worked with departments across campus on recruitment for a couple of years, and departments will now approach us with cancer-relevant faculty candidates that would benefit our research portfolio. After a national search for the dean of the UAMS Graduate School, Sean Taverna, PhD, was recruited as a cancer researcher from John Hopkins University in Baltimore, Maryland. The Winthrop P. Rockefeller Cancer Institute has also used a recruitment firm to target cancer researchers for leadership positions, and Yong Zhu, PhD, will assume the role of associate director of Population Sciences and Translational Science in addition to his position as professor in the Department of Epidemiology (**Table 3**). Their CVs are also provided in **Appendix B**. To date, our large-scale effort has yielded 24 diverse candidates across 11 academic departments, four colleges, and the graduate school.

Table 3. Cancer Research Recruitments June 1, 2023 – November 30, 2023.

Candidate	Current/Previous Institution	Recruited Rank	Recruitment Status	Recruitment Home Department	Research Interest	Peer-Reviewed Cancer Research Funding at Time of Legislative Reporting	CI investment*
Sean Taverna, PhD	Johns Hopkins University School of Medicine	Professor and Dean, UAMS Graduate School	Started November 1, 2023	Biochemistry and Molecular Biology	Melanoma, leukemia and lymphoma, and head and neck cancers	None	$1,000,000 total for start-up resources over 5 years (FY24 – FY29); $490,000 for graduate student stipends
Yong Zhu, PhD	Yale School of Public Health and School of Medicine	Professor and Associate Director of Population Sciences and Translational Science	Starting January 15, 2024	Epidemiology	Prostate and breast cancers	None	$4,238,750

*Cancer Institute investment represents the total commitment made by the Cancer Institute to support the cancer research candidate and generally represents a three-to-five-year period. This support is to pay for operating expenses including lab equipment, personnel salary and fringe, supplies, services, and other relative cancer research costs.

Strategic Recruitment of Oncology Clinical Faculty and Staff

In the last six months, we have hired three additional physicians to join our impressive clinical team in 2023 and 2024 (**Table 4**). Manojna Konda, MD; Anuradha Kunther, MD; and Alan Baltz, MD will be joining our hematology/oncology team. Their CVs are presented in **Appendix C**. We continue to use medical search firms and our own advertisements to recruit top medical oncologists from around the country.

Table 4. Clinical Oncology Recruitments June 1, 2023 – November 30, 2023.

Incoming	Anticipated Start Date	Clinic	Subspeciality	Previous Organization
Manojna Konda, MD	August 2023	Hematology	Hematology/Oncology	UAMS Hematology/Oncology Fellow
Anuradha Kunther, MD	February 2024	Hematology	Hematology/Oncology	UAMS Hematology/Oncology Fellow
Alan Baltz, MD	August 2024	Hematology	Hematology/Oncology	UAMS Hematology/Oncology Fellow

External Advisory Board

The WPRCI EAB provides external oversight, critical feedback, and guidance as it relates to aligning infrastructure and programmatic development with NCI's expectations for an NCI-designated cancer center. The EAB is currently chaired by Adekunle "Kunle" Odunsi, MD, PhD, director of the University of Chicago Medicine Comprehensive Cancer Center, and is composed of nine additional members who are nationally recognized for their expertise in cancer research, prevention, control, and treatment (**Table 5**). Specifically selected for their diverse demographic, geographic, and professional backgrounds, the EAB includes current directors, advisors, and research investigators from NCI-designated cancer centers as well as national experts in community outreach and engagement; diversity, equity, and inclusion; cancer research; and administration who guide and inform the WPRCI's strategic vision. EAB member bios are provided in **Appendix D**.

Table 5. Winthrop P. Rockefeller Cancer Institute External Advisory Board

EAB Member Name	Title/Rank	Institution
Adekunle "Kunle" Odunsi, MD, PhD (Chair)	Director Dean for Oncology, Biological Sciences Division	University of Chicago Medicine Comprehensive Cancer Center
Marcela G. del Carmen, MD, MPH	Professor of Obstetrics, Gynecology and Reproductive Biology Exec. Vice President at Mass General Brigham	Massachusetts General Hospital
Edward Chu, MD, MMS	Director Professor, Department of Medicine (Oncology) Professor, Department of Molecular Pharmacology	Albert Einstein Cancer Center
E. Claire Dees, MD, ScM	Professor of Medicine, Division of Oncology Director, Early Phase Clinical Trials Group Co-Lead, Clinical Research Program	UNC Lineberger Comprehensive Cancer Center
Chad A. Ellis, PhD	Deputy Director, Research Administration	Hillman Cancer Center, University of Pittsburg Medical Center
John Farley, MD, COL (ret), FACOG, FACS	Division of Gynecologic Oncology	Dignity Health Cancer Institute
Andrew K. Godwin, PhD	Deputy Director, University of Kansas NCI-Designated Cancer Center Professor, Department of Pathology & Laboratory Medicine Director, Molecular Oncology	Kansas University Medical Center
Samir N. Khleif, MD	Professor of Oncology	Lombardi Cancer Center, Georgetown University
Timothy R. Rebbeck, PhD	Professor of Cancer Prevention	Dana-Farber Cancer Institute, Harvard Medical School
Sora Park Tanjasiri, DrPH, MPH	Professor, Department of Epidemiology & Biostatistics	Chao Family Comprehensive Cancer Center, University of California, Irvine

Increased Research Funding

Our recruitment of active researchers has continued to bring in additional cancer research funding. Our 24 signed recruits have brought in $17 million of active external peer-reviewed funding (total); this number does not include any of the recruits' planned grant submissions once arriving on campus. Investments thus far through FY23 in new recruits amounted to a 112% return on investment. In addition, our current researchers continue to submit multiple grants to cancer-related funding sources such as NCI, American Cancer Society (ACS), and Department of Defense (DOD). Our researchers were awarded $16.5 million in new peer-reviewed, cancer-related funding (total) during the current reporting period of June 1, 2023 – November 30, 2023. As of

November 30, 2023, our cancer researchers held $18.4 million in peer-reviewed, cancer-related annual project direct cost grant funding.

Cancer Research Grant Activity

A total of nine external peer-reviewed grants were awarded during the latest reporting period, resulting in more than $16 million in grant funding for cancer-related research (**Table 6**) from four different external funding agencies (**Table 7**).

Table 6. Cancer Research Grant Activity.

External Peer-Reviewed New Grants Awarded (#)	Awarded External Peer-Reviewed New Grant Funding (Project Period Total Costs)
9	**$16,525,267**

Table 7. Detailed List of Cancer Research Grant Activity.

Grant Number	Title	Funding Agency	PI	Total Amount Awarded
1 CE1HS52094	MRI Facility and Equipment	Health Resources & Services Administration	Birrer, Michael	$1,750,000
1 CE1HS52245	Regional Cancer Care Facilities and Equipment	Health Resources & Services Administration	Birrer, Michael	$7,000,000
1 CE1HS52481	Cancer Care Mobile Van and Mammography Equipment	Health Resources & Services Administration	Birrer, Michael	$1,750,000
5R21CA285135	Role of a latent OriLyt RNA in KSHV latency in primary effusion lymphoma	NIH/Nat. Cancer Institute	Manzano, Mark	$429,166
5R37CA282349	Ryanodine Receptors as Therapeutic Targets to Prevent Doxorubicin-Induced Lymphatic Dysfunction	NIH/Nat. Cancer Institute	Stolarz, Amanda	$1,801,737
2R01CA209882	Contribution of osteocytes to the musculoskeletal effects of Multiple Myeloma	NIH/Nat. Cancer Institute	Delgado-Calle, Jesus	$2,249,025
ASTRO-CSDG-23-1037280-01-CDP	Targeting the KRAS-USP7-RAD18 Axis to Overcome Radiation Resistance in Pancreatic Cancer	American Cancer Society, Inc.	Wolfe, Adam	$583,200
RSGI-23-1039245-01-HOPS	Affordable care act on racial disparity in endocrine therapy use among females with early stage hormone receptor positive breast cancer	American Cancer Society, Inc.	Li, Chenghui	$222,000
W81XWH2110053	Development of Novel Inducers of Non-Apoptotic Cell Death to Target TNBC	US Department of Defense	Tiwari, Amit	$740,139
Total				**$16,525,267**

Philanthropic Fundraising

The Winthrop P. Rockefeller Cancer Institute's Gala for Life was held on September 22, 2023, and raised over $1,000,000, which is in line with pre-pandemic numbers. Attendance for the event has remained steady but lower than before the pandemic. We had a savings of almost $23,000 on expenses, which is exceptional considering inflation. The Envoys continue to engage constituents outside UAMS to attend the Ambassador Program, adding 33 new members, our largest class to date. The remaining three educational sessions will be held after the first of the year. On May 4, 2024, the Winthrop P. Rockefeller Cancer Institute will host its fourth

annual “Be a Part of the Cure Walk,” and we continue to raise our annual goals with hopes of succeeding them in registration as well as sponsorships. We will hold our Day at the Races event hosted by Oaklawn Racing Casino Resort on March 7, 2024. This is an event hosted by Louis Cella owner of Oaklawn Racing Casino Resort who is also past chairman of the Winthrop P. Rockefeller Cancer Institute Board of Advisors. These events set us apart from others in the community. We continue to collaborate with the Vice Chancellor of Institutional Advancement, John Erck, and with end-of-year donations, we have reached our $30 million goal and will continue to take donations.

Radiation Oncology Center and Proton Center of Arkansas

On July 18, 2023, the Winthrop P. Rockefeller Cancer Institute opened a new, 58,000 sq. ft. Radiation Oncology Center, which includes the Proton Center of Arkansas, a partnership between UAMS, Arkansas Children’s Hospital, Baptist Health, and Proton International. The Radiation Oncology Center and Proton Center of Arkansas provides advanced radiation treatments for children and adults with cancer as well as alternative treatment to traditional radiation therapy using a precisely focused high-energy beam that targets tumors without affecting the surrounding tissue and organs. As part of the Winthrop P. Rockefeller Cancer Institute, the Proton Center of Arkansas is the only proton center in the state, giving residents the opportunity to receive cutting-edge treatment without having to leave the state. In July 2023, the first patients began receiving photon therapy at the new Radiation Oncology Center, and the Proton Center began treating patients in September 2023. Since September, the average number of patients seen has grown from 48 to 69. Additionally, the total number of photon and proton treatments has seen steady increases (**Table 8**).

Table 8. Radiation Oncology Center and Proton Center of Arkansas.

Month	AVG # of Patients	Total # of Photon Treatments	Total # of Proton Treatments
September	48	961	74
October	59	1,157	140
November	69	1,090	221

Clinical Trials

To provide the best cancer treatment options for Arkansans, the Winthrop P. Rockefeller Cancer Institute continues to expand its clinical trials program. A staff of 75 research nurses, research coordinators, and regulatory and financial specialists currently support over 300 clinical research studies in brain, breast, cutaneous, gastrointestinal, genitourinary, gynecological, head and neck, lung, radiation oncology, phase I, and hematological cancers. Clinical trials staff have enrolled 110 participants in therapeutic trials and over 600 total participants during this reporting period. Enrollment is up over 30% since the previous reporting period. We also expanded our staff presence and clinical trial access to Northwest Arkansas and the Central Arkansas Veterans Healthcare System, with three therapeutic enrollments during the current reporting period. We plan to continue to expand our portfolio across the network and continue to see an increase in therapeutic clinical trial enrollment.

UAMS Baptist Health Cancer Network

In 2020, the University of Arkansas System Board of Trustees approved a joint venture between UAMS and Baptist Health to expand comprehensive cancer care, allowing the two medical centers to deliver state-of-the-art treatments with the most innovative technology available in Arkansas. The collaboration simplifies treatment and allows onoclogists to personalize therapy options, including clinical trials. In June 2022, the first UAMS Baptist Health Cancer Center opened on the campus of Baptist Health Medical Center in North Little Rock, and in October 2023, UAMS and Baptist Health opened a second cancer clinic and 32-bay infusion center on the

campus of Baptist Health Medical Center in Little Rock. The North Little Rock clinic currently averages 16 new patients per month. The number of infusions has grown from an average of 186 visits/infusions per month during the previous reporting period to an average of 309 visits/infusions per month during the current reporting period.

Community Outreach and Engagement

Advancing cancer care coordination and improving access continue to be top priorities for the Winthrop P. Rockefeller Cancer Institute Community Outreach and Engagement (COE) team. Specific efforts were made to offer services to more Arkansans by expanding the team from seven to eleven staff members, located in Fort Smith, Fayetteville, Batesville, Jonesboro, Helena, Little Rock, Pine Bluff, Magnolia, and Texarkana. The focus on capacity building extended beyond adding resources and aimed to ensure a high level of service delivery. The COE team has expanded awareness of our program by visiting over 1,600 FQHCs, health care facilities, community-based organization, faith-based organization, top employers, and other businesses across the state collectively. Referrals were made for over 3,100 individuals and/or families seeking cancer screenings and over 500 individuals and/or families were navigated to wellness and financial resources.

The COE team, including staff and leadership, completed the George Washington University Oncology Patient Navigation Training program, which is nationally known as the professional standard. The collective investment of more than 200 training hours establishes a performance standard for addressing barriers to care for cancer patients and survivors. This no-cost comprehensive, competency-based training uses evidence-based information and case studies as its basis and aligns Wintrhop P. Rockefeller Cancer Insitute's COE navigation team practices with the national standard.

This summer, the COE team collaborated with UAMS' Health, Research and Social Justice team in the College of Public Health to conduct town hall meetings focused on cancer prevention needs in Helena (June 5), Jonesboro (July 17), and Texarkana (August 9). The town hall meetings were well attended and provided rich data on the challenges residents face with cancer prevention and cancer care, as well as potential interventions and solutions. Additional town hall meetings will take place in 2024, starting with Pine Bluff in January.

To support physicians and other clinicians, the COE office conducted its second semi-annual education symposium focused on breast, cervical, and ovarian cancers. Education and awareness activities continued with the support of Union County CONNECT, a federally funded grant. These initiatives – a collaboration between Heather Williams, MD, an assistant professor of Obstetrics and Gynecology in the UAMS College of Medicine; the Cancer Research Training and Education Core (CRTEC); and Winthrop P. Rockefeller Cancer Institute Diversity, Equity, and Inclusion (DEI) teams – deliver a curriculum on the human papillomavirus to high school students across the county. The curriculum has been accepted by four school districts: El Dorado, Junction City, Smackover, and Strong. The lesson was taught in Strong during the 2022-2023 school year, and the remaining schools have commited to complete the lesson before the end of the 2023-2024 school year.

Cancer Research Training and Education Core

A critical component needed for gaining designation as an NCI cancer center is a means for our scientists to directly interact with the greater national and international cancer research community. Such interactions can introduce our scientists to cutting-edge ideas and raise the profile of our scientists nationally and internationally. CRTEC uses travel grants and two seminar series, Forum Seminar Series and Cancer Institute Grand Rounds, to foster direct interaction with scientific leaders and to raise awareness of our investigators and the advanced research they are doing in Arkansas. The CRTE arranges travel, speaker honoraria, and speaker

itineraries for both Forum and Grand Rounds. This is a large undertaking that we have successfully executed for the past two years.

Travel grants allow Winthrop P. Rockefeller Cancer Institute members, their fellows, and students to present their research at national and international meetings. This gives exposure of our scientists to the international scientific community and provides a path for exchange of ideas with other leading scientists. These discussions, often around a poster, foster collaborations, and refinement of scientific concepts. The CRTE core has awarded 14 grants between June 1, 2023, and November 30, 2023.

The Forum Seminar Series targets internationally recognized basic and translational scientists who are doing transformative cancer research with the goal of promoting interactions and collaborations among scientists. The Forum Seminar series is bi-weekly, and a total of seven speakers (one of which was virtual) gave presentations from September 2023 to December 2023. Members interested in the speaker's work have the opportunity to attend a dinner with the host and speaker the evening before their scheduled presentation. The following day, the speaker meets with small groups of investigators to discuss ongoing cancer research, allowing our scientists to showcase their cancer research and to potentially establish long-term relationships with the speakers. Similarly, Grand Rounds attracts internationally known clinical scientists who are applying the latest treatments and conducting clinical trials. From June 2023 to November 2023, this CME accredited series featured interactions between our clinical teams with six leaders in cancer treatment.

Pilot Funding

To achieve NCI designation, cancer centers are expected to have a robust research portfolio with funding and publications in thematic areas aligned with catchment area needs. To grow our research portfolio in pursuit of NCI designation, the Winthrop P. Rockefeller Cancer Institute offers pilot opportunities for members who conduct research across the translational spectrum. These pilot opportunities are meant to fund new avenues of cancer research that will accelerate the collection of data for NCI grant submissions and cancer-relevant publications. Pilot funding opportunities include the following:

Rural Research Award Program – The Rural Research Award Program (RRAP) supports cancer-focused research and strives to address a healthcare problem in rural Arkansas populations. Funding supports investigators or teams of investigators seeking to collect data for competitive NCI/NIH R01 grant submissions. Areas of special funding interest include projects that focus on prostate, colon, breast, and/or lung cancer; cancer patient outcomes; cancer screening and prevention; and/or cancer health disparities. RRAP was created to highlight the work of the UAMS Rural Research Network (RRN), which was established in January of 2020 to leverage the existing clinical and educational infrastructure of UAMS Regional Programs for research and to help ensure that Arkansas' rural populations are included in health research. The network comprises UAMS' eight Regional Campuses, located across the state, and is supported by an intra-institutional partnership. Its partners are UAMS Community Health & Research, the Translational Research Institute, UAMS Regional Programs, and the Cancer Institute. RRAP awardees are not required to use the RRN, but projects that do are given priority. Projects are funded for 18 months with budgets up to $100,000. During FY23, four Cancer Institute researchers received funding through the RRAP, totaling $399,702 in pilot funding (**Table 9**). While this mechanism has only been active since 2020, the Winthrop P. Rockefeller Cancer Institute maintains a summary of productivity metrics of total number of awards as well as related publications, presentations, and extramural funding (**Table 10**).

Table 9. Rural Research Award Program – FY23.

Project Title	Principal Investigator	Total Budget Amount
Arkansas Rural Mailed FIT Outreach Program	Ronda Henry-Tillman, MD, FACS	$99,718
Follow-up through Rural Research Network to Tackle High Early-Onset Breast Cancer in Arkansas Rural Community Health Study (ARCH)	Ping-Ching Hsu, PhD, MSc	$100,000
Assessing the Burden of Colorectal Cancer Mortality and Potential Risk Factors in Persistent Poverty Counties Compared to Other Counties in Arkansas	Chenghui Li, PhD	$100,000
Implementation of pharmacy-embedded community health workers to improve HPV vaccination in rural communities	Benjamin Teeter, PhD	$99,984

Table 10. Rural Research Award Program Productivity Metrics – Summary.

Total Number of Pilots Awarded	Number of Presentations	Number of Publications	Total Extramural Grant Funding
7	2	3	0*

*The RRAP mechanism has only been in place since 2021, so no external grant funding has been obtained. Two PIs have three grant submissions under consideration at the submission of this report.

Research Program Internal Funding

As one of the "six essential characteristics" of an NCI-designated cancer center, research programs are defined by a common research focus and comprise the research activities, common scientific interests, and goals of basic research scientists. Each member of the Winthrop P. Rockefeller Cancer Institute participates in one of three research programs, Cancer Biology, Cancer Prevention & Population Sciences, and Cancer Therapeutics. Members play a vital role in defining the goals of the research programs and identifying collaborative opportunities, and the Winthrop P. Rockefeller Cancer Institute is committed to supporting those initiatives and fostering collaboration within and across the three research programs.

In response to the EAB's recommendation to provide funds to help support research program initiatives, Dr. Birrer has provided $250,000 in funding to each research program. It is up to each program leader to decide how to spend the funds to enhance the program. Internal funding for each research program is described below.

Cancer Biology – The Cancer Biology Research Program has implemented three funding programs designed to increase extramural funding of program members from NCI-recognized funding sources and the number of collaborative, high-impact, cancer-relevant publications. Internal funding programs include (1) a program to improve grant resubmissions, which provides funds to address the concerns and needed revisions of applications that were not funded but received a score and comments from an NCI-recognized funding source; (2) a program to improve high-impact publication resubmissions, which provides funds to address the concerns and requested revisions of cancer-relevant manuscripts reporting primary research; and (3) a program to reward high-impact, collaborative publications, which recognize faculty members who have cancer-relevant publications that are high-impact, collaborative, and acknowledged using Winthrop P. Rockefeller Cancer Institute resources. To date, six funding applications have been made available, providing $83,000 in support to Cancer Biology members (**Table 11**).

Table 11. Internal Funding Programs for Cancer Biology

PI/Lead Author	Grant/Manuscript Title	Total Amount Awarded
Robert Eoff, PhD	Redox-sensitive replication gap suppression by DNA polymerase kappa	$25,000
Zhiqiang Qin, PhD	Targeting Hyaluronan Signaling against the Multidrug Chemoresistance of Virus-associated Lymphoma Cells	$25,000
Lu Dai, PhD	Identification of New Natural Compounds against KSHV-associated Malignancies	$15,000
Fenghuang Zhan, MD	Bispecific BCMA/CD24 CAR-T Cells Control Multiple Myeloma Growth	$6,000
Fenghuang Zhan, MD	BCMA-CAR-T cells secreting CST6 lyse tumor cells and suppress osteolytic lesions in multiple myeloma	$6,000
Fenghuang Zhan, MD	High NEK2 expression in myeloid progenitors suppresses T-cell immunity in multiple myeloma	$6,000
Total		**$83,000**

Cancer Prevention & Population Sciences – The Cancer Prevention & Population Sciences Research Program has made funding available so that members may acquire preliminary data necessary for the submission of NIH NCI R01 or R01-equivalent grant applications. Members applying to the program may request up to $50,000 in funding to support their research. To date, a total of two funding opportunities have been awarded, providing $100,000 in support to Cancer Prevention & Population Sciences members (**Table 12**). Dr. Ping-Ching Hsu has applied for extramural funding.

Table 12. Internal Funding Programs for Cancer Biology

PI/Lead Author	Grant/Manuscript Title	Total Amount Awarded
Ping-Ching Hsu, PhD	Arkansas Rural Community Health Study (ARCH)	$50,000
Benjamin Amick, PhD	Clinical, Psychosocial and Social Predictors of Sustainable Employment Among Cancer Survivors	$50,000
Total		**$100,000**

Cancer Therapeutics – The Cancer Therapeutics Research Program has implemented two funding programs to increase federal funding of program members, especially from NCI-recognized funding sources, and to increase the number of cancer-relevant publications in high-impact journals. Internal funding programs include (1) funding to support grant application resubmissions and (2) a publication award to support resubmission of high-impact factor manuscripts. To date, a total of three funding opportunities have been awarded, providing $20,000 in support to Cancer Therapeutics members (**Table 13**).

Table 13. Internal Funding Programs for Cancer Biology

PI/Lead Author	Grant/Manuscript Title	Total Amount Awarded
Analiz Rodriguez, PhD	Metabolic Imaging to Predict Treatment Response in Glioblastoma	$10,000
Alicja Urbaniak, PhD	Monensin and its Derivatives as Therapeutic Agents for Metastatic Breast Cancer	$10,000
Total		**$20,000**

Shared Resources

Shared resources play an essential role in advancing our research mission. The Winthrop P. Rockefeller Cancer Institute provides access to state-of-the-art equipment, technologies, services, and scientific consultation that enhance scientific interaction and productivity among members and other researchers at UAMS. The Winthrop P. Rockefeller Cancer Institute supports six shared resources: Bioinformatics, Biostatistics, Genomics, Proteomics, Radiation Biology, and Translational Pathology. We continue to grow, develop, and enhance available shared resources to support its effort to obtain NCI designation. Shared resources accomplishments during the current reporting period include the following:

Expansion of Services and Equipment – The Radiation Biology Shared Resource has initiated a new service. A Bruker 7T PharmaScan small animal MRI machine is now available to perform MRI scans of research animals for investigators. The Translational Pathology Shared Resource recently purchased OpenSpecimen management software. The installation and data migration phase for all the CI tissue repositories has been completed. This makes OpenSpecimen an institutional resource that will facilitate translational research by facilitating access to information about cancer specimens.

Extramural Funding Applications – Adam Wolfe, MD PhD, a member of the Cancer Biology program, received a new Clinician Scientist Development Grant from the American Cancer Society that uses the Radiation Biology Shared Resource. John Imig, PhD, newly recruited chair of the Department of Pharmaceutical Sciences and member of the Cancer Therapeutics program, has brought R01 funding from the NIDDK that uses the Radiation Biology Shared Resource. The Genomics Shared Resource applied for an NIH Shared Instrument Grant to receive an Illumina NovaSeq X-Plus Next Generation Sequencing (NGS) system for the UAMS Genomics Core Facility. If funded, the Winthrop P. Rockefeller Cancer Institute will provide institutional support for the balance of the cost.

Education – The Associate Director for Shared Resources, Steve Post, PhD, presented an overview of Cancer Institute resources and their importance for NCI designation in the monthly Forum Seminar meetings. In addition, the Shared Resource Directors continue to present at Research Program meetings to increase awareness of services offered by their respective laboratories. Dr. Post has also presented the services that the Translational Pathology Resource provides to support clinical trials to the clinical trials staff.

APPENDIX A

Expense Breakdown

Expense Breakdown – Senate Bill 151 – Trust Fund for NCI Designation

Program Account Description	Fund Center Account	Salary	Fringe	M&O	Total Expense	Notes
Imig, John	CC004122	62,975.50	14,566.82	59,302.81	136,845.13	Recuitment package support
Owsley, Kelsey	CC004123	13,799.98	3,161.39	0.00	16,961.37	Recruitment package support
Van Der Plas, Ellen	CC004124	44,035.12	13,661.62	43,884.48	101,581.22	Support of head & neck clinical trial
Griffin, Robert	CC004127	-4,141.00	-928.75	2,860.23	-2,209.52	Support of head & neck clinical trial
Atiq, Omar, MD (COM Internal Medicine-Medical Oncology)	CC100244	27,972.01	6,880.42	24,183.51	59,035.94	Support of head & neck clinical trial
Cancer Service Line Support	CC100246	50,536.51	10,872.28	0.66	61,409.45	Clinical research effort for Jibran Ahmed, MD
Cancer Institute Administration $8,436,639	CC100248	52,600.85	14,328.91	8,947,666.87	9,014,596.63	Staff salaries, equipment, supplies, etc.
Cancer Institute Basic Research	CC100249	15,463.50	2,711.11	61,553.06	79,727.67	For WPRCI Research Retreat
Cancer Clinical Trials Research Administration (CCTRA)	CC100250	497,980.49	129,272.31	61,827.57	689,080.37	Cancer Clinical Trials
Lewis, Gary, MD (COM - Radiation Oncology)	CC100252	22,215.52	2,678.15	0.00	24,893.67	Recruitment package support
Leung, Ricky, PhD (COM Pharmacology Toxicology)	CC100253	21,262.48	6,268.08	8,905.58	36,436.14	Recruitment package support
Birrer, Michael, MD, (Cancer Institute)	CC100332	10,500.00	16.80	20,243.77	30,760.57	Recruitment package support
Manzano, Mark, PhD (COM Microbiology & Immunology)	CC100335	30,174.90	8,052.20	242.27	38,469.37	Recruitment package support
Zhan, Frank MD, PhD (COM Internal Medicine - Medical Oncology)	CC100336	58,944.85	13,785.49	5,930.93	78,661.27	Recruitment package support
Cancer Institute Bioinformatics Core Support	CC100353	0.00	0.00	63,884.62	63,884.62	Supplement to Core for expense in excess of operating revenue
Belido, Teresita, PhD (COM Physiology and Biophysics)	CC100360	46,619.19	13,913.75	19,646.58	80,179.52	Recruitment package support
Cancer Institute Genomics Core Support	CC100363	0.00	0.00	193,495.32	193,495.32	Supplement to Core for expense in excess of operating revenue
Cancer Institute Health Disparities - Ronda Henry-Tillman, MD	CC100366	31,900.28	7,447.94	3,214.19	42,562.41	Retention package support
Core Voucher Program	CC100372	0.00	0.00	38,683.75	38,683.75	Cancer core use vouchers for CI members
Cancer Pilot Program	CC100373	0.00	0.00	200,000.00	200,000.00	Support for 4 cancer pilot projects at $100K each, credit represents balance not yet spent
Amick, Benjamin III, PhD (CPH Epidemiology)	CC100391	35,603.17	6,411.51	2,231.55	44,246.23	Recruitment package support
Cornett, Larry (AR INBRE grant support)	CC100415	0.00	0.00	12,000.00	12,000.00	Program support
Ryan, Katie, PhD (COM Biochemistry)	CC100416	45,917.36	11,275.56	2,750.02	59,942.94	Recruitment package support
Jones, Dina (CPH HBHE Center for Tobacco Study)	CC100418	29,620.06	4,834.31	6,407.81	40,862.18	Recruitment package support

Program Account Description	Fund Center Account	Salary	Fringe	M&O	Total Expense	Notes
Cancer Institute Community Outreach	CC100422	468,890.57	108,488.21	121,179.68	698,558.46	Support for Associate Director for Community Outreach and Engagement
Cancer Institute CCSG Administration	CC100423	8,250.43	1,993.61	79.54	10,323.58	Recruit ads
Wolfe, Adam	CC100428	195,744.37	35,165.02	30,303.13	261,212.52	Recruitment package support
Cancer Institute Tissue Bank Support	CC100434	0.00	0.00	39,501.00	39,501.00	Replace end of life cancer research equipment
Delgado-Calle, Jesus, MD, (COM Physiology & Biophysics)	CC100457	0.00	0.00	1,377.00	1,377.00	Recruitment package support
Radiation Core	CC100471	5,150.01	943.14	841.36	6,934.51	Purchase of x-ray cabinet
Recruitment Costs	CC100488	0.00	0.00	13,393.01	13,393.01	Advertising costs, travel, interview meals, etc.
Dr. Karbassi Breast Vaccine Support	CC100509	22,523.37	5,192.38	14,156.71	41,872.46	Support of clincal trial for a breast cancer vaccine
Roy Choudhury, Samrat, PhD (COM Pediatrics)	CC100771	27,420.00	3,920.00	146.25	31,486.25	Recruitment package support
Yeh, Ed (COM Internal Medicine)	CC100779	0.00	0.00	37,403.42	37,403.42	Recruitment package support
Nagalo, Marius (COM Pathology)	CC100783	28,765.09	6,702.62	35,815.68	71,283.39	Recruitment package support
Miah, Syem (COM Biochemistry)	CC100924	32,163.39	7,737.73	4,418.73	44,319.85	Recruitment package support
Seeds of Science Pilot Program	CC100790	0.00	0.00	298,873.94	298,873.94	Support 4 Pilot Projects at $50K each
Park, Mark (COPH Epidemiology)	CC100794	44,600.02	11,266.01	612.02	56,478.05	Recruitment package support
Enemark, Eric (COM-Biochemisty)	CC100826	36,526.40	12,509.42	3,440.56	52,476.38	Recruitment package support
Chang, Ming (COM Pharmacology and Toxicology)	CC100827	22,533.31	4,930.81	1,312.18	28,776.30	Recruitment package support
Brochausen, Mathias (DBMI)	CC100840	50,935.86	12,626.08	-107.64	63,454.30	Recruitment package support
Tackett, Alan (COM Biochemistry)	CC100988	62,211.22	16,362.90	33,261.51	111,835.63	Research support
Leung, Justin (COM Radiation Oncology)	CC100989	0.00	0.00	1,350.00	1,350.00	Recruitment package support
Qin, Z (COM Pathology)	CC100991	697.20	5.22	10,219.83	10,922.25	Recruitment package support
Byrd, Alicia (COM Biochemistry)	CC100992	0.00	0.00	32,938.75	32,938.75	Recruitment package support
Xia, Fen (COM Radiation Oncology)	CC100993	-1,589.50	772.34	20,436.12	19,618.96	Recruitment package support
Proteomics Core (COM Biochemistry)	CC100994	12,308.85	3,420.83	0.00	15,729.68	Proteomics Core support
Lu, Williams (COM Pathology)	CC101002	58,966.29	11,579.49	201,564.93	272,110.71	Recruitment package support
Hsu, Ping-Ching (COPH EOH)	CC101004	16,353.16	4,280.04	2,020.59	22,653.79	Recruitment package support

Program Account Description	Fund Center Account	Salary	Fringe	M&O	Total Expense	Notes
Structural Biology	CC101007	0.00	0.00	333,946.98	333,946.98	Stuctural Biology Core support
WPRCI Diversity	CC101028	45,490.97	5,801.14	4,810.10	56,102.21	Support for Associate Director for Diversity, Equity, and Inclusion
Johann, Don (DBMI)	CC101114	132,249.04	32,119.54	36,324.26	200,692.84	Research support
Rahman, Mohammad (COM Biochemistry)	CC101130	92,114.98	22,180.73	31,967.96	146,263.67	Recruitment package support
Racine-Miousse, Isabella (COM Biochemistry)	CC101152	7,500.00	1,910.38	1,994.08	11,404.46	Recruitment package support
Bai, Mei	CC101156	7,813.59	1,056.10	681.64	9,551.33	Recruitment package support
Travel Grant Program	CC102679	0.00	0.00	8,535.58	8,535.58	Support for cancer related research travel
KL2-Lu, Williams (COM Pathology)	CC102683	0.00	0.00	236,875.00	236,875.00	KL2-Award
CTRM Scholars (TRI)	CC102684	9,321.66	5,866.32	0.00	15,187.98	Translational Research support
Koss, Brian (COM Biochemistry)	CC102685	21,043.57	6,386.92	64,833.31	92,263.80	Recruitment package support
Tobacco Cessation	CC102719	26,397.16	4,864.16	0.00	31,261.32	Tobacco cessation program support
Hallgren, Emily	CC102779	45,000.01	11,654.86	4,811.36	61,466.23	Recruitment package support
Clawson, Emily	CC102782	24,487.87	4,917.48	2,004.38	31,409.73	Recruitment package support
Van Rhee, Fritz	CC102810	36,276.79	8,904.04	911.94	46,092.77	Translational Research support
Schootman, Mario	CC102817	91,329.17	17,218.29	442.73	108,990.19	Recruitment package support
Rodriguez, Analiz	CC102823	50,833.30	3,272.91	0.00	54,106.21	Research support
Cancer Prevention and Population Sciences	CC102830	11,237.98	1,952.22	0.00	13,190.20	Program support
Genomics Core Secondary	CC102833	14,627.07	4,623.29	0.00	19,250.36	Additional support to the Core for expense not included in the recharge rate sheet.
Jaemsen, Joonas	CC102851	51,996.11	10,622.33	187,619.27	250,237.71	Recruitment package support
Moldoveanu, Tudor	CC102852	48,809.40	15,850.63	83,822.77	148,482.80	Recruitment package support
Biostatistics	CC102853	82,112.52	16,556.64	0.00	98,669.16	Support to Biostatistics Core
DelNero, Peter	CC103030	49,000.02	11,052.71	2,687.78	62,740.51	Recruitment package support
Hematology/Oncology Fellowship	CC103123	0.00	0.00	24,478.23	24,478.23	
Kim, KyoungHyun	CC103331	60,676.45	17,404.12	71,882.12	149,962.69	Recruitment package support
Cancer Prevention and Control	CC103351	81,077.81	8,742.18	3,170.91	92,990.90	Program support

Program Account Description	Fund Center Account	Salary	Fringe	M&O	Total Expense	Notes
Cancer Grand Rounds	CC103373	0.00	0.00	8,418.93	8,418.93	Support to cancer education
Allen, Antino	CC103374	3,115.40	0.00	176,973.14	180,088.54	Recruitment package support
Cancer Forum	CC103376	0.00	0.00	15,210.04	15,210.04	Support to cancer education
Tiwari, Amit	CC103501	0.00	0.00	2,551.90	2,551.90	Recruitment package support
Shared Resources Support	CC103506	17,498.64	3,124.17	0.00	20,622.81	Program Support
Research Education Support	CC103507	17,501.36	3,467.21	1,000.00	21,968.57	Program Support
Spillman, Monique	CC103565	0.00	0.00	0.00	0.00	Recruitment package support
Urbaniak, Alicja Support	CC103682	0.00	0.00	3,740.42	3,740.42	Program Support
Eoff, Robert Support	CC103707	5,000.00	8.00	0.00	5,008.00	Program Support
Hasan, Afsheen Support	CC103708	10,534.71	2,707.25	247.65	13,489.61	Recruitment package support
Taverna, Sean Support	CC103793	0.00	0.00	29,145.00	29,145.00	Recruitment package support
WPRCI Administration	CC103375	0.00	0.00	-16.12	-16.12	Will be corrected to correct fund associated with this account
CAN Basic Research	CC001773	0.00	0.00	-0.20	-0.20	Will be corrected to correct fund associated with this account
Total Expense		**3,229,476.39**	**739,369.37**	**12,022,525.04**	**15,991,370.80**	

APPENDIX B

Curricula Vitae of Cancer Research Recruits

CURRICULUM VITAE
The Johns Hopkins University School of Medicine

(Signature) _____ ___09/24/2023____
(Typed Name) Sean D. Taverna

DEMOGRAPHIC AND PERSONAL INFORMATION

Current Appointments

2015-Present Associate Professor, Pharmacology and Molecular Sciences, The Center for Epigenetics, Johns Hopkins University School of Medicine
2015-Present Associate Professor, Department of Medicine (Joint), Johns Hopkins University School of Medicine
2015-Present Associate Professor, Department of Oncology (Joint), Johns Hopkins University School of Medicine
2017-Present Associate Director, IBBS Center for Epigenetics
2017-Present Director of Graduate Recruiting, Pharmacology and Molecular Sciences

Personal Data

Department of Pharmacology and Molecular Sciences
The Johns Hopkins University School of Medicine
Rangos Building, Room 576
855 N. Wolfe Street
Baltimore, MD 21205
Phone: 410-502-0790
Fax: 410-955-1119
Email: staverna@jhmi.edu

Education and Training

Undergraduate
1995 B.S., Molecular Biology, University of Texas, Austin
Doctoral
2003 M.S., Biochemistry and Molecular Genetics, Mentor: C. David Allis, University of Virginia, Charlottesville
2004 Ph.D., Biochemistry and Molecular Genetics, Mentor: C. David Allis, University of Virginia, Charlottesville
Postdoctoral
2004-08 Chromatin Biology and Epigenetics, Mentor: C. David Allis, The Rockefeller University, New York

Professional Experience

2008-2015 Assistant Professor, Pharmacology and Molecular Sciences, Johns Hopkins University School of Medicine, Baltimore
2008-2013 Faculty member, Anti-Cancer Drug Development (ACDD) Training Program, Johns Hopkins University
School of Medicine, Baltimore
2008-Present Faculty member, Biochemistry, Cellular and Molecular Biology Graduate Program, Johns Hopkins University School of Medicine, Baltimore
2009-2015 Assistant Professor, Department of Oncology, Johns Hopkins University School of Medicine, Baltimore
2009-2015 Assistant Professor, Department of Medicine, Johns Hopkins University School of Medicine, Baltimore
2009-Present Faculty member, Sydney Kimmel Comprehensive Cancer Center - Cancer Chemical and Structural Biology Program (CCSG), Johns Hopkins University School of Medicine, Baltimore
2010-Present Faculty member, Human Genetics Program, Johns Hopkins University School of Medicine, Baltimore

2015-Present Associate Professor, Pharmacology and Molecular Sciences, The Center for Epigenetics, Johns Hopkins
University School of Medicine, Baltimore
2015-Present Associate Professor, Department of Oncology, Johns Hopkins University School of Medicine, Baltimore
2015-Present Associate Professor, Department of Medicine, Johns Hopkins University School of Medicine, Baltimore
2017-Present Associate Director, IBBS Center for Epigenetics, Johns Hopkins University School of Medicine, Baltimore

PUBLICATIONS:

Original Research [OR]

1. Jacobs SA*, **Taverna SD***, Zhang Y, Briggs SD, Li J, Eissenberg JC, Allis CD, Khorasanizadeh S. Specificity of
the HP1 chromodomain for the methylated N-terminus of histone H3. ***EMBO J.*** 2001; 20(18): 5232-41. PMCID:PMC125272; ***first authorship**
-This is the first work to structurally characterize the interaction of a histone reader with a methylated lysine, to identify the "aromatic cage" motif present in most histone readers that bind trimethyl-lysine, and to localize H3K9 methylation to pericentic heterochromatin.
2. **Taverna SD***, Coyne RS*, Allis CD. Methylation of Histone H3 at Lysine 9 Targets Programmed DNA Elimination in *Tetrahymena*. ***Cell***. 2002; 110(6): 701-11; ***first authorship**.
-This was one of the first reports to describe a molecular pathway in eukaryotic cells wherein small non-coding RNAs trigger a nuclear (chromodomain) protein to bind histone methylation and promote heterochromatin formation at complementary DNA. This is one of four papers cited in ***Science*** as the "Breakthrough of the Year" in 2002 (https://www.science.org/content/article/breakthrough-year-small-rnas).
3. Morshead KB, Ciccone DN, **Taverna SD**, Allis CD, Oettinger MA. Antigen receptor loci poised for V(D)J rearrangement are broadly associated with BRG1 and flanked by peaks of histone H3 dimethylated at lysine 4. ***Proc Natl Acad Sci***. 2003; 100(20): 11577-82. PMCID: PMC208800.
4. Barber CM, Turner FB, Wang Y, Hagstrom K, **Taverna SD**, Mollah S, Ueberheide BM, Meyer BJ, Hunt DF, Cheung P, Allis CD. The enhancement of Histone H4 and H2A serine 1 phosphorylation during mitosis and Sphase is evolutionary conserved. ***Chromosoma***. 2004; 112(7): 360-71.
-I developed and characterized the H4/H2AS1ph antibody used in this study, which was subsequently licensed by
the University of Virginia, Charlottesville.
5. **Taverna SD***, Ilin S, Rogers RS, Tanny JC, Lavender H, Li H, Baker L, Boyle J, Blair LP, Chait BT, Patel DJ, Aitchison JD, Tackett AJ, Allis CD. PHD Finger Binding to Histone H3 Trimethylated at K4 Promotes NuA3 HAT Activity at K14 of H3 and Transcription at a Subset of Targeted ORFs. ***Molecular Cell***. 2006; 24(5): 785-96; ***first authorship**
- Structural biology, enzymology, and chromatin immunopreceipitation were used to detail how binding of H3K4me3 to a protein found in a KAT6 family acetyltransferase complex can promote cis-acetylation of single
H3 molecules, and subsequent transcription. This is one of the first reports to describe a molecular pathway connecting H3K4me3 and acetylation, and their link to transcription.
6. **Taverna SD***, Ueberheide BM, Liu Y, Tackett AJ, Diaz R, Shabanowitz J, Chait BT, Hunt DF, Allis CD. Longdistance combinatorial linkage between methylation and acetylation on H3 N-termini. ***Proc Natl Acad Sci.*** 2007; 104(7): 2086-91. PMCID: PMC1892956; ***first authorship**
-This is the first report to observe and characterize endogenous combinations of H3K4me, H3K36me, and acetylation on single molecules of endogenously purified histone H3, and thus identified modification patterns relevant to unique epigenetic states in euchromatin.
7. Liu Y*, **Taverna SD***, Muratore T, Shabanowitz J, Hunt DF, Allis CD. RNAi-dependent histone H3K27 methylation is required for heterochromatin formation and DNA elimination in *Tetrahymena*. ***Genes and Development***. 2007; 21(12): 1530-45. PMCID: PMC1891430; ***first authorship.**

-This work identified an H3K27me3 methyltransferase, the activity of which is used to guide chromodomaincontaining proteins in an RNAi-dependent pathway in order to promote heterochromatin formation. This work also uncovered distinctions in localization and roles between H3K9me3 and H3K27me3 states of heterochromatin.

8. Song X, Gjoneska E, Ren Q, **Taverna SD**, Allis CD, Gorovsky MA. Phosphorylation of the SQ H2A.X motif is
required for proper meiosis and mitosis in *Tetrahymena thermophila*. ***Mol Cell Biol***. 2007; (7): 2648-2660. PMCID:
PMC1899910
9. Gradolatto A, Rogers RS, Lavender H, **Taverna SD**, Allis CD, Aitchison JD, Tackett AJ. *Saccharomyces cerevisiae* Yta7 Regulates Histone Gene Expression. ***Genetics***. 2008; 179(1): 291-304. PMCID: PMC2390607
10. Smart SK, Mackintosh SG, Edmondson RD, **Taverna SD†**, Tackett AJ†. Mapping the local protein interactome
of the NuA3 histone acetyltransferase. ***Protein Science***. 2009; 18(9): 1987-1997. PMCID: PMC2777373; **†corresponding authorship**.
-This work developed a novel technique (Transient I-DIRT) for identifying transient or stable protein-protein interactions. It was used to identify complexes that interact with a KAT6 histone acetyltransferase complex in yeast, NuA3, and provided novel mechanistic insight into NuA3-associated transcription
11. Gradolatto A, Smart SK, Byrum S, Rogers RS, Lavender H, Kolar E, Aitchison JD, **Taverna SD**, Tackett AJ. A
noncanonical bromodomain in the AAA ATPase protein Yta7 directs chromosomal positioning and barrier chromatin activity. ***Mol Cell Bio***. 2009; 29(17): 4604-11. PMCID: PMC2725702
12. Blair LP, Avaritt NL, Huang R, Cole PA, **Taverna SD**, Tackett AJ. MassSQUIRM: An assay for quantitative measurement of lysine demethylase activity. ***Epigenetics.*** 2011; 6(4): 490-9. PMCID: PMC3230537.
13. Byrum SD, Mackintosh SG, Edmondson RD, Cheung WL, **Taverna SD**, Tackett AJ. Analysis of Histone Exchange during Chromatin Purification. ***J Integr OMICS.*** 2011; 1(1): 61-65. PMCID: PMC3119864.
14. Byrum SD, **Taverna SD†**, Tackett AJ†. Quantitative analysis of histone exchange for transcriptionally active chromatin. ***J Clin Bioinforma.*** 2011; 1(1): 17. PMID: 21709819; **†corresponding authorship**.
15. Li R, Zhu J, Xie Z, Liao G, Liu J, Chen MR, Hu S, Woodard C, Lin J, **Taverna SD**, Desai P, Ambinder RF, Hayward GS, Qian J, Zhu H, Hayward SD. Conserved herpesvirus kinases target the DNA damage response pathway and TIP60 histone acetyltransferase to promote virus replication. ***Cell Host Microbe.*** 2011; 10(4): 390-
400. PMCID: PMC3253558
-We helped design experiments for determining epigenetic changes at the EBV lytic replication origin promoter.
16. Byrum, SD., Raman, A., **Taverna, SD†**, Tackett, AJ**†.** ChAP-MS: A comprehensive method for identification of
specifically associated proteins and histone posttranslational modifications at a single genomic locus. ***CellReports***. 2012; 2(1): 198-205. PMCID: PMC3408609; **†corresponding authorship**.
-This reports the first use of the ChAP-MS approach to purify nucleosomes from a defined chromosomal locus,
after which mass spectrometry is used to identify proteins and combinatorial posttranslational histone modifications in an unbiased manner. ChAP-MS is a major advance over standard ChIP-based epigenetic analysis
because multiple proteins and histone modifications can be detected in one experiment. Commentary in *Nature*,
2012, 491, 143-147).
17. Dancy BC, Ming SA, Papazyan R, Jelinek CA, Majumdar A, Sun Y, Dancy BM, Drury WJ 3rd, Cotter RJ, **Taverna**
SD, Cole PA. Azalysine analogues as probes for protein lysine deacetylation and demethylation. ***J Am Chem Soc.***
2012; 134(11): 5138-48. PMCID: PMC3313494
18. Yan G, Eller MS, Elm C, Larocca CA, Ryu B, Panova IP, Dancy BM, Bowers EM, Meyers D, Lareau L, Cole PA†, **Taverna, SD†**, Alani RM†. Selective Inhibition of p300 HAT Blocks Cell Cycle Progression, Induces

Cellular Senescence, and Inhibits the DNA Damage Response in Melanoma Cells. ***J Invest Dermatol.*** 2013; 133(10): 2444-52. PMID: 23698071; **†corresponding authorship**.

19. Byrum SD, **Taverna SD†**, Tackett AJ†. Purification of a specific native genomic locus for proteomic analysis. ***Nucleic Acids Res.*** 2013; 41(20):e195. PMCID: PMC3814360; **†corresponding authorship**.
20. Prusevich P, Kalin JH, Ming SA, Basso M, Givens J, Li X, Hu J, Taylor MS, Cieniewicz AM, Hsiao PY, Huang R,
Roberson H, Adejola N, Avery LB, Casero RA Jr, **Taverna SD**, Qian J, Tackett AJ, Ratan RR, McDonald OG,
Feinberg AP, Cole PA. A Selective Phenelzine Analogue Inhibitor of Histone Demethylase LSD1. ***ACS Chem Biol***. 2014; 9(20): 1284-93. PMID: 24707965
-We provided assistance with demethylation assays and western blotting.
21. Gilbert TM, McDaniel SL, Byrum SD, Cades JA, Dancy BCR, Wade H, Tackett AJ, Strahl BD†, **Taverna SD†**. An H3K36me3 binding PWWP protein targets the NuA3 acetyltransferase complex to coordinate transcriptional
elongation at coding regions. ***Molecular and Cellular Proteomics***, 2014; 13(11):2883-95. PMCID:PMC4223479;
†corresponding authorship.
-This study identified the minimal functional PWWP domain, and showed that the domain is used to target a KAT6 acetyltransferase complex (NuA3b) to promote transcription elongation through its interaction with the epigenetic mark H3K36me3.
22. Waldrip ZJ, Byrum SD, Storey A, Gao J, Byrd AK, Mackintosh SG, Wahls WP, **Taverna SD**, Raney KD, Tackett
AJ. A CRISPR-based Approach for Proteomic Analysis of a Single Genomic Locus. ***Epigenetics***, 2014;9(9):1207-11. PMCID: PMC4169012
-I helped design experiments and analyze data.
23. Cieniewicz AM, Moreland L, Ringel AE, Mackintosh SG, Raman A, Gilbert TM, Wolberger C, Tackett AJ, **Taverna SD†**. The bromodomain of Gcn5 regulates site-specificity of lysine acetylation on histone H3. ***Molecular and Cellular Proteomics***, 2014; 13(11):2896-910. PMCID: PMC4223480; **†corresponding authorship**.
-The novel quantitative assay developed for this study allowed the first detailed kinetic examination of how the GCN5 bromodomain controls site-specificity for lysine acetylation by GCN5. We identified a hierarchy of temporally ordered acetylation events along the histone H3 N-terminus, and found that a bromodomain disruption leads to an acetylation state that is associated increased oncoprotein activity.
24. Papazyan R, Voronina E, Chapman JR, Luperchio TR, Gilbert TM, Meier E, Mackintosh SG, Shabanowitz J, Tackett AJ, Reddy KL, Coyne RS, Hunt DF, Liu Y, **Taverna SD†**. Methylation of histone H3K23 blocks DNA
damage in pericentric heterochromatin during meiosis. ***eLife***, 2014; 3:e02996. PMCID: PMC4141274;
†corresponding authorship.
-Here we used the ciliate *Tetrahymena thermophila* to identify a novel histone methylation mark (H3K23me3) which
is involved in promoting proper meiosis and is conserved through mammals.
25. Brown LJ, Baranowski M, Wang Y, Schrey A, Lenz T, **Taverna SD**, Cole PA, Sefkow M. Using SAH Capture Compounds to Characterize S-Adenosylmethionine and S-Adenosylhomocysteine Binding proteins. ***Anal Biochem***, 2014; 467:14-21. PMCID: PMC4315328
-I co-mentored Brown, analyzed data, and helped write the paper.
26. Byrum SD, **Taverna SD**, Tackett AJ. Purification of specific chromatin loci for proteomic analysis. ***Methods Mol Biol.*** 2015; 1228:83-92. PMID 25311124
27. Ringel AE, Cieniewicz AM, **Taverna SD**, Wolberger C. Nucleosome competition reveals processive acetylation
by the SAGA HAT module. ***Proc Natl Acad Sci.*** 2015; 112(40):E5461-70 PMCID: PMC4603478
-We helped design experiments, perform experiments, and write the paper.
28. Xiong J, Gao S, Dui W, Yang W, Chen X, **Taverna SD**, Pearlman RE, Ashlock W, Miao W, Liu Y. Dissecting relative contributions of cis- and trans-determinants to nucleosome distribution by comparing *Tetrahymena* macronuclear and micronuclear chromatin. ***Nucleic Acids Res.*** 2016; 44(21):10091-10105.

-We helped design experiments and train personnel.

29. Su Z, Fengbin Wang F, Lee JH, Stephens KE, Papazyan R, Voronina E, Krautkramer KA, Thorpe JJ, Boersma
MD, Kuznetsov V, Miller MD, **Taverna SD†**, Phillips Jr GN, Denu JM, Reader Domain Specificity and Lysine
Demethylase-4 Family Function. ***Nat Commun.*** 2016; 7:13387; **†corresponding authorship**.
- For this study, we provided our in-house antibody and other reagents, designed, and performed *in vitro* and *in vivo* experiments, analyzed data, and helped write the paper.

30. Hamilton EP, Kapusta A, Huvos PE, Bidwell SL, Zafar N, Tang H, Hadjithomas M, Krishnakumar V, Badger JH, Caler EV, Russ C, Zeng Q, Fan L, Levin JZ, Shea T, Young SK, Hegarty R, Daza R, Gujja S, Wortman JR, Birren BW, Nusbaum C, Thomas J, Carey CM, Pritham EJ, Feschotte C, Noto T, Mochizuki K, Papazyan R, **Taverna SD**, Dear PH, Cassidy-Hanley DM, Xiong J, Miao W, Orias E, Coyne RS. Structure of the germline genome of *Tetrahymena thermophila* and relationship to the massively rearranged somatic genome. ***Elife***. 2016; 5. pii:
e19090.
-We optimized the technique to purify the genetic material, and I provided the genetic material itself for this study.

31. Bhat S, Hwang Y, Gibson MD, Morgan MT, **Taverna SD**, Zhao Y, Wolberger C, Poirier MG, Cole PA. Hydrazide Mimics for Protein Lysine Acylation To Assess Nucleosome Dynamics and Deubiquitinase Action**.** ***J***
Am Chem Soc. 2018;140(30):9478-9485.
- I helped design experiments to assay antibody recognition of acylation and analyzed the data.

32. Stephens KE, Chen Z, Sivanesan E, Raja SN, Linderoth B, **Taverna SD†**. Guan Y**†**, RNA-seq of Spinal Cord from Nerve-injured Rats after Spinal Cord Stimulation. ***Mol Pain***. 2018 Jan-Dec;14:1744806918817429; **†corresponding authorship**.

33. West KL, Byrum SD, Mackintosh SG, Edmonson RD, **Taverna SD†**, Tackett AJ**†,** Proteomic Characterization
of the Arsenic Response Locus in S. cerevisiae. ***Epigenetics.*** 2019 Feb 10:1-16; **†corresponding authorship**.
-Here we refined our ChAP-MS approach to purify nucleosomes from a defined chromosomal locus, using Protein A fused to dCas9 to examine the epiproteome of the arsenic response locus in yeast. This approach does
not involve genetic manipulation of the targeted chromatin.

34. Stephens KE, Zhou W, Ji Z, He S, Ji H, Guan Y**†**, **Taverna SD†**. Sex differences in gene regulation in the dorsal
root ganglion after nerve injury. ***BMC Genomics***. 2019 Feb 19;20(1):147; **†corresponding authorship**.

35. Waldrip ZJ, Jenjaroenpun P, DeYoung O, Nookaew I, **Taverna SD**, Raney KD, Tackett AJ. Genome-wide Cas9
binding specificity in *Saccharomyces cerevisiae*. ***PeerJ***. 2020 Jul 29;8:e9442. PMCID: PMC7395602
- I helped design the experiments, analyze the data, and write the paper.

36. Xu J, Zhao X, Mao F, Basrur V, Ueberheide B, Chait BT, Allis CD, **Taverna SD**, Gao S, Wang W, Liu Y. A Polycomb repressive complex is required for RNAi-mediated heterochromatin formation and dynamic distribution of nuclear bodies. ***Nucleic Acids Res***. 2021; 49(10), 5407.
I helped design the experiments, generate reagents, perform the experiments, analyze the data, and write the paper.

37. Rizzardi LF, Hickey, PF, Idrizi A Tryggvadóttir R, Callahan CM, Stephens KE, **Taverna SD**, Zhang H, GTEx Consortium, Hansen KD, Feinberg AP. Human brain region-specific variably methylated regions (VMRs) are enriched for heritability of distinct neuropsychiatric traits. ***Genome Biol.*** 2021 Apr 22;22(1):116.
I helped design the experiments dealing with nuclear isolation, analyze the data, and write the paper.

38. Stephens KE, Zhou W, McLeroy-Charles K, Ji Z, Ji H, Guan Y, **Taverna SD†**. Global gene expression and chromatin accessibility of the peripheral nervous system in animal models of persistent pain. ***J Neuroinflammation*** 2021Aug 26; 18(1):185; **†corresponding authorship**.

39. Vinson DA, Stephens KE, O'Meally RN, Bhat S, Dancy BCR, Cole RN, Yegnasubramanian S†, **Taverna SD†**, De novo methylation of histone H3K23 by the methyltransferases EHMT1/GLP and EHMT2/G9a, ***Epigenetics Chromatin.*** 2022;15(1):36. **†corresponding authorship**.

-There was news coverage of this paper at Johns Hopkins:
https://www.hopkinsmedicine.org/news/newsroom/news-releases/found-lost-puzzle-piece-involved-in-generegulation-revealed-in-search-that-began-in-water-loving-one-celled-organism

40. Stephens KE†, Moore C, Vinson DA, White BE, Renfro Z, Zhou W, Ji Z, Ji H, Zhu H, Guan Y†, **Taverna SD†**.
Identification of regulatory elements in primary sensory neurons involved in trauma-induced neuropathic pain. ***Molecular Neurobiology***. (*In press* as MOLN-D-23-00810); **†corresponding authorship**.
41. Vinson D, Stephens KE, Yegnasubramanian S†, **Taverna SD†**. Interplay between H3K23me3 and H3K4me3 at
gene promoters helps regulate transcription during neuronal differentiation *(in preparation)*
42. Saettone A, Canonizado M, Horsey D, Avaritt N, Tackett AJ, Liu, Y, **Taverna SD†**. Functional characterization
of a *Tetrahymena* polycomb repressive complex required for H3K23me3 in heterochromatin *(in preparation)*
43. Edmondson, J, Reed, M, Avaritt, N, **Taverna SD**, Tackett, AJ, Koss, B. EZH2 and AFT6 sense metabolism stress to balance MHC-I antigen presentation in melanoma *(in preparation)*
44. Nguyen, MC, Raman A, Canonizado M, Kanishk J, Strahl BD†, **Taverna SD†**, Kutateladze TG†. Structure and
function of the interaction between Yng1 and Taf14 in the MOZ/MORF acetyltransferase family member NuA3.
(*in preparation to submit in October, invitation from editor to submit to* ***Cell Reports***).

Review Articles [RA]

1. **Taverna SD***, Allis CD and Hake SB. "Hunt"-ing for post-translational modifications that underlie the histone
code. ***International Journal of Mass Spectrometry***. 2007; 259(1-3): 40-45. ***first authorship**
2. **Taverna SD*†**, Li H, Ruthenburg AJ, Allis CD†, and Patel DJ†. How chromatin binding modules interpret histone modifications. ***Nat Struct Mol Bio***. 2007; 14(11):1025-40. ***first authorship, †corresponding authorship**.
-Was also a hypothesis paper, and has been cited almost 1,650 times
3. **Taverna SD*†**, Cole PA†. Drug discovery: Reader's block. ***Nature***. 2010; 468,1050-1. PMID: 21179160. ***first authorship, †corresponding authorship**.

Case Reports [CR]

Book Chapters, Monographs [BC]

1. Papazyan R, **Taverna SD†**. Separation and purification of multiply acetylated proteins using cation-exchange chromatography. **Methods Mol Biol**. 2013; 981:103-13. (Also designed the book cover) [BC]

Other Publications:

1. Ueberheide BM, **Taverna SD***, Allis CD, Syka JEP, Shabanowitz J, Hunt DF. Breaking the Histone Code: Analyzing the interdependence of acetylation and methylation on histone H3 using electron transfer dissociation
(ETD). 54th ASMS Conference Proceedings. 2006. [PR]
2. Li H*, **Taverna SD***, Ruthenburg AJ, Patel DJ and Allis CD, Readout of chromatin marks by histone-binding modules. 2007. ***Nat. Rev. Mol. Cell Biol***, *8*(1). ***first authorship.** [OM]
3. Papazyan R, **Taverna SD**, Orias E, Coyne RS, *Tetrahymena* Comparative Sequencing Project Database, Broad Institute of Harvard and MIT. 2011; Database contribution
http://www.broadinstitute.org/annotation/genome/Tetrahymena/MultiHome.html
4. "Why Ciliates" 2016; Educational video; https://www.youtube.com/watch?v=ICfd5glXcaY [MR] [OM]
5. Stephens KE, Zhou W, Ji Z, Ji H, Guan Y, Taverna SD. Differential chromatin accessibility at dorsal root ganglia
enhancers is associated with nerve injury. J Clin Transl Sci. 2021;5(Suppl 1):5.
6. **Taverna SD**, Contributor, "Cancer Matters with Dr Bill Nelson." DNA and Epigenetics, 2/26/2023, https://hopkinskimmel.libsyn.com/cancer-matters-with-dr-bill-nelson-dna-and-epigenetics [OM]

EXTRAMURAL Funding

Research Extramural Funding

Current:

4/19-3/24 Precision Medicine Indicators of Melanoma Immunotherapy Responsiveness
R01 CA221306-01A1
Sponsor: NIH/CII Cancer Immunopathology and Immunotherapy Study Section
Total direct costs (Taverna portion): $200,000
Role: Co-I, 8% effort

11/19-6/24 EFRI CEE: A mesoscopic bottom-up approach for understanding and modulating the physical epigenome
Award number: 132452
Sponsor: NSF
Total direct costs (Taverna portion) $346,000
Role: Multi-PI, 2.08% effort

5/20-4/24 Differential Regulation and Roles of A-type Lamins in Early G1
R01 GM132427
Sponsor: NIH
Total direct costs (Taverna portion): $38,000
Role: Co-I, 5% effort

12/21-12/25 The molecular mechanism of the yeast NuA3 histone acetyltransferase complex during transcription
Award number: 160091
Sponsor: Pacific Northwest Cryo-EM Center
Total direct costs (Taverna): Direct Access
Role: Co-PI, % effort N/A

Pending:

3/24-2/29 Impact of bivalent epigenetic modifications and transcription factor pairs on tumor immune recognition

Delayed submission from 6/5/23
Sponsor: NIH/NCI
Total direct costs (Taverna portion): $810,000
Role: Multi-PI, 25% effort

6/24-6/27 Tuning Immune Recognition of Metastatic Melanoma to Increase Efficacy of Immunotherapy
Sponsor: Melanoma Research Alliance Team Science Award
Total direct costs (Taverna portion): $300,000
Role: Multi-PI, 25% effort

Previous:

9/08-7/13 Development of technology for high resolution epigenetic profiling of chromatin
1R01 DA025755
Sponsor: NIH / NIDA
Total direct costs (Taverna): $500,000
Role: Co-PI, 30% effort

8/09-7/10 Development of technology for high resolution epigenetic profiling of chromatin
3R01 DA025755 (Supplement to 1R01 DA025755)
Sponsor: NIH / NIDA
Total direct costs (Taverna): $85,997

Role: Co-PI, Percent effort: N/A; Used funds to buy PPS-110C Prelude peptide synthesizer

8/09-7/14 Networks, pathways, and dynamics of lysine modification
U54 RR020839
Sponsor: NIH
Total direct costs (Taverna): $200,000
Role: Co-Investigator 8% effort

8/10-7/14 Understanding the dynamics of histone modifications at distinct genomic loci using antibody arrays and
synthetic chemistry
U54 RR020839
Sponsor: NIH
Total direct costs (Taverna): $200,000
Role: PI, 12% effort; Driving Biological Project

8/11-7/12 Development of a quantitative assay for mass spectrometry-based detection of methylation states
U54 RR020839
Sponsor: NIH
Total direct costs (Taverna): $20,000
Role: PI, % effort N/A; Driving Biological Project

9/10-6/15 Chaperone-Enabled Biology and Structure (CEBS) technology platform to advance the structure and functional characterization of key epigenetic regulators
1U01 GM094588-05
Sponsor: NIH
Total direct costs (Taverna): $207,889
Role: Co-Investigator, 5% effort

7/13-4/17 Using ChAP-MS to Study Macromolecular Chromatin Composition during Transcription
1R01 GM106024-02
Sponsor: NIH/NIGMS
Total direct costs (Taverna): $262,056
Role: Co-PI, 20% effort

3/16-1/22 Epigenetic profiling and enzymatic regulation of H3K23me3 during cellular differentiation
1R01 GM118760
Sponsor: NIH/NIGMS
Total direct costs (Taverna portion): $1,000,000
Role: PI, 30% effort

Educational Extramural
Current:
3/20-3/23 2023 Ciliate Molecular Biology Conference (Montpellier, France)
Award number: 2016451
Sponsor: NSF
Total Direct costs $15,000
Role: PI, % effort N/A; To reimburse early-career scientists for need-based travel expenses related to the
conference.

INTRAMURAL Funding
Previous:

1/15-12/15 Blaustein Pain Grant
Sponsor: The Johns Hopkins School of Medicine
Total direct costs (Taverna): $50,000
Role: PI, % effort N/A

CLINICAL ACTIVITIES
N/A

EDUCATIONAL ACTIVITIES

Teaching

Classroom instruction

JHMI/Regional:

2008-2009 Instructor for 20 graduate students, single class each Spring, Epigenetics Course- Chromatin Remodeling Complexes (ME:260.710), Johns Hopkins University School of Medicine, Baltimore, MD

2008-2016 Instructor for 20 graduate students, single class each Spring, Epigenetics Course- The History and Biochemistry of Chromatin (ME:260.710), Johns Hopkins University School of Medicine, Baltimore, MD

2009-2019 Director/Instructor/ for 10 graduate students, 18-20 classes throughout academic school year, Primary Course Readings and Analysis (ME:330.708), Johns Hopkins University School of Medicine, Baltimore, MD, JHMI

2010-Present Instructor for 5-8 medical school students, 3-day intensive class each Spring, Translation Science Intersession / Topics in Interdisciplinary Medicine (Epigenetics in Health and Cancer) (ME:800.627), Johns Hopkins University School of Medicine, Baltimore, MD

2010-Present Instructor for 12 graduate students, single class each Spring, Molecular Mechanisms of Disease (ME:710.702), Johns Hopkins University School of Medicine, Baltimore, MD

2011-2019 Instructor for 15 High school students, single class each Summer, Journal Club for Center for Talented Youth program, Johns Hopkins University School of Medicine, Baltimore, MD

2016-2019 Co-director/Instructor for 7 graduate students, 6 weeks intensive class held each Fall, Essential Grantsmanship: Writing the Research Grant Proposal (ME:330:714), Johns Hopkins University School of Medicine, Baltimore, MD

2017-2019 Instructor, for 30 graduate students, single class each Spring, Physical Epigenetics (EN.580.446), Johns Hopkins University Homewood Campus, Baltimore, MD

Clinical instruction

N/A

CME instruction

N/A

Workshops /seminars

JHMI/Regional

2008-2019 Instructor, Graduate, Grant Proposal Writing Workshop, BCMB, Led small (3 people) groups to develop

2009 Discussion Panelist, Postdoc Conference, Finding a job in academia, (>300 registrants), Johns Hopkins School of Medicine, Baltimore, MD

2012 Panelist, Graduate Student Association, Career development course- Job Search and starting your own

lab, Johns Hopkins School of Medicine, Baltimore, MD
2015 Instructor, Undergraduate Juniors and Seniors, Survival Skills Workshop; Morgan State University, Mock
interviews for Graduate School
2017-Present Panelist, BioMed Virtual Fair, Office of Graduate Biomedical Education, Johns Hopkins School of Medicine, Baltimore, MD, Answered questions about graduate career and graduate school admissions
2019 Panelist, Networking workshop for visiting underrepresented students, Johns Hopkins School of Medicine, Baltimore, MD, workshop to explain the importance of networking, provide tips for creating
new connections, and showcase examples of good follow-up
2022 Panelist, Summer Internship Program (SIP), Career development workshop, Johns Hopkins School of Medicine, Baltimore, MD, Workshop for SIP students to learn more about the graduate admissions process, what admissions committees are looking for when reviewing applications, and how to strengthen
their applications

Mentoring

High School Student Advisees/ Mentees

2011 Bianca Barrera (Center for Talented Youth Scholar). Mentor. Columbia University, NY
2012 Matthew Green-Hill (Boys Hope Girls Hope Scholar). Mentor. Community College of Baltimore County,
MD
2012 Gina Lightner (Center for Talented Youth Scholar). Mentor. Rice University, TX
2013 Anthony Preza (Center for Talented Youth Scholar). Mentor. MIT, MA
2014 Caleb Smith (Center for Talented Youth Scholar). Mentor. Palos Verdes Peninsula High School, CA, Dartmouth, Hanover NH
2014 Assefa Akinwole (Summer Academic Research Experience Scholar). Mentor. Seed School of Maryland,
Baltimore, MD, Morehouse College
2015 Phoenix Wilson (Center for Talented Youth Scholar). Mentor. Mary Baldwin College
2015 Princess Massaquoi (Summer Academic Research Experience Scholar). Mentor. Baltimore, MD
2016 Amy Guo (Center for Talented Youth Scholar). Mentor. Centennial High School, Ellicott City, MD; Columbia University Mailman School of Public Health
2016 Shaquita Johnson (Summer Academic Research Experience Scholar). Mentor. Seed School of Maryland,
Baltimore, MD
2017 Micaela Wilson-Wheatley (Summer Academic Research Experience Scholar). Mentor. Seed School of Maryland, Baltimore, MD; Coppin State University
2017 Rhea Krishman (Center for Talented Youth Scholar). Mentor Shrewsbury High School, Shrewsbury, MA;
Case Western Reserve University
2018 Madison Pomeroy (Center for Talented Youth Scholar). Mentor. Darien High School, Darien, CT; Johns
Hopkins University
2019 Ilana Chalom (Center for Talented Youth). Mentor. Livingston High School, Livingston, NJ; Johns Hopkins University
2020 Kristiana Smith (Summer Academic Research Experience Scholar). Mentor. Seed School of Maryland, Baltimore, MD; Johns Hopkins University
2022 Jazmine Green (Summer Academic Research Experience Scholar). Mentor. Baltimore, MD
2023 Hanaa Elfernani (Summer Academic Research Experience Scholar). Mentor. Meade Senior High School,
MD

Undergraduate Student Advisees/ Mentees

2010 Jazmine Robertson (Summer Internship Program). Mentor. Currently studied Pharmacy at Virginia Commonwealth University, Richmond, VA

2011 Brandy Garzel (Sr. Alma McNicholas Women Scientist program at College of Notre Dame). Mentor. Attended graduate school at the University of Maryland, Baltimore, MD

2012 Phillip Thomas (Summer Internship Program), Won a poster presentation award at ABRCMS 2013. Mentor. Ph.D at NYU School of Medicine; Currently a postdoctoral researcher at Regeneron

2014 Raiha Tahir (Summer Internship Program). Mentor. Ph.D at Johns Hopkins School of Medicine, Baltimore, MD; Currently Senior test engineer Ginko Bioworks, Boston, MA

2015-2016 Luis Milburn (Summer Internship Program). Mentor. Was undergrad student studying Biochemistry, and Molecular Biology at Rhodes College, Memphis TN

2020-2021 Madison Pomeroy, Mentor, Currently an undergrad student at Johns Hopkins University (Former Center for Talented Youth Scholar).

2021 David Horsey, Mentor, (University of Maryland, Baltimore County; UMBC). Currently a graduate student in the BCMB program at Johns Hopkins School of Medicine, and was awarded a Vivian Thomas Fellowship (https://provost.jhu.edu/about/vivien-thomas-scholars-initiative/).

2023 Carson Currie, Mentor. Currently a senior at Johns Hopkins University.

Pre-doctoral Advisees /Mentees

2009-2014 Romeo Papazyan, B.S., Ph.D, Graduate Student in Pharmacology and Molecular Sciences at Johns Hopkins School of Medicine; was a postdoctoral fellow with Dr. Mitch Lazar at The University of Pennsylvania, PA, currently a Scientist II at Ferring Pharmaceuticals, San Diego, CA
Publications: OR 17, 24, 29, 30; BC1; OP3
2009 Pharmacology Retreat Poster presentation award
2012 Scheinberg Travel award
2013 Epigenetics and Chromatin meeting (Selected for talk)
2014 Ph.D awarded
2015 NRSA Fellowship

2010-2014 Tonya Gilbert, B.S., Graduate Student in BCMB program at Johns Hopkins School of Medicine; was a postdoctoral fellow with Dr. Jacob Hooker at Harvard, Boston, MA, currently Director of Translational Research at Eikonizo Therapeutics, Inc. Cambridge, MA
Publications: OR 21, 23, 24
2011-14 Individual NSF fellowship (90046096)
2012 Seminar award (BCMB)
2012 Oral presentation award (BCMB)
2013 Poster Presentation, Chromatin Structure and Function, Grand Cayman
2013 Scheinberg Travel award
2014 Poster presentation award (BCMB)
2014 Oral presentation award (BCMB)
2014 Travel award, Center for Innovation in Graduate Biomedical Education
2014 Student Fellowship, Discovery on Target, Boston MA
2014 Discovery on Target meeting, Boston MA (Poster presentation)
2014 Ph.D. awarded

2011-2015 Annie Cieniewicz, B.S., Graduate Student, Graduate Student in Pharmacology and Molecular Sciences at Johns Hopkins School of Medicine; was a postdoctoral fellow at Janssen Pharmaceuticals, Philadelphia, PA, currently a Senior Scientist at RayzeBio, San Diego, CA
Publications: OR 20, 23, 27
2012-15 Individual NSF fellowship (1232825),
2013 Poster Presentation, Chromatin Structure and Function, Grand Cayman

2014 Scheinberg Travel award
2014 Student Fellowship, Discovery on Target, Boston MA
2014 Discovery on Target meeting, Boston MA (Poster presentation)
2014 Co-President, Hopkins Biotech Network
2015 Ph.D. awarded

2011-2012 Gai Yan, B.S., Ph.D., Graduate Student in Cellular and Molecular Medicine at Johns Hopkins School of Medicine, (Co-mentored with Rhoda Alani), Currently a postdoctoral associate at Georgetown University Medical Center, DC
Publications: OR 18
2012 Ph.D. awarded

2011-2013 Lindsey Brown, Ph.D. Graduate student in Biochemistry, Cellular and Molecular Biology, (Co-mentored with Andrew Feinberg), Currently a microbiologist with the FDA.
Publications: OR 25
2013 Ph.D. awarded

2013-2014 Kimberly Cox, MD/ Ph.D., Maastricht University, Netherlands (trained in epigenetics and genome sequencing as a visiting student from NL), currently a general practitioner, Maastricht, NL
2013 Travel grant Ter Meulen Fonds (KNAW)
2015 Awarded MD/Ph.D

2016-2017 Nkosi Adejola, B.S. Medical Student in Human Genetics program at Johns Hopkins School of Medicine, currently a researcher at NIH
Publications: OR 20
2016 The Allied Genetics Conference (Poster)
2016 Human Genetics Travel award
2020 Awarded MD/MS

2016-2022 David Vinson, B.S., Graduate Student, Graduate Student in Pharmacology and Molecular Sciences at Johns Hopkins School of Medicine, accepted a postdoctoral fellowship with Dr. Ian Maze at Ichan School of Medicine in New York, NY
Publications: OR 39, 40, 41
2017 Poster Presentation, Chromatin Consortium Workshop (Homewood)
2018-22 NIH F31 Fellowship (F31 GM130114-01)
2018 Represented Hopkins at URM recruitment fair (UMBC, MD)
2019 Represented Hopkins at ABRCMS
2019 JHU Chromatin Workshop (Talk)
2022 Ph.D. awarded

Post-doctoral Advisees /Mentees

2017 Blair Dancy. Ph.D, Interim postdoctoral associate, U.S. Army Medical Service Corps, currently serving at the United States Army Center for Environmental Health Research, Fort Detrick, MD
Publications: OR 17, 18, 21

2013-2019 Kimberly Stephens, Ph.D., R.N., Post-Doctoral Fellowship, Johns Hopkins University School of Nursing, currently a tenure-track Assistant Professor at both University of Arkansas for Medical Sciences and Arkansas Children's Hospital, Little Rock, AR

Publications: OR 29, 32, 34, 37, 38; OP 5
2013-15 JHU Interdisciplinary Training Program in Biobehavioral Pain Research. (NIMH NS070201)
2016-17 NIH/NINR fellowship (F32 NR015728-01); $56,118 Direct Costs

2020-2021 Alejandro Saettone, Ph.D. currently a Research Fellow at The Hospital for Sick Children, Toronto
Publications: OR 42
2019 MITACS Globalink award for summer research in Taverna laboratory
2021 NSERC award, (557615) $90,000 Direct Costs, Canadian funding for two years
2021 Had to return permanently to Canada due to family issues related to Covid

Thesis committees

JHMI/Regional:

2008-2009 Chris Cherry, Ph.D. *The chromatin remodeling factor NURF maintains stem cells in the Drosophila testis by regulating the JAK/STAT signaling pathway.* Member.

2008-2009 Rocio Montes De Oca, Ph.D. *BAF (Barrier to autointegration factor) and its interaction with chromatin and histones.* Member/ Reader.

2008-2012 Blair Dancy, Ph.D. *Azalysine analogs as probes for protein lysine deacetylation and demethylation.* Member/ Reader.

2008-2013 Beverley Dancy (Rabbitts), PhD. *Chemical modification on H3K56 to study the in vitro effects of K56 acetylation on the nucleosome.* Member.

2008-2013 Kristen Rennoll-Bankert, Ph.D. *The regulatory role of AnkA during A. phagocytophilum infection of neutrophils.* Member/ Chair/ Reader.

2009-2012 Katherine Fiedler (Stamper), Ph.D. *Lysine post-translational modification analysis and quantitation using chemically derivatized analogs.* Member.

2009-2012 Gai Yan, Ph.D. *Histone acetyltransferase p300/CBP as a functionally significant target in melanoma.* Member/ Co-PI/ Reader.

2009-2014 Megan Cleveland, Ph.D. *Epigenetic regulation of pancreas development.* Member.

2009-2011 Dilini Ranatunga, Ph.D. *Modeling Human IL-10 expression in mice.* Member.

2010-2011 Erin Bowers, Ph.D. *Novel insights into p300 histone acetyltransferase activity: inhibition and modulation.* Member.

2010-2013 Lindsey Brown, Ph.D. *A novel chemical probe to identify and characterize SAM binding proteins.* Member/ Reader.

2010-2012 Arvin Gouw, Ph.D. *The role of the histone H3K9 demethylase JMJD1A in Myc pathways and hypoxia.* Member.

2010-2013 Akiko Doi, Ph.D. *The role of epigenetic mechanisms in regulating cell identity and maintenance of pluripotency.* Member/ Chair/ Reader.

2010-2013 Elisabeth Hersman, Ph.D. *Histone Post-translational modification identification and quantification using mass spectrometry and chemical derivatization.* Member.

2010-2014 Zheng Kuang, Ph.D. *The interaction between transcription, histone modification, and metabolism in yeast metabolic cycle.* Member/ Reader.

2011-2014 Romeo Papazyan, Ph.D. *The role of histone methylation in gene silencing.* Member/ P.I./ Reader.

2011-2015 Ben Leadem, *Understanding the interaction between the de novo DNA methyltransferase DNMT3b and histone H3K4 demethylases, and their role in gene silencing.* Member.

2011-2013 Hwajin Lee, Ph.D. *Effects of prenatal environment on epigenetic marks.* Member.

2011-2014 Vuong Tran, Ph.D. *Epigenetic profiling of the Drosophila germline cell lineage.* Member.

2011-2015 Alison Ringel, *Organization and Activity of the SAGA HAT Module.* Member.

2011-2016 Teresa Luperchio (Romeo). *The functional role of LADs (lamin associated domains) during development.* Member/ Reader

2011-2015 Andres Hernandez. *Characterization of nudix hydrolases: a utilitarian superfamily of enzymes*. Member. Reader
2011-2014 Tonya Gilbert, *The mechanism of NuA3 chromatin localization and its role in transcriptional activation.* Member/ P.I.
2012-2015 Xianrong Wong, *The role of Lamin A in genome organization during development and differentiation.* Member.
2012-2013 Risheng Xu, Ph.D. *The role of IPMK and inositol polyphosphates in p53-mediated apoptosis.* Member.
2012-2015 Annie Cieniewicz, *The role of nucleosomal histone modifications in regulating the ADA HAT complex in yeast.* Member/ P.I.
2012-2017 Nathan Lee, *Dynamic control of facultative heterochromatin in gene silencing.* Member.
2012-2015 Amy Vandiver, *Epigenetic mechanisms of human aging.* Member.
2012-2015 Polina Prusevich, *The synthesis and testing of novel lysine-specific demethylase 1 (LSD1) inhibitors.* Member/ Reader
2012-2015 Jennifer Harr, *Chromatin repositioning and gene regulation in mammalian cells.* Member/ Reader
2013-2018 Jingchuan Luo, *Assembly and functional study of synthetic chromosomes in yeast.* Member.
2014-2015 Phil Cox, *Characterization of the polymorphic Cytochrome P450 2B6 substrate specificity, stability, and activity.* Member.
2014-2016 Yun Qing, *The molecular mechanism underlying the transcriptional coactivator function of Yorkie in Drosophila.* Member.
2014-2018 Kim Stuchul, *Examining the specificity of Saccharomyces cerevisiae sirtuins.* Member.
2015-2017 Dawn Hayward, *Characterization of the CoREST complex.* Member
2016-2017 Nkosi Adejola. *The role of histone methylation on H3 at lysine 23 during meiosis*. Member/ P.I.
2016-2020 Heather Wick. *The role of topoisomerase II beta in facilitating the androgen-induced transcriptional program.* Member
2017-2020 Brittany Avin. *Telomerase Reverse Transcriptase (TERT) Promoter Regulation in Thyroid Cancer Cell Lines.* Member
2016-2020 Jessica Hopkins. *Polo-like Kinase 4 in DNA repair and epigenetic remodeling of the X and Y chromosomes during meiosis.* Member.
2017-2022 David Vinson. *Investigating the epigenetic mechanisms surrounding neuronal stem cell differentiation.* Member, Mentor
2017-2021 Mel Nune. *Biochemical and structural studies of the roles of FACT and Ubp10 in histone H2B deubiquitination and nucleosome dynamics.* Member
2017-2022 Kyle Cavagnini. *Genetic and epigenetic regulation of hepatic fatty acid metabolism*. Member
2018-2022 Sara Haile. *The SAGA HAT module is tethered by its SWIRM domain and regulates SAGA DUB activity.* Member/ Reader
2019-2022 Yinan Liu. *RNA binding proteins in the control of cell shape during cell division and cell migration in Dictyostelium discoideum*. Member
2019-2022 Mithra Kumar. *The relationship between resting CD4+ T cell repertoire, resting T-cell subsets and HIV-1 latency*. Member
2019-2023 Claudia Carcamo. *Properties of DNA that dictate its condensability by multivalent cations and chromatinizing protein factors*. Member
2020-2023 Jasmin Zarb. *The role of CTCF in regulating chromatin structure*. Member
2020-Present Chad Hicks. How *Dot1L regulation impacts deposition of H3K79me1/2/3 onto nucleosomes.* Member
2021-Present Ashley Melendez-Perez (SARE student, Postbac). *Role of Lamin C in 3D genome organization after mitosis*. Member
2022`-Present Joan Sobo (SARE student, Postbac). *Differential Interactomes of Lamin A and Lamin C in Early G1.* Member

National:
2014- 2018 Kirk West, *Arsenic regulation of chromatin dynamics.* University of Arkansas for Medical Sciences, Outside Member.
2017-2020 Brian Koss. *Epigenetic control of Cdkn2a$_{Arf}$ protects tumor-infiltrating lymphocytes from exhaustion.* University of Arkansas for Medical Sciences, Outside Member.
2021-present Jake Edmonson. *The role of activation of ATF6 in attenuating antigen presentation and promoting immune escape in*

metastatic melanoma. University of Arkansas for Medical Sciences MD/PHD, Outside Member.

International:

2013-2014 Kimberly Cox, *Epigenetic mechanisms in fetal preconditioning of the brain.* Maastricht University, Netherlands, MD/Ph.D., Mentor/ Outside Member

2015 Jan Henrik Suhren, *Heterochromatin components are required for limiting biogenesis of siRNAs to sequences targeted for DNA elimination in Tetrahymena.* IMBA, Vienna, Austria, Ph.D., Outside Member. Reader

Educational Program Building / Leadership

N/A

RESEARCH ACTIVITIES

Research Focus

My group focuses on characterizing the molecular links leading to establishment and maintenance of epigenomes, with respect to proteins and post-translational histone modifications found in chromatin. I have worked in chromatin biology for over 22 years using human and rodent models, and single-cell model organisms like *Tetrahymena thermophila* and *Saccharomyces cerevisiae*. My group identifies epigenetic regulators and histone modifying machineries using a variety of screens and purification techniques, and subsequently characterizes them biochemically, biologically, and structurally. My laboratory also has an excellent track record of applying and adapting biochemical techniques towards understanding *in vivo* epigenetic pathways in diseases like melanoma and altered neuronal function in clinical pain.

Research Program Building / Leadership

2008-Present Pharmacology Graduate Program
NIGMS
PI: Caren Meyers
Role: Graduate recruiting/admissions director, Interview candidates, Serve as research mentor for rotation and graduate students, Attend conferences/ events for recruiting underrepresented minorities,
Wrote recruitment section for T32 application, Developed new Doctoral Board Oral exam format and questions, departmental website redesign.

2008-2013 Training in Anti-Cancer Drug Development
NCI
PI: Wade Gibson
Role: Interview Candidates, Serve as research mentor for rotation and graduate students and postdoctoral Fellows

2008-Present Biochemistry, Cellular and Molecular Biology (BCMB) Training Program
NIGMS
PI: Rachel Green
Role: Interview Candidates, Serve as research mentor for rotation and graduate students, Lead grant writing workshops, Attend conferences/ events for recruiting underrepresented minorities, Alternate for Pharmacology BCMB Policy Committee member

2009-Present MSTP/ MD-PhD training Program
NIGMS
PI: Andrea Cox

Role: Interview Candidates, Attend conferences/ events for recruiting underrepresented minorities, Serve as research mentor for rotation and graduate students

2011-Present Human Genetics Graduate Program
NIGMS
PI: David Valle
Role: Interview Candidates, Serve as research mentor for rotation and graduate students

Inventions, Patents, Copyrights

Invention:

2002 **Taverna SD**, Allis CD. Anti-phospho-Histone H2A/H4 (Ser1) Antibody; University of Virginia, Charlottesville, VA

2011 **Taverna SD** et al., JHU C11429; H3K23me3 Antibody; Johns Hopkins University, Baltimore, MD)

2022 **Taverna SD** et al., JHU, Histone H3 K-to-M mutant (oncohistone) cell lines; Johns Hopkins University, Baltimore, MD

2023 **Taverna SD, Zhu, H** et al., JHU, NextGen CUT&Tag; (D17594; P17594) Johns Hopkins University, Baltimore, MD

Patents:

2009 **Taverna SD**, Allis CD, Tackett AJ. Methods and Kits for assaying acetyl transferase or deacetylase activity. U.S. Non-Provisional Patent Application Serial No.:11/811,886

2010 **Taverna SD**, Allis CD, Tackett AJ. Methods and kits for assaying acetyl transferase or deacetylase activity. U.S. Non-Provisional Patent Application Serial No.: 12/587,776

2014 **Taverna SD**, Byrum SD, Tackett AJ, Raney K. Methods and Kits for Isolation and Analysis of a Chromatin Region. U.S. Non-Provisional Patent Application Serial No.: 62/014,428

SYSTEM INNOVATION AND QUALITY IMPROVEMENT ACTIVITIES

N/A

ORGANIZATIONAL ACTIVITIES

Institutional Administrative Appointments

2008-Present Member, Epigenetics Faculty Search Committee, Johns Hopkins University School of Medicine, Baltimore, MD

2011-2017 Senator (Pharmacology representative), Medical School Council/ Faculty Senate, Johns Hopkins University School of Medicine, Baltimore, MD

2015-Present Graduate Admissions Committee, Pharmacology and Molecular Sciences Training Program, Johns Hopkins University School of Medicine, Baltimore, MD

2016-2022 Graduate Admissions Committee, Biochemistry, Cellular and Molecular Biology (BCMB) Training Program, Johns Hopkins University School of Medicine, Baltimore, MD

2017-2019 Young Investigators' Day Program review committee

2017-Present Associate Director, IBBS Center for Epigenetics

2017-Present Director of Graduate Recruiting, Pharmacology and Molecular Sciences

2017-Present Pharmacology and Molecular Sciences Steering Committee

2018-2020 BCMB Curriculum Executive committee

2018-2021 Admissions Committee for Basic Science Institute Summer Internship Program Admissions (Triage of ~150 applicants to 10%)

Journal peer review activities

2009-Present PNAS, Reviewer

2009-Present Cell, Reviewer

2010-Present Cellular and Molecular Life Sciences, Reviewer

2010-Present Current Biology, Reviewer
2010-Present Nature Communications, Reviewer
2011-Present EMBO J, Reviewer
2012-Present Biology of the Cell, Reviewer
2012-Present Journal of Molecular Biology, Reviewer
2012-Present PLOS Genetics, Reviewer
2012-Present Cell Reports, Reviewer
2013-Present Molecular Cell, Reviewer
2013-Present Eukaryotic Cell, Reviewer
2014-Present Nucleic Acids Research, Reviewer
2020-Present BMC Biology
2020-Present Genomics, Proteomics, and Bioinformatics

Advisory Committees, Review Groups/Study Sections

2010 Outside member, Workshop on Epigenetic Basis of Intellectual and Developmental Disabilities: From Etiologic Discovery to Therapeutic Interventions (NIH/ NICHD).
2012 Outside Reviewer, Austrian Academy of Sciences Doctoral Fellowship (Doctoral Fellowship Programme of the Austrian Academy of Sciences)
2015 Outside Reviewer "Fondation pour la Recherche Médicale", French private foundation that supports excellence in medical research.
2016 NIH study section (MGB), San Francisco
2016 NIH Study Section (Member Conflict), Internet assisted meeting
2017 NIH study section (MGB), Baltimore
2017-Present Arkansas Children's Hospital Center for Translational Pediatric Research, External Advisory Committee for NIH COBRE grant
2017-2022 TetRA Board (Tetrahymena Research Advisory Board; now Ciliate Research Advisory Board); Served as Chair 2019-2022
2019 NIH study section (MIRA-ZRG1), Bethesda, MD

Professional Societies

2003-2005 New York Academy of Sciences
2013-2014 SACNAS
2014-Present UT Austin Alumni Association (Project Worldwide organizer, Baltimore Chapter)
2016-2018 Genetics Society of America

Conference Organizer (*separate into JHMI/Regional - National - International activities*)

JHMI/Regional:

2014 Co-organizer, "Organization and function of the epigenome", Symposium of the Institute for Basic Biomedical Sciences, JHMI, Baltimore, MD
2022 Co-Organizer, Chromatin and Chromosomes (In-person conference, 95 registered participants), JHU/JHMI, Baltimore, MD

International:

2015 Co-organizer/Session Chair, Ciliate Molecular Biology Conference, Camerino, Italy
2020 Organizer; Junior Investigator Ciliate Molecular Biology Conference (virtual, international, >200 registered participants)
2021 Co-Organizer; Ciliate Molecular Biology Conference (virtual, international, >200 registered participants)
2022 Co-Organizer; Ciliate Molecular Biology Conference (virtual, international, >200 registered participants)
2023 Co-Organizer, Ciliate Molecular Biology Conference (in-person, international), Montpellier, France

-I wrote an NSF grant to secure $15,000 in travel funds for early career investigators.

Session Chair

International:

2013 Session Chair, FASEB Ciliate Molecular Biology Conference, Steamboat Springs, CO
2015 Session Chair, "Epigenetic discoveries driven by ciliates", The Allied Genetics Conference, Orlando, FL
2023 Session Chair, "Memorial Session", Ciliate Molecular Biology Conference (in-person, international), Montpellier, France

Consultantships

2010 Outside speaker, Epigenetics, BioRad.

RECOGNITION

Awards, Honors

1991 Phi Eta Sigma, Freshman Honor Society (UT Austin)
1992 Beta Beta Beta, Biological Honor Society (UT Austin)
1992-1994 Dean's List (UT Austin)
1993 Alpha Epsilon Delta (UT Austin)
1994 National Golden Key Honor Society (UT Austin)
1994-1995 University Honors (UT Austin)
2001 GBS symposium poster competition (3rd place) (UVA)
2001 GBS Vice-president (UVA)
2001-2003 Graduate Student council representative (UVA)
2003 Michael J. Peach Outstanding Graduate Student (Runner-up) (UVA)
2003 Graduate Biosciences (GBS) symposium poster competition (1st place) (UVA)
2003 GBS Treasurer (UVA)
2004-2006 Postdoctoral Association representative (Rockefeller), Treasurer
2011 Mentor of the Year, Johns Hopkins Graduate Student Association
2019 During my tenure as Director of Graduate Recruiting for Pharmacology and Molecular Sciences, Viceprovost Nancy Kass recognized the program as "in the top third of JHU PhD programs with regard to diversity numbers among domestic students. Specifically, our data indicate that 25% of domestic PhD students in pharmacology are URM."
2020 Recognized as a Sustainable Sourcer by the Johns Hopkins Office of Sustainability in the 2020 Green Blue Jay Awards

Invited Talks

JHMI/ Regional:

1/21/09 Panelist, "Reflections on becoming an independent investigator", Postdoctoral Career Development Conference, JHMI, MD
3/10/09 Speaker, "Reading histone methylation and regulating transcription" Special K, JHMI, MD
9/17/09 Speaker, "Reading and Writing Histone Methylation" MGB, JHMI, MD
10/28/10 Speaker, "Reading histone methylation and regulating transcription", NIH, DC
11/6/10 Speaker, "Histone modifications and epigenetics", MSTP/ MD-PhD retreat, Hershey, PA
3/30/11 Speaker, "Histone modifications and epigenetics" Institute of Genetic Medicine, JHMI, MD
6/20/11 Speaker, Mentor of the Year seminar, "Memories of mentors and methylation", Graduate Student Association, JHMI, MD
7/9/12 Speaker, "Histone methylation in germ-line heterochromatin" NIH All-Hands Meeting for TCNP, NIH, DC

10/13/12 Speaker, "Heterochromatic histone modification markers and meiosis" Wellcome Trust Epigenomics of
Common Disease Conference, MD
11/14/12 Panelist, "Searching for a faculty position and starting your own lab", Johns Hopkins University Graduate Students Association Career Development course, JHMI, MD
3/11/13 Speaker, "Heterochromatin and meiotic histone modifications", Carnegie Institute, Baltimore, MD
4/16/14 Panelist, "Investigator's Reflections" Johns Hopkins University Graduate Students Association Career Development, JHMI, MD
7/22/14 Speaker, "Finding novel functions for histone methylation" JHMI, MD
9/10/14 Speaker, "Finding new roles for histone methylation", UMBC, MD
11/20/14 Speaker, "Histone methylation and integrity of the germline genome", Epigenetics Symposium, Johns Hopkins School of Medicine, MD
4/23/24 Speaker, Cancer Invasion and Metastasis Weekly Seminar Series, Sidney Kimmel Comprehensive Cancer
Center

National:
5/7/08 Speaker, "Histone modifications and epigenetics", UAMS, AR
9/3/08 Speaker, "Histone modifications and epigenetics", UVA, VA
4/28/10 Graduate student invited speaker, "Histone modifications and epigenetics", Chemical-Biology Interface
Group at University of Delaware, DE
10/5/11 Speaker, "Histone PTMs in the heterochromatic germ-line micronucleus of Tetrahymena", The Rockefeller University, NY
1/10/13 Speaker, "Heterochromatin and meiotic histone modifications", University of Pennsylvania, Philadelphia,
PA
1/10/13 Speaker, "Heterochromatin and meiotic histone modifications", University of Pennsylvania, Philadelphia,
PA
9/17/14 Speaker, "Finding new roles for histone methylation", UAMS, AR
11/12/14 Speaker, "Finding new roles for histone methylation", Wesleyan, CT
4/13/19 Speaker, "New roles for histone methylation in genome instability", University of Virginia. VA
5/5/22 Speaker KUMC, Kansas City, Kansas (cancelled due to pandemic)
7/14/23 Invited Speaker, "Unlocking the roles of combinatorial histone modifications across the epigenome", University of Arkansas for Medical Sciences, Little Rock, Arkansas

International:
8/8/09 Speaker, "Determining differences in epigenetic marks using an antibody array", Biotech Meeting, Dalian, China
7/12/11 Speaker, "Histone modification states in the germ-line micronucleus of Tetrahymena", FASEB Ciliate Biology meeting, Crete, Greece
9/15/12 Speaker, "Methylation of histone H3 at lysine 23 by an Enhancer of Zeste homolog insulates heterochromatin from programmed double strand breaks during meiosis" Cold Spring Harbor Epigenetics and Chromatin
7/11/13 Speaker/Session Chair, "Understanding the role of H3K23 trimethylation during meiosis" FASEB Ciliate
Biology Meeting, Steamboat Springs, CO
9/23/13 Speaker/Short Course, "Characterization and Quantification of Histone Modifications", CHI Discovery
on Target, Boston, MA
7/13/15 Speaker / Session Chair/ Co-organizer, "Methylation of H3K23me3 blocks DNA damage during meiosis", Conference on Ciliate Molecular Biology, Camerino, Italy

12/10/15	Speaker, "Finding new roles for histone methylation", Pacifichem 2015, Honolulu, HI
12/4/16	Speaker, "Finding new roles for histone methylation", IMBA (Institute of Molecular Biotechnology of the Austrian Academy of Sciences), Vienna, Austria
7/15/16	Speaker / Session Chair, "Epigenetic discoveries driven by ciliates", The Allied Genetics Conference, Orlando, FL
7/20/21	Speaker, 2021 Ciliate Molecular Biology Conference, Lisbon, Portugal (cancelled due to pandemic)
2020-21	Invited distinguished speaker, "Mittwochs-Kolloquium", Max Planck-Institute for Developmental Biology, Tübingen, Germany (cancelled due to pandemic)
5/5/22	Invited speaker at KUMC, Kansas City, Kansas (cancelled due to pandemic)
7/2022	Invited keynote speaker, How Evolution learnt to learn: Epigenetics of Experienced Context. Symposium. Salzberg, Austria (did not accept due to pandemic).
6/28/23	Invited Speaker, 2023 Ciliate Molecular Biology Conference, Montpellier, France
7/14/23	Invited Speaker, "Unlocking the roles of combinatorial histone modifications across the epigenome", University of Arkansas for Medical Sciences, Little Rock, Arkansas
3/9/24	Invited Speaker (tentative), "Unlocking the roles of combinatorial histone modifications across the epigenome", Molecular Psychiatry Meeting, Kona, Hawaii

OTHER PROFESSIONAL ACCOMPLISHMENTS

Posters

09/13/12	Poster, "Methylation of histone H3 at lysine 23 by an Enhancer of Zeste homolog insulates heterochromatin from programmed double strand breaks during meiosis" Cold Spring Harbor Epigenetics and Chromatin
10/12/13	"Histone methylation and DNA damage during meiosis", ABCAM Chromatin Conference, Grand Cayman

Humanitarian Activities

2014	"Texas Exes Project Worldwide!" Organized food donation event at the Maryland Food Bank for volunteering alumni of UT Austin

Philanthropic Activities

Other

2002-Present	Scientific Cartoonist, ***The Scientist***, *Natural Selections*, other venues
2004-2005	Contributing Cartoonist, ***Nature Genetics*** journal
2006	Book: Sex, Drugs, and DNA (Cartoonist)
2014	Poster: "Be a Hero" Blood donation campaign for JHMI, MD
2023	Contributing Cartoonist, ***Cell***; 186 (4):663-667, https://doi.org/10.1016/j.molcel.2023.02.002

CURRICULUM VITAE

Name: Yong Zhu, Ph.D., M.S., M.A.
Email: yong.zhu@yale.edu
Phone: 203-500-2136

Education:

B.S.	Cell Biology, Zhejiang University, Hangzhou, China, 1991
M.S.	Molecular Biology, Chinese Academy of Sciences, Beijing, China, 1994
M.A.	Molecular Systematics, Rice University, Houston, Texas, 1998
Ph.D.	Molecular Biology, Department of BioSciences, Rice University, Houston, Texas, 2000
Postdoc	Molecular Cancer Epidemiology, Department of Epidemiology, The University of Texas, MD Anderson Cancer Center, Houston, TX, 2000-2002

Career/Academic Appointments:

2002-2003	Instructor, Department of Environmental Health Sciences, Yale School of Public Health and School of Medicine, New Haven, CT
2003-2008	Assistant Professor of Epidemiology, Department of Environmental Health Sciences, Yale School of Public Health and School of Medicine, New Haven, CT
2008-2012	Associate Professor of Epidemiology, Department of Environmental Health Sciences, Yale School of Public Health and School of Medicine, New Haven, CT
2018-2021	Guest Professor, Beijing University of Chinese Medicine, Beijing 2012-present Associate Professor of Epidemiology (with Tenure), Department of Environmental Health Sciences, Yale School of Public Health and School of Medicine, New Haven, CT

Administrative Positions:

2004-2007	Member of Doctoral Committee, Yale School of Public Health, New Haven, CT 2004-
2005	Member of Library Committee, Yale School of Public Health, New Haven, CT 2005-2006 Member of Information Technology Resources Committee, Yale School of Public Health, New Haven, CT
2008-2010	Member of MPH Admission Committee, Yale School of Public Health, New Haven, CT
2008-2010	Member of Academic and Professional Integrity Committee, Yale School of Public Health, New Haven, CT
2010-2015	Co-Director of Cancer Prevention and Control Program, Yale Cancer Center, New Haven, CT
2015-2020	Assistant Director of Yale Cancer Center for Global Cancer Epidemiology, New Haven, CT
2011-2016	Member of Education Committee, Yale School of Public Health, New Haven, CT 2012-
2018	Chair of Faculty Search Committee, Department of Environmental Health Sciences, Yale School of Public Health, New Haven, CT
2015-2019	Member of Academic and Professional Integrity Committee, Yale School of Public Health, New Haven, CT
2018-present	Co-Director, Yale-ZJU (Zhejiang University) Duel Degree Program, Yale School of Public Health, New Haven, CT
2019-present	Co-Director, International Summer Training Program in Environmental Health Sciences, Yale School of Public Health, New Haven, CT
2020-present	Faculty Track Director (EHS) of YSPH Online MPH Program, Yale School of Public Health, New Haven, CT
2020-present	Member of Global Health Concentration Committee, Yale School of Public Health, New Haven, CT
2021-present	Member of Research Advisory Committee, Yale School of Public Health, New Haven, CT

Professional Honors and Recognition (list from most recent to earliest):

2007, 2019	Member of IARC (The International Agency for Research on Cancer, WHO) Monograph working group on Carcinogenicity of Shift-work
2010	The work on CLOCK gene (#58 on publication list below) was selected as one of the 10 featured Research Highlights in 2010 by the NCI Epidemiology and Genetics Research Program (EGRP)
2002	Bristol-Myers Squibb Award in Clinic/Translational Research, The University of Texas, M. D. Anderson Cancer Center
2002	Scholar-in Trainee Award, American Association for Cancer Research (AACR) 2000 Cancer Prevention Post-Doctoral Fellowship, The University of Texas, M. D. Anderson Cancer Center
1996 --1999	Wray-Todd Fellowship, College of Natural Sciences, Rice University 1998 --1999 Graduate Student Travel Award, Rice University
1995	Graduate Student Fellowship, Rice University

Grant History

A. Current grants

1. NIEHS R25ES029052-01, "Summer Research Experience in Environmental Health (SREEH)" (Co-PI), 01/29/2019–01/28/2024
2. NCI R21CA238100-01, "Explore piRNA as a novel therapeutics for hepatocellular carcinoma" (PI), 02/08/2019–02/07/23
3. NIEHS 3R25ES029052-02S1 "Summer Research Experience in Environmental Health (SREEH)" (Co-PI), 08/20/20-01/31/2024
4. Tina Brozman Foundation "Use of piRNAs for ovarian cancer early detection" (PI), 06/01/2020–05/30/2023
5. NCI T32 CA250803 "The Yale Cancer Prevention and Control Training Program" (Training faculty), 08/01/2020–07/31/2025

B) Completed grants

6. NCI R01CA204120-01 "Novel methods for identifying genetic interactions in cancer prognosis" (Co-I), 07/01/2016 – 06/30/2022
7. NCI R03 CA216017-01 "Assisted Network-based Analysis of Cancer Gene Expression Studies" (Co-I), 08/01/17-07/31/20
8. Sponsored Research Project (Genotech Matrix. Inc.) "Develop a novel immune repertoire analysis for cancer biomarker study" (PI), 08/01/18-04/30/19
9. NINR P20 NR014126 "Yale Center for Sleep Disturbance in Acute and Chronic Conditions" (Collaborator), 9/27/2012-6/30/2017
10. Tina Brozman Foundation "Exploration of piRNA signatures as diagnostic biomarkers of ovarian cancer" (PI), 12/01/2015–11/30/2019
11. Departmental Seed Fund "Dissect genes involved in the inverse relationship between cancer and asthma" (PI), 05/01/2016 – 04/30/2018
12. NCI R01 CA154653 "Molecular Epidemiology/Functional Analysis of MicroRNAs in Non- Hodgkin's Lymphoma" (PI), 04/01/2011–03/31/2016
13. NCI R03 CA182984 "Development of integrated analysis methods and applications to TCGA data" (Co-I), 01/01/2014–12/31/2016
14. NIEHS R21 ES018915 "Can Shift Work Shift Epigenetic Patterns?" (PI), 07/01/2010– 06/30/2014
15. NCI R01 CA142774 "Novel Methods for Integrative Analysis of Cancer Genomic Data" (Co-I), 07/01/2010–06/30/2015
16. American Cancer Society R09658 "Epidemiology Study of Thyroid Cancer" (Co-I), 01/01/2010–12/31/2015
17. NCI K07 CA134831 "DNA repair, Cell cycle Checkpoints and Apoptosis and Bladder Cancer Risk" (Consultant), 06/01/2009–05/30/2014
18. NCI R01 CA104786 "Environment, Gene and Testicular Cancer Risk" (Co-I), 05/01/2006–

04/30/2014
19. NIAID D43TW008323 “Research Training for Cancer Epidemiology & Biostatistics in China” (Training Faculty), 08/01/2009-07/31/2014
20. NCI TU2 CA105666 “Yale/NCI Cooperative Training Program in Cancer Epidemiology” (Training Faculty), 09/30/2003–08/30/2013
21. NCI P30 CA16359-31 “Yale Comprehensive Cancer Center” (Program leader of the Cancer Prevention and Control), 09/01/2010 - 08/31/2015
22. DOD PC073134 “Circadian Genes and Risk for Prostate Cancer” (Co-I), 03/01/2008– 02/28/2012
23. NIAID D43 TW007864 “Research Training for Study of Air Pollution Control in China” (Training Faculty), 05/01/07 – 01/31/12
24. NIEHS R01 CA122676 “Database of Functional SNPs in Cancer-Related Environmentally Responsive Genes” (PI), 03/01/2007–02/28/2012
25. NIDA U01 DA023822 “Light Measuring Device for Correcting Circadian Disruption” (Site PI), 10/01/2007–09/30/2011
26. Yale Cancer Center Pilot “Fusion Genes, Circadian Genes and High-Grade Prostate Cancer” (PI), 09/01/2009–08/31/2010
27. CT Department of Public Health “Genetics and Smoking in Pregnancy” (Co-I), 01/01/2007–12/31/2008
28. NCI R03 CA110937 “Circadian Genes and Breast Cancer” (PI), 09/01/2004–08/31/2007
29. NCI R03 CA108369 “Methylation Related Genes and Breast Cancer Risk” (PI), 3/01/2004–02/28/2007
30. NIEHS R01 ES07456 “Gene-Environment Interactions in Asthma Development” (Co-I), 03/18/2005–02/28/2008
31. NCI R01 CA074880 “Markers for Genetic Susceptibility to Bladder Cancer” (Consultant), 05/01/2004–04/30/2009

C) Pending grants

32. NIH R01 “Impact of maternal circadian disruption during pregnancy on newborns” (PI), Submitted on 02/05/2023
33. NCI R21 CA263994-01 “Explore piRNAs as a novel group of biomarkers for ovarian cancer early detection” (PI), 18 percentile from the last review meeting in 2022, resubmitted on 2/13/2023
34. NIEHS R01ES027846-01A1 “Study of Health Impact of Fluctuating-work Time (SHIFT): A Molecular Perspective” (PI), 34 percentile from the last review meeting
35. NCI R01 CA255686-01 “Tumor suppressive role of piwi-interacting RNA in hepatocellular carcinoma” (PI)
36. NCI R01 CA283188 “Investigate the inverse relationship between asthma and cancer” (PI), submitted in 2022
37. NCI R21 CA280580-01 “Genetic determinants for the racial disparities in the risk of prostate and testicular cancers” (PI), submitted in 2022
38. NCI R21 CA223306 “Exploration of piRNA as a novel therapeutics in glioblastoma multiform” (PI), 15 percentile from the last review meeting
39. NCI R03 CA230937-01 “Linking piRNA to breast cancer: genetic association and expression profiling analyses” (PI), Impact Score of 33 from the last review meeting
40. NIEHS R01 HL159977-01 “Multiomics and deep-learning to understand adolescent asthma severity” (Co-PI),
41. Emmerson Foundation “Multiomic analyses of risk factors for colorectal cancer” (Co-I)
42. NCI R41CA261590-01 “Therapeutic use of valeric acid for hepatocellular carcinoma” (PI), Impact Score of 40 from the last review meeting
43. NCI R21 CA170806 “Genes involved in the inverse relationship between cancer and asthma” (PI), 6 percentile from the last review meeting
44. NCI R01 CA136811 “Circadian Disruption, Circadian Genes and Breast Cancer” (PI), 17 percentile from the last review meeting

Bibliography (list from earliest to most recent; H-index=53, i10-index=106, total citations=9968) (https://scholar.google.com/citations?hl=en&user=sGHdE1sAAAAJ&view_op=list_works&sortby=pubdate)

A) Peer-Reviewed Publications

1. Ezenwa VO, Peters JM, Zhu Y, Arevalo E, Hastings M, Seppa P, Pederson J, Zacchi F, Queller DC, Strassmann JE. Ancient conservation of trinucleotide microsatellite loci in Polistine wasps. Molecular Phylogenetics and Evolution 10 (2): 168-177, 1998. PMID: 9878228
2. Strassmann JE, Zhu Y, Queller DC. Altruism and social cheating in the social amoeba Dictyostelium discoideum. Nature 408: 965-967, 2000. PMID: 11140681
3. Zhu Y, Strassmann JE, Queller DC. Insertions, substitutions, and the origin of microsatellites. Genetical Research 76: 227-236, 2000. PMID: 11204970
4. Zhu Y, Landi M, Queller DC, Turillazzi S, Strassmann JE. Polymorphic microsatellite loci for primitively social Stenogastrine wasps. Molecular Ecology 9:2153-2155, 2000. PMID: 11123654
5. Zhu Y, Queller DC, Strassmann JE. A phylogenetic perspective on sequence evolution in microsatellite loci. Journal of Molecular Evolution 50:324-338, 2000. PMID: 10795824
6. Zhu Y, Spitz MR, Lei L, Gordon BM, Wu X. A single nucleotide polymorphism in the matrix metalloproteinase-1 (MMP-1) promoter enhances lung cancer susceptibility. Cancer Research 61: 7825-7829, 2001. PMID: 11691799
7. Wu X, Lippman SM, Lee JJ, Zhu Y, Wei QV, Thomas M, Hong WK, Spitz MR. Chromosome instability in lymphocytes: a potential indicator of predisposition to oral premalignant lesions. Cancer Research 62: 2813-2818, 2002. PMID: 12019158
8. Zhu Y, Spitz MR, Zheng YL, Hong WK, Wu X. BPDE-induced lymphocytic 3p21.3 aberrations may predict head and neck cancer risk. Cancer 95: 563-568, 2002. PMID: 12209748
9. Zhu Y, Spitz MR, Hsu TC, Wu X. Genetic instability of specific chromosomes associated with a family history of cancer. Cancer Genetics and Cytogenetics 136: 73-77, 2002. PMID: 12165456
10. Zhu Y, Spitz MR, Strom S, Tomlinson GE, Minna JD, Wu X. A case-control analysis of lymphocytic chromosome 9 aberrations in lung cancer. International Journal of Cancer 102(5):536-40, 2002. PMID: 12432559
11. Hazra A, Chamberlian RM, Grossman HB, Zhu Y, Spitz MR, Wu X. Death receptor 4 and bladder cancer risk. Cancer Research 63(6):1157-9, 2003. PMID: 12649168
12. Wang Y, Spitz MR, Zhu Y, Dong Q, Shete S, Wu X. From genotype to phenotype: correlating XRCC1 polymorphisms with mutagen sensitivity. DNA Repair 2(8):901-8, 2003. PMID: 12893086
13. Wu X, Amos CI, Zhu Y, Zhao H, Grossman BH, Shay JW, Swan GE, Benowitz NL, Luo S, Spitz MR. Telomere dysfunction: a potential cancer predisposition factor. Journal of National Cancer Institute 95(16):1211-8, 2003. PMID: 12928346
14. Arévalo E, Zhu Y, Carpenter JM, and Strassmann J. The phylogeny of the social wasp subfamily Polistinae: evidence from microsatellite flanking sequences, mitochondrial COI sequence, and morphological characters. BMC Evolutionary Biology 4:8, 2004. PMID: 15070433
15. Zhu Y, Spitz MR, Amos CI, Lin J, Schabath MB, Wu X. An evolutionary perspective on SNP screening in molecular cancer epidemiology. Cancer Research 64: 2251-2257, 2004. PMID: 15026370
16. Zhu Y, Spitz MR, Zhang H, Grossman BH, Frazier ML, Wu X . Methyl-CpG-binding domain 2: a protective role in bladder cancer. Cancer 100(9):1853-8, 2004. PMID: 15112265
17. Zheng Y, Zhang Y. Morton L, Zhu Y. Re: No increased risk of non-Hodgkin's lymphoma with steroids, estrogens and psychotropics (Netherlands). Cancer Causes & Control 15(4): 433-434, 2004. PMID: 15248307
18. Hazra A, Grossman HB, Zhu Y, Luo S, Spitz MR, Wu X. Benzo[a]pyrene diol epoxide- induced 9p21 aberrations associated with genetic predisposition to bladder cancer. Genes Chromosomes Cancer 41(4):330-338, 2004. PMID: 15390186
19. Zhang Y, Wise JP, Holford TR, Xie H, Boyle P, Zahm SH, Rusiecki J, Zou K, Zhang B, Zhu Y, Owens PH, Zheng T. Serum Polychlorinated Biphenyls, Cytochrome P4501A1 Polymorphisms, and Risk of Breast Cancer in Connecticut Women. American Journal of Epidemiology 160(12):1177-83, 2004. PMID: 15583370

20. Zhu Y, Brown H, Zhang Y, Stenvens, RG, Zheng T. Period3 Structural Variation: A Circadian Biomarker Associated with Breast Cancer in Young Women. Cancer Epidemiology, Biomarkers & Prevention 14(1):268-70, 2005. PMID: 15668506
21. Zhang Y, Cantor KP, Lynch CF, Zhu Y, Zheng T. Occupation and risk of pancreatic cancer: A Population-based Case-Control Study in Iowa. The Journal of Occupational and Environmental Medicine 47(4):392-8, 2005. PMID: 15824631
22. Gu J, Zhao H, Dinney CP, Zhu Y, Leibovici D, Bermejo CE, Grossman HB, Wu X.. Nucleotide Excision Repair (NER) Gene Polymorphisms and Recurrence After treatment for Superficial Bladder Cancer. Clin Cancer Res.11(4):1408-15, 2005. PMID: 15746040
23. Zhu Y, Brown HN, Zhang Y, Holford TR, Zheng T. Genotypes and Haplotypes of the Methyl-CpG-Binding Domain 2 Modify Breast Cancer Risk Dependent upon Menopausal Status. Breast Cancer Research 7:R745-R752, 2005. PMCID: PMC1242141
24. Zhang Y, Lan Q, Rothman N. Zhu Y, Zahm SH, Wang SS, Holford TR, Leaderer BP, Boyle P, Zhang B, Zou K, Chanock S, Zheng T. An Exonic Splicing Polymorphism in the BCL6 Gene and Risk of Non-Hodgkin Lymphoma. Journal of National Cancer Institute 2;97(21):1616-8, 2005. PMID: 16264183
25. Zhang Y, Cantor K, Dosemeci M, Lynch CF, Zhu Y, Zheng T. Occupational and Leisure- Time Physical Activity and Risk of Colon Cancer by Subsite. The Journal of Occupational and Environmental Medicine Mar;48(3):236-43, 2006. PMID: 16531827
26. Zhu Y, Zheng T, Zhang Y, Stevens R, Boyle P. Does “clock” matter in prostate cancer? Cancer Epidemiology, Biomarkers & Prevention 15(1):3-5, 2006. PMCID: PMC2366206
27. Lan Q, Zheng T, Rothman N, Zhang Y, Wang S, Shen M, Berndt S, Zahm SH, Holford TR, Leaderer BP, Yeager M, Welch R, Boyle P, Zhang B, Zou K, Zhu Y, Chanock S. Cytokine Polymorphisms in the Th1/Th2 Pathway and Susceptibility to non-Hodgkin Lymphoma. Blood 107(10):4101-8, 2006. PMCID: PMC1895277
28. Shen M, Zheng T, Lan Q, Zhang Y, Zahm SH, Wang S, Berndt S, Holford TR, Leaderer BP, Yeager M, Welch R, Kang D, Boyle P, Zhang B, Zou K, Zhu Y, Chanock S, Rothman N. Polymorphisms in DNA repair genes and risk of non-Hodgkin lymphoma among women in Connecticut. Human Genetics 119(6):659-68, 2006. PMID: 16738949
29. Pettigrew MM, Gent JF, Zhu Y, Triche EW, Belanger KD, Holford TR, Bracken MB, and Leaderer BP. Association of surfactant protein A polymorphisms with otitis media in infants at risk for asthma. BMC Medical Genetics 7:68, 2006. PMID: 16884531
30. Lin J, Dinney CP, Grossman HB, Jhamb M, Zhu Y, Spitz MR, Wu X. E-cadherin promoter polymorphism (C-160A) and risk of recurrence in patients with superficial bladder cancer. Clin Genet. Sep;70(3):240-5, 2006. PMID: 16922727
31. Zhang Y, Zhu Y, Risch H. Changing incidence of thyroid cancer. Journal of American Medical Association Sep 20;296(11):1350, 2006. PMID: 16985224
32. Zhu Y, Leaderer D, Guss C, Brown H, Zhang Y, Boyle P, Stevens R, Qin Q, Han X, Zheng T. Ala394Thr Polymorphism in the Clock Gene NPAS2: A Circadian Modifier for the Risk of Non-Hodgkin's Lymphoma. International Journal of Cancer Jan 15;120(2):432-5, 2007. PMID: 17096334
33. Zhang Y, Wang Y, Holford TR, Leaderer BP, Zahm SH, Boyle P, Zhu Y, Qin Q, Zheng T. Family History of Hematopoietic and Non-Hematopoietic Malignancies and Risk of Non- Hodgkin Lymphoma. Cancer Causes and Control 18(4):351-9, 2007. PMID: 17206533
34. Xing J, Zhu Y, Zhao H, Yang H, Chen M, Spitz MR, Wu X. Differential induction in telomerase activity among bladder cancer patients and controls upon radiation. Cancer Epidemiology, Biomarkers & Prevention 16(3):606-9, 2007. PMID: 17372259
35. Pettigrew MM, Gent JF, Zhu Y, Triche EW, Belanger KD, Holford TR, Bracken MB, and Leaderer BP. Respiratory symptoms among infants at risk for asthma: association with surfactant protein A haplotypes. BMC Medical Genetics Apr 2;8:15, 2007 PMID: 17407567
36. Zhu Y, Stevens RG, Leaderer D, Hoffman A, Holford TR, Zhang Y, Brown HN and Zheng T. Non-synonymous polymorphisms in the circadian gene NPAS2 and breast cancer risk. Breast Cancer Research and Treatment 2008 Feb;107(3):421-5. PMCID:PMC2366999

37. Zhang Y, Holford TR, Leaderer BP, Zahm SH, Boyle P, Zhu Y, Wang R, Zou K, Zhang B, Flynn S, Han J, Zheng T. Ultraviolet Radiation Exposure and Risk of Non-Hodgkin Lymphoma. American Journal of Epidemiology 165(11):1255-64, 2007 PMID: 17327216
38. Zhu Y and Zheng T. Clock-cancer connection in Non-Hodgkin Lymphoma. Medical Hypothesis 70(4):788-92, 2008, PMID: 17935900
39. Chu LW, Zhu Y, Zheng T, Yu H, Zhang Y, Sesterhenn I, Danforth KN, Yu K, Shen MC, Stanczyk F, Gao YT, and Hsing AW. Variants in circadian rhythm genes and risk for prostate cancer: a population-based study in China. Prostate Cancer Prostatic Dis. 11(4):342-8; 2008 PMID: 17984998
40. Yang H, Dinney CP, Ye Y, Zhu Y, Grossman HB, Wu X. Evaluation of genetic variants in microRNA-related genes and risk of bladder cancer. Cancer Res. Apr 1;68(7):2530-7 2008 PMID: 18381463
41. Koutros S, Zhang Y, Zhu Y, Zahm SH, Holford TR, Boyle P, Zheng T. One-carbon Nutrient Intakes Are Associated with the Risk of Non-Hodgkin Lymphoma. American Journal of Epidemiology 2008 Feb 1;167(3):287-94, PMID: 17989056
42. Zhu Y, Hoffman A, Wu X, Zhang H, Zhang Y, Leaderer D, and Zheng T. Correlating observed odds ratios from lung cancer case-control studies to SNP functional scores predicted by bioinformatic tools. Mutation Research March 1; 2008 PMID: 18191955.
43. Hosgood HD 3rd, Baris D, Zhang Y, Zhu Y, Zheng T, Yeager M, Welch R, Zahm S, Chanock S, Rothman N, Lan Q. Caspase polymorphisms and genetic susceptibility to multiple myeloma. Hematol Oncol.. 2008 Apr 1. [Epub ahead of print], PMID: 18381704
44. Hoffman A, Zheng T, Ba Y, Zhu Y. The circadian gene NPAS2, a putative tumor suppressor, is involved in DNA damage response. Molecular Cancer Research Sep;6(9):1461-8. 2008, PMID: 18819933
45. Han X, Kilfoy B, Zheng T, Holford TR, Zhu Y, Zhang Y. Lymphoma survival patterns by WHO subtype in the United States, 1973-2003. Cancer Cause and Control Oct;19(8):841- 58, 2008, PMID: 18365759
46. Chu LW, Zhu Y, Yu H, Yu K, Zheng T, Stanczyk F, Chokkalingam AP, Gao YT, and Hsing AW. Correlation between Circadian Gene Variants and Serum Levels of Sex Steroids and Insulin-like Growth Factor I. Cancer Epidemiology, Biomarkers & Prevention. Nov;17(11):3268-73, 2008, PMID: 18990770
47. Chin L, Ratner E, Leng S, Zhai R, Nallur S, Babar I, Muller R, Straka E, Su L, Burki EA, Crowell RE, Patel R, Kulkarni T, Homer R, Zelterman D, Kidd K, Zhu Y, Christiani DC, Belinsky SA, Slack F and Joanne B. Weidhaas (2008). A SNP in a let-7 microRNA complementary site in the KRAS 3□UTR Increases Non-Small Cell Lung Cancer Risk. Cancer Research Oct 15;68(20):8535-40, 2008, PMID: 18922928
48. Zhang Y, Guo GL, Han X, Zhu C, Kilfoy BA, Zhu Y, Boyle P, Zheng T. Do Polybrominated Diphenyl Ethers (PBDEs) Increase the Risk of Thyroid Cancer? Biosci Hypotheses 1(4):195-199, 2008 PMID: 19122824, PMCID: PMC2612591
49. Hosgood HD 3rd, Menashe I, Shen Min, Yeager M, Yuenger J, Rajaraman P, He X, Chatterjee N, Caporaso, Zhu Y, Chanock S, Zheng T, Lan Q. Pathway-based evaluation of 380 candidate genes and lung cancer susceptibility suggests the importance of the cell cycle pathway. Carcinogenesis Oct;29(10):1938-43, 2008, PMID: 18676680, PMCID: PMC2722857
50. Wang R, Zhang Y, Lan Q, Holford TR, Leaderer B, , Zahm SH, Boyle P, Dosemeci M, Rothman N, Zhu Y, Qin Q, Zheng T. Occupational Exposure to Solvents and Risks of Non-Hodgkin's Lymphoma in Connecticut Women. American Journal of Epidemiology Jan 15;169(2):176-85, 2009, PMID: 19056833, PMCID: PMC2727253
51. Hoffman A, Zheng T, Stevens RG, Ba Y, Zhang Y, Leaderer D, Yi CH, Holford TR, Zhu Y. Clock-cancer connection in Non-Hodgkin's Lymphoma: a genetic association study and pathway analysis of the circadian gene Cryptochrome 2. Cancer Research Apr 15;69(8):3605-13, 2009, PMID: 19318546; PMCID: PMC3175639
52. Yi CH, Zheng T, Leaderer D, Hoffman A, Zhu Y. Cancer-related transcriptional targets of the circadian gene NPAS2 identified by genome-wide ChIP-on-chip analysis. Cancer Letter May 18,

2009, PMID: 19457610
53. Hoffman A, Zheng T, Yi CH, Leaderer D, Weidhaas J, Slack F, Zhang Y, Paranjape T, Zhu Y. microRNA miR-196a-2 and Breast Cancer: A Genetic and Epigenetic Association Study and Functional Analysis. Cancer Research July 15;69 (14), 2009, PMCID: PMC2716085
54. Yi CH, Mu L, de la Longrais R, Sochirca O, Arisio R, Yu H, Zhu Y, Katsaro D. Circadian gene NPAS2 is a novel prognostic biomarker for breast cancer. Breast Cancer Research and Treatment Aug 1. 2009 [Epub ahead of print], PMID: 19649706
55. Zhu C, Zheng T, Kilfoy B, Han X, Ma S, Ba Y, Bai Y, Wang R, Zhu Y, Zhang Y. A Birth Cohort Analysis of the Incidence of Papillary Thyroid Cancer in the United States, 1973- 2004. Thyroid Oct;19(10):1061-6, 2009, PMID: 19732011, PMCID: PMC2833179
56. Zhang Y, Hughes KJ, Zahm SH, Zhang Y, Holford TR, Dai L, Bai Y, Han X, Qin Q, Lan Q, Rothman N, Leaderer B, Zhu Y, Zheng T. Genetic Variations in Xenobiotic Metabolic Pathway Genes Modify the Relationship Between Personal Hair Dye Use and Risk of Non- Hodgkin Lymphoma. American Journal of Epidemiology Nov 15;170(10):1222-30, 2009, PMID: 19822571
57. Zhu Y, Stevens RG, Hoffman A, FitzGerald LM, Kwon EM, Ostrander EA, Davis S, Zheng T, Stanford JL. Testing the circadian gene hypothesis in prostate cancer: a population- based case-control study. Cancer Research Dec 15;69(24):9315-22, 2009, PMID: 19934327
58. Hoffman A, Yi CH, Zheng T, Stevens RG, Leaderer D, Zhang Y, Holford TR, Hansen J, Paulson J, Zhu Y. CLOCK in breast tumorigenesis: genetic, epigenetic, and transcriptional profiling analyses. Cancer Research 70(4) February 15, 2010. PMCID: PMC3188957
This paper was selected as one of the 10 featured Research Highlights in 2010 by the NCI Epidemiology and Genetics Research Program (EGRP).
59. Hoffman A, Zheng T, Yi CH, Stevens RG, Ba Y, Zhang Y, Leaderer D, Holford TR, Hansen J, Zhu Y. The core circadian gene cryptochrome 2 influences breast cancer risk, possibly by mediating hormone signaling. Cancer Prevention Research 3(4) April 2010, PMID: 20233903
60. Hoffman A, Zheng T, Ba Y, Stevens RG, Yi CH, Leaderer D, Zhu Y. Phenotypic effects of the circadian gene Cryptochrome 2 on cancer-related pathways. BMC Cancer Mar 24;10:110, 2010, PMID: 20334671
61. Leaderer D, Hoffman A, Zheng T, Fu A, Weidhaas J, Paranjape T, Paulson J, Zhu Y. Genetic and epigenetic association studies suggest a role of microRNA biogenesis gene exportin-5 (XPO5) in breast tumorigenesis. Int J Mol Epidemiol Genet 2011;2(1):9-18. PMCID: PMC3077234
62. Kim SJ, Kelly WK, Fu A, Haines K, Hoffman A, Zheng T, Zhu Y. Genome-wide methylation analysis identifies involvement of TNF-α mediated cancer pathways in prostate cancer. Cancer Letter 2011: Jan 13. [Epub ahead of print], PMID: 21237555
63. Sharkey KM, Carskadon MA, Figueiro MG, Zhu Y, Rea MS. Effects of an Advanced Sleep Schedule and Morning Short Wavelength Light Exposure on Circadian Phase in Young Adults with Delayed Sleep Schedule Misalignment. Sleep Medicine 2011 Aug;12(7):685-92. PMCID: PMC3145013
64. Zhou F, He X, Liu H, Zhu Y, Jin T, Chen C, Qu F, Li Y, Bao G, Chen Z, Xing J. Functional polymorphisms of circadian positive feedback regulation genes and clinical outcome of Chinese patients with resected colorectal cancer. Cancer 2011 Jul 19. PMID: 21773969
65. Zhu Y, Stevens RG, Hoffman AE, Tjonneland A, Vogel UB, Zheng T, Hansen J. Epigenetic impact of long-term shiftwork: pilot evidence from circadian genes and whole- genome methylation analysis. Chronobiol Int. 2011 Dec;28(10):852-61. doi: 10.3109/07420528.2011.618896. PubMed PMID: 22080730, PMCID: PMC3631105
66. Paranjape T, Heneghan H, Lindner R, Keane FK, Hoffman A, Hollestelle A, Dorairaj J, Geyda K, Pelletier C, Nallur S, Martens JW, Hooning MJ, Kerin M, Zelterman D, Zhu Y, Tuck D, Harris L, Miller N, Slack F, Weidhaas J. A. 3'-untranslated region KRAS variant and triple-negative breast cancer: a case-control and genetic analysis. Lancet Oncol. 2011 Apr;12(4):377-86. PubMed PMID: 21435948; PubMed Central PMCID: PMC3488438.
67. Lu L, Katsaros D, Zhu Y, Hoffman A, Luca S, Marion CE, Mu L, Risch H, Yu H. Let-7a regulation of insulin-like growth factors in breast cancer. Breast Cancer Res Treat. 2011 Apr;126(3):687-94.

doi: 10.1007/s10549-010-1168-5. Epub 2010 Sep 17. PubMed PMID: 20848182.
68. Fu A, Leaderer B, Gent J, Leaderer D, Zhu Y. An environmental epigenetic study of ADRB2 5'-UTR methylation and childhood asthma severity. Clinical and Experimental Allergy. 2012 Jun 18. PMCID: PMC3673701
69. Fu A, Leaderer D, Zheng T, Hoffman AE, Stevens RG, Zhu Y. Genetic and epigenetic associations of circadian gene TIMELESS and breast cancer risk. Mol Carcinog. 2012 Dec;51(12):923-9. doi: 10.1002/mc.20862. Epub 2011 Oct 17. PMID: 22006848.
70. Liu R, Fu A, Hoffman AE, Zheng T, Zhu Y. Melatonin enhances DNA repair capacity possibly by affecting genes involved in DNA damage responsive pathways. BMC Cell Biol. 2013 Jan 7;14:1. doi: 10.1186/1471-2121-14-1. PubMed PMID: 23294620; PMCID: PMC3543845.
71. Zhao B, Lu J, Yin J, Liu H, Guo X, Yang Y, Ge N, Zhu Y, Zhang H, Xing J. A functional polymorphism in PER3 gene is associated with prognosis in hepatocellular carcinoma. Liver Int. 2012 Oct;32(9):1451-9. PMID: 22809120
72. Zhou F, He X, Liu H, Zhu Y, Jin T, Chen C, Qu F, Li Y, Bao G, Chen Z, Xing J. Functional polymorphisms of circadian positive feedback regulation genes and clinical outcome of Chinese patients with resected colorectal cancer. Cancer. 2012 Feb 15;118(4):937-46. doi: 10.1002/cncr.26348. Epub 2011 Jul 19. PMID: 21773969
73. Bassig BA, Zheng T, Zhang Y, Berndt SI, Holford TR, Hosgood HD 3rd, Hu W, Leaderer B, Yeager M, Menashe I, Boyle P, Xu J, Zou K, Zhu Y, Chanock S, Rothman N, Lan Q. Polymorphisms in complement system genes and risk of non-Hodgkin lymphoma. Environ Mol Mutagen. 2012 Mar;53(2):145-51. doi: 10.1002/em.21675. Epub 2011 Dec 15. PubMed PMID: 22170086; PMCID: PMC3391498.
74. Hu W, Bassig BA, Xu J, Zheng T, Zhang Y, Berndt SI, Holford TR, Hosgood HD rd, Leaderer B, Yeager M, Menashe I, Boyle P, Zou K, Zhu Y, Chanock S, Lan Q, Rothman N Polymorphisms in pattern-recognition genes in the innate immunity system and risk, of non-Hodgkin lymphoma. Environ Mol Mutagen. 2013 Jan;54(1):72-7. doi: 10.1002/em.21739. Epub 2012 Oct11, PMCID: PMC6800161
75. Zhu Y, Hoffman A, Alan F, Figueiro M, Carskadon MA, Sharkey KM, Rea M. Advanced sleep schedules affect circadian gene expression in young adults with delayed sleep schedules. Sleep Medicine 2013 May;14(5):449-55. Epub 2013 Apr 3, PMID: 23562184; PMCID: PMC3640645
76. Hoffman A, Demanelis K, Fu A, Zheng T, Zhu Y. Association of AMP-activated Protein Kinase with Risk and Progression of Non-Hodgkin Lymphoma. Cancer Epidemiol Biomarkers Prev. 2013 Apr;22(4):736-44. Epub 2013 Feb 8. PubMed PMID: 23396962; PMCID: PMC3631103.
77. Hoffman AE, Liu R, Fu A, Zheng T, Slack F, Zhu Y. Targetome profiling, pathway analysis and genetic association study implicate miR-202 in lymphomagenesis. Cancer Epidemiol Biomarkers Prev. 2013 Mar;22(3):327-36. Epub 2013 Jan 18. PMID: 23334589.
78. Jacobs, D.I., Hansen, J., Fu, A., Stevens, R.G., Tjonneland, A., Vogel, U.B., Zheng, T. and Zhu, Y. Methylation alterations at imprinted genes detected among long-term shiftworkers. Environ Mol Mutagen, 54, 141-6. 2013. PMCID: PMC4993623
79. Jacobs, D.I., Mao, Y., Fu, A., Kelly, W.K. and Zhu, Y. Dysregulated methylation at imprinted genes in prostate tumor tissue detected by methylation microarray. BMC Urol, 13, 37. 2013. PMCID: PMC3751920
80. Mao, Y., Fu, A., Leaderer, D., Zheng, T., Chen, K. and Zhu, Y. Potential cancer-related role of circadian gene TIMELESS suggested by expression profiling and in vitro analyses. BMC Cancer, 13, 498, 2013. PMCID: PMC3924353
81. Shi, F., Chen, X., Fu, A., Hansen, J., Stevens, R., Tjonneland, A., Vogel, U.B., Zheng, T. and Zhu, Y. Aberrant DNA methylation of miR-219 promoter in long-term night shiftworkers. Environ Mol Mutagen, 2013 54, 406-13, 2013. PMID: 23813567
82. Fu, A., Hoffman, A.E., Liu, R., Jacobs, D.I., Zheng, T., Zhu, Y. Targetome profiling and functional genetics implicate miR-618 in lymphomagenesis. Epigenetics. 2014 May 1;9(5):730-7. PMCID: PMC4063832
83. Li Q, Lan Q, Zhang Y, Bassig BA, Holford TR, Leaderer B, Boyle P, Zhu Y, Qin Q, Chanock S, Rothman N, Zheng T. Role of one-carbon metabolizing pathway genes and gene-nutrient

interaction in the risk of non-Hodgkin lymphoma. Cancer Causes Control. 2013 Oct;24(10):1875-84. doi: 10.1007/s10552-013-0264-3. Epub 2013 Aug 3. PMID: 23913011
84. Yuan P, Wang S, Zhou F, Wan S, Yang Y, Huang X, Zhang Z, Zhu Y, Zhang H, Xing J. Functional polymorphisms in NPAS2 gene are associated with overall survival in TACE- treated hepatocellular carcinoma patients. Cancer Sci. 2014 Apr 23. PMID: 24754267
85. Guo H, Bassig BA, Lan Q, Zhu Y, Zhang Y, Holford TR, Leaderer B, Boyle P, Qin Q, Zhu C, Li N, Rothman N, Zheng T. Polymorphisms in DNA repair genes, hair dye use, and the risk of non-Hodgkin lymphoma. Cancer Causes Control. 2014 Oct;25(10):1261-70. doi: 10.1007/s10552-014-0423-1. Epub 2014 Sep 2. PubMed PMID:25178586.
86. Guo H, Jin Y, Cheng Y, Leaderer B, Lin S, Holford TR, Qiu J, Zhang Y, Shi K, Zhu Y, Niu J, Bassig BA, Xu S, Zhang B, Li Y, Hu X, Chen Q, Zheng T. Prenatal exposure to organochlorine pesticides and infant birth weight in China. Chemosphere. 2014 Sep;110:1-7. doi: 10.1016/j.chemosphere.2014.02.017. Epub 2014 Apr 5. PubMed PMID: 24880592; PubMed Central PMCID: PMC4097106.
87. Fu A, Jacobs DI, Zhu Y. Epigenome-wide analysis of piRNAs in gene-specific DNA methylation. RNA Biol. 2014;11(10):1301-12. doi: 10.1080/15476286.2014.996091. PubMed PMID: 25590657; PMCID: PMC4615395
88. Zhang Z, Ma F, Zhou F, Chen Y, Wang X, Zhang H, Zhu Y, Bi J, Zhang Y. Functional polymorphisms of circadian negative feedback regulation genes are, associated with clinical outcome in hepatocellular carcinoma patients receiving, radical resection. Med Oncol. 2014 Dec;31(12):179. doi: 10.1007/s12032-014-0179-1. Epub 2014 Oct 26. PubMed ID: 25344870
89. Liu R, Jacobs DI, Hansen J, Fu A, Stevens RG, Zhu Y. Aberrant methylation of miR-34b is associated with long-term shiftwork: a potential mechanism for increased breast cancer susceptibility. Cancer Causes Control. 2015 26(2):171-8. PMID: 25398683
90. Li N, Hauser R, Holford T, Zhu Y, Zhang Y, Bassig BA, Honig S, Chen C, Boyle P, Dai M, Schwartz SM, Morey P, Sayward H, Hu Z, Shen H, Gomery P, Zheng T. Muscle-building supplement use and increased risk of testicular germ cell cancer in men from Connecticut and Massachusetts. Br J Cancer. 2015 Mar 31;112. PMCID: PMC4385953
91. Mao Y, Fu A, Hoffman AE, Jacobs DI, Jin M, Chen K, Zhu Y. The circadian gene CRY2 is associated with breast cancer aggressiveness possibly via epigenomic modifications. Tumour Biol. 2015 Mar 5. PMID: 25740058
92. Stevens RG, and Zhu Y. Electric light, particularly at night, disrupts human circadian rhythmicity: is that a problem? Philos Trans R Soc Lond B Biol Sci. 2015 May 5;370(1667). Review. PubMed PMID: 25780233.
93. Stevens RG, and Zhu Y. Re: Bracci M et al. "Rotating-shift nurses after a day off: peripheral clock gene, expression, urinary melatonin, and serum 17-estradiol levels.". Scand J Work Environ Health. 2015 Jan;41(1):105-6. PubMed ID:25153335
94. Hu X, Zheng T, Cheng Y, Holford T, Lin S, Leaderer B, Qiu J, Bassig BA, Shi K, Zhang Y, Niu J, Zhu Y, Li Y, Guo H, Chen Q, Zhang J, Xu S, Jin Y. Distributions of heavy metals in maternal and cord blood and the association with, infant birth weight in China. J Reprod Med. 2015 Jan-Feb;60(1-2):21-9. PubMed ID: 25745747
95. Fu, A., Jacobs, D.I., Hoffman EA, Zheng T, Zhu, Y. PIWI-interacting RNA 021285 is involved in breast tumorigenesis possibly by remodeling the cancer epigenome. Carcinogenesis. 2015 Oct;36(10):1094-102. PMCID: PMC5006152
96. Jacobs DI, Qin Q, Lerro MC, Fu AN, Dubrow R, Claus EB, DeWan AT, Wang G, Lin H, Zhu Y. PIWI-interacting RNAs in Gliomagenesis: Evidence from Post-GWAS and Functional Analyses. Cancer Epidemiol Biomarkers Prev. 2016 Jul;25(7):1073-80. EPI-16- 0047. PMID: 27197292
97. Pietrzak RH, Zhu Y, Slade MD, Qi Q, Krystal JH, Southwick SM, Levy BR. Association Between Negative Age Stereotypes and Accelerated Cellular Aging: Evidence from Two Cohorts of Older Adults. J Am Geriatr Soc. 2016 Nov;64(11):e228-e230. PMCID: PMC5118148
98. Pang J, Zhang Z, Zheng TZ, Bassig BA, Mao C, Liu X, Zhu Y, Shi K, Ge J, Yang YJ, Dejia-Huang, Bai M, Peng Y. Green tea consumption and risk of cardiovascular and ischemic related diseases: A meta-analysis. Int J Cardiol. 2016 Jan 1;202:967-74. PMID: 26318390

99. Huang H, Zhu Y, Eliot MN, Knopik VS, McGeary JE, Carskadon MA, Hart AC. Combining Human Epigenetics and Sleep Studies in C. elegans: A Cross-species Approach for Finding Conserved Genes Regulating, Sleep 2017 Jun 1;40(6). PMCID: PMC6075530
100. Chu L, Till C, Yang B, Tangen CM, Goodman PJ, Yu K, Zhu Y, Han S. Hoque AM, Ambrosone C, Thompson I, Leach R, Hsing AW. Circadian Genes and Risk of Prostate Cancer in the Prostate Cancer Prevention Trial. Molecular Carcinogenesis 2018 Mar;57(3):462-466. PMCID: PMC5940353
101. Qiu W, Guo X, Lin X, Yang Q, Zhang W, Zhang Y, Zuo L, Zhu Y, Li CR, Ma C, Luo X. Transcriptome-wide piRNA profiling in human brains of Alzheimer's disease. Neurobiol Aging 2017 Sep;57:170-177. PMCID: PMC5542056
102. Jacobs DI, Qin Q, Fu AN, Chen Z, Zhou J, Zhu Y. piRNA-8041 is downregulated in human glioblastoma and suppresses tumor growth in vitro and in vivo. Oncotarget. 2018; 9:37616-37626. PMCID: PMC6340885
103. Wang LY, Solá DA, Mao YX, Bielecki P, Shan L, Zhu Y, Sun ZK, Flavell R, Bazzy-Asaad A, DeWan A. Family-based study reveals decreased abundance of sputum Granulicatella in asthmatics. Allergy 2018 Sep;73(9):1918-1921. PMCID: PMC6586473
104. Gao ZK, Liu H, Shi YJ, Yin LH, Zhu Y, Liu R. Identification of cancer stem cell molecular markers and effects of hsa-miR-21-3p on stemness in Esophageal Squamous Cell Carcinoma. Cancers 2019, 11(4), 518. PMCID: PMC6521292
105. Chen Y, Chen X, Gao J, Xu C, Xu P, Li Y, Zhu Y, Yu C. Long noncoding RNA FLRL2 alleviated nonalcoholic fatty liver disease through Arntl-Sirt1 pathway. FASEB J. 2019 Jul 16 [Epub ahead of print]. PMID: 31311301
106. Ward EM, Germolec D, Kogevinas M, McCormick D, Vermeulen R, Anisimov VN, Aronson KJ, Bhatti P, Cocco P, Costa G, Dorman DC, Fu L, Garde AH, Guénel P, Hansen J, Härmä MI, Kawai K, Khizkhin EA, Knutsson A, Lévi F, Moreno CR, Pukkala E, Schernhammer E, Travis R, Waters M, Yakubovskaya M, Zeeb H, Zhu Y, Zienolddiny S, Grosse Y, Hall AL, Benbrahim-Tallaa L, Girschik J, Bouvard V, El Ghissassi F, Turner MC, Diver WR, Herceg Z, Olson N, Rowan EG, Rumgay H, Guyton KZ, Schubauer-Berigan MK. Carcinogenicity of night shift work. Lancet Oncology. 2019 Aug;20(8):1058-1059. doi: 10.1016/S1470-2045(19)30455-3. Epub 2019 Jul 4. PMID: 31281097
107. Chen Y, Jiang T, Zhang H, Gou X, Han C, Wang J, Ma J, Liu J, Chen Z, Baqri M, Jing X, Wang Z, Fan L, Zhu Y, Bindra R, Hansen J, Dou J, Huang C, Zhou J. LRRC31 inhibits DNA repair and sensitizes breast cancer brain metastasis to radiation therapy. Nature Cell Biology 2020 Oct;22(10):1276-1285
108. Han R, Nusbaum O, Chen XY, and Zhu Y. Valeric acid suppresses liver cancer development by acting as a novel HDAC inhibitor. Molecular Therapy Oncolytics, 2020 Aug 29;19:8-18, PMID: 33024815 PMCID: PMC7520432
109. Shi FQ, Li Y, Han R, Fu A, Wang RH, Nusbaum O, Qin Q, Chen X, Hou L, and Zhu Y. Valerian and valeric acid inhibit growth of breast cancer cells possibly by mediating epigenetic modifications. Scientific Report 2021 Jan 28;11(1):2519.
110. Cheng ZY, Zhang XC, Bassig BA, Hauser R, Holford T, Zheng E, Shi D, Zhu Y, Schwartz SM, Chen C, Shi KC, Qian ZM, Boyle P, and Zheng T. Serum polychlorinated biphenyl (PCB) levels and risk of testicular germ cell carcinoma: results from a population-based case-control study in Connecticut and Massachusetts. Environ. Pollut. 2021 Jan 11;273:116458.
111. Cheng ZY, Zhang XC, Bassig BA, Hauser R, Holford T, Zheng E, Shi D, Zhu Y, Schwartz SM, Chen C, Shi KC, Qian ZM, Boyle P, and Zheng T. Dataset of testicular germ cell tumors (TGCT) risk associated with serum polychlorinated biphenyl (PCB) by age at diagnosis and histologic types. Data in Brief. 2021 March 27, 107014.
112. Maimaitiyiming Y, Chen H, Zhu H, Wang QQ, Ogra Y, Yang C, Lou HY, Smith C, HussainL. Li X, Zhu Y, Chang KJ, Lin JB, Liu JF, Wang LF, Li HY, Huang Y, Tse E, Sun J, Jin J, Bu N, Chiou SH, Zhang YF, Hua HY, Ma LY, Huang P, Ge MH, Cao FL, Cheng XD, Sun HZ, Vasliou V, Xu PF, Bjorklund M, Zhou J, Hsu CH, Naranmandura H. Hyperthermia Destabilizes PML/RARα Oncofusion in Acute Promyelocytic Leukemia. Blood Cancer Discovery 2021 Jul;2(4):388-401

113. Meng Y, Zhu V, Zhu Y. Co-distribution of light at night (LAN) and COVID-19 incidence in the United States. BMC Public Health 2021 Aug 4;21(1):1509
114. Li S, Wang S, Zhu Y, Wang S, Yuan C, Wu X, Cao S, Xu X, Chen C, Ye Y, Li W, Lei H, Hu K, Xu X, Zhu H. Impact of socioeconomic status, population mobility and control measures on COVID-10 development in major cities of China. Journal of Zhejiang University (Medical Sciences) 2021 Feb 25;50(1):52-60
115. Jun Liu, Xiaoying Wang, Ann T. Chen, Benjamin T. Himes, Xingchun Gao, Hongyi Zhang, Zeming Chen, Jianhui Wang, Gang Deng, Yang Xiao, Pan Zou, Shenqi Zhang, Fuyao Liu, Yong Zhu, Rong Fan, Toral R. Patel, W. Mark Saltzman, Jiangbing Zhou. ZNF117 regulates glioblastoma stem cell differentiation towards oligodendroglial lineage. Nature Communication 2022 Apr 22;13(1):2196, PMCID: PMC9033827
116. Girardi K, Zheng T, Zhu Y. Can muscle building supplements increase testicular cancer risk? Frontiers in Nutrition, 2022 Jan 28;9:778426. PMCID: PMC8834066
117. Uzamere I, Wang YQ, Zheng TZ, and Zhu Y. Genetic Determinants for the Racial/Ethnic Disparities in the Risk of Prostate and Testicular Cancer. Communications Medicine 2022, 2, 138
118. Xianghu Wang, Mingjun Sun, Zhikui Gao, Lihong Yin, Yuepu Pu, Yong Zhu, Xiaobin Wang, Ran Liu. N-Nitrosamines-mediated Downregulation of LncRNA-UCA1 Induces Carcinogenesis of Esophageal Squamous by Regulating the Alternative Splicing of FGFR2. Science of the Total Environment 2023 Jan 10;855:158918, 2022.158918. Epub 2022 Sep 19
119. Shunjia Zhang, Michael Lerro, Olivia Nusbaum, Ya Li, Rui Han, Daniel Jacob, Tianshu Wu, Yong Zhu. Post-GWAS and Functional Analyses of PIWI-Interacting RNAs in Prostate Cancer. Human Genomics (accepted)

Manuscripts under review

120. Han R, Nusbaum O. Zhang S, Qin Q. Li Y. Zhu Y. Tumor suppressing role of piR-37213 in Hepatocellular Carcinoma
121. Ibrahim EY, Fritz A, Fu AN, Ehrlich BE, and Zhu Y. A putative tumor suppressing role of hsa-miR-154 in breast cancer that acts by targeting CLOCK gene.
122. Ya Li, Yingying Mao, Olivia Nusbaum, Alan Fu, Li Hou, Yong Zhu. Role of circadian gene CSNK1E in breast cancer prognosis possibly via its properties in protein phosphorylation.
123. Fengqin Shi; Peng Lv; Li Hou; Yong Zhu; Lingeng Lu; Yayue Zhang; Ya Li; Chong Wang. Diosgenin inhibits the proliferation and migration of breast cancer cells MCF-7 through the demethylation of miR-145 gene.

B) Book Chapters

1. Zheng T, Zhang Y, Zhu Y, Morton L. Hair-Colourant Use and Associated Pathology – Cancer? Hair in Toxicology, Ed D. Tobin, 2006, pp: 229-285.
2. Zhu Y. Essential for Molecular Epidemiology? Epidemiology and Biostatistics, Ed Zheng T, Boffetta P, and Boyle P. International Prevention Research Institute, Lyon, France, 2011, pp: 257-269.
3. Zheng T, Zhu Y, Boyle P, Zhang Y, Niu J. Generating Hypothesis Epidemiology and Biostatistics, Ed Zheng T, Boffetta P, and Boyle P. International Prevention Research Institute, Lyon, France, 2011, pp: 487-495.

C) Patents

1. PCT/US17/147594: Zhu Y. “Compositions and methods of using piRNAs in cancer diagnostics and therapeutics”. (granted in 2020). This international patent was granted for 5 countries (USA, EU, China, Japan, and Australia) and covers about 50 piRNA candidates identified for 5 cancer types (Liver, Brian, Breast, Prostate and Pancreatic cancers)

Teaching Activities

2021-present “Public Health Emergencies: Disaster Planning and Response”, Co-Instructor
2021-present “Environmental Epidemiology”, Co-Instructor

2013-present "Molecular Epidemiology", Instructor
2012-present "Independent project for SPH students", Instructor
2003-2012 "Introduction to Environmental Genetics", Instructor
2011-2013 "Seminar in Environmental Health", Instructor
2014-2015 "Principles of Environmental Health", Lecturer
2004-2010 "Seminar in Environmental Epidemiology", Lecturer
2004-2014 "Environmental Epidemiology", Lecturer
2016 "Assessing Exposures to Environmental Stressors", Lecturer

Invited Speaking Engagements, Presentations, Symposia & Workshops (list from most recent to earliest)

11/2022 "Clock-cancer connection: A molecular epidemiological perspective", School of Public Health, Brown University, Providence, RI
05/2022 "Translational epidemiology of circadian factors and small noncoding RNAs in tumorigenesis", Jonsson Comprehensive Cancer Center, UCLA, Los Angeles, CA
07/2021 "Molecular epidemiology of circadian factors and small noncoding RNAs in tumorigenesis", Division of Epidemiology, Weill Cornell Medicine, New York, NY
12/2020 "Therapeutic use of valeric acid in cancer treatment: a preclinical study", Department of Oncology & Hematology, Beijing University of Chinese Medicine, Beijing, China
11/2020 "Molecular Biology in Cancer Epidemiology", School of Public Health, Brown University, Providence, RI
11/2020 "Molecular Epidemiology of Circadian Factors in Human Cancer", Xiangya School of Medicine, Central South University, China
11/2019 "Light at night, circadian disruption and tumorigenesis -- A molecular epidemiologic perspective", University of Connecticut Health Center, Farmington, CT
10/2019 "Translational cancer epidemiology of circadian genes and small noncoding RNAs", Simmons Comprehensive Cancer Center, UT Southwestern Medical Center, Dallas, TX
07/2019 "A novel piRNA-based drug candidate for cancer treatment", The 17th Annual Congress of International Drug Discovery Science & Technology. Kyoto, Japan
06/2019 "Translational cancer epidemiology of circadian genes and small noncoding RNAs", Lombardi Comprehensive Cancer Center, Georgetown University Medical Center. Georgetown, DC
04/2019 "Investigate anti-tumor efficacy of valerian and valeric acid in breast and liver cancers", 2019 NSFC-NCI Integrative Oncology Workshop. Beijing, China
04/2019 "The role of piwi-interacting RNAs in hepatocellular carcinoma", The 4TH Alcohol and Cancer Conference. Newport, RI
04/2018 "Diosgenin inhibits the proliferation of MCF-7 breast cancer cells through the demethylation of miR-145 gene", The 109th Annual Meeting of the American Association for Cancer Research. Chicago, IL
06/2018 "Molecular Epidemiology: small noncoding RNAs and cancer", School of Public Health, Zhejiang University, Zhejiang Province, Hangzhou, China
05/2018 "A molecular epidemiological perspective of circadian factors in human cancer", Department of Oncology & Hematology, Beijing University of Chinese Medicine, Beijing, China
05/2017 "A molecular epidemiological perspective of circadian factors in human cancer", School of Biological Sciences, Zhejiang University, Zhejiang Province, Hangzhou, China
08/2016 "Clock-cancer connection: environmental epigenetic and molecular epidemiological approaches", School of Biological Sciences, Zhejiang University, Zhejiang Province, Hangzhou, China
07/2016 "Clock-cancer connection: a global perspective", Institute of Environmental Health and Related Product Safety, Chinese CDC, Beijing, China
02/2016 "Essentials in Molecular/Genetic Epidemiology", School of Public Health, Brown University

10/2015 “Clock-cancer connection: a molecular epidemiological approach”, Tongde Hospital of Zhejiang Province, Hangzhou, China

05/2015 “Clock-cancer connection: from epidemiology to pharmacology”, Xiangya Medical School, Central South University, Hunan, China

04/2013 “Targetome profiling, pathway analysis and genetic association analysis implicate miR-618 in follicular and T-cell non-Hodgkin lymphoma”, The 104th Annual Meeting of the American Association for Cancer Research. Washington, DC

05/2012 “Molecular cancer epidemiology of circadian genes and microRNAs”, Department of Oncology & Hematology, Beijing University of Chinese Medicine, Beijing, China

04/2012 “Circadian biomarkers for human cancers”, School of Public Health, Zhengzhou University, Henan, China

11/2011 “Molecular epidemiology and functional analyses of circadian and microRNA biomarkers for human cancers”, Department of Biomedical Informatics, Vanderbilt University Medical Center, Nashville, TN

10/2011 “Circadian Biomarkers for Human Cancers”, 2011 Asia-Pacific Conference of Tumor Biology and Medicine, Shanghai, China

09/2010 “Clock-Cancer Connection: Molecular Epidemiology and Functional Analysis”, 19th Annual Symposium on Molecular Pathology - Clinical Applications of Genomic Medicine, Beaumont Laboratory, Royal Oak, MI

08/2010 “Clock-Cancer Connection: Molecular Epidemiology and Functional Analysis”, Beijing Jiaotong University, Beijing, China

07/2010 “Molecular epidemiology of circadian genes and human breast cancer”, Danish Cancer Society, Copenhagen, Denmark

07/2010 “Circadian and microRNA biomarkers for human cancer”, 4th Military Medical School, Xi’an, China

06/2010 “Role of circadian genes and their measurements in human cancer study”, 18th Annual Meeting of the Society for Prevention Research, Denver, CO

03/2010 “Molecular epidemiology and functional analysis of microRNAs in human cancers”, CHI’s Conference of microRNA in Human Disease and Development, Cambridge, MA

04/2009 “Molecular epidemiology and functional analysis of microRNAs in breast tumorigenesis”, School of Public Health, Nanjing Medical University, Nanjing, China

07/2008 “Molecular epidemiology of circadian genes and human cancer”, School of Public Health, Nanjing Medical University, Nanjing, China

06/2008 “Molecular epidemiology of circadian genes and human cancer”, Department of Cancer Etiology and Carcinogenesis, Peking Union Medical College, Beijing, China

07/2007 “Role of the human circadian gene NPAS2 in tumorigenesis”, Gordon Research Conferences, New London, NH

09/2006 “Molecular Epidemiology of Circadian Genes and Human Cancers”, National Institute of Environmental Health Sciences, Washington, DC

06/2005 “Cancer predisposition: a molecular epidemiological approach”, Eppley Cancer Center, Omaha, NE

07/2004 “Circadian genes and breast cancer risk”, Meeting of Circadian Disruption and Breast Cancer, Chapel Hill, NC

06/2004 “Per3 structural variation: a circadian biomarker for breast cancer”, Department of Epidemiology, M. D. Anderson Cancer Center, The University of Texas, Houston TX

08/2002 “Genetic predisposition to cancer: a molecular epidemiological approach”, Department of Epidemiology, Memorial Sloan-Kettering Cancer Center, New York, NY

06/2002 “Genetic predisposition to cancer: a molecular epidemiological approach”, Human Cancer Genetic Program, Comprehensive Cancer Center, The Ohio State University, Columbus, OH

04/2002 “DNA demethylase: a cancer protective factor?”, The 93rd Annual Meeting of the American Association for Cancer Research. San Francisco, CA

01/2002 "MMP1 polymorphism and lung cancer risk", The Institutional Aerodigestive Tract Cancer Research Group, M. D. Anderson Cancer Center, The University of Texas, Houston, TX

04/2001 "Genetic susceptibility to cancer: using a molecular cytogenetic marker", Division of Cancer Prevention, M. D. Anderson Cancer Center, The University of Texas, Houston, TX

Professional Service:

A) Peer Review Groups/Grant Study Sections (list from most recent to earliest)

02/2023 ZCA1 RPRB-7 (M1) S, NIH Predoc to Postdoc Fellow Transition Award (F99/K00)
11/2020 Florida Department of Health Biomedical Review 20-21
10/2020 ZCA1 RTRB-U (J1) S, NCI, Research Projects in Cancer Systems Biology (U01) 09/2020 Czech Science Foundation
06/2020 ZES1 LAT-D, NIEHS, Outstanding New Environmental Scientist (ONES) Award (R01)
03/2020 ZCA1 SRB-H (M1) S, NCI, The NCI Predoctoral to Postdoctoral Fellow Transition Award (F99/K00)
05/2019 ZES1 LAT-S, NIEHS, Outstanding New Environmental Scientist (ONES) Award (R01)
04/2019 Breast Cancer Now, UK Breast Cancer Research Charity
02/2019 ZCA1SRBPM2, SEP-5: NCI Clinical and Translational R21 and Omnibus R03 02/2019 Pennsylvania Department of Health Review Panel
10/2018 ZCA1RTRBUJ1, SEP-5: NCI Provocative Questions Review Committee (R01/R21)
06/2018 ZES1 JAB-K (R1), NIEHS, Outstanding New Environmental Scientist (ONES) Award (R01)
04/2018 ZCA1 RTRB-R (O1), NCI, Program Project Applications (P01 Clinical Trial Optional)
06/2017 ZCA1 SRB-P NCI Clinical and Translational Exploratory/Developmental Studies (R21)
2015-present Panel Member, USAMRMC/CDMRP, DOD
2015-present Member, Florida Department of Health Review Panel
2012 Specific panel for RFA (R01/R21), NIH/NIDCR
2010-2016 Member, NCI Special Emphasis Panel for Cancer Epidemiology R03
2011-present Reviewer, the Czech Science Foundation, Czech Republic
2010-present Reviewer, National Medical Research Council, Ministry of Health, Singapore
2010-present Reviewer, Research Grants Council, Hong Kong, China
2010-present Reviewer, Division Director of Oncology Division, Department of Health Science, NSFC
2010-2015 Member, Reviewer Panel for Yale Cancer Center Pilot Grant
2010-present Chair, Review Committee for YSPH-Ovarian Cancer Research Grant, The Tina Brozman Foundation.
2009 Superfund Basic Research and Training Program Special Emphasis Panel, NIEHS
2008-2010 Member, Special Emphasis Panel for Cancer Prevention, NCI
2008 Reviewer, Medical Research Council, UK 2008-present Reviewer, British Council, UK
2007-present Member, Pennsylvania Department of Health Review Panel
2006 Reviewer, Health Research Board Ireland Special Review Panel for Cancer Biomarker Research Network
2005 Reviewer, Thomes F & Miller Jeffress Memorial Trust Special Review Panel
2004 Member, Special Review Panel for NCI-EGRB-F, NIH/NCI

B) Reviewer for Journals

Cancer Research, International Journal of Cancer, Journal of National Cancer Institute, Cancer Epidemiology, Biomarkers & Prevention, Cancer Causes and Controls, Cancer, British Journal of Cancer, Cancer Prevention Research, Mutation Research, Journal of Neurogenetics, Endocrine-Related Cancer, Molecular Cancer, Cellular and Molecular Life Sciences, Cancer Investigation, Clinical Medicine Insights: Oncology, Psychoneuroendocrinology, Physiological Genomics, Cancer Biology & Therapy, Nuclei Acid Research, Behavior Genetics, Clinical Cancer Research, European Journal of Cancer, European Journal of Human Genetic, PLoS ONE, Cancer Letter, Current Bioinformatics, Epigenetics,

Gene, Human Immunology, Carcinogenesis, Molecular Carcinogenesis, Human Genomics, The New England Journal of Medicine, Scientific Report, Breast Cancer Research and Treatment, RNA

C) Professional Organizations (list from most recent to earliest)

2020-present	Associate Editor, Human Genomics
2019	Member of the writing group for IARC (International Agency for Research on Cancer, WHO) Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 124: Night shift work
2017-present	Member, Society for Research on Biological Rhythms (SRBR)
2015-2018	Member of Scientific Advisory Board, National Institute for Environmental Health and Related Product Safety, China CDC
2007	Member of the working group for IARC (International Agency for Research on Cancer, WHO) Monographs on the Evaluation of Carcinogenic Risks to Humans; Vol. 98: Fire-fighting, painting and shift-work
2006	Member, American Society of Human Genetics
2006	Member of the NIEHS workshop on "Circadian Rhythms in Human Health and Disorders"
2003-present	Active Member, American Association for Cancer Research (AACR)

D) University Service: (list from most recent to earliest)

School of Public Health Committees

2021-present	Research Advisory Committee, YSPH
2020-present	Faculty Track Director (EHS) of YSPH EMPH online program
2020-present	Faculty Advisory Committee, Global Health Concentration, YSPH
2015-2019	Member of Academic and Professional Integrity Committee, Yale School of Public Health, New Haven, CT
2012-2014	Member of Department Chair Search Committee, Yale School of Public Health, New Haven, CT
2011-2016	Member of Education Committee, Yale School of Public Health, New Haven, CT
2008-2010	Member of Academic and Professional Integrity Committee, Yale School of Public Health, New Haven, CT
2008-2010	Member of MPH Admission Committee, Yale School of Public Health, New Haven, CT
2005-2006	Member of Information Technology Resources Committee, Yale School of Public Health, New Haven, CT
2004-2007	Member of Doctoral Committee, Yale School of Public Health, New Haven, CT
2004-2005	Member of Library Committee, Yale School of Public Health, New Haven, CT

Departmental Committees

2012-2018	Chair, Faculty Search Committee, Department of Environmental Health Sciences, Yale School of Public Health, New Haven, CT
2012-2018	Diversity Representative of Faculty Search Committee, Department of Environmental Health Sciences, Yale School of Public Health, New Haven, CT

APPENDIX C

Curricula Vitae of Oncology Clinical Faculty

Alan Patrick Baltz

640 W. Riverfront Dr. Apt B229 | North Little Rock, Arkansas 72114
ABaltz@uams.edu | 501-690-4845

PROFESSIONAL

University of Arkansas for Medical Sciences — **Little Rock, Arkansas**
Hematology/Oncology Fellow and Chief Fellow — *July 2021 – Present*

University of Arkansas for Medical Sciences — **Little Rock, Arkansas**
Internal Medicine Resident — *July 2018 – June 2021*

MedStar Health — **Columbia, Maryland**
Research Fellow — *July 2019 – June 2020*

- Examined the effects of telemedicine in palliative care on hospital readmission rates
- Analyzed data and drafted manuscripts pertaining to quality of life, Medical Oncology, telemedicine and Palliative Care
- Performed statistical analyses within a randomized multicenter pilot study

EDUCATION

University of Arkansas for Medical Sciences — **Little Rock, Arkansas**
Doctor of Medicine — *August 2014 – May 2018*
Advisor: Dr. Robert Bradsher

Hendrix College — **Conway, Arkansas**
Bachelor of Arts, Chemistry, summa cum laude — *August 2010 – May 2014*
Minor: Religious Studies
GPA: 4.00 / 4.00
Honors: Dean's List (8 semesters)
Phi Beta Kappa Academic Honor Society (2014)
Thesis: Biochemical Mechanism of bendamustin hydrochloride and its applications as a DNA alkylating agent and possible purine antimetabolite.

Catholic High School — **Little Rock, Arkansas**
Salutatorian — *August 2006 – May 2010*

LICENSURE AND CERTIFICATIONS

American Board of Internal Medicine — Internal Medicine Certified 2021 -Present

Drug Enforcement Administration — Licensed, 2018-Present

RESEARCH

Peer-Reviewed Publications

Manuscripts Accepted for Publication

Fugere T, Baltz A, Mukherjee A, Gaddam M, Veeraputhiran M, Gentille Sanchez CG. Immune effector cell associated HLH-like syndrome: A review of the literature of an increasingly recognized entity. Cancers: Special Issue Advance Research in Oncology. 2023 Oct; 26: https://www.mdpi.com/2072-6694/15/21/5149/pdf

Costantino RC, Leonard J, Gorman EF, Ventura D, Baltz AP, Gressler LE. Benzonatate Safety and Effectiveness: A Systematic Review of the Literature. Ann Pharmacother. 2023 Jan; 23:10600280221135750. doi: 10.1177/10600280221135750. Epub ahead of print. PMID: 36688284.

Baltz AP, Siegel ER, Kamal AH, Siegel R, Kozlik MM, Crist STS, Makhoul I; ASCO Quality Publications Task Force. Clinical Impact of ASCO Choosing Wisely Guidelines on Staging Imaging for Early-Stage Breast Cancers: A Time Series Analysis Using SEER-Medicare Data. JCO Oncol Pract. 2023 Feb;19(2):e274-e285. doi: 10.1200/OP.22.00500. Epub 2022 Nov 14. PMID: 36375114.

Gressler LE, Baltz AP, Costantino RC, Slejko JF, Onukwugha E. Exploring the Use of State Medical Cannabis Legislation as a Proxy for Medical Cannabis Use Among Patients Receiving Chemotherapy. Curr Treat Options Oncol. 2020 Nov 19;22(1):1. doi: 10.1007/s11864-020-00803-2. PMID: 33215230.

Baltz AP, Gressler LE, Costantino RC, McPherson ML. Nonprescription Medication Use in Hospice Patients. Am J Hosp Palliat Care. 2020 May;37(5):336-342. doi: 10.1177/1049909119876259. Epub 2019 Sep 17. PMID: 31529974.

Manuscripts Submitted for Publication

Baltz A, Peng C, Gressler LE, Bhatti SA, Lewis K. Exploring the association between medical marijuana cardholder status and antiemetic overuse. [Submitted, Journal of Oncology Practice]

Published Abstracts

Konda M, Ananthula A, Baltz A, Pandey Y, Atwal D, Makhoul I, Moore HC. A physician-led team approach to improve advance directive completion rates in an inpatient oncology unit. J Clin Oncol 37, 2019 (suppl; abstr e18271).

Fugere T, Chen JZ, Baltz A, Schmit T, Douli R, Hoque S, Khalil M, Bhatti SA. Participation in a multidisciplinary institutional committee, "RQUEST," to enhance quality improvement education, project design, and implementation for hematology/oncology fellows. Journal of Clinical Oncology 2023 41:16_suppl, (June 01, 2023) e18733 DOI: 10.1200/JCO.2023.41.16_suppl.e18733

Baltz A, Peng C, Gressler LE, Bhatti SA, Lewis K. Exploring the association between medical marijuana cardholder status and antiemetic overuse. *Journal of Clinical Oncology.* 41, no. 16_suppl (June 01, 2023) e18812-e18812. doi: 10.1200/JCO.2023.41.16_suppl.e18812

Peer-Reviewed Online Publications

Baltz AP, Costantino RC, Gressler LE, McPherson ML. Sex Differences in Over the Counter Medication Use Among Hospice Patients Diagnosed with Cancer. International Palliative Care Network Poster Exhibition. November 15, 2019.

Book Chapters

Baltz AP, Gressler LE. "Chemotherapy-Induced Peripheral Neuropathy Treatment with Duloxetine" in 50 Pharmacotherapy Studies Every Palliative Practitioner Should Know. Oxford University Press. [In Press]

Presentations

Conference Poster Presentations

Chen JZ, Baltz A, Fugere T, Sanders EN, Amisha F, Gentille Sanchez CG. Leveraging Deep Neural Networks to Predict Timeto Event in Pediatric B-Lymphoblastic Leukemia. A Poster Presented at the 2023 American Society for Hematology Annual Meeting, San Francisco, CA, USA.

Baltz A, Siegel E, Makhoul I. Clinical Impact of ASCO "Choosing Wisely" Guidelines on Staging Imaging for Early Stage Breast Cancers a Time Series Analysis Utilizing SEER-Medicare Data. A Poster Presented Digitally at the American Society of Clinical Oncology Annual Meeting, Chicago, IL, USA.

Baltz A, Siegel E, Makhoul I. Clinical Impact of ASCO "Choosing Wisely" Guidelines on Staging Imaging for Early Stage Breast Cancers a Time Series Analysis Utilizing SEER-Medicare Data. A Poster Presented Digitally at University of Arkansas for Medical Sciences Annual Research Symposium. Little Rock, AR, USA. May 13, 2020. [Winner of Best Resident Poster Presentation Award.]

Pandey Y, Middleton D, Baltz A, Roy A, Broadfoot B. The Clinical Conundrum of Intravascular Large Cell Lymphoma. A Poster Presented at the Southern Regional Meeting. New Orleans, LA, USA. February 13-15, 2020.

Reviewer

American Journal of Hospice and Palliative Medicine *2020-present*

GRANTS AND FELLOWSHIPS

Team Science Voucher: Exploring the Association between Medical Marijuana Status and Antiemetic Overuse. PI: Kanna Lewis. Role: Co-Investigator; Funding: UAMS Translational Research Institute (TRI) ; $20,000; September 2022 – September 2023.

ANCILLARY

Dana Farber Master's Class Course for Oncologists **Chicago, Illinois**
Participant *October 2022*

- Participated in interactive lecture sessions on advances in the standard of care for Hematology and Medical Oncology
- Reviewed clinical trials results and studies pertaining to new pharmaceutical agents and treatment strategies for advanced malignancies
- 18 continuing medical education hours of classes, presentations, and interactive review

Dana Farber Master's Class Course for Oncologists **New York City, New York**
Participant *October 2017*

- Attended lectures on latest standards of care in Medical Oncology
- Reviewed recently published studies and clinical trials pertaining to treatment advances and their effects on survivability and quality of life
- 18 hours of classes, presentations, and interactive review

Harvard Master's Course for Oncologists **Chicago, Illinois**
Participant *April 2016*

- Studied updates on latest standard of care chemotherapy
- Examined in depth the latest advances in experimental immunotherapy and other treatments on quality of life and survival
- 18 hours of classes, presentations, and interactive review

UAMS Christian Medical and Dental Association **Little Rock, Arkansas**
Peer Mentor and Volunteer *August 2014 – May 2016*

- Organized student volunteer opportunities and service projects
- Performed maintenance and aided in food distribution at homeless shelters
- Mentored incoming students with regards to outreach opportunities and medical school navigation
- 40 hours of community service and peer mentoring activities

Hematology Oncology Services of Arkansas **Little Rock, Arkansas**
Clinical Trials Research Assistant *May 2013 – August 2013*

- Recruited patients for Phase III clinical trials for a varicella zoster killed vaccine for immuno-compromised patients
- Assisted in digitalization of patient records
- Collected past medical histories on patients considered for enrollment in the study

Hematology Oncology Services of Arkansas **Little Rock, Arkansas**
Patient Triage Intern *May 2011 – August 2012*

- Escorted elderly patients between sites of care in a clinical office setting
- Enrolled patients and families in their "Patient Portal" access to their EMR and obtained appropriate informed consent to release information to that site
- Assisted patients and families the meaningful utilization and navigation of their healthcare information as made available on the patient portal

AWARDS AND SKILLS

Professional Organizations

Representative for State of Arkansas and UAMS, ASCO Advocacy Summit (2023)
Resident Coordinator, UAMS Internal Medicine Research Mentorship and Advocacy Council (2018-present)
UAMS Hematology and Oncology Interest Group (2014-present)
Member, American College of Physicians (2017-present) Member,
UAMS Internal Medicine Interest Group (2015-2018)
Student Leader, UAMS Christian Medical and Dental Association (2014-2016)
Member, American Chemical Society (2010-2014)

Honors and Awards

- Selected as Representative for State of Arkansas and UAMS for ASCO Advocacy Summit (2023)
- UAMS Research Internal Medicine Symposium Best Resident Poster Presentation (2020)
- UAMS Charles Ray Moon Endowed Scholarship (2014-2015)
- Phi Beta Kappa Academic Honor Society (2014)
- Arkansas Governor's Distinguished Scholarship (2010, 2011, 2012, 2013)
- Odyssey Distinction Award (2010, 2011, 2012, 2013)

- Hendrix Academic Scholarship (2010, 2011, 2012, 2013)
- Hays Participation Award (2010, 2011, 2012, 2013)
- Hendrix College Governor's Scholar Award (2010, 2011, 2012, 2013)
- National Merit Scholar (2010)

Languages

- English (fluent, written and spoken) and Italian (conversational)

Skills

- Licensed General HAM Radio Operator
- Software: EPIC, Meditech, VA CPRS, IKNOMED, Microsoft Office

MANOJNA KONDA, MD

9 NEWBRIDGE CT, LITTLE ROCK, AR 72227
PHONE: (501) 553-1297 E-MAIL: dr.manojnakonda@gmail.com

MEDICAL LICENSING

- ***American Board of Internal Medicine Certified***
- *Current **Arkansas Medical License** Holder*
- ***USMLE** Step 1 Score: 253; Step 2 CK Score: 261; Step 2 CS: Passed, Step 3 Score: 228*
- *ECFMG Certified*
- *Visa: Not required, US CITIZEN*

EDUCATION

- ***American Board of Internal Medicine Certified*** *2020 - 2030*

- ***University of Arkansas for Medical Sciences, Little Rock, AR*** *2020- 2023*
  Hematology & Oncology Fellow, will graduate in 2023

- ***University of Arkansas for Medical Sciences, Little Rock, AR*** *2016 - 2019*
  Resident Physician – Internal Medicine

- ***Gandhi Medical College, NTRUHS, Telangana, India*** *2006 - 2012*
  Bachelor of Medicine & Surgery

WORK EXPERIENCE

- ***University of Arkansas for Medical Sciences, Little Rock, AR*** *2019 – 2020*
  Assistant Professor – Hospitalist in the Division of Hematology & Oncology

- ***K.V.R. Hospital, Hyderabad, India*** *2012 – 2014*
  Chief Medical Officer

PUBLICATIONS

- **Book Chapter: Cancer Screening and Prevention: Sex and gender evidence in lung, breast and colorectal cancer**

  In book: How Sex and Gender Impact Clinical Practice, DOI: 10.1016/B978-0-12-816569-0.00005-X

  *Authors: **Manojna Konda,** Rashmi Verma*

- **Vitamin B12 deficiency mimicking Acute Leukemia**

  Published in Baylor University Medical Center Proceeding Journal, July 2019

  *Authors: **Manojna Konda**, Abhijit Godbole, Soumya Pandey, Appalanaidu Sasapu*

- **Gender variation in clinical activity and Medicare payments among medical oncologists and hematologists**

  Journal of Clinical Oncology 38(15_suppl):11014-11014, May 2020

  *Authors: **Manojna Konda**, Arya Roy, Richa Parikh, Tyler Fugere, Manoja Gullapalli, Yadav Pandey, Rashmi Verma*

- **A physician-led team approach to improve advance directive completion rates in an inpatient oncology unit.**

  Journal of Clinical Oncology May 2019 37:15_suppl,e18271-e18271

  *Authors: **Manojna Konda**, Aneesha Ananthula, Alan Baltz, Yadav Pandey, Dinesh Atwal, Issam Makhoul, and Heather C Moore*

- **Getting high on loperamide**

  Journal of Investigative Medicine Feb 2019;77:354-565

  *Authors: **Manojna Konda**, Gayathri Krishnan, Richa Parikh, Kulsum Bano and Katie Defore*

- **Febrile case of Primary Hepatic Neuroendocrine tumor**

  Journal of General Internal Medicine May 2019, 34 (suppl 2): 99.

  *Authors**: Manojna Konda**, Gayathri Krishnan, Richa Parikh, Kulsum Bano*

- **Not for Human Consumption!**

  Journal of General Internal Medicine May 2019, 34 (suppl 2): 99.

  *Authors: **Manojna Konda**, Kinza Ahmed, Susan Beland*

- **Characteristics, associations, and outcomes of hemophagocytic lymphohistiocytosis: Retrospective data over a period of 13 years from a university hospital.**

  Journal of Clinical Oncology 2018 36:15_suppl,e19563-e19563

*Authors: Dinesh Atwal, Derek Middleton, **Manojna Konda**, Belal Firwana, Naveen Yarlagadda, Pooja Motwani, Muthu Kumaran Veeraputhiran and Appalanaidu Sasapu*

- **Cellular Immune Function Assay (Immuknow) Values during treatment of Chronic GvHD status with combined immunosuppressive drug and extracorporeal photopheresis therapy**

  Biology of Blood and Marrow Transplantation, Volume 25, Issue 3, S233-S234
  *Authors: Asiya Matin, Leoandro Morales, Dinesh Atwal, **Manojna Konda**, Yadav Pandey, Amy Heigel, Michele Cottler Fox, Muthu Veeraputhiran*

- **Absolute lymphocyte count (ALC) as predictor of Pneumocystis Jiroveci Pneumonia (PCP) infection in patients on immune checkpoint inhibitors (ICPi).**

  Journal of Clinical Oncology May 2019 37:15_suppl,e14255-e14255
  *Authors: Krishna Prasad Joshi, Dinesh Atwal, Eric R Siegel, Anusha Jillella, **Manojna Konda**, Richa Parikh, Aneesha Ananthula, Kulsum Bano, Kostas Arnaoutakis, Luidmila Schafer, Natasa Milojkovic, Fade Mahmud, Rangaswamy Govindarajan*

- **Risk factors associated with suicide in patients with prostate cancer in the United States**

  Journal of Clinical Oncology 37(31_suppl):84-84
  *Authors**: Manojna Konda**, Rohan Sharma, Arya Roy and Rashmi Verma*

- **Low Advance Directive Completion rates in Hospitalized Oncology Patients: Room for Improvement**

  Journal of Clinical Oncology 37(31_suppl):1-1
  *Authors: **Manojna Konda**, Aneesha Ananthula, Alan Baltz, Yadav Pandey, Issam Makhoul and Heather Moore*

- **Epidemiology and factors associated with mortality among inpatients with neoplasm related pain.**

  Accepted for publication and presentation at the ASCO-Supportive care symposium 2019
  *Authors: Arya Mariam Roy, **Manojna Kond**a, Aravind Mohanakumar Warrier, Issam Makhoul*

- **Role of Autoantibodies in the screening, diagnosis and monitoring of esophageal cancer: A literature review**

  European Journal of Gastroenterology & Hepatology 32(7):1, March 2020
  *Authors: Abhilash Perisetti, Mahita Bellamkonda, **Manojna Konda**, Samantha Edwards, Salman Ali Khan, Pardeep Bansal, Hemant Goyal*

- **Acquired Amegakaryocytic thrombocytopenia mimicking immune thrombocytopenic purpura**

  Case Report. Perm J. 2020 Dec;24:1-3. doi: 10.7812/TPP/19.203.
  *Authors: Arya Roy, **Manojna Konda**, Dinesh Atwal, Anuradha Kunthur*

- **Acquired hemophilia A**

  Proceedings (Baylor University. Medical Center) 33(3):1-4
  *Authors: Yadav Pandey, Dinesh Atwal, **Manojna Konda**, Arya Mariam Roy and Appalanaidu Sasapu*

- **Potentially modifiable risk factors 30-day readmission in adults with sickle cell disease: A national database study**

  Blood 134(Supplement_1):4857-4857
  *Authors: **Manojna Konda**, Arya Roy, Anusha Jillella, Akshay Goel and Appalanaidu Sasapu*

- **Retrospective Review of patients with large granular lymphocyte (LGL) leukemia in a single institution over a period of 11 years**

  Blood 134(Supplement_1):5279-5279
  *Authors: Kulsum Bano, **Manojna Konda**, Dinesh Atwal, Richa Parikh, Anusha Jillela, Aasiya Matin, Aneesha Ananthula and Appalanaidu Sasapu*

- ***Hemoglobin C Trait Presenting with Bilateral Central Retinal Vein Occlusion***

  Retinal Cases & Brief Reports, November 2020 DOI: 10.1097/ICB.0000000000001097
  *Authors: Adam Neuhouser, Riley Sanders, **Manojna Konda**, Sami Uwaydat*

- **Treatment Strategies and Outcomes for Patients with Peripheral T-Cell Lymphoma and Its Subtypes**

  Blood 136(Supplement 1): 36-37
  *Authors: Arya Roy, Yadav Pandey, **Manojna Konda**, Naveen Yarlagadda, Appalanaidu Sasapu*

- **Cardiotoxicity and heart failure in patients receiving chemotherapy: A nationwide analysis**

  Journal of Clinical Oncology 38(15_suppl):e19097-e19097
  *Authors: Arya Roy, Akshay Goel, **Manojna Konda**, Rashmi Verma*

- **Characteristics and factors affecting mortality of patients admitted for chemotherapy in the United States during the year 2017**

Journal of Clinical Oncology 38(15_suppl):e19025-e19025
*Authors: Arya Mariam Roy, **Manojna Konda**, Akshay Goel, Rashmi Verma*

- **C-reactive protein (CRP) as a predictive biomarker in lung cancer patients receiving immune checkpoint inhibitors (ICI).**
  Journal of Clinical Oncology 38(15_suppl):e21645-e21645
  *Authors: Aneesha Ananthula, **Manojna Konda**, Milan Bimali, Ahmad Mazen Safar, Rangaswamy Govindarajan*

- **Fertility Preservation Discussion in Young Adults with Cancer: How often are we documenting?**
  Journal of the National Comprehensive Cancer Network: JNCCN 18(3.5):QIM20-131
  *Authors: Yadav Pandey, Arya Mariam Roy, **Manojna Konda**, Jacob Leffert, Issam Makhoul, Appalanaidu Sasapu*

- **Utilization of palliative care in patients with genitourinary malignancies**
  Journal of Clinical Oncology 38(6_suppl):669-669
  *Authors: Arya Mariam Roy, **Manojna Konda**, Akshay Goel, Rashmi Verma*

PRESENTATIONS

- Southern Regional Meeting 2019, New Orleans - *Oral presentation*
- National ACP 2019, Philadelphia – *Poster Presentation*
- National ACP 2018, New Orleans – *Poster Presentation*
- American Society for Bone Marrow and Transplant 2019, Houston – *Poster presentation*
- Society of General Internal Medicine 2019, Washington – *Poster presentation*
- UAMS Internal Medicine annual research day – *Oral presentation*
- Annual Cancer Research Retreat, Little Rock – *Poster presentation*

AWARDS AND ACHIEVEMENTS

- *SAFMR/SSCI trainee award 2019: Presented during Southern Regional Meeting, New Orleans 2019*
- *ACP Young Achiever 2019*
- *Arkansas Clinical Vignette Poster Finalist in National ACP 2019*
- *Arkansas Clinical Vignette Poster Finalist in National ACP 2017*
- *Outstanding adult case report chosen for discussion in Southern Regional Meeting 2019*
- *Best oral presentation for QI project in UAMS Internal Medicine Research Day 2019*

HOBBIES AND PERSONAL INTERESTS

- *Reading books, taking long walks and hikes, boating and fishing with my husband*

Anuradha Kunthur, M.D.
Hematology Oncology,
10001 lile Drive
Little Rock, AR 72205
Cell +1 2814154430
Office: 501 552 6100
Email anuradha.kunthur@commonspirit.org
akunthur@gmail.com

Current Appointment

Clinical Attending
Hematology/Medical Oncology, 02/2022 to present
10001 Lile Drive
St. Vincents Hospital
Littlerock 72205

Staff Physician 10/2011 to 02/2022
Hematology/Medical Oncology
John McClellan VA Medical Center
4300 W 7th street,
Little Rock 72205

Adjunct Assistant Professor
Division of Hematology/Oncology,
University of Arkansas for Medical Sciences 10/10/2011 to 10/2021
Department of Hematology/Medical Oncology

Education:

Fellowship

Hematology/Medical Oncology 07/2008 to 09/2011
University Of Arkansas for Medical Sciences
Little Rock 72205

Residency

Montefiore North Division (Our lady of Mercy hospital)
600, East 233rd Street
Bronx NY 10466 July 2001-June 2004

Medical School

Sri Venkateswara Medical School June 1991- May 1997

Tirupathi, India.

Junior Resident
Divya Hospital, 1998-1999
Anantapur, India.

Research Associate
Department of Gastroenterology
Montefiore North, 233 rd street, 600E,
Bronx, NY 10466 August 2000-May 2001

Research Intern
MD. Anderson Cancer Center,
Translational Research lab, August 2004-September 2005
Division of Gynecologic Oncology,
Houston, Texas.

Employment
Internist
North East Medical Center 10/2005 to 1/2008
18955 Memorial North, Humble 77338

Active State License : Arkansas E7727

ECFMG certified 2000 (ECFMG no 0-606 -613- 8)

Board Certifications:

Hematology December 2011 to present
Medical Oncology December 2011 to present

Membership

Member of American Society of Clinical oncology

Honors and awards: Excellence in education award September 2020. Awarded by UAMS hematology/Oncology Fellowship program

Publications

1) Navo M, **Kunthur A**, Badell ML, Coffer LW 2nd, Markman M, Brown J, Smith JA.

Evaluation of the incidence of carboplatin hypersensitivity reactions in cancer patients. Gynecol Oncol. 2006 Jun 21.

2) **Kunthur A**, Wiernik PH, Dutcher JP.

Renal parenchymal tumors and lymphoma in the same patient: Case series and review of the literature. Am J Hematol. 2006 Apr;81(4):271-80.

3) Smith JA, Badell ML, **Kunther A**, Palmer JL, Dalrymple JL, Ramin SM. Utilization of complimentary and alternative medicines in gyenecologic and Obstetrics clinics**.** J Reprod Med. 2012 Sep-Oct;57(9-10):390-6.

4) Abdallah AO, Vallurupalli S, Kunthur A. Pazopanib-and bevacizumab-induced reversible heart failure in a patient with metastatic renal cell carcinoma: A case report. J Oncol Pharm Pract. 2016 Jun;22(3):561-5.

5) Harjot Kaur; Zhifu Xiang, Anuradha Kunthur,; and Paulette Mehta. Castleman disease.Fed Pract. 2015 Aug;32(Suppl 7):41S-46S.

6) Anuradha Kunthur, Zhifu Xiang, Harjot Kaur, Sarah Jewell, and Paulette Mehta. Updates on cancer survivorship care planning. Fed Pract. 2015 Aug;32(Suppl 7):64S-69S..

7) Jewell S, Xiang Z, Kunthur A, Mehta P. Multiple myeloma: Updates on diagnosis and management.Fed Pract. 2015 Aug;32(Suppl 7):49S-56S

8) Anuradha Kunthur, MD, Paulette Mehta, MD. Addressing End- of Life care – When the patient or Family doesn't want to let go. Fed Pract.2010 Aug 27,(suppl 5).

9) Kunthur A. A castrate-resistant metastatic prostate cancer patient with severe pancytopenia, successfully treated with docetaxel chemotherapy. J Oncol Pharm Pract. 2016 Jun;22(3):561-5.

10) 10). Pandey Y, Matin A, Broadfoot B, Kunthur A. Clinical and histological complete response to combination nivolumab and ipilumumab in metastatic renal cell carcinoma. Proc (Bayl Univ Med Cent). 2020 Jan 30;33(2):258-260.

11) Anuradha Kunthur, Eric Siegel, and Rangaswamy Govindarajan. Survival outcomes in stage IV bladder cancer patients treated with cisplatin/gemcitabine versus carboplatin/Gemcitabine: A retrospective analysis in Veteran patients. Clinical Oncology and research. 2020 June;3 (6): 2-4.

12) Roy AM, Konda M, Sidarous GK, Atwal D, Schichman SA, Kunthur A. Acquired Amegakaryocytic Thrombocytopenia Misdiagnosed as Immune Thrombocytopenia: A Case Report. Perm J. 2020 12; 24:1-3

Abstracts and Presentations in National Meetings:

1) Smith JA, **Kunthur A,** Liu L, Meng Z, Wolf JK, Gaikwad A, Cohen L
In vitro evaluation of HuaChanSu alone and in combination with antineoplastic agents in human ovarian and endometrial cancer cell lines. North American Research Conference. 2006

2) Presented as poster at North American Research conference on complimentary and Integrative Medicine (http://www.bridgehealth.com/cahc_content/index.html --Poster abstracts>>Basic Science), Edmonton, AB, Canada, May, No. A8, pg15, 2006.

3) Navo M, **Kunthur A**, Badell M, Smith JA. Evaluation of the incidence of carboplatin hypersensitivity reactions in cancer patients. Pharmacotherapy 25(10)Abstract 243, 2005.
4) Anuradha Kunthur, Rangaswamy Govindarajan, Eric Siegel. Influence of thiozolidinediones exposure on progression of oral leukoplakia and erythroplakia to the development of head and neck cancer. Poster presented in 2010 ASCO annual meeting .
5) Kunthur, A. Aldwairi, F. Simmen, R. Govindarajan; Effect of metformin alone and in combination with 5-fluorouracil , oxaliplatin and irinotecan on human colon cancer cell lines. J Clin Oncol 29: 2011 (suppl; abstr e13041)
6) Marie Mesidor, Ph. D., Timothy Boling, Ph.D., Paulette Mehta, MD, Anuradha kunthur, MD, CAVHS, Littlerock, AR. Promoting mindfulness practice among veterans with cancer. Poster presented at AVAHO Annual meeting October 2015.
7) Anuradha Kunthur, Eric Siegel, Rangaswamy Govindarajan. Cisplatin and gemcitabine versus carboplatin and gemcitabine in metastatic bladder cancer patients: Survival analysis of veteran's health care data. JCO 35: 2017 NO 14_S.
8) A. Kunthur, N. Milojkovic, C.C. Reed, M. Safar, R Govindarajan, and P. Mehta. CAVHS, Little Rock, AR. Use of template to increase referral to palliative care. Poster presented at AVAHO Annual meeting Sep 2020.

APPENDIX D

2023 Winthrop P. Rockefeller Cancer Institute External Advisory Board Bios

Adekunle "Kunle" Odunsi, MD, PhD (Chair)
Director, University of Chicago Medicine Comprehensive Cancer Center
Dean for Oncology, Biological Sciences Division
The Abbvie Foundation Distinguished Service Professor
Department of Obstetrics and Gynecology
University of Chicago
Chicago, IL

Adekunle "Kunle" Odunsi, MD, PhD, FRCOG, FACOG, is an expert in immunotherapy and vaccine therapy for cancer. Dr. Odubsi pioneered the development of antigen-specific vaccine therapy and "next generation" adoptive T-cell immunotherapies to prolong remission rates in women with ovarian cancer. Dr. Odunsi received his medical degree from the University of Ife and his doctoral degree from the Imperial Cancer Research Fund Laboratories, MRC Weatherall Institute of Molecular Medicine, John Radcliffe Hospital, in Oxford, United Kingdom. He completed his residencies in obstetrics and gynecology at the Rosie Maternity and Addenbrooke's Hospitals, University of Cambridge, and Yale University School of Medicine. His fellowship in gynecologic oncology was at Roswell Park Comprehensive Cancer Center, in Buffalo, New York, where he joined the faculty in 2001 and remains. Dr. Odunsi's research interests focus on understanding the mechanisms of immune recognition and tolerance in human ovarian cancer, and the translation of the findings to clinical immunotherapy trials.

Marcela G. del Carmen, MD, MPH
Professor of Obstetrics, Gynecology and Reproductive Biology
Executive Vice President at Mass General Brigham
President of the Massachusetts General Physicians Organization
Division of Gynecologic Oncology
Massachusetts General Hospital
Boston, MA

Marcela G. del Carmen, MD, MPH, is a graduate of the Johns Hopkins School of Medicine. She completed her OB/GYN residency at Johns Hopkins Hospital and her fellowship in gynecologic oncology at Massachusetts General Hospital, and she has an MPH from the Harvard School of Public Health. Dr. del Carmen was on the faculty at Johns Hopkins before returning to join the faculty at Massachusetts General Hospital. She is a professor of obstetrics, gynecology, and reproductive biology at Harvard Medical School. Dr. del Carmen's research interests include the surgical treatment of gynecologic malignancies, specifically ovarian cancer; the management of rare gynecologic tumors; and improving access to health care services for underserved populations.

Edward Chu, MD, MMS
Director, Albert Einstein Cancer Center
Vice President for Cancer Medicine, Montefiore Medicine
Professor, Department of Medicine (Oncology)
Professor, Department of Molecular Pharmacology
Carol and Roger Einiger Endowed Professor of Cancer Medicine
Albert Einstein College of Medicine
Bronx, New York

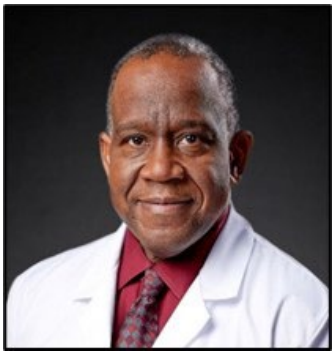
Edward Chu, MD, MMS, received his undergraduate, graduate, and medical degrees from the Brown University Program in Liberal Medical Education and continued at Brown to complete his internal medicine residency. Dr. Chu currently serves as the Deputy Director of the University of Pittsburgh Medical Center's (UPMC) Hillman Cancer Center (HCC), Co-leader of the HCC Cancer Therapeutics Program, Director of the HCC Phase I Program, Associate Director of the University of Pittsburgh Drug Discovery Institute, and Chief of the Division of Hematology-Oncology. In addition to his leadership positions, Dr. Chu is a National Institutes of Health-funded basic, translational, and clinical investigator. As well as clinical oncologist with a long history of developing and leading phase I and phase II clinical trials, particularly for colorectal cancer and other gastroenterology cancers. With his expertise in cancer pharmacology and drug development, he has been active in designing and developing novel agents and treatment approaches.

E. Claire Dees, MD, ScM
Professor of Medicine, Division of Oncology
Breast Oncology and Developmental Therapeutics
Director, Early Phase Clinical Trials Group
Co-Lead, Clinical Research Program
UNC Lineberger Comprehensive Cancer Center
Chapel Hill, NC

E. Claire Dees, MD, ScM, is an experienced medical oncologist and clinical trialist. She is a Professor of Medicine at the University of North Carolina School of Medicine, and a member of The UNC Lineberger Comprehensive Cancer Center and the UNC Breast Center. She founded the Developmental Therapeutics (Phase I trials) Working Group at UNC-LCCC, and she now directs the early phase clinical trials program and the breast cancer clinical trials group. Dr. Dees co-leads the LCCC Clinical Research Program. Her research focuses on early phase clinical trials of novel therapeutics, especially those focused on breast cancer. She has been the principal investigator for over 100 trials including 10 currently open early phase trials.

Chad A. Ellis, PhD
Deputy Director, Research Administration
Hillman Cancer Center
University of Pittsburg Medical Center
Pittsburgh, PA

Chad Ellis, PhD, earned his bachelor's degree in microbiology and cell science from the University of Florida and his doctorate in pharmacology from the University of Illinois School of Medicine. He joined the NCI as a postdoctoral fellow in 1999 where he focused on the regulation, activation, and signaling pathways of the *Ras* proteins and identified and oversaw a patent application for the novel protein, *Rig*. Dr. Ellis served as Deputy Director of Research Affairs at the Yale Comprehensive Cancer Center, where he led strategic planning activities for the center, oversaw cancer research activities, managed key infrastructure and administrative tasks, and handled faculty retention and recruitment. In 2014, he was appointed Associate Director of Administration at UNC Lineberger Comprehensive Cancer Center. Dr. Ellis also spent several years as a research scientist and consultant to private companies, including Rexahn Corporation, FBA, Inc., and Cellectricon Inc.



John Farley, MD, COL (ret), FACOG, FACS
Division of Gynecologic Oncology
Center for Women's Health
Dignity Health Cancer Institute
Phoenix, AZ

John Farley, MD, COL (ret), is a board-certified gynecologic oncologist at Dignity Health – Cancer Institute and the Division of Gynecologic Oncology at the Center for Women's Health at Dignity Health St. Joseph's Hospital and Medical Center. He is dual board-certified in obstetrics and gynecology. Dr. Farley's expertise includes clinical trial design, new drug development, and treatment of complex gynecologic malignancies. He is a member of NRG Oncology, American Association of Cancer Research, Society of Gynecologic Oncologists, American Society of Clinical Oncology, and is a Fellow of the American Congress of Obstetricians and Gynecologists. In 2020, he received the Uniformed Services University of the Health Sciences Distinguished Alumni Award and the Society of Gynecologic Oncology Ambassador Award. Dr. Farley is a highly decorated Colonel in the U.S. Army and was awarded the Bronze Star Medal in 2005 and Meritorious Service Medal in 2006. He received his undergraduate degree from the United States Military Academy. He then received his medical degree from Uniformed Services University of the Health Sciences. He later completed his residency in Obstetrics and Gynecology and fellowship in Gynecologic Oncology at Walter Reed Army Medical Center.

Andrew K. Godwin, Ph.D.
Chancellors Distinguished Chair in Biomedical Sciences Endowed Professor
Professor, Department of Pathology & Laboratory Medicine
Division Director, Genomic Diagnostics, Department of Pathology & Laboratory Medicine.
Director, Molecular Oncology
Deputy Director, University of Kansas NCI-Designated Cancer Center
Founding Director, Kansas Institute for Precision Medicine COBRE
Professor, Department of Cancer Biology (secondary)
Professor, Department of Internal Medicine (secondary)
Professor, Department of Microbiology, Molecular Genetics and Immunology (secondary)
Biorepository Coordinator for the HICTR Translational Technologies Resource Center
Director, Biospecimen Shared Resource
Director, Biospecimen Repository Core Facility
KBA Eminent Scholar
Kansas University Medical Center
University of Kansas
Kansas City, KS

Andrew K. Godwin, PhD, is the Chancellors Distinguished Chair in Biomedical Sciences Endowed Professor and Division Director of Genomic Diagnostics in the Department of Pathology at KUMC. He serves as a professor of Pathology and Laboratory Medicine and is the founding director of the Clinical Molecular Oncology Laboratory, a CLIA-certified, CAP-accredited molecular diagnostics laboratory for the KU Health System. Dr. Godwin also serves as the founding director of the KU Cancer Centers' Biospecimen Shared Resource and the KU Medical Center's Biospecimen Repository Core Facility, as well as the founding scientific director for the Biomarker Discovery Laboratory (BDL) which supports integral and integrated biomarker studies for clinical trials. He is a leader in the field of translational research and precision medicine, and his laboratories at KUMC continue to focus on various aspects of both basic and translational research, with an emphasis on the early detection of cancer, predictive and prognostic biomarkers, liquid biopsies based on extracellular vesicles, molecular therapeutics, companion diagnostics, clinical trials, and biosample ascertainment. He is currently a member of the Early Therapeutics and Rare Cancers Committee and vice chair of the Breast Translational Medicine Subcommittee of the Southwest Oncology Group (SWOG), Dr. Godwin remains active in ovarian cancer advocacy.

Samir N. Khleif, MD
Professor of Oncology
Georgetown University
Washington D.C.

Samir N. Khleif, MD, is an immunologist and immune therapist. His research program ''Translational Tumor Immunology'' focuses on understanding mechanisms through which the immune system and cancer cells interact and how to overcome tumor tolerance in developing therapeutic approaches. Specifically, his research interests include developing novel immune therapeutics, cancer vaccines and delineating the mechanisms of resistance to immunotherapy. From 2006-2009, Dr. Khleif was asked by the U.S. government to develop and direct the King Hussein Cancer Centre in Amman. Dr. Khleif served as Director of Georgia Cancer Center at Augusta University. As Director of the Georgia Cancer Center, Dr. Khleif oversaw the development of a large integrated program of basic scientists and clinicians merging the Cancer Center's strengths in immunology, inflammation, tolerance, basic science, and immune therapy. Dr. Khleif was an intramural NIH scientist for 20 years. While at NCI, he served as a leader of the Cancer Vaccine Section, leading a nationally active Immune Therapy Program. His laboratory has conducted some of the earliest clinical trials in antigen vaccines and was the first to conduct vaccines against mutant oncogenes. He has published several studies on the mechanisms of tumor-induced suppression in animal models and has overcome such inhibition by developing strategies that have been translated into clinical trials.

Timothy Richard Rebbeck, PhD
Vincent. L. Gregory, Jr. Professor of Cancer Prevention
Director, Zhu Family Center for Global Cancer Prevention
Director, Center for Cancer Equity and Engagement
Harvard T.H. Chan School of Public Health
Dana-Farber Cancer Institute
Harvard Medical School
Boston, MA

Timothy Rebbeck, PhD, is the Vincent L. Gregory, Jr. Professor of Cancer Prevention at the Harvard TH Chan School of Public Health and Professor of Medical Oncology at the Dana-Farber Cancer Institute. Dr. Rebbeck's research focuses on the etiology and prevention of cancer with an emphasis on cancers with a genetic etiology and those that are associated with disparities in incidence or mortality by race. He has directed multiple large molecular epidemiologic studies and international consortia that have been used to identify and characterize genes involved in cancer etiology, understand the relationship of allelic variation with biochemical or physiological trait s, and explore interactions of inherited and somatic genomic variation with epidemiological risk factors. He has also led studies of BRCA1 or BRCA2 mutations to understand breast, ovarian, and prostate cancer risk and precision prevention interventions that may reduce that risk. In addition to his research activities, Dr. Rebbeck leads several initiatives on the Harvard Campus. He serves as Associate Director for Equity and Engagement in the Dana-Farber / Harvard Cancer Center and Co-Director for the Collective Impact Program of Harvard Catalyst.

Sora Park Tanjasiri, DrPH, MPH
Professor, Department of Epidemiology & Biostatistics
Equity Advisor, Program in Public Health
Associate Director, Cancer Health Equity & Community Engagement
Chao Family Comprehensive Cancer Center
University of California, Irvine
Orange, CA

Sora Park Tanjasiri, DrPH, MPH, is a Professor in the department of Epidemiology at the University of California, Irvine Department and The Associate Director of Cancer Health Disparities and Community Engagement at the Chao Family Comprehensive Cancer Center. Her research focuses on community health promotion to reduce cancer health disparities among diverse populations, particularly Asian Americans and Pacific Islanders. She has served as PI or Co-PI on over two dozen extramurally funded cancer-related studies, including multiple Principal Investigator of the Bristol-Myers Squibb Foundation-funded Optimizing Access to Cancer Care for Asian Americans, and the NCI-funded U54 Community Network Program Center WINCART: Weaving an Islander Network for Cancer Awareness, Research and Training. Her research has been published in such peer-reviewed journals as *American Journal of Public Health*, *Journal of the American Medical Association*, *Health Education & Behavior*, and *Health Promotion Practice*. Dr. Tanjasiri also serves as an advisor to numerous non-profit organizations, including the Orange County Asian Pacific Islander Community Alliance, St. Joseph Health System Community Partnership Fund, and the Orange County Women's Health Project.

APPENDIX E

Act 181

State of Arkansas *As Engrossed: S2/4/19*
92nd General Assembly **A Bill**
Regular Session, 2019 SENATE BILL 151

By: Senators Irvin, Bledsoe, B. Davis, J. English
By: Representatives M. Gray, Barker, Bentley, Brown, Capp, Cavenaugh, Crawford, Dalby, C. Fite, Lundstrum, J. Mayberry, Petty, Rushing, Speaks, Vaught, Gazaway

For An Act To Be Entitled

AN ACT CONCERNING THE PURSUIT OF A NATIONAL CANCER INSTITUTE-DESIGNATED CANCER CENTER AT THE WINTHROP P. ROCKEFELLER CANCER INSTITUTE AT THE UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES; TO CREATE THE UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES NATIONAL CANCER INSTITUTE DESIGNATION *TRUST FUND*; AND FOR OTHER PURPOSES.

Subtitle

CONCERNING THE PURSUIT OF A NATIONAL CANCER INSTITUTE-DESIGNATED CANCER CENTER AT THE WINTHROP P. ROCKEFELLER CANCER INSTITUTE AT THE UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF ARKANSAS:

SECTION 1. DO NOT CODIFY. Legislative findings.

The General Assembly finds that:

(1) In 2018, approximately sixteen thousand (16,000) Arkansans were diagnosed with cancer in 2018, which means that forty-four (44) Arkansans were diagnosed with cancer per day;

(2) Of those sixteen thousand (16,000) Arkansans diagnosed with cancer, six thousand nine hundred ten (6,910) will die of the disease;

(3) The four (4) types of cancer with significantly high annual

diagnosis rates in Arkansas are:

(A) Lung and bronchus cancer, with two thousand seven hundred twenty (2,720) diagnoses;

(B) Breast cancer, with two thousand one hundred sixty (2,160) diagnoses;

(C) Prostate cancer, with one thousand two hundred sixty (1,260) diagnoses; and

(D) Colon and rectal cancer, with one thousand three hundred seventy diagnoses (1,370);

(4) Over the past twenty-eight (28) years, nationwide cancer-related deaths have decreased by five percent (5%), but in Arkansas the rate of cancer-related deaths has increased by nine percent (9%);

(5) Only Kentucky, Mississippi, and Oklahoma had higher cancer-related death rates in the past twenty-eight (28) years than Arkansas;

(6) Cancer is the second-leading cause of death in Arkansas and may become the leading cause of death within the next decade, surpassing the current leading cause, cardiovascular disease, based on the diagnosis trends in the state;

(7) There are currently seventy (70) National Cancer Institute-Designated Cancer Centers, located in thirty-six (36) states and the District of Columbia, including National Cancer Institute-Designated Cancer Centers in Texas, Missouri, Oklahoma, and Tennessee;

(8) There are no National Cancer Institute-Designated Cancer Centers in Arkansas, Mississippi, or Louisiana;

(9) In 2018, the State of Oklahoma received the seventieth National Cancer Institute-Designated Cancer Center;

(10) Having a National Cancer Institute-Designated Cancer Center in Arkansas will improve and expand access to clinical trials, cancer treatment, cancer prevention, cancer screening, and education in Arkansas;

(11) A National Cancer Institute-Designated Cancer Center in Arkansas would act as a hub of groundbreaking treatments and care for the communities around the state;

(12) Arkansas cancer patients often times are required to leave the state to receive treatment at a National Cancer Institute-Designated Cancer Center;

(13) National Cancer Institute-Designated Cancer Centers have

expanded treatment options due to research grant funds and experimental trials, and hundreds of research studies are underway at these centers, ranging from basic laboratory research to clinical assessments of new treatments not currently available in Arkansas;

(14) Having a National Cancer Institute-Designated Cancer Center in the state would save the lives of thousands of Arkansans through expanded treatment opportunities, including opportunities to participate in experimental cancer treatments;

(15) Being a National Cancer Institute-Designated Cancer Center would allow the Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences to be awarded more research funds, which will provide additional experimental cancer treatments in the state;

(16) A National Cancer Institute-Designated Cancer Center will provide support for cancer treatment providers, clinics, and hospitals in Arkansas;

(17) In addition to the human suffering caused by cancer, there are economic costs that result from the disease, including medical costs and the impact on the productivity of the cancer patient and his or her family;

(18) The Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences is pursuing designation as a National Cancer Institute-Designated Cancer Center for the benefit of the more than three million (3,000,000) citizens of Arkansas;

(19) The National Cancer Institute recommends that a cancer center have at least twenty million dollars ($20,000,000) in National Cancer Institute-funded research;

(20) The Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences currently has approximately ten million dollars ($10,000,000) in National Cancer Institute-funded research;

(21) The Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences can apply for only a limited number of National Cancer Institute grant funds because over sixty percent (60%) of the National Cancer Institute's grant applications require that the cancer center be a National Cancer Institute-Designated Cancer Center in order to apply for the grant funds;

(22) In order to achieve status as a National Cancer Institute-Designated Cancer Center, the Winthrop P. Rockefeller Cancer Institute at the

University of Arkansas for Medical Sciences will need to recruit:

(A) A renowned expert in cancer research to serve as the Director of the Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences; and

(B) Nationally recognized National Cancer Institute-funded medical professionals;

(23) To be successful in gaining status as a National Cancer Institute-Designated Cancer Center, ongoing, dedicated financial support from the State of Arkansas is critical;

(24) The Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences will need a stream of funding between ten million dollars ($10,000,000) and twenty million dollars ($20,000,000) per year to establish and maintain a National Cancer Institute-Designated Cancer Center;

(25) Like other states that have been successful in securing status as a National Cancer Institute-Designated Cancer Center for their cancer centers, it is incumbent that the State of Arkansas invest in this initiative;

(26) It is a strategic goal of the Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences to becomes a National Cancer Institute-Designated Cancer Center;

(27) State government funds will assist the Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences secure vital investments from other public and private sources;

(28) The Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences is committed to raising at least thirty million dollars ($30,000,000) in private funds to support the pursuit of achieving status as a National Cancer Institute-Designated Cancer Center;

(29) The private resources pursued by the Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences are a part of a cohesive and focused plan that will forever change the state;

(30) It is estimated that having a National Cancer Institute-Designated Cancer Center will bring in an additional seventy million dollars ($70,000,000) annually to Arkansas's economy and will create one thousand five hundred eighty-four (1,584) new jobs over five (5) years;

(31) The state should establish a fund solely for the purpose of pursuing and maintaining status as a National Cancer Institute-Designated Cancer Center for the Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences;

(32) If upon June 30, 2027, the Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences has not achieved status as a National Cancer Institute-Designated Cancer Center, then the fund created in this act should sunset; and

(33) Future General Assemblies will have the authority and responsibility to evaluate the progress of the Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences toward achieving status as a National Cancer Institute-Designed Cancer Center and adjust this act accordingly.

SECTION 2. Arkansas Code Title 19, Chapter 5, *Subchapter 11*, is amended to add an additional section to read as follows:

19-5-1149. University of Arkansas for Medical Sciences National Cancer Institute Designation *Trust Fund* — Report.

(a) There is created on the books of the Treasurer of State, the Auditor of State, and the Chief Fiscal Officer of the State a *trust* fund to be known as the "University of Arkansas for Medical Sciences National Cancer Institute Designation *Trust Fund*".

(b) The fund shall consist of:

(1) Moneys obtained from private grants or other sources that are designated to be credited to the fund; and

(2) Any other funds authorized or provided by law.

(c) The fund shall be used by the Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences solely to achieve and maintain status as a National Cancer Institute-Designated Cancer Center.

(d) The Treasurer of State shall invest the moneys available in the fund.

(e)(1) The investment of funds under this section is exempt from § 19-3-518(a)(2)(B)(i)(b) and (c).

(2) Moneys in the fund may be invested in any instrument:

(A) Listed in § 19-3-518(b)(1)(B); and

(B) Approved by the guidelines established by the State Treasury investment policy approved by the State Board of Finance.

(f) Moneys remaining in the fund at the end of each fiscal year shall carry forward and be made available for the purposes stated in this section in the next fiscal year.

(g)(1) The Winthrop P. Rockefeller Cancer Institute at the University of Arkansas for Medical Sciences shall submit a semiannual report containing the following information to the Governor; the Legislative Council or, if the General Assembly is in session, the Joint Budget Committee; the Senate Committee on Public Health, Welfare and Labor; and the House Committee on Public Health, Welfare, and Labor:

(A) The balance of the fund as of the reporting date;

(B) A list of the administrative costs paid for from the fund, including without limitation salaries, pensions, and packages;

(C) The total revenue received by the fund during the reporting period; and

(D) A detailed description of the steps taken and the progress made toward achieving status as a National Cancer Institute-Designated Cancer Center during the reporting period.

(2) The semiannual report required under this subsection shall be submitted by January 1 and July 1 of each year.

/s/Irvin

APPROVED: 2/19/19