



Internships in Global Health

Sponsored by the Center for Health and Wellbeing



Summer 2020

Hands-on work in the developed and developing world. Research internships at the forefront of global health. Access to those creating tomorrow's global health policies.

Princeton's Center for Health and Wellbeing (CHW) sponsors the **Internships in Global Health**, fully-funded internships spanning global health topics overseas and in the U.S. Hands-on experience brings new dimensions to classroom work, and can inspire future research, lead to new interests, and influence career directions.

SUMMER 2020 INTERNSHIPS IN GLOBAL HEALTH

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The above internships are open to all Princeton first-years, sophomores, and juniors. Internships on this list are all pre-approved for the Service Focus program, and all satisfy the GHP certificate summer research requirement for rising seniors. For these internships, the Center for Health and Wellbeing will cover all expenses including airfare, housing, food, local transportation and incidentals.

Students may apply to the Internships in Global Health at globalhealth.princeton.edu/internships or by searching gps.princeton.edu. Students may apply to as many internship opportunities as interest them; there is no limit. Finalists will be notified by mid-December and will be invited for brief interviews in early January, after which final selections will be made.

Questions? Contact CHW Program Coordinator Sara Goldman at sarajg@princeton.edu or (609) 258-7083.

**INTERNSHIP APPLICATION DEADLINE:
SUNDAY, DECEMBER 8 AT 11:59 PM**



Visit globalhealth.princeton.edu/internships



Oxford University Clinical Research Unit

➤ *Antibiotic Resistance Internships*

Location: Hanoi, Vietnam

Duration: 8-12 weeks

Number of Positions: 2

Stipend: \$5,000

To Apply via GPS: Click [Here](#)

About: The Oxford University Clinical Research Unit (OUCRU) aims to have a positive and significant impact on global health and, in particular, the prevention, diagnosis and treatment of infectious diseases. OUCRU's key areas of research are: Dengue fever; malaria; tuberculosis; influenza; enterics; HIV and HIV coinfection; central nervous system infections; animal health and zoonoses; pharmacology; and statistics, bioinformatics, modeling, and mapping.

Intern Responsibilities: The OUCRU Hanoi research group is evaluating a range of interventions in different settings to tackle inappropriate antibiotic use and antibiotic resistance. This work includes antibiotic stewardship in hospitals and primary healthcare, point-of-care diagnostics to guide better prescribing, health messaging for the public, and community engagement using a one health approach to generate collective solutions. All of these approaches will be evaluated through both qualitative and quantitative research. Epidemiological and modelling work on vaccine-preventable diseases will also be conducted, as well as investigating the role of vaccination as a potential tool in the fight against antibiotic resistance.

There are many possibilities for what interns could be involved with, depending on their skills and interests. These may include:

- Statistical analysis, using R or Stata
- Systematic literature review
- Mathematical modelling
- Qualitative data analysis
- Drafting research papers
- Compiling reference libraries
- Background research and scoping

Research activities will primarily be based at the OUCRU offices in Hanoi. These are split across two sites, one at the National Hospital for Tropical Diseases, and one at the National Institute for Hygiene and Epidemiology. There will also be extensive fieldwork in Nam Dinh Province, to the South East of Hanoi, and there may be opportunities for students to visit the sites. There will be closer supervision at the beginning of the internship, but interns should expect to work more independently as they become familiar with the tasks.

Qualifications: Interest in public health. Depending on the project, candidates may benefit from experience in mathematical modeling, basic statistical principles, the R programming language (or ability to learn it), Linux command line tools, literature review, visual media methods (photography/film), and geographical information systems. Language skills are not required.

Website: www.oucru.org

View Internship Summary Posters from Past OUCRU Princeton Student Interns:

Summer 2019

Jaeyoon Cha '21 - [Analysis of 546 M. tuberculosis Genomes from the Indian Subcontinent](#)

Mary DeVellis '21 - [Antimicrobial Resistance in Vietnam: A Qualitative Approach](#)

Arielle Lawson '20 and Nikita Nangia '20 - [Vaccine Non-specific Effects: A Solution to the Antibiotic Resistance Crisis](#)

Sarah Perkins '21 - [Incidence Estimation for Uncertain Events](#)

Summer 2018

Dylan Kim '21 - [Child Vaccination Indicators in Developing Countries](#)

Katherine Park '19 - [Health Policies Regarding Antimicrobial Resistance in Developing and Developed Countries](#)

Tiffany Pham '20 - [Mapping of Resistance Data for Non-Malarial Febrile Illness in South East Asia](#)

Tianyi Wang '19 - [Care-Seeking and Antibiotic Use Over Time in Children Under 5 in Vietnam](#)

Summer 2017

Crystal Wang '18 - [Post-Viral Burden of Dengue in Vietnam](#)

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Telethon Kids Institute

➤ *Various Research Internships*

Location: Perth, Australia

Duration: 8-12 weeks

Number of Positions: 7

Stipend: \$6,000

To Apply via GPS: Click [Here](#)

About: The Telethon Kids Institute (TKI) is a research organization that brings together communities, researchers, practitioners, policy makers and funders, who share a vision to improve the health and wellbeing of children through excellence in research. TKI's research focus areas include aboriginal health; brain and behavior; chronic and severe diseases; and early environment.

Intern Responsibilities: There are seven potential focus areas for a student intern.

FOCUS AREA #1 – Physical Activity Policy for Early Childhood Education and Care

The Child Physical Activity, Health and Development team works to uncover the best environments, policies and programs to improve children's physical activity levels, health and development to support lifelong health and wellbeing. Research draws on the skills and experience of the research team's multi-disciplinary backgrounds to engage with stakeholders and deliver high quality research, policy, programs and training for children, parents and educators to support physically active and healthy childhoods. Research training and experience is provided for undergraduate and post-graduate students who are interested in pursuing a career in child health and development, health promotion or population health.

The PLAYCE program of research focuses on developing, evaluating and translating strategies for improving young children's movement behaviors, health and development. This research targets the environments in which young children are exposed; home, neighborhood and early childhood education and care. This is a research intensive internationally recognized multidisciplinary team with complimentary expertise in child physical activity and related health behaviors, community and early childhood education and care based interventions, supportive environments for physical activity and health, national and international physical activity policy and guideline development, physical activity measurement, health promotion policy implementation and evaluation, qualitative and quantitative health research methods, and consumer and community engagement.

The intern will work primarily with Associate Professor Hayley Christian and will have the opportunity to work with other leading researchers from other departments and institutions nationally and internationally. The intern will aid the development, implementation and evaluation of evidence informed physical activity policy for early childhood education and care (ECEC) providers in Australia. S/he will work collaboratively with government, NGOs and private partners and work on quantitative and qualitative studies to capture high quality data, data processing and analyses, and assist with the dissemination and translation of findings to

partners investigators and stakeholders. The intern will be part of this multi-institutional NHMRC-funded project and have the opportunity to partake in stakeholder engagements with different partner agencies.

Day to day tasks will include:

- Policy/guideline development and dissemination
- Meetings with partner agencies (Cancer Council, National Heart Foundation, Goodstart Australia, Nature Play Australia, the Australian Childcare Alliance, Minderoo Foundation-Collaboration for Kids, Department of Health and Department of Local Government, Sport and Cultural Industries)
- Working with the Cancer Council SunSmart schools team
- Data analysis
- Research translation processes
- Childcare professional development training program role out
- Stakeholder consultation and events

*There is scope for the intern to travel with a staff member to external offsite meetings if interested.

Desired Qualifications: An enthusiastic, competent student who will be able to work well independently and collaboratively with the wider research team, along with all external partners and stakeholders. Clear, critical thinking skills and a strong conceptual and analytical background in quantitative and qualitative methods will be an advantage. Excellent writing and communication skills along with an interest in child health and physical activity related research is preferred. A keen interest in health promotion program and policy development, implementation and evaluation methods and implementation research is preferred.

FOCUS AREA #2 – The SToP Trial (See, Treat, Prevent Skin Sores and Scabies: a Cluster Randomized, Stepped-Wedge Trial for Skin Disease Control in Remote Western Australia)

In remote Australian Aboriginal communities, skin infections (sores and scabies) are common. At any one time, almost one out of every two children have skin sores, and one in five children may have scabies. If left untreated, skin infections may lead to more serious health conditions including severe infection (sepsis), bone infection, kidney disease and rheumatic heart disease, all of which occur at among the highest rates in the world in Aboriginal people. The SToP Trial aims to achieve a 50% reduction in the prevalence of impetigo (skin sores) in school aged children 5-9 years. The SToP trial will implement several activities aimed at improving the recognition, treatment and prevention of skin infections over a three year period:

- “See”ing skin infections through development of training resources/packages within a community dermatology model through school-based surveillance of the primary outcome;
- “Treat”ing skin infections using the latest evidence implemented using the Structured Administration and Supply Arrangements ‘standing orders’ namely co-trimoxazole for 3 days BD for impetigo, ivermectin on days 0 and 8 for scabies cases and their contacts and holistic care including treatment of those identified with crusted scabies (ivermectin on days 0, 1 and 8 for grade 1 crusted scabies) and;
- “Prevent”ing skin infections through embedded, culturally informed and developed health promotion and environmental health activities.

The intern will collect and analyze data in support of the SToP Trial, including a visit to a remote community in Northern West Australia. The remote visit would include assisting in assessing children for skin infections as part of school based screening activities. The student will work independently but in frequent contact with Dr. Asha Bowen, the SToP trial team, the Project Manager for Skin Health, and the broader Skin Health team.

Desired Qualifications: An interest in Indigenous health, epidemiology and clinical studies in remote contexts. The student will be involved in quantitative data analysis.

FOCUS AREA #3 – The Missing Piece Surveillance Study: Understanding Contribution of Gas Pharyngitis in the Context of High Impetigo Prevalence

Primary prevention of Acute Rheumatic Fever (ARF) and Rheumatic Heart Disease (RHD) begins with early treatment of Group A streptococcal (GAS) infections. Unfortunately in remote northern Australia where the burden of ARF/RHD is the highest amongst Aboriginal children, it remains unclear whether GAS pharyngitis or GAS impetigo is the primary driver of ARF/RHD. The burden of GAS pharyngitis is anecdotally low in this population. The burden of GAS impetigo is well documented and highly prevalent. To prevent RHD, it is critical to determine whether either or both GAS diseases are contributing to ARF/RHD in order to effectively target and prioritize primary prevention activities. This project will implement prospective surveillance to determine the concurrent burden of skin and throat infections in children, from two remote communities in Northern Australia, over a one year period. The results will help inform the primary prevention strategies needed to reduce ARF/RHD in remote Australian populations.

An opportunity exists for an intern to be involved in data analysis and/or data collection, including a visit to a remote community in Northern West Australia. The remote visit would include assisting in assessing children for skin and throat infection. Data analysis of this project will help inform the primary prevention strategies needed to reduce ARF/RHD in remote Australian populations. The student will work independently but in frequent contact with Dr. Asha Bowen, the Post-Doctoral Fellow who leads the project, as well as the broader Skin Health Team.

Desired Qualifications: An interest in Rheumatic Heart Disease and primary prevention, epidemiology and clinical studies in remote contexts. The student will be involved in developing resources for this study and study visits.

FOCUS AREA #4 – Quality of Life in Children with Intellectual Disability

The Child Disability team at Telethon Kids Institute works towards understanding the natural history of childhood disabilities and improving quality of life for affected children and their families. Our focus is on children with rare genetic disorders and those with intellectual disability.

Children with intellectual disability and their families often experience poor health and wellbeing yet our understanding as to which factors are associated with the best quality of life is disappointingly poor. The Child Disability team has access to several data collections that will allow specific analyses to clarify risk factors for poor health, quality of life and the validation of outcome measures. The precise research question to be addressed in this internship will be determined together with the prospective student. Activities could involve 1) data of large population administrative and health datasets or 2) analyses of questionnaire data that describe impairments, functional abilities, community participation, family functioning, and child and family quality of life.

The intern will identify a research question that can be addressed within the dataset and construct an analysis plan. Thereafter, the intern will clean the data and conduct analyses in the statistical software program Stata. As a member of the authorship group, the intern will draft a manuscript together with Child Disability team members for submission to a journal.

Desired Qualifications: An interest in child disability issues and professional writing, and in applying biostatistical skills.

FOCUS AREA #5 – Interaction and Behavior: Evaluating an Equine (Horse) Assisted Learning Program for Aboriginal Young People

The Yawardani Jan-ga team's main aim is to increase "life-skills" among Aboriginal young people, or increase their capacity to manage feelings and emotional highs and lows. Better life-skills can help build healthy relationships with others, and respond in healthier ways to life stresses.

There are two main components to Yawardani Jan-ga:

1. Intervention: The Yawardani Jan-ga EAL (Equine Assisted Learning) program will be Aboriginal run and staffed. Supervised by Professor Juli Coffin, the delivery of EAL sessions by local Aboriginal EAL Practitioners provides a vehicle for the delivery of a culturally secure and appropriate intervention to improve mental, emotional, social and spiritual wellbeing. Through guided experiences with the horse, a young person is encouraged to develop increased self-awareness, self-regulation, positive relationship skills, healthy boundaries, persistence, and confidence.

2. Intervention-science (evaluation research): To understand the impact on young people and evaluate the intervention, a non-experimental research design has been employed. Data collection is qualitatively led. Techniques employed will include direct observation, interviews, and video, photo and voice technology to capture observable behavior during EAL sessions.

Project Description: The EAL component of Yawardani Jan-ga is a direct response to the urgent need for culturally safe mental health programs in the Kimberley region of Australia, as highlighted by the findings of an investigation into the deaths of 13 Aboriginal young people in the Kimberley between 2012 and 2016. The findings highlighted the severe impact of intergenerational trauma on the wellbeing of young people and the lack of culturally safe mental health services in the Kimberley. Through the Yawardani Jan-ga EAL Program, the team has access to qualitative and quantitative data that will allow the development of a coding guide to enable the assessment of each member of the dyad and of the interactive component that affects each member differently.

The precise research question to be addressed in this internship will be determined together with the prospective student intern, depending on their skills and interests. Thereafter, the intern will clean the data and conduct analyses. Data analysis activities could involve 1) Qualitative analysis of photo/video/voice and/or 2) analyses of quantitative data that describe the EAL program (participant behavioral characteristics, number of sessions, type of sessions, progress measures). *There may be scope for the student to travel with a staff member to external offsite meetings and the Telethon Kids office in the town of Broome.

Data analysis of this project will help inform the development of a coding guide to analyze accurately and thoroughly visible behavior and interactions. This is an excellent opportunity to work with an inspiring team motivated to change the path of Aboriginal youth. The successful candidate will be rewarded with a diverse and multidisciplinary team each with their own specific skills, a friendly and professional learning environment, and comprehensive and modern facilities.

Day to day tasks will include familiarization with project (including literature and data); background reading on the use of observation in the analysis of dyad relationships, focusing on animal-assisted therapies; data analysis; attend meetings with project team and stakeholders; research translation; coding guide outline and development; and incorporating EAL-practitioner feedback on the coding guide.

Desired qualifications: Background or interest in psychology, education, rehabilitation therapy, occupational therapy, or experiential therapy; previous experience in qualitative and quantitative data analysis; excellent critical thinking and problem-solving skills; excellent attention to detail and record-keeping ability.

FOCUS AREA #6 – The Link between Inflammation and the Daily Lives of Aboriginal People

'Kulunga' is a Noongar word meaning child. The Kulunga Aboriginal Unit was so named to recognize its focus on improving Aboriginal child health. Kulunga has four core aims:

1. Provide support, advice and community navigation for all Telethon Kids Institute (TKI) researchers focused on the health and wellbeing of Aboriginal children and families to ensure the research responds to community needs and meets the Institute's Standards for Aboriginal Health Research
2. Provide cultural training and oversight of cultural governance within research projects
3. Provide training and support for all Aboriginal people involved in conducting research at TKI, and enable their career trajectory
4. Build awareness and understanding of TKI research in Aboriginal communities

Project Description: This project will be led by Kristen White - Program Manager (Kimberley and Pilbara) and aims to address Kulunga objective 4. The specific focus of the project is help communities understand the link between inflammation and the daily lives and social experiences of Aboriginal people. Inflammation is an integral part of the stress response. In the context of the "fight or flight" reaction, acute psychosocial stress can induce activation of important inflammation regulatory pathways, in turn promoting increased susceptibility to infection (skin and respiratory), impaired repair of damaged tissue, and potentially an important role in the development of chronic conditions such as cardiovascular disease and diabetes. Inflammation therefore, may potentially link many of the research projects underway at Telethon Kids. The information compiled for this project will help inform the development of training packages targeting school-age Aboriginal children and communities.

Desired Qualifications: Clear, critical thinking skills and a strong conceptual and analytical background in quantitative and qualitative methods will be an advantage. Excellent writing and communication skills along with an interest in the Developmental Origins of Health and Disease is preferred. A keen interest in health promotion will be advantageous, along with initiative and resourcefulness to gather and synthesize relevant information.

FOCUS AREA #7 - Sensitizing Medulloblastoma to Treatment Using Kinase Inhibitors

The Brain Tumor Research Program at Telethon Kids Institute, established in 2011, brings together the clinic and the laboratory to advance research into childhood brain tumors. We are dedicated to finding and testing new therapies for the treatment of deadly childhood brain cancers. We do this by identifying good therapeutic candidates in the laboratory and testing them on tumors growing in the brains of mice. Our tumor cells are carefully chosen to represent the breadth of different tumors from patients as best as is currently possible. We test if the therapy can improve survival of the mice, how the therapy works and if there are any adverse effects on normal tissue. We use this data to inform clinical trial design aimed at improving the outcomes of children with brain cancer.

More children die from brain tumors than any other disease. This project focuses on the most common malignant brain cancer of childhood: medulloblastoma. One in three patients with high-risk disease die within 5 years of diagnosis and we need more effective therapies. Our goal is to find ways to enhance existing treatments, prove the new methods work using laboratory techniques, then translate them into clinical use. Medulloblastoma is treated with a combination of surgery, radiotherapy and chemotherapy. Radiation and chemotherapy work by damaging the DNA inside cancer cells, causing the cells to die. However, cancer cells often repair the DNA damage, survive and multiply; leading to treatment failure and tumor regrowth. We have evidence that both radiotherapy and chemotherapy can be improved if DNA repair is stopped.

The drug that we will investigate in this project is iATR, which stops DNA repair by blocking a protein in the call called ATR. When DNA is damaged, ATR normally works to repair DNA, which allows cancer cells to survive; but in the presence of iATR, DNA repair is stopped, and the cells die. This works better in cancer cells than healthy cells because cancer cells multiply faster. We have demonstrated that iATR enhances the tumor-killing activity of chemotherapy in mouse models of medulloblastoma, resulting in reduced tumor growth and improved animal survival. This project will focus on understanding the mechanisms by which this drug works.

Laboratory benchwork may include but not be limited to the following techniques:

- Immunohistochemistry, histology, microscopy and quantitative morphometry
- Tissue culture of mouse and human brain cancer cells

Desired Qualifications: No mandatory qualifications required, however understanding of PC2 laboratory practices and some laboratory experience would be preferred including knowledge occupational health and safety requirements.

Website: www.telethonkids.org.au

View Internship Summary Posters from Past Telethon Kids Institute Princeton Student Interns:

Summer 2019

Coco Chou '20 - [Missing Piece Surveillance Study](#)

David Cordoba '20 - [Cardiovascular Risk Factors in Youth with Type 1 Diabetes in Western Australia](#)

Jocelyn Galindo '21 - [The Measurement of Adequate Housing Conditions in Aboriginal Households Living in Urban Settings](#)

Rachel Kim '20 - [Quality of Life and Child Intellectual Disability](#)

Lucy Wang '21 - [SToP Trial: Assessing Impetigo and Scabies in Remote Aboriginal Communities](#)

Summer 2018

Ellen Anshelevich '19 - [Developing an Effective Community Care Program For Skin Infections in Aboriginal Communities](#)

Andy Zheng '20 - [Evaluating and Supporting Suicide Prevention: Addressing Social and Emotional Wellbeing](#)

Summer 2017

Patrick Dinh '18 - [Racism & Skin Disease in Aboriginal Communities in the Western Desert](#)

Aaron Gurayah '18 - [Beat CF: Overview of an Adaptive Clinical Trial in Respiratory Medicine](#)

Danielle Victoriano '19 - [AusVaxSafety: Descriptive Analysis for Zostavax](#)

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Zhejiang University: Lab of Translational Medicine, Chronic Disease Research Institute, and Center for Health Policy Studies

➤ Research Internships

Location: Hangzhou, China

Duration: 8-10 weeks

Number of Positions: 4

Stipend: \$2,000 plus full university meal plan and lodging in China

To Apply via GPS: Click [Here](#)

About: Zhejiang University is a university in the eastern China city of Hangzhou, about one hour by train east southwest of Shanghai. Founded in 1897, it is one of China's oldest, most selective and most prestigious institutions of higher education. The city of Hangzhou is known for its natural beauty and is home to the West Lake UNESCO World Heritage Site.

Intern Responsibilities: There are three potential focus areas for summer interns.

FOCUS AREA #1 – Lab of Translational Medicine, Zhejiang University School of Medicine

This lab conducts research on the molecular mechanism underlying stomach cancer, the second leading cause of cancer-related death in China. Interns will acquire basic laboratory skills and will assist with studies on gastric cancer. They will begin by learning bio-information analysis, which they will use to search for genes differentially expressed in gastric cancer tissues compared with their corresponding noncancerous tissues. Next the interns may participate in cloning one mRNA or long non-coding RNA. Then they will study basic cellular functions of the target gene and submit a written survey report, with research tasks to include literature review, experiments, data analysis and attending a weekly lab seminar. At the close of the internship students will visit Zhejiang University School of Medicine's Department of Gastroenterology to learn the clinical features of stomach cancers. Chinese language skills are NOT required for this internship.

FOCUS AREA #2 - Chronic Disease Research Institute, Zhejiang University School of Public Health China

The Chronic Disease Research Institute (CDRI) at Zhejiang University School of Public Health is committed to conducting high-quality research on the prevention and treatment of obesity, metabolic syndrome, hypertension, diabetes, cardiovascular disease, and other related chronic diseases. Currently, CDRI primarily aims to develop research on obesity and related chronic diseases, such as cardiovascular disease, hypertension, diabetes, etc. Research at CDRI spans across many disciplines, including molecular biology, basic medicine, clinical medicine, epidemiology, health economics, biomedical engineering, nutrition and sports science research, etc. CDRI has also developed five research bases to support its research study.

Following a week designated for lab orientation and basic field survey methods training, the intern/s will design their own summer research projects related to chronic disease studies. For the remainder of the internship, the intern/s will collect data in the practice base (Lanxi Cohort Research Base or Chronic Disease Intervention Base at Hangzhou Ziyang Community) under the guidance of a Ph.D. student, review the relevant literature, analyze the data, present results and submit a written survey report. For CDRI interns, basic spoken Mandarin Chinese proficiency skill is preferred.

FOCUS AREA #3 – Center for Health Policy Studies, Zhejiang University School of Medicine

The Center for Health Policy Studies specializes in the following research areas: mental health, health determinants and outcomes assessment, health economics and policy, family medicine and community health services. This internship exposes Princeton undergraduates to the challenge of data collection, analysis and research in field setting, and some summer projects may lead to senior theses. Past projects have focused on topics such as dementia care models, health insurance and maternal mortality.

Following basic field survey methods training, interns will design their own summer research projects and collect data in the practice base (including Lanxi County rural area and the urban Westlake District in Hangzhou) under the guidance of a Ph.D. student. They will then analyze their data and submit a written survey report on their research findings. Other intern responsibilities may include literature review, survey design and organizing interviews. For CHPS interns, basic spoken Mandarin Chinese proficiency is preferred.

Qualifications: Interest and basic knowledge of health. For Lab of Translational Medicine, laboratory skills in molecular biology is required, but no proficiency in Mandarin Chinese is required. For CDRI and CHPS, basic spoken Mandarin Chinese proficiency is preferred.

Website: www.cmm.zju.edu.cn/index.php?web=english and www.phs.zju.edu.cn/english

View Internship Summary Posters from Past Zhejiang University Princeton Student Interns:

Summer 2019

Alison Chang '20 and Jasmine Lu '21 - [Health and Honesty in Hangzhou](#)

Xuefei Gao '22 - [Pseudouridine Synthase mRNA and Protein Expression Levels in Gastric Cancer](#)

Summer 2018

Leslie Chan '20 - [Potential Role of heylin Gastric Cancer Progression](#)

Young Sheng '19 - [Sleep Quality's Relationship with Obesity, Sarcopenia, Sarcopenic Obesity among Chinese Women](#)

Summer 2017

Natalia Roszkowska '20 - [Tumour Suppressor GEN: Protein Level Expression Effects on Metastasis](#)

Jessica Sheng '19 - [Relationship between Nicotine Dependence and Fat Distribution](#)

Young Sheng '19 - [The Cost Burden of MDR-Infections in Chinese Hospitals](#)

Lydia Zhong '20- [Lentivirus-mediated Knockdown of ERK3 Inhibits Migration of Gastric Cancer Cells](#)

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Gavi, the Vaccine Alliance

➤ ***Advocacy and Public Policy Internship***

Location: Geneva, Switzerland

Duration: 8-10 weeks

Number of Positions: 1

Stipend: \$5,000 to \$6,000

To Apply via GPS: Click [Here](#)

About: Created in 2000, Gavi is an international organisation - a global Vaccine Alliance, bringing together public and private sectors with the shared goal of creating equal access to new and underused vaccines for children living in the world's poorest countries. Our four strategic goals are to:

- Accelerate equitable uptake and coverage of vaccines
- Increase effectiveness and efficiency of immunization delivery as an integrated part of strengthened health systems.
- Improve sustainability of national immunization programmes.
- Shape markets for vaccines and other immunization products.

The Gavi headquarters office in Geneva, Switzerland mobilizes resources to fund programs, coordinates program approvals and disbursements; develops policy and implements strategic initiatives; monitors and evaluates ongoing projects; and provides legal and financial management.

Intern Responsibilities: The intern will join the Public Policy Engagement team to implement Gavi's advocacy and public policy strategy. Responsibilities will include:

- Review and analyze global and regional public policy instruments and landscape to identify advantageous entry points for immunization, primary healthcare and universal health coverage (UHC).
- Document and analyze emerging areas in health policy landscape and linkages to the United Nations' 2030 Agenda for Sustainable Development and other cross-cutting areas (nutrition, education, etc.).
- Assist with writing quality policy reports, briefings, background pieces, and policy briefs.
- Work independently and as part of the Public Policy Engagement (PPE) team on special non-recurring and on-going projects.
- Coordinate internal and external discussions/meetings as needed, taking meeting notes and coordinating follow-up on action points.
- Identify, document and propose stakeholders (government officials, influencers, academic, research organisations, networks and alliances) to be mobilised for Gavi's advocacy and public policy strategy.
- Support relevant stakeholder coordination & management within the political "will building" strategy
- Contribute to organization of relevant public policy meetings, events, and forums.
- Support the development of advocacy and public policy documents, including presentations, reporting, policy positions, datasets, and factsheets.
- Other duties as assigned by supervisor.

Qualifications: Demonstrated interest in public policy, global health, and/or international affairs. Strong research and document review skills. Excellent writing and communications skills in English. Excellent team-working and collaborative skills. Solid time-management and organizational ability, including the ability to work independently. Demonstrated initiative, willingness to innovate, and flexibility. Ability to work effectively in a fast-paced, multicultural setting. Strong analytical, critical reasoning skills and ability to make logical or implied connections between policy themes, agendas and priorities. The office working language is English, but French language ability is advantageous, and fluency in any other language is a potential asset.

Website: www.gavi.org

New Internship for 2020; no past Princeton interns.

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reach

To stop rheumatic heart disease



Reach NGO Rheumatic Heart Disease & Rheumatic Fever

➤ *Prevention and Control Internship*

Location: Geneva, Switzerland

Duration: 8-10 weeks

Number of Positions: 1

Stipend: \$5,000 to \$6,000

To Apply via GPS: Click [Here](#)

About: Reach is an international NGO that works to promote the health of vulnerable populations by providing technical support to countries around the world to prevent and control rheumatic fever and rheumatic heart disease.

Reach provides technical support and policy translation to amplify rheumatic heart disease control and rheumatic fever efforts. As an organization we aim to identify, describe and disseminate solutions for this neglected disease and to reduce the burden on vulnerable populations around the world. As a collaborative organization, we partner with a broad range of stakeholders – including clinicians, other disease communities, academics, donors, governments, industry and people living with RHD – to achieve our common goals.

Intern Responsibilities: The intern will join the Program Team working to support in-country efforts to strengthen RF and RHD prevention and control. Responsibilities will include:

- Engaging in dialogue with global and regional stakeholders regarding the role and work of Reach
- Contributing to the drafting of Reach publications and website articles
- Conducting desk reviews of current national RF/RHD activities
- Contributing to the drafting and review of reports on Reach activities

Qualifications: Demonstrated interest in global health and development. Excellent writing and communications skills in English. Excellent team-working and collaborative skills. Solid time-management and organizational ability. Demonstrated initiative, willingness to innovate, and flexibility. Ability to work effectively in a multicultural setting. Proficient in MS Office, advanced internet literacy. Experience in review and synthesis of research evidence.

Website: stoprhd.org

New Internship for 2020; no past Princeton interns.

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**University of
Sunderland**

**Veterans in Crisis Sunderland and
University of Sunderland, Faculty of Health Sciences and Wellbeing**
➤ ***Art Therapy to Promote Veteran Wellbeing and Social Inclusion***

Location: Sunderland, United Kingdom

Duration: 8-10 weeks

Number of Positions: 2

Stipend: \$5,000

To Apply via GPS: Click [Here](#)

About: Veterans in Crisis Sunderland (VICS) is a social enterprise dedicated to supporting the welfare of veterans and their families based in the City of Sunderland, England. VICS offers a range of services and programs to veterans which promote social inclusion and are driven by the health and wellbeing needs of the veterans themselves. VICS carry out their work, supported by a range of partners across Sunderland including the University of Sunderland, local businesses and Sunderland Clinical Commissioning Group (CCG), who are the hosting institution for the North East Armed Forces Health Network. Current projects include running regular drop in sessions, a series of arts workshops at the National Glass Centre in Sunderland, and establishing a network of support services for veterans and their families to access. VICS is a young, dynamic organization, and other projects are in various stages of development, allowing a wide range of experiential learning to be gained.

Intern Responsibilities: Interns will be linked in to the current work that VICS undertakes, i.e. supporting the well-being and social inclusion of veterans and their families within Sunderland. The day to day supervision would come from VICS themselves, and the two placements are not prescriptive roles, as the nature and ethos of the work of VICS relies on the needs of the service users, thus there needs to be a degree of flexibility as to the duties carried out on a day to day basis. These placements will involve working across a variety of projects with VICS which will include engagement with veterans and their families, as well working collaboratively with core VICS staff and other agencies involved in the implementation and delivery of the projects. The work of VICS takes place within the City of Sunderland, with any travel anticipated to be local, but will be specific to individual projects.

The successful applicants will be expected to work within a team and also with a relative degree of independence. Regular meetings will be held between the supervisor and the interns to discuss progress. Subject related mentoring support will be provided by the Faculty of Health Sciences and Wellbeing, University of Sunderland.

Qualifications: Applicants should have knowledge and an interest in the health and wellbeing of the veteran population and the role of voluntary organizations in supporting health and wellbeing and reducing social isolation. Applications should possess strong communication skills, be able to demonstrate high levels of empathy and be prepared to be flexible in working across a range of projects with different people and liaising with other organizations.

Website: veteransincrisis.co.uk and www.sunderland.ac.uk

New Internship for 2020; no past Princeton interns.

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Center for Disease Dynamics, Economics & Policy

➤ *Vaccine & Antimicrobial Resistance Research*

Location: New Delhi, India

Duration: 8-12 weeks

Number of Positions: 1

Stipend: \$5,000 to 6,000

To Apply via GPS: Click [Here](#)

About: The Center for Disease Dynamics, Economics & Policy (CDDEP) produces independent, multidisciplinary research to advance the health and wellbeing of human populations around the world. CDDEP projects are global in scope, spanning Africa, Asia, and North America and include scientific studies and policy engagement. The CDDEP team is experienced in addressing country-specific and regional issues, as well as the local and global aspects of global challenges, such as antibiotic resistance and pandemic influenza. CDDEP research is notable for innovative approaches to design and analysis, which are shared widely through publications, presentations and web-based programs. CDDEP has offices in Washington, D.C. and New Delhi and relies on a distinguished team of scientists, public health experts and economists.

Intern Responsibilities: CDDEP has openings for interns in its New Delhi office to work on research related to the intersection of vaccines and antimicrobial resistance, as well as on social norms that promote the overuse of antibiotics and the underuse of vaccines. The position involves locating, pulling, and synthesizing data and evidence from the primary scientific literature. There is potential for motivated candidates to extend this work to do independent research.

Qualifications: Familiarity with ecology, statistics, and experience reading the scientific and social science literature are an asset, as are problem-solving, experience with Excel, and ability to work independently.

Website: cddep.org

View Internship Summary Posters from Past CDDEP Princeton Student Interns:

Summer 2019

Daniel Liu '21 - [The End of Modern Medicine: The Rise of Antimicrobial Resistance](#)

Summer 2018

Nell McKenna '20 - [The Rising Threat of Antimicrobial Resistance: A Look into Effects of Primary Care, Medical Standards, and Antibiotic Consumption](#)

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International Care Ministries

➤ *Community-Based Health Impact Assessment*

Location: Manila, Philippines

Duration: 8-12 weeks

Number of Positions: 2

Stipend: \$5,000

To Apply via GPS: Click [Here](#)

About: International Care Ministries (ICM) is a non-governmental organization that has been serving the ultrapoor in the Philippines since 1992. In partnership with community leaders from thousands of slum communities, ICM delivers programs that transform the lives of more than 100,000 destitute people each year. These multidisciplinary interventions address values, health and livelihood. ICM is a Christian faith-based non-governmental organization; however, interns may be from any background, and the analytical work is secular.

Intern Responsibilities: Interns will partner with the ICM Health Services and Research Teams to analyze survey and operational data in assessing the impact of community-based health interventions. They will use statistical and epidemiological methods to understand the outcomes of these interventions, and the potential underlying variables that are associated. Interns may also have the opportunity to participate in health program design efforts, and may travel to project sites on islands in central Philippines to interview stakeholders and collect data.

This internship will give the student an opportunity to work with a real dataset collected through an intervention that is currently running in the Philippines. The households receiving the interventions live in extreme poverty, therefore the student will also get an understanding of the challenges associated with working in these contexts. As the interventions will continue to run, the outcomes of analyses could be utilized to benefit future protocols and delivery strategies. Past student projects include preparing frameworks for the revision of ICM's primary health education curriculum (including qualitative assessment of feasibility and effectiveness in the field); regional epidemic mapping of health needs; assisting in development and revision of current health intervention protocols; and analysis and evaluation of ICM's overall data collection systems.

Qualifications: Strong quantitative and qualitative analytical skills. Familiarity with public health issues.

Website: www.caremin.com

View Internship Summary Posters from Past ICM Princeton Student Interns:

Summer 2019

Maricar Almeda '22 - [Barriers to Maternal Care Access in Resource Limited Areas in the Philippines](#)

Annika Kruse '20 - [A Follow-up on Children with Severe Acute Malnutrition Treated with Ready-to-Use Therapeutic Food in Rural Philippines](#)

Summer 2018

Mitashee Das '20 - [Maternal Care Access in Resource-Limited Settings in the Philippines](#)

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University of Malaya

➤ *Health Research Internships*

Location: Kuala Lumpur, Malaysia

Duration: 8-12 weeks

Number of Positions: 2

Stipend: \$5,000

To Apply via GPS: Click [Here](#)

About: University of Malaya (UM), Malaysia's oldest university, is situated on a 922 acre campus in the southwest of Kuala Lumpur, the capital of Malaysia. UM is committed to advancing knowledge and learning through quality research and education for the nation and for humanity.

Intern Responsibilities: There are eight potential focus areas for a student intern.

FOCUS AREA #1 – PrEP Scale Up and PrEP Navigator Project

This project will work on scaling up community-based organizations (CBO)-led Pre-Exposure Prophylaxis (PrEP) and the evaluation of a PrEP navigator program. Scope of work includes data collection, analysis, and qualitative interviews.

FOCUS AREA #2 – Harapan 11/Kerinci Project

This project is about substance use and latent tuberculosis infection (LBTI) treatment among prisoners. Scope of work includes data collection and analysis.

FOCUS AREA #3 – Keluarga Sihat 50

This project is about non-communicable diseases (NCD) prevention amongst the urban poor. Scope of work includes data collection and analysis.

FOCUS AREA #4 – Life after Falls among Older Adults

This project focuses on determining factors which influence physical activity after falls among older adults. Scope of work includes data collection and qualitative interviews.

FOCUS AREA #5 – Malaysia Breast Cancer Survivorship Cohort Study

This project aims to determine lifestyle factors which influence breast cancer outcomes. Scope of work includes data analysis.

FOCUS AREA #6 – Improving access to Breast Cancer Early Diagnosis Pathway for Urban Women in Selangor

This project aims to understand health system barriers and facilitators to provision and financing of breast cancer diagnostic pathway. Scope of work includes data collection and qualitative focus group discussions.

FOCUS AREA #7 – Disclosure of HIV Positive Status of Men who Inject Drugs to Female Intimate Partners

The project explores how HIV-positive men who inject drugs make decisions to disclose their status to intimate partners and how these decisions can, ultimately, result in consistent condom use. Scope of work includes data analysis.

FOCUS AREA #8 – Teacher Health Risk Factors and Stress

This project aims to understand the clustering of lifestyle risk factors and stress on health among teachers. Scope of work includes data analysis and report writing.

Qualifications: Applicants should have a baseline understanding of epidemiology and determinants of health, and should seek to gain knowledge of the health context in Malaysia prior to arrival. Applicants should have quantitative and qualitative research ability. Knowledge of statistical applications is preferred.

Website: www.um.edu.my

New Internship for 2020; no past Princeton interns.

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Mpala Research Center and Wildlife Foundation

Location: Laikipia County, Kenya

Duration: 8 weeks

Stipend: variable

Number of Positions: variable

About: The Mpala Research Center and Wildlife Foundation is located on the Laikipia Plateau in north central Kenya. The facility is operated as a partnership involving Princeton University, the Smithsonian Tropical Research Institute, the Kenya Wildlife Service and the National Museums of Kenya. Mpala facilitates and exemplifies sustainable human-wildlife co-existence and the advancement of human livelihoods and quality of life.

Intern Responsibilities: Princeton students normally travel to Mpala to conduct self-directed research projects, taking advantage of the ecological setting and support infrastructure there. No pre-arranged internships are available through the Center for Health and Wellbeing (CHW) at Mpala, and there is no application in Global Programs System (GPS); however, students are welcome to request partial CHW funding for independent health-related research, including senior thesis research, to be conducted at Mpala once CHW's online funding opportunity opens in the spring 2020 semester in the Student Activity Funding Engine, or SAFE (studentfunding.princeton.edu).

Qualifications: Appropriate academic background and experience to conduct desired self-directed research.

Website: www.mpala.org

View Internship Summary Posters from Past Mpala Princeton Student Interns:

Summer 2019

Nourhan Ibrahim '20 - [Secondary School Conservation Biology Education in Laikipia County Kenya](#)

Summer 2018

Carly Bonnet '19 - [Medicinal Herb and Clinic Use in Mpala, Kenya](#)

Ayodele Foster-McCray '20 - [Health Education and Healthcare Implementation in Rural Kenya](#)

Gabriela Rivera '20 - [Mpala Research Centre: Health Education and Mobile Health Outreach](#)

Sebastian Silveira '19 - [The Importance of Nutrient Availability and Parasitic Risk on the Foraging Behaviors of Grevy's & Plains Zebra](#)

Summer 2017

Annabel Lee '20 - [Laikipia Rabies Vaccination Campaign](#)

Maria Malik '19 - [Evaluating the Biodiversity of the Local Anopheles Mosquito Population at MPALA through Larval Sampling](#)

Lily Reisinger '18 - [The Function of Zebra Stripes in Thermoregulation & the Deterrence of Disease-Carrying Biting Flies](#)

Madeleine Sumner '20 - [Faces of Rural Kenya: A Journey through the Kenyan Public Health System](#)

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Children's Hospital Pediatric Obesity Program

➤ *Research, Outreach, & Clinical Opportunities*

Location: Memphis, Tennessee

Duration: 8-12 weeks

Number of Positions: 1

Stipend: \$5,000

To Apply via GPS: Click [Here](#)

About: The University of Tennessee Health Science Center/Le Bonheur Children's Hospital Pediatric Obesity Program conducts clinical and basic science research with the goal of developing individualized treatments for obesity and obesity-related health complications. The Healthy Lifestyle Clinic provides multi-disciplinary care for children with obesity through team-based approach (dietitian, exercise physiologist, behavioral psychologist, and medical subspecialists) and conducts clinical trials using novel medications and devices for weight loss. The Metabolic Research Center studies mice and cellular models to elucidate the role of genetics, dietary composition, physical activity, and microbiome profile in obesity and metabolic diseases. The Healthy Lifestyle Network aims at prevention measures in the community including active video games in the school, cooking classes for community members, and educational meetings open to the public.

Intern Responsibilities: One summer internship position is available, with specific assignments to be tailored to the skills of the intern in alignment with program priorities. The intern will assist with research participant recruitment, preparation and delivery of interventions, assessment of outcome measures, analysis of human specimens (and if interested, translation studies in the basic science lab that directly relate to clinically relevant questions), data entry, statistical analyses, medical literature review, and presentation of data. Interns are also encouraged to accompany doctors on clinical rounds, and to attend seminars and events.

Qualifications: Prior experience working in a molecular biology laboratory is necessary if interested in participating in basic science research. For the clinical research component, prior experience is not necessary but comfort working with children and teenagers is essential. Willingness to work during some evenings and weekends is required. Prior experience in clinical research is not required because training will be provided for all necessary skills to perform assigned duties.

Website: www.lebonheur.org

View Internship Summary Posters from Past Le Bonheur Princeton Student Interns:

Summer 2019

Sandra Yang '22 - [Le Bonheur Children's Hospital: Pediatric Obesity Program](#)

Summer 2018

Jocelyn Galindo '21 - [Le Bonheur Children's Hospital: The Importance of Diets in Liver Metabolism](#)

Summer 2017

Autumn Rose '19 - [Pediatric Obesity Program in Memphis, TN](#)

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**U.S. Peace Corps
Office of Global Health and HIV**

➤ ***Global Planning and Evaluation Internships***

Location: Washington, DC

Duration: 9-12 weeks

Number of Positions: 2

Stipend: \$5,000

To Apply via GPS: Click [Here](#)

About: The Peace Corps Office of Global Health and HIV (OGHH) provides technical and operational support to Peace Corps posts and headquarters offices to improve the health and well-being of individuals, families and communities where Volunteers serve. It accomplishes this by proactively securing and managing the best available human, financial and technical resources; promoting excellent programming consistent with the capabilities of Volunteers; and capitalizing on the contributions of other sectors to improve community health programming. The OGHH Programming and Training (P&T) team supports Peace Corps posts by providing quality training and resources to staff and Volunteers; technical assistance to develop and monitor evidence-based programs; and external support to conduct process and outcome evaluations. OGHH is the primary arm of Peace Corps that directs the implementation of its role in PEPFAR (the U.S. President's Emergency Plan for AIDS Relief).

Intern Responsibilities: Possible Summer Intern Assignments include: 1) Programmatic Data Analysis related to how Peace Corps Volunteers can best implement effective programming for orphans and vulnerable children; 2) Strategic Programmatic Planning by developing a strategy on how Peace Corps Volunteers can address Non-communicable Diseases (NCDs) across the life cycle. An intern would help with researching and meeting various organizations addressing NCDs and developing a strategy on how PC can best contribute to the emerging health problems; 3) Gender Integration into existing programs – There is a growing demand to incorporate a gender lens into PC current health programs. An intern would assist the Gender Specialist in reviewing current programs and approaches and how they would best work both in our work in HIV/AIDS and Maternal and Child Health.

Qualifications: Qualitative and/or quantitative research skills, familiarity with global health issues.

Website: www.peacecorps.gov/volunteer/what-volunteers-do/#health

View Internship Summary Posters from Past Peace Corps Princeton Student Interns:

Summer 2019

Gabriela Oseguera Serra '20 - [What are We Doing? Orphans and Vulnerable Children in Sub-Saharan Africa](#)

Morgan Nicolao '20 - [Peace Corps Office of Global Health and HIV](#)

Summer 2018

Charlotte Moss '19 - [Non-Communicable Disease: Prevention is the Name of the Game](#)

Claire Nussbaum '19 - [Peace Corps Programs for Orphans and Vulnerable Children \(OVC\)](#)

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NYC Health+Hospitals Special Pathogens Program

➤ Emergency Management and Planning Internships

Location: New York City, New York

Duration: 8-12 weeks

Number of Positions: 2

Stipend: \$5,000-\$6,000

To Apply via GPS: Click [Here](#)

About: NYC Health + Hospitals Emergency Management provides the strategic and operational framework and resources to protect our patients, visitors, staff, communities and infrastructure from natural, technological, and intentional incidents through the mitigation of, preparedness for, response to, and recovery from them.

Intern Responsibilities: This is an opportunity for two highly motivated students to contribute to NYC Health + Hospitals' system-wide, emergency management-centric approach to special pathogens preparedness and response activities and assist the National Ebola Training and Education Center. The Special Pathogens Program Interns, reporting to the Director for System-wide Special Pathogens will provide support in one or more of the following project areas:

- Using an emergency management approach to develop special pathogen discussion- or operations-based exercises to maintain healthcare delivery readiness.
- Training of frontline healthcare workers as it relates to identification, isolation, donning/doffing of personal protective equipment, preliminary management and transfer of a suspected Ebola or other special pathogens patient within a U.S. or international frontline healthcare delivery
- Development of exercise resource materials related to Ebola and other special pathogens for national stakeholders including frontline hospitals, assessment hospitals, Ebola treatment centers, Regional Ebola and other special pathogen treatment centers, healthcare coalitions and EMS.
- Using an emergency management approach, research, design, develop, and evaluate topics relating to CBRNE (chemical, biological, radiological, and nuclear issues) to maintain healthcare delivery readiness.

Activities undertaken by the interns will include several of the following:

- Conduct needs assessments
- Research emerging/re-emerging threats that would qualify as a special pathogen/high consequence infectious diseases and would pose a threat to healthcare delivery
- Assist in design and development of a discussion-based exercise based on the Homeland Security Exercise and Evaluation Program (HSEEP) model
- Engage with internal and external stakeholders including public health partners and liaisons
- Participating in planning meetings
- Assist in conducting the discussion-based exercise
- Assist in evaluation of the discussion-based exercise through after action report and improvement planning process

- Participate in walkthroughs of site of exercise
- Assist with developing additional resource tools (e.g., processes, plans, protocols) that would aide in the core elements mentioned above
- Assist in design, development and evaluation of frontline hospital readiness assessments for H+H sites
- Participate in on-site readiness assessments
- Assist in tailoring U.S. based frontline training to meet the needs of the middle-to-low income frontline healthcare delivery
- Work with international stakeholders and participate in planning meetings
- Research specific topic in CBRNE as it relates to healthcare delivery preparedness and response
- Opportunity to present at various councils and forums.
- Opportunity to publish findings

NOTE: Princeton students at this internship will have no exposure to or involvement with any pathogens or dangerous substances at any time.

Qualifications: Highly motivated, with demonstrated interest and exposure to public health, global health, healthcare administration, emergency management, or related field.

Website: www.nychealthandhospitals.org/special-pathogens-program

View Internship Summary Posters from Past NYC Health & Hospitals Princeton Student Interns:

Summer 2019

Sanjana Duggirala '21 and Katya Vera '20 - [Measles Secret Shopper](#)

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Rutgers Cancer Institute & Center for Tobacco Studies

➤ **Research Internships**

Location: New Brunswick, New Jersey

Duration: 8-12 weeks

Number of Positions: 5

Stipend: \$4,000

To Apply via GPS: Click [Here](#)

About: As New Jersey's only National Cancer Institute (NCI) – designated Comprehensive Cancer Center, Rutgers Cancer Institute of New Jersey's team of internationally recognized physicians and researchers is driven by a singular focus and mission, to help individuals fight cancer. Through the transformation of laboratory discoveries into clinical practice, we target cancer with precision medicine, immunotherapy and clinical trials and provide the most advanced, comprehensive, and compassionate world-class cancer care to adults and children. This mission is being accomplished in partnership with RWJBarnabas Health. Rutgers Cancer Institute physicians and scientists work side by side to make sure the most sophisticated treatments are delivered to our patients quickly and safely - the future of cancer treatments today.

The mission of the Center for Tobacco Studies (CTS) is to enhance the evaluation and surveillance of tobacco control as well as industry initiatives and strategies, by conducting research studies, that include primary and secondary data collection and analysis and qualitative and quantitative methods, and to translate and disseminate findings to program planners and policy makers. We seek to advance the scientific base for tobacco surveillance and evaluation by conducting applied research of high quality, integrity, and innovation. We also have a strong collaborative working relationship with the Cancer Prevention & Control Research Program at Rutgers Cancer Institute of New Jersey.

Intern Responsibilities: There are 14 possible internship focus areas for student interns. When applying, please indicate the one or ones you would like to be considered for. There is no limit.

FOCUS AREA #1 – Tobacco Control Policy Research

An intern will join CTS in its mission to conduct, translate and disseminate tobacco-related health research in order to improve public health outcomes. The specific assignment for the intern will be finalized pursuant to student skills and organizational needs, however priority project content areas include:

Supporting the exploration of the effects of exposure to cigar packaging with varying warning labels on cigar perceptions, use intentions, and use among young adults

- Examining marketing tactics and product descriptors for specific combustible products.
- Reviewing statewide Tobacco 21 legislation and the exploration of implementation of Tobacco 21 policies.
- Activities may involve literature search and reviews, data, entry and document drafting.

FOCUS AREA #2 – Cancer Prevention Research

An intern will join with CINJ's efforts to reduce cancer risk behaviors and improve cancer outcomes through individual, family, and system-level interventions. This aim includes interventional and observational research. The intern will engage on several potential projects focusing on skin cancer prevention or detection, patient or survivor quality of life, pediatric or young adult cancer survivorship, and cancer disparities or systems factors related to cancer care. Specific activities may include literature reviews, data management, online and social media tasks, participant recruitment and monitoring, and assisting with presentation of results.

FOCUS AREA #3 – Metastatic Pancreatic Cancer

Pancreatic cancer (PC) is a highly lethal malignancy (projected second leading cause of cancer death in the United States by 2030) even though it is only the eleventh most common cancer. One of the reasons for this aggressive nature is that it spreads distantly in the body very early during its formation. As a result, the majority of patients (85%) are stage IV at diagnosis. Surgical resection is the only therapeutic option that can result in long term survival, however, the majority (>80%) of resected patients go on to die of recurrent pancreatic cancer. These recurrences are due to the dissemination of cancer cells in the body that occur prior to surgery. While the majority of resected patients go on to recur within the first two years (early recurrence), there is a substantial fraction that recur late (latent recurrence) indicating that the biology of these disseminated tumor cells (DTCs) is different. Understanding these differences will translate not only into new therapeutic strategies to control or eliminate these DTCs, but also to provide biomarkers that will help guide clinical management. Pancreatic surgery is highly morbid and the population of patients are increasingly elderly making decisions regarding surgery and/or treatment with potentially toxic chemotherapy challenging. Having a tool to predict who might recur early versus late as well as new therapeutics to target these latent DTCs would make a substantial impact to the management of these patients.

FOCUS AREA #4 – Cancer Epigenetics

Epigenetic dysregulations are commonly found in various types of cancer, but generally have not been well understood. The research in the Cao lab focuses on two recurrent epigenetic events: unbalanced chromatin remodeling in melanoma and Hepatitis B-induced histone modification alteration in liver cancer. The lab utilizes patient-derived cancer cell lines and mouse models to study the consequences of these epigenetic events and their contributions to tumorigenesis, aiming to develop targeted therapeutics. Applicants will have opportunities to participate in these projects and receive training on gene cloning, CRISPR technique, tissue culture, chromatin status analyses, and other cancer-related experiments.

FOCUS AREA #5 – Mechanism of Resistance

The last two decades have seen the development of increasingly effective cancer therapies which target different facets of transformed cells including aberrant proliferation/survival, immune evasion, and dysregulated transcriptional programs. EGFR mutant non-small cell lung cancer has dramatic clinical response to EGFR inhibitors. However, in the majority of lung cancer patients who respond to anti-cancer therapies, therapeutic relapse subsequently ensues such that these responses do not lead to long-term cures. In a subset of these cases, MET amplification arises as a mechanism of resistance to EGFR inhibitors. When different metastases from a single resistant tumor are studied, it is found that they harbor different MET amplifications suggesting convergent evolution. This project will study the chromosome rearrangements leading to amplification of MET from whole genome sequencing of the metastatic tumors to infer the mechanism of genome instability that gave rise to resistance.

FOCUS AREA #6 – Cancer-Risk Genetic Susceptibility

An essential goal in the field of prostate cancer is to reduce prostate cancer mortality by screening and early detection. However, current approaches have led to overdiagnosis of disease that is clinically insignificant, and would not have been detected in the absence of advanced screening techniques. Overdiagnosis frequently results in overtreatment, which can have detrimental long-term effects on quality of a patient's life. Urologists are now addressing overtreatment by increasingly triaging patients with low-risk prostate cancer to active surveillance. However, a significant proportion of localized prostate cancer will exhibit aggressive tumor biology and biochemical recurrence. Hence, there is a need for better risk-stratification to address overtreatment and undertreatment of localized prostate cancer.

Prostate cancer is among the most heritable of human cancer, with around 57% of the inter-individual risk attributed to genetic factors. Recently, metastatic prostate cancer was found to have a higher overall frequency (~11.8%) of germline aberrations in DNA repair genes such as BRCA1/2, ATM, CHEK2, PALPB2 and others. Furthermore, the odds of DNA-repair gene mutations being present among men with metastatic prostate cancer significantly differed from those with localized low-to intermediated risk-tumor (odds ratio, 5.3; 95% CI, 1.9 to 20.2, $p < 0.001$). This project will test the hypothesis that DNA repair genes associated with cancer predisposition have a high frequency of alterations in localized-aggressive prostate cancer in comparison to localized-indolent tumors by analyzing the exome sequenced from a group of selected prostate cancer patients.

FOCUS AREA #7 – Improving the Lives of Children and Adolescents with Blood Disorders and Cancer

Dr. Cole's laboratory, funded by the National Institutes of Health, investigates why some patients suffer side effects of cancer treatment, while others do not. The Cole lab has identified common genetic variants and specific dietary factors that increase the risk of experiencing side effects of anticancer therapies. In addition, they are working to develop interventions to reduce specific side effects, such as the loss of short-term memory or attention span (symptoms of "chemo brain"). Clinically, Dr. Cole has been actively involved on a global level, in designing and conducting clinical trials for children diagnosed with leukemia or lymphoma and has led multiple COG clinical trials testing innovative, targeted combination therapy for adolescents and young adults with relapsed or refractory Hodgkin lymphoma.

FOCUS AREA #8 – Parkin in the Development of Cancer

Parkin, encoded by PARK2 gene, is an E3 ubiquitin ligase. Mutations in PARK2 have been linked to autosomal recessive juvenile Parkinson's disease, a common familial form of Parkinson's disease. Ubiquitination activity of Parkin has been reported to contribute greatly to the role of Parkin in preventing Parkinson's disease. Interestingly, ample studies have shown that Parkin is a bona fide tumor suppressor. PARK2 mutations have been reported in different types of human cancers. Parkin expression is also frequently downregulated in many cancers. Currently, the mechanism of the tumor-suppressive function of Parkin is poorly defined. The ubiquitination activity of Parkin has been suggested to be critical for the tumor-suppressive function of Parkin. Using co-immunoprecipitation followed by liquid chromatography-tandem mass spectrometry (LC-MS/MS), they found that Parkin binds to some proteins that play important roles in cancer metabolism, suggesting that Parkin may suppress tumorigenesis through its regulation of cancer metabolism. They will study the role and mechanism of Parkin in cancer metabolism and tumor suppression.

FOCUS AREA #9 - DNA Repair Effects and their Consequences in Human Cancer

An underlying defect in homologous recombination mediated repair, such as that seen in the setting of mutation in BRCA1 or BRCA2, leads to gross genomic instability and generation of multiple genomic

rearrangements. Some of the hundreds of genomic rearrangements seen in these cancers likely result in oncogenic gene alterations that are driving cancer growth, but current clinical-grade sequencing strategies are not optimal for identifying these changes. This lab is utilizing novel sequencing strategies, including long-read sequencing and targeted RNA analyses, to interrogate the rearrangement landscape of a subset of aggressive breast cancers. The project will focus on identifying and characterizing novel rearrangements affecting likely driver oncogenes in these cancers, and determining if their presence render tumors sensitive to targeted therapies. The project will involve experiments in cell line models of cancer as well as some computational analyses of sequencing data.

FOCUS AREA #10 – The Functional Role of Cytokine Leukemia Inhibitory Factor (LIF)

The LIF protein is a highly pleiotropic cytokine and has multiple important functions. Interestingly, the functions of LIF are highly context dependent; LIF can even display opposing effects on different cells depending on cell types, development stages, etc. It has been well-established that LIF is essential for maintaining pluripotency of mouse embryonic stem cells. However, basal LIF expression levels are generally low in normal adult tissues and the role of LIF in adult stem cells in somatic tissues is not well-understood. The adult intestinal epithelium has a high self-renewal rate driven by intestinal stem cells (ISCs) at the base of crypts. The intestinal crypt is one of the best-defined adult stem cell models. Dr. Hu's lab found that LIF expresses at the ISC niche and is critical for ISC function to maintain the homeostasis of intestinal epithelium. LIF deficiency in mice impairs the renewal of intestinal epithelium under the physiological condition and the regeneration of intestinal epithelium after injury in response to irradiation. These results strongly support a previously unidentified and crucial role of LIF in ensuring ISC function, promoting regeneration of intestinal epithelium in response to irradiation. They are currently investigating the molecular mechanism underlying the role of LIF in intestinal stem cells and characterizing its potential beneficial effect on gut syndrome induced by different injuries.

FOCUS AREA #11 – Metastatic Prostate Cancer

Clinical research involves the development and management of a prostate cancer tumor bank with full clinical annotation. Specimens include post-radical prostatectomy tissues, blood, and urine. In addition, Dr. Kim is interested in the role of surgery in the management of high-risk and metastatic prostate cancer. As for basic science research, Dr. Kim is interested in androgen signaling and tumor microenvironment. Specifically, the lab has identified Wnt5a as a mediator of castration resistance in prostate cancer bone metastasis. Most recently, the lab has focused on prostate cancer neuroendocrine differentiation and androgen signaling as well as developing small molecules that target androgen signaling in prostate cancer cells.

FOCUS AREA #12 – Investigating Molecular Mechanisms and Developing Novel Cancer Therapies

Research focuses on investigating molecular mechanisms of tissue-specific tumorigenesis of neuroendocrine tumors and developing novel cancer therapies through an understanding of the tumor microenvironment by studying the interaction between tumor cells and the components of the tumor microenvironment. They also developed novel transgenic mouse models and established a large of human tumor tissue bank for their research.

Multiple Endocrine Neoplasia Type I (MEN1) is a familial cancer syndrome defined by tumor formation in distinct endocrine tissues while not in other parts of the body. Patients with MEN1 syndrome develop tumors of the endocrine glands, including the anterior pituitary, parathyroid and endocrine pancreas. Mutations in the gene MEN1 cause inactivation of menin protein, which is a transcriptional modulator and tumor suppressor involved in cell proliferation, DNA repair and apoptosis. Epigenetic alterations are a critical mechanism of tumorigenesis, including widespread aberrations in DNA methylation. Dr. Libutti's team has shown that

inactivation of menin results in increased activity of DNA methyltransferase 1 (DNMT1), causing a drastic increase in global DNA methylation in tumor cells. With a focus on characterizing the role of Dnmt1 in pancreatic islet cells, which in MEN1 patients from an insulinoma, their recent work using a somatic gene transfer system in mice showed that the upregulation of Dnmt1 promotes the proliferation of pancreatic endocrine islet cells. Furthermore, they demonstrated that blockade of Dnmt1 with Dnmt1 inhibitors prevented MEN1 tumor transformation. These findings suggest the significance of Dnmt1 in driving pancreatic neuroendocrine tumorigenesis, making Dnmt1 a potential therapeutic target for patients with MEN1 syndrome. In addition, Dr. Libutti's lab is developing a novel, comprehensive, multiplexed genome and epigenome editing system for further investigating the tissue-specificity of MEN1 tumorigenesis.

Another arm of the lab focuses on the immune system, specifically a new B7 immune-checkpoint protein as a target for the treatment of neuroendocrine tumors. The B7 family are an appealing target for cancer therapy because they are major immune checkpoint proteins that regulate T-cell activation and function. Recent analysis of patient samples and work in genetically engineered Men1 knockout mice demonstrated that B7x is a key mediator of tumor immunity in the tumor microenvironment of neuroendocrine tumors. In preclinical studies where the research team evaluated the efficacy of B7x blockade with a B7x antibody, they found that the B7x antibody can inhibit tumor cell proliferation and induce apoptosis, both of which improved the tumor immune microenvironment and resulted in increased survival. Their work has shown that the regulation of the B7x immune checkpoint results in the inactivation of the immune system and promotes neuroendocrine tumorigenesis, and targeting B7x with a high affinity antibody is a promising cancer immunotherapy.

FOCUS AREA #13 – Lung Cancer

Lung cancer is the leading cause of all cancer deaths in the U.S. and worldwide. Lung cancer risk is heterogeneously distributed among U.S. populations. African-American men have a higher incidence of lung cancer than European-American men, even after adjusting for smoking and socioeconomic factors. The tumor-specific biological factors responsible for the racial differences are not yet understood. The goal of this project is to define the mechanisms by which the JAK/STAT3 pathway operates as a key biological contributor of racial health disparities in non-small cell lung cancer (NSCLC), the most common type of lung cancer. Preliminary data suggest that NSCLCs from African Americans are more likely than NSCLCs from European Americans to have persistent activation of Signal Transducer and Activator of Transcription-3 (STAT-3), a transcription factor that drives expression of genes that regulate anti-apoptotic responses, angiogenesis, cell proliferation, tumor progression, and signal transduction. STAT3 is an oncogenic transcription factor that is hyperactivated in many cancers, contributing to growth, survival and therapeutic resistance. The premise of this application is that the JAK/STAT3 signaling axis is inappropriately activated in the context of NSCLC, particularly among tumors from African Americans, and that therapeutic intervention will be of clinical benefit to a molecular subset of patients with NSCLC. The goals of this project are to characterize the molecular profiles in NSCLC from African Americans and European Americans including JAK/STAT3 and impact on racial differences, tumor grade, histological subtypes, and patient survival. It will utilize CRISPR-mediated genome editing on patient-derived models of cancer from African American NSCLCs and other models to test the hypothesis that aberrant STAT3 activation results from these mutations, and that the mutations drive NSCLC development and tumor progression. They will generate patient-derived NSCLC xenografts primarily from African-American patients, and test the hypothesis that JAK/STAT3 pathway mutations can serve as predictive biomarkers for effective antitumor response to STAT3 blockade in NSCLC. From these efforts, they expect to uncover a novel set of biological determinants of NSCLC health disparities, and to open a path to clinical trials for potential therapies to improve the clinical outcome of NSCLC patients and reduce lung cancer health disparities.

FOCUS AREA #14 – DNA Damage, Oxidative Stress and Autophagy in Cancer Development

Research is focused on the roles of DNA damage, oxidative stress and autophagy in cancer development. Currently, they are pursuing the following lines of study: 1) Mechanistic analyses of the BRCA1-PALB2-BRCA2 and KEAP1-NRF2 pathways in the DNA damage response and oxidative stress response; 2) Mouse models of BRCA- and PALB2-associated cancer development, focusing on the roles of DNA damage, oxidative stress and autophagy throughout the process; and 3) Functional characterization of clinically relevant BRCA1, BRCA2 and PALB2 mutations in DNA repair and therapy resistance.

Qualifications: Will vary depending on the desired internship. May include laboratory skills in molecular biology, quantitative or qualitative research experience, interest and coursework in relevant fields. Desirable qualifications include academic or technical writing experience or experience with social media.

Websites: www.cinj.org and sph.rutgers.edu/centers/cts/index.html.

Research Posters from Past Rutgers CINJ & CTS Princeton Student Interns:

Summer 2019

Kristen Pagliai '20 - [From Pilot to Publication: The Lifecycle of Cancer Prevention Research](#)

Sophia Peifer '21 - [The Availability of JUUL Flavored Products near Rutgers Campus](#)

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