Open Postdoctoral Positions

Department	Faculty Member	Research Topic
Biostatistics	Motomi Mori	Basic, translational, clinical and population science
	Stanley Pounds	Statistical methods for genomics studies
Chemical Biology & Therapeutics	Taosheng Chen	Small-molecule transcription factor drug discovery
	Anang Shelat	Multi-scale modeling of biological and chemical data
Computational Biology	Paul Geeleher	Computational methods and drug repositioning
	Xiang Chen	Computational approaches in predicting drug responses in Pediatric Cancers
Developmental Neurobiology	Jay Bikoff	Functional organization of spinal interneurons
	Michael Dyer	Retinal development and retinoblastoma
	Stephen Mack	Tumor cell origin, epigenetics, and transcriptional regulation of ependymoma
	Paul Northcott	Integrative genomics and molecular features of pediatric brain tumors
	David Solecki	Cell polarity in neuron precursor differentiation
Epidemiology & Cancer Control	Yadav Sapkota	Genetic epidemiology and pharmacogenomics
	Zhaoming Wang	Genetic epidemiology of cancers
Hematology	Wilson Clements	Vascular/hematopoietic development and leukemia
	Mitchell Weiss	Blood development and associated diseases
Immunology	Hongbo Chi	Cellular signaling in innate and adaptive immunity
	Thirumala-Devi Kanneganti	Mechanisms of host defense and inflammation
	Benjamin Youngblood	T cell memory differentiation and exhaustion
Infectious Diseases	Richard Webby	Influenza pathogenesis and vaccine design
Oncology	Kim Nichols	Heritable cancers and primary immunodeficiency syndromes
	Esther Obeng	Myeloid malignancies and bone marrow failure syndrome
Pharmaceutical Sciences	Daniel Savic	Pharmacogenomics and cis-regulatory architecture of pediatric leukemia
Radiation Oncology	Austin Faught	Proton therapy, biological modeling, adaptive therapy
Structural Biology	Scott Blanchard	Mechanics of biological systems
	Mario Halic	Epigenetic regulation of gene expression
	Ji Sun	Structural and pharmacological studies of membrane proteins
Tumor Cell Biology	Chunliang Li	Genome editing in cancer development

Biostatistics

Motomi Mori, PhD **Basic, Translational, Clinical and Population Science**

The Mori Lab has 2 open positions. St. Jude is seeking outstanding candidates for postdoctoral fellowships in biostatistics methods and applications involving pediatric cancer and catastrophic diseases. Positions are available in diverse biostatistics research areas, including designs of early phase clinical trials, epidemic modeling and microsimulation methods, machine learning, analysis of high-dimensional data, integrative omics analysis, survival analysis, and longitudinal data. St. Jude leads two of the world's largest pediatric survivorship research studies, St. Jude LIFE and the Childhood Cancer Survivor Study, and has the largest pediatric cancer genome database, St. Jude Cloud.

Requirements: A Ph.D. in statistics, biostatistics, or closely related field is required. Applicants must have a strong computational background and demonstrate excellent written and verbal communication skills.

Stanley Pounds, PhD **Statistical Methods for Genomics Studies**

St. Jude seeks a postdoc to pioneer the development and application of innovative data analysis methods in statistical cancer genomics and pharmacogenomics. In close collaboration with Drs. Charles Mullighan (St. Jude Pathology Department) and Jatinder Lamba (University of Florida College of Pharmacy), the successful applicant will develop and apply innovative statistical methods that integrate multiple forms of omic data (genomic, epigenomic, transcriptomic, proteomic, metabolomic) with multiple clinical outcomes (initial response, relapse-free survival, overall survival) to make fundamental biological discoveries that accelerate our progress towards curing childhood leukemias.

Requirements: A Ph.D. in statistics, biostatistics, bioinformatics, computational biology, or a closely related field is required. Knowledge of cancer biology and/or high-performance computing is a plus.

Chemical Biology & Therapeutics

Taosheng Chen, PhD **Small-Molecule Transcription Factor Drug Discovery**

This lab studies the role of PXR and CAR (ligand-regulated transcription factors) in regulating drug-induced liver toxicity and cancer drug resistance. The lab develops novel chemical probes/therapeutic leads and uses them to interrogate the function of PXR and CAR in order to overcome drug toxicity and drug resistance in cellular and animal models. Available projects: 1) Lead optimization of small molecule modulators of PXR and CAR (medicinal chemistry & structure-based approach). 2) In vitro and in vivo validation of novel small molecule modulators of PXR and CAR in regulating drug metabolism, toxicity, and resistance (pharmacological approach). 3) Regulation of PXR and CAR signaling pathways (multidisciplinary approach).

Requirements: PhD or MD. Biologists, pharmacologists, medicinal chemists, or structural biologists are encouraged to apply. Experience in one of the following areas is required: cell and molecular biology, biochemistry, pharmacology, medicinal chemistry, or structural biology.

Anang Shelat, PhD **Multi-Scale Modeling of Biological and Chemical Data**

A postdoctoral position is available to discover and characterize small molecules that induce synthetic lethality in pediatric sarcoma. The identification of the mechanism of action of the compound, and the molecular determinants which govern susceptibility and resistance, are key motivations for this position. The ultimate goal is identifying clinically relevant chemotherapeutic strategies.

Requirements: PhD and evidence of scientific accomplishment. Good communication skills and willingness to work in a team environment are essential. A background in modern drug discovery techniques, chemistry, and chemical biology is desirable.

Computational Biology

Paul Geeleher, PhD **Computational Methods and Drug Repositioning**

The Geeleher lab has 2 open positions. 1) Developing machine learning approaches for integration of pre-clinical, clinical genomics, and electronic health record data for drug re-purposing and pharmacogenomics of anticancer agents. The postdoc will explore, optimize and build on emerging informatics techniques, including integrating somatic variation with transcriptomic variation. 2) Developing statistical methods for integrating single-cell and bulk tissue expression data to understand the relationship between common inherited genetic variation, gene expression, and drug response. The postdoc will explore how inherited genetic variation influences cancer risk, disease progression, and drug response, building on methods developed in the lab to deconvolute eQTL signals from bulk tissue expression data.

Requirements: Applicants with a Ph.D. in a quantitative field are encouraged to apply. Strong candidates from a primarily wet-lab or clinical background who wish to develop sophisticated quantitative skills will also be considered.

Xiang Chen, PhD

The postdoc will develop and apply computational approaches to understand interactions between genetic alterations and epigenetic deregulations and to discover potential biomarkers for predicting drug responses in pediatric cancers.

Requirements: Candidates with a recent PhD and evidence of scientific accomplishment are encouraged to apply.

Developmental Neurobiology

Jay Bikoff, PhD **Functional Organization of Spinal Interneurons**

A position is available to study quantitative approaches to behavior, *in vivo* calcium imaging, and optogenetics/chemogenetics of neural circuitry in mice. The Bikoff lab aims to understand the functional organization of neural circuits that control movement, including how descending pathways from the brain interact with spinal circuits to implement motor output. The lab approaches this problem from multiple perspectives, using mouse genetics, single-cell transcriptomics, viral tracing and whole-brain imaging, and animal behavior to explore the role of molecularly discrete subsets of neurons in motor control.

Requirements: PhD in neuroscience or related discipline. Prior experience in quantitative behavioral analysis or in vivo calcium imaging is preferred—familiarity with Matlab or Python for data analysis.

To apply, email your CV to postdoc@stjude.org
March 2022. EOE/Minorities/Females/LGBTQ/Vet/Disability
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excluding those with an approved medical or religious accommodation as a condition of employment.

Developmental Neurobiology Continued

Michael Dyer, PhD   **Retinal Development and Retinoblastoma**

A position is available to study the role of core regulatory circuit super-enhancers (CRC-SEs) in retinal development and diseases such as macular degeneration and diabetic retinopathy. We previously identified a series of CRC-SEs adjacent to genes having important roles in retinal development, including *Vsx2, Crx, Six3, Otx2, Fgf15,* and *Ascl1.* Each of those CRC-SEs have been deleted in mice using CRISPR-Cas9 and analysis is ongoing. We are also analyzing the evolutionary conservation of those CRC-SEs in human stem cell derived retinal organoids. The results of these studies will be important for filling a fundamental gap in our knowledge about the role of CRC-SEs in retinal development and will set the stage for characterization of CRC-SEs in other genes required for retinogenesis.

Requirements: PhD and training in epigenetics, retinal biology, and human stem cell research is preferred.

Stephen Mack, PhD   **Tumor Cell Origin, Epigenetics, and Transcriptional Regulation of Ependymoma**

Two positions are available in the Mack lab. The first is to characterize the role of key oncogenic drivers in the brain tumor ependymoma. We will build engineered mouse models alongside isogenic patient tumor models to study the impact of these drivers on tumor transcriptomes. In addition, work will focus on targets/pathways with potential clinical translation. The second project is to characterize the role of oncogenic histones and their impact on non-coding regions of the tumor transcriptome. We will utilize a series of isogenic and patient derived models to study non-coding repeat elements of the genome and the processes by which they are activated and functionally relevant in disease.

Requirements: PhD with expertise in molecular/cell biology, genetics, mouse handling, and bioinformatics experience or willingness to learn bioinformatics will be of high value.

Paul Northcott, PhD   **Integrative Genomics and Molecular Features of Pediatric Brain Tumors**

A wet-lab postdoctoral position is available to study the developmental and molecular basis of the childhood brain tumor medulloblastoma. Leveraging our exquisite access to patient material linked to large clinical trial cohorts, we are applying a combination of innovative, multi-omic approaches to discover new biological, mechanistic, and clinical insights responsible for medulloblastoma initiation, progression, and relapse. The successful applicant will be part of a multi-disciplinary team studying the biological and clinical utility of medulloblastoma liquid biopsies obtained from unprecedented clinical trial cohorts (Liu, Smith, Kumar et al, *Cancer Cell*, 2021).

Requirements: PhD with experience in cancer biology, molecular and cellular biology, genomics/epigenomics/transcriptomics, and clinical sample processing are highly desirable. Individuals possessing hands-on experience with sample processing for next-generation sequencing, single-cell genomics, and/or liquid biopsies will be deemed highly competitive. No bioinformatics experience is required for this position.

David Solecki, PhD   **Cell polarity in Neuron Precursor Differentiation**

Postdoc positions are available in the Solecki lab for motivated individuals interested in understanding the cell biology of neuronal polarity or the regulation of nuclear architecture during neuronal differentiation. The Solecki Lab takes a multidisciplinary approach via cutting edge imaging technologies such as lattice light-sheet (LLS) microscopy or correlative super-resolution electron microscopy (CLEM) and computational approaches to analyze the molecular and cellular mechanisms controlling neuronal differentiation, migration, and polarization.

Requirements: PhD and/or MD with a strong background in cell biology, neuroscience, or biophysics.

Epidemiology & Cancer Control

Yadav, Sapkota, PhD   **Genetic Epidemiology and Pharmacogenomics**

Successful candidates will work on projects related to pharmacogenomics of long-term toxicities of cancer therapy in childhood cancer survivors. Specific research topics include 1) genetic association analyses (whole genome and whole exome sequence associations and polygenic risk scores) for various long-term health outcomes among survivors of European and African ancestries; 2) analyses of multi-omics (epigenomics, transcriptomics, proteomics, and metabolomics) and system genetics (e.g., eQTLs regulating molecular responses to cancer therapies in human induced pluripotent stem cells) data for elucidating molecular mechanisms for health outcomes; and 3) evaluating health disparities through pharmacogenomics. The Department of Epidemiology and Cancer Control also has a T32 training grant in cancer survivorship, for which the candidate may be eligible.

Requirements: PhD or equivalent degree in genetics, epidemiology, biostatistics, bioinformatics, or a related quantitative field. Strong publication record, experience in statistical and computational analyses of high-throughput omics, ability to code in one or more scientific programming languages (e.g., R, Python, C/C++), and excellent communication and writing skills.

Zhaoming Wang, PhD   **Genetic Epidemiology of Cancers**

Dr. Zhaoming Wang, a joint faculty member between St. Jude Department of Epidemiology and Cancer Control and the Department of Computational Biology, is seeking highly motivated and creative candidates for a fully supported postdoctoral fellow position to conduct high impact clinical research primarily in genetic epidemiology of cancers (childhood and subsequent adulthood cancers), biomarker discovery for treatment- and/or aging-related late effects of survivors of childhood cancer, and omics-based precision preventive medicine. You will have the opportunity to work with large-scale whole-genome sequencing, whole-exome sequencing, epigenetic profile, and RNA sequencing data for a well-established cohort of childhood cancer survivors with clinically assessed rich set of phenotypes including subsequent neoplasms.

Requirements: Ph.D. or equivalent degree in genetics, epidemiology, bioinformatics, biostatistics, or a related area. To succeed in this position, you should have a strong quantitative and programming skills in R, Python, or other computer programming languages. Applicants with research experiences in human genetics/epigenetics, cancer genomics, or cancer epidemiology, with hands-on experience in next-generation sequencing or high-throughput array data analysis, are strongly encouraged to apply.

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Hematology

Wilson Clements, PhD   **Vascular/Hematopoietic Development and Leukemia**

A position is available in the Clements lab to study how the adult hematopoietic system is established during vertebrate embryonic development. We are interested in understanding how early precursors of the sympathetic nervous system and vascular smooth muscle precursors interact with developing endothelial cells to establish the earliest hematopoietic stem cells. Our recent findings and unpublished data define the existence of this connection in vertebrates, and we are working to better understand key details.

Requirements: PhD and experience in developmental hematopoiesis, as well as molecular, biochemical, and cell biological techniques.

Mitchell Weiss, MD, PhD   **Blood Development and Associated Diseases**

The joint lab of Mitchell Weiss and Yong Cheng is looking for a postdoc candidate interested in therapeutic genome editing using next generation genome editors such as Base Editor or Prime editors. The candidate will study the interplay between genome editors and different types of blood cells (such HSCs, other progenitors, and erythroid cells) and develop and optimize novel treatments for genetic blood disorders. In this position, the candidate will gain extensive experience and training in genomics, stem cell biology, and pre-clinical study.

Requirements: PhD and experience with molecular biology techniques (DNA, RNA, protein), cell culture, genome editing (base editing, Cas9, ZFN, TALEN, etc). Preferred skills include high throughput sequencing, stem cell experience, and knowledge of hematopoiesis.

Immunology

Hongbo Chi, PhD   **Cellular Signaling in Innate and Adaptive Immunity**

Postdoc positions are available to study cell metabolism of the immune system and its implications in cancer and other diseases. We are interested in understanding the metabolic programs, signaling pathways, and systems-level regulatory networks in basic T cell and dendritic cell biology, tumor immunity and therapy, and autoimmune disorders. We integrate immunological and genetic approaches with cutting-edge systems immunology tools, including single-cell transcriptomics, proteomics, metabolomics, network reconstruction, and CRISPR.

Requirements: Candidates with a PhD in immunology or cell biology and a strong publication record are encouraged to apply.

Thirumala-Devi Kanneganti, PhD   **Mechanisms of Host Defense and Inflammation**

Two positions are available investigating cellular signaling in the immune system. We are interested in signaling pathways in innate immunity and cell death (NLRs, inflammasomes).

Requirements: PhD, DVM, MD/PhD in biomedical sciences with practical experience in immunology.

Benjamin Youngblood, PhD   **T Cell Memory Differentiation and Exhaustion**

The Youngblood laboratory is seeking a postdoctoral researcher to study T cell responses to chronic infections and cancer. The project will include assessment of T cell differentiation in individuals with hematological malignancies, with opportunities to utilize animal models to investigate molecular mechanisms involved in memory T cell differentiation.

Requirements: A PhD in the area of immunology, microbiology, or a related field.

Infectious Diseases

Richard Webby, PhD   **Influenza Pathogenesis and Vaccine Design**

The position available is within the NIAID-funded St. Jude Center of Excellence in Influenza Research and Response (SJCEIRR) Program which integrates comprehensive global influenza virus surveillance with fundamental research that provides insight into the mechanisms that foster pandemic influenza emergence at the human-animal interface. The successful candidate will participate in a robust and highly productive program on antiviral research. Antiviral drugs are a critical line of defense against epidemic and emerging viruses, particularly when vaccines are unavailable. A central part of pandemic preparedness and response is understanding the susceptibility of emerging viruses to existing and new treatments. We seek to understand the efficacy, likelihood of resistance generation, and optimal treatment regiments of approved and investigational antivirals, particularly those targeting influenza viruses.

Requirements: PhD and/or MD with experience in virology and molecular biology, with evidence of scientific accomplishment. Prior experience with influenza viruses, tissue culture and animal models is highly preferred.

Oncology

Kim Nichols, MD   **Heritable Cancers and Primary Immunodeficiency Syndromes**

The Nichols Lab at St. Jude Children's Research Hospital is seeking a highly motivated Postdoctoral Fellow with interests and research experience in hematopoiesis, stem cell biology, or leukemia modeling to carry out projects in cancer predisposition. Dr. Nichols is interested in identifying novel genes and genetic variants that contribute to the development of cancer and primary immunodeficiency. Specifically, she uses human and mouse models to decipher how germline variants of the essential hematopoietic transcription factor, ETV6, impact hematopoiesis and promote leukemogenesis.

Requirements: PhD in molecular biology, cell biology, or a related field. The Postdoctoral Fellow should have experience working with mice, such as breeding, genotyping, harvesting organs, completing flow cytometry. A background in hematopoiesis or leukemia modeling is desired.

Esther Obeng, MD, PhD   **Myeloid Malignancies and Bone Marrow Failure Syndromes**

A position is available to study the pathogenesis of myeloid malignancies. Major interests are determining how acquired mutations in hematopoietic stem cells lead to the development of clonal hematopoiesis and leukemia, in addition to identifying novel treatments that selectively target malignant clones. The postdoc will develop projects using several model systems including (1) Isogenic immortalized cell lines generated using CRISPR-Cas gene editing, (2) Novel xenograft and transgenic in vivo systems, and (3) Primary patient samples.

Requirements: PhD in molecular biology, cell biology, genetics, or a related field. To succeed in this position, applicants must have a strong cell and molecular biology background and an interest in working within vivo model systems. Applicants with expertise in genome editing, computational biology, and working with hematopoietic stem cells are encouraged to apply.

Pharmaceutical Sciences

Daniel Savic, PhD — **Pharmacogenomics and cis-Regulatory Architecture of Pediatric Leukemia**

A position is available to study the pharmacogenomics of treatment in childhood leukemia. The primary research focus involves studying the gene regulatory architecture of pediatric leukemia to define how the noncoding portion of the human genome impacts chemotherapeutic drug response, chemotherapeutic drug resistance and leukemia relapse. To address these questions, the lab applies various orthogonal functional genomic assays and high-throughput screening approaches to identify and functionally characterize genetically and/or epigenetically disrupted *cis*-regulatory elements impacting childhood leukemia pharmacogenomics. The long-term goal of the Savic laboratory is to gain a better understanding of the genetic and epigenetic underpinnings of chemotherapeutic drug resistance and relapse in childhood leukemia.

Requirements: PhD with expertise in gene regulation, epigenetics, functional genomics, and an excellent understanding of next-generation sequencing technology. Experience with bioinformatics/computational biology and/or statistical genetics is highly desirable.

Radiation Oncology

Austin Faught, PhD — **Proton Therapy, Biological Modeling, Adaptive Therapy**

The primary focus of the Faught lab is on using Big Data analytics tools to improve treatment plan quality in proton therapy. We are interested in understanding the roles of linear energy transfer and treatment plan robustness. Research aims include the following: 1) Contributing to data infrastructure efforts by reviewing clinical treatment plans, analyzing Monte Carlo dose distributions, and using good data practices, 2) Testing and validating novel analytics tools on curated data sets to better understand radiation therapy outcomes of children with cancer, and 3) Investigating ways that AI may contribute to improving outcomes models. Research activities will include data collection, image analysis, dosimetry comparisons with treatment planning systems and Monte Carlo calculations, experimental validation with proton beams. Opportunities to gain clinical experience in proton and photon radiotherapy physics may be made available pending adequate progress.

Requirements: PhD or DSc degree in medical physics, biomedical engineering, radiological sciences, or other relevant engineering or physical sciences. Strong knowledge and experience in analytical and scientific programming, with preference for MATLAB, Python, and/or C#.

Structural Biology

Scott Blanchard, PhD — **Mechanics of Biological Systems**

A position is available to drive interdisciplinary research initiatives in the laboratory of Dr. Scott Blanchard. The laboratory utilizes a range of quantitative biophysical and photophysical methods, as well as structural techniques, to explore clinically important biological systems, such as ribosome-catalyzed protein synthesis, membrane protein transport/signaling, and host-virus interactions, at the single-molecule scale.

Requirements: PhD in structural biology or related field with significant computational skills for custom data analysis and automation.

Mario Halic, PhD — **Regulation of Genome Expression**

We seek a highly motivated postdoctoral research associate to join the group of Dr. Mario Halic in the Department of Structural Biology at St. Jude Children's Research Hospital. The Halic lab studies the epigenetic regulation of gene expression using genetics, molecular biology, biochemistry and structural biology approaches. In particular, we study heterochromatin formation and the chromatin-modifying proteins involved in this process. We use cryo-EM methodologies to examine processes involved in chromatin organization and also apply genetics and molecular biology approaches to investigate heterochromatin formation in fission yeast.

Requirements: We seek an independent researcher with a PhD and strong background in molecular biology and genetics/epigenetics or in biochemistry and structural biology to join our group.

Ji Sun, PhD — **Structural and Pharmacological Studies of Membrane Proteins**

We use cryo-EM, biophysical, electrophysiological, and biochemical approaches to study the function of membrane proteins. The postdoc will lead research projects focusing on structural mechanisms of membrane proteins. The lab has access to the state-of-the-art cryo-EM facility, which houses a 300kV Titan Krios and a 200 kV Talos Arctica electron microscope, both equipped with K3 detectors.

Requirements: PhD degree in biochemistry, structural biology, biophysics, or related fields, as well as project management and scientific writing experience. Expertise in cell imaging and structural biology (single particle cryo-EM or X-ray crystallography) would be a plus.

Tumor Cell Biology

Chunliang Li, PhD — **Genome Editing in Cancer Development**

St. Jude is seeking a postdoc to study dysregulated transcription dependency under the 3D chromatin niche in human cancers. Cutting-edge technologies and multidisciplinary approaches, including genetic and epigenomic CRISPR editing, comprehensive genetic screens, and the auxin-induced protein degradation system, are used to investigate the precise function of transcription factors and noncoding segments involved in gene transcription, chromatin architecture, and chromatin accessibility maintenance in pediatric leukemia. Those efforts are anticipated to shed light on understanding how gene regulation is precisely controlled in temporal and spatial gene expression in cancers and will provide insights into alternative therapy development. The candidate will be offered an excellent research environment to work on novel candidates identified from our own CRISPR screens and integrative analysis of multidimensional datasets.

Requirements: PhD or MD in molecular biology, cancer cell biology or relevant fields are encouraged to apply.

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