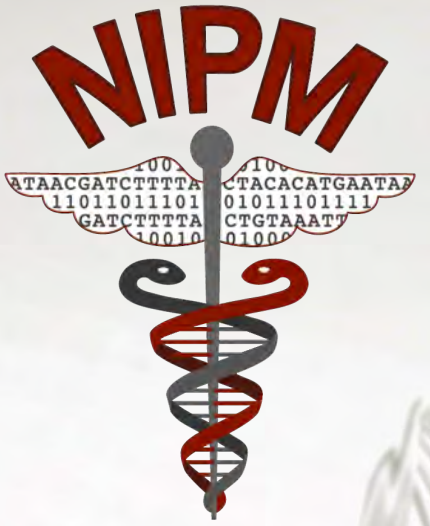
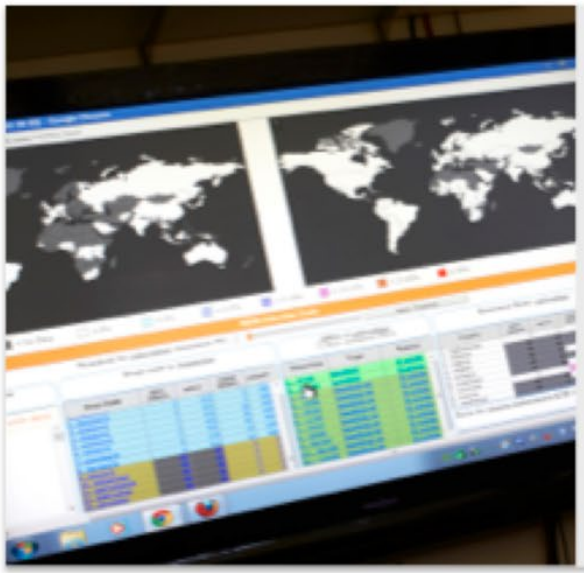


Nevada Institute of Personalized Medicine

University of Nevada, Las Vegas
4505 S. Maryland Parkway, MS 4009
Las Vegas, NV 89154

Email: nipm@unlv.edu
UNLV NIPM Website

MISSION



UNLV

NIPM

The Nevada Institute of Personalized Medicine (NIPM) at the University of Nevada, Las Vegas is working to improve individual and systemic healthcare through translational clinical scientific research, education and workforce training, commercialization of technologies, and job creation.

NIPM GOALS

The Nevada Institute of Personalized Medicine (NIPM) at UNLV is working to improve individual and community health in Nevada through research, education, workforce training, technology commercialization, and job creation.

Modern healthcare relies largely on an expensive “one-size-fits-most” model for diagnosis and treatment that often fails to account for biological differences between people. Personalized medicine is different. Your unique genetic makeup – your DNA – already encodes the blueprint for effective treatment and disease prevention.

NIPM will help move Nevada from the trial-and-error medicine of today to the data-driven decision-making of tomorrow by decoding the human genome to predict disease susceptibility, sift through treatment options, and fine-tune drug dosages to minimize adverse effects, and help Nevadans lead longer and healthier lives.

UNLV PARTNERS

- UNLV VPRED, Provost, President
- College of Sciences
- School of Integrated Health Sciences
- Kirk Kerkorian School of Medicine
- School of Life Sciences
- School of Community Health
- School of Nursing
- Department of Mathematical Sciences
- Department of Chemistry and Biochemistry
- Advisory Boards
- National Supercomputing Institute
- Office of Economic Development
- Cleveland Clinic Lou Ruvo Brain Center for Health

SUPPORT: NIH COBRE Grant

- On June 1, 2018, UNLV was awarded an $11.4 Million Federal Grant to Advance Personalized Medicine in Nevada
- Funding from the National Institutes of Health will support human genetics research
- Will develop pipeline of scientists working to make Nevada a leader in personalized medicine
- Project Number: 5P20GM121325

UNLV

CENTER OF EXCELLENCE IN PERSONALIZED MEDICINE

SUPPORT: GOVERNOR'S KNOWLEDGE FUND

Nevada Governor's Office of Economic Development

Empowering Success

NIPM is the first GOED-funded project to break even and become sustainable with non-state dollars!

TECHNOLOGY COMMERCIALIZATION

- Technology Commercialization in Nevada
- Knowledge Fund
  - Center for Gaming Innovation at the University of Nevada, Las Vegas
  - Institute for Quantitative Health Sciences at the University of Nevada, Las Vegas
  - Nevada Advanced Autonomous Systems Innovation Center at the University of Nevada, Reno
  - Applied Innovation Center for Advanced Analytics at the Desert Research Institute
  - Nevada Water Center of Excellence Knowledge Fund Proposal
  - NSHE-Industry Unmanned Autonomous Systems Collaboration Program
- Battle Born Venture
- Water Center of Excellence

Knowledge Fund

The Knowledge Fund is a $10 million budget allocation intended to spur research, innovation and commercialization in Nevada. It was created in 2011 as part of Assembly Bill 499, and received funding during the 2013 legislative session. To obtain this funding, the Nevada System of Higher Education (NSHE) submits applications to GOED for projects that could benefit from Knowledge Fund support. GOED, together with the Knowledge Fund Advisory Council, selects the projects that are best suited for funding. In its first year, the Knowledge Fund has supported and established six new projects within NSHE.

Knowledge Fund Advisory Council

- Dr. Nancy E. Brune, Executive Director, Kenny Guinn Center for Policy Priorities
- Anthony Ciorciari, former Executive Vice President, IGT
- Steve Henry, Director for Global Security, NSTec
- Jason Mendenahll, Executive Vice President, Switch
- Billy P. Smith, consulting Principle Health Physicist, M.H. Crew & Associates
- Roger Wittenberg, Founder, Boulder Bay

Knowledge Fund Projects

- Center for Gaming Innovation at University of Nevada, Las Vegas
- Institute of Quantitative Health Sciences at the University of Nevada, Las Vegas
- Nevada Advanced Autonomous Systems Innovation Center at the University of Nevada, Reno
- Applied Innovation Center for Advanced Analytics at the Desert Research Institute

NIPM SYMPOSIUM SPONSORS

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part of Thermo Fisher Scientific

Nevada Governor's Office of
ECONOMIC DEVELOPMENT

SONY

NIPM - EXTERNAL ADVISORY BOARD

Hong-Wen Deng
PhD

Tulane University

Jerome Rotter
MD, PhD

LABioMed

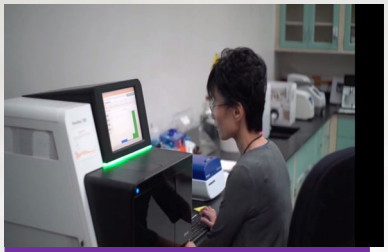
Kenton Sanders
PhD

University of Nevada, Reno

Bill Shuttleworth
PhD

THE UNIVERSITY OF NEW MEXICO

NIPM NGS AND GENOTYPING SERVICE



Illumina NextSeq 500

In 2017, NIPM launched comprehensive DNA/RNA sequencing services

Whole Genome Sequencing

Whole Exome Sequencing

RNA Sequencing

Methylation Sequencing

NIPM

Gene Expression Profiling

10x Single Cell Sequencing

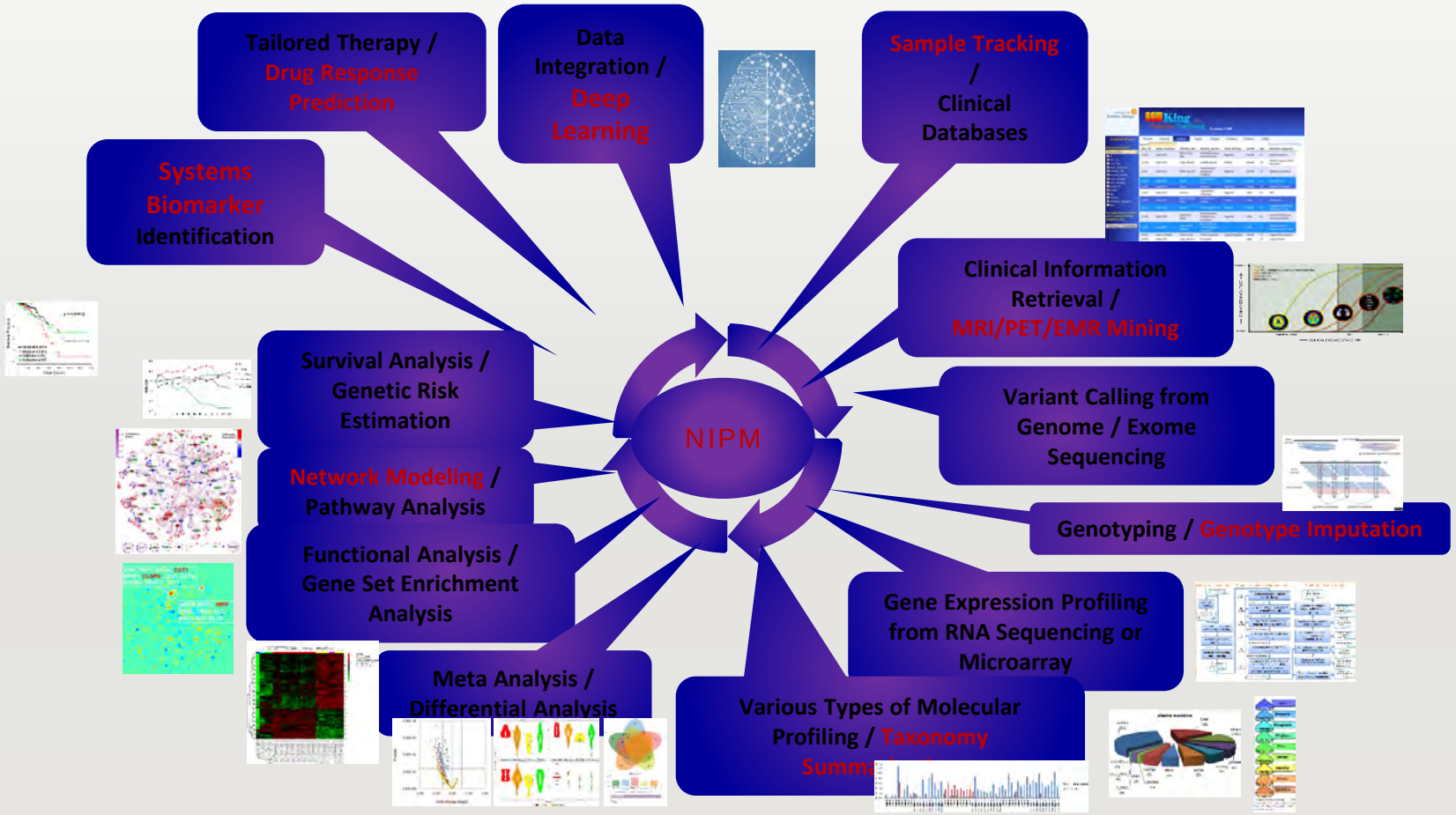
Agilent Bioanalyzer

Services include QC checks, sample prep, and library prep. Grants are available.

Contact us for more details and a custom quote: shirley.shen@unlv.edu

http://www.unlv.edu/nipm/ngs

NIPM BIOINFORMATIC SERVICES



NIPM NGS and Genotyping Services are available at:
http://www.unlv.edu/nipm/ngs

Seed Grants are available for application at:
http://www.unlv.edu/nipm/grants

UNLV

nipm@unlv.edu
www.unlv.edu/NIPM

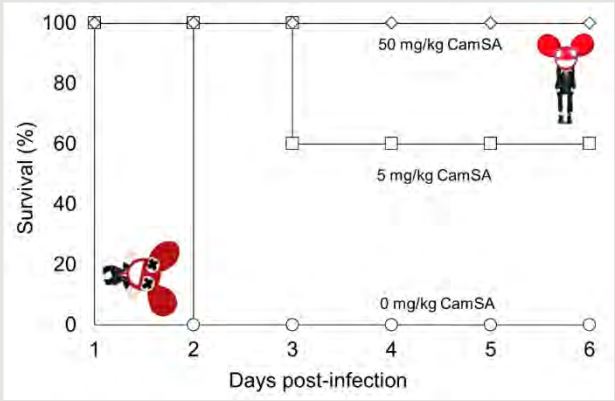
NIPM

Ernesto Abel-Santos-Affiliate Faculty

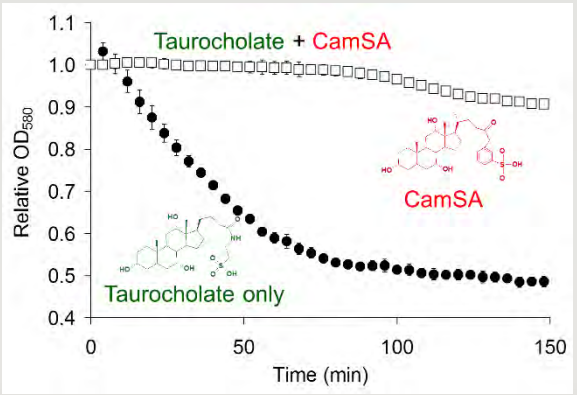
Professor
Chemistry and Biochemistry
ernesto.abelsantos@unlv.edu
702-895-2608
CHE 218B

The Abel-Santos Laboratory is working on a compound that could aid your intestinal tract when antibiotics have wiped out much of the “good” bacteria. This anti-germinant compound, known as CamSA, works by stopping the germination of *Clostridium difficile* (C. diff). While C. diff can be a normal component of bacteria in the human gut, it also can become a problem when competing bacteria are wiped out by antibiotics. That is particularly dangerous for patients with suppressed immune systems, many of whom have been in hospitals, nursing homes, surgery centers and other environments where C. diff thrives. This work has been patented.

CamSA protects mice from CDI



CamSA inhibits Cdiff spore germination



UNLV

nipm@unlv.edu
www.unlv.edu/NIPM

NIPM

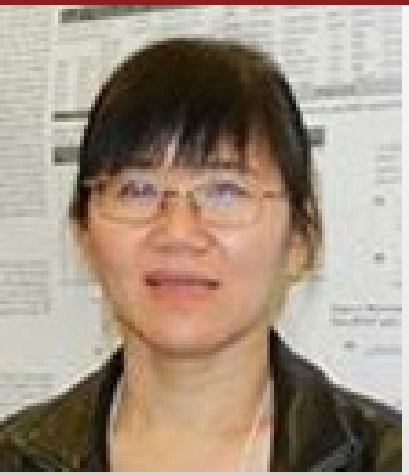
Amei Amei - Affiliate Faculty

Associate Professor of Statistics
Mathematical Sciences
amei.amei@unlv.edu
702-895-5159
SEB 3127

Development of novel methods in statistics and probability to address issues in genetics of complex diseases and evolution of biological species. Specifically,

- retrospective association testing methods for longitudinal outcomes which can be applied to longitudinal association analysis of cocaine use or cardiovascular diseases
- interaction effects of sets of genetic variants by environment using variance component association tests in generalized linear models
- quantitative methods for genetically informed biomedical research on complex diseases, especially on mental disorders such as schizophrenia, bipolar disorder and addiction

Jingchun Chen – NIPM Faculty



Associate Professor,
Nevada Institute for Personalized Medicine,
Interdisciplinary Program in Neuroscience

jingchun.chen@unlv.edu

702-895-1196
HRC 182

Area of Research Interests:

- Artificial intelligence and deep machine learning modeling to classify complex diseases, such as Alzheimer's disease and psychiatric diseases (schizophrenia, bipolar disorder, major depressive disorder)
- Drug discovery for Alzheimer's disease using multi-omics data and networking
- Genetic correlation/association and causal effects between Alzheimer's disease and other diseases, such as COVID-19, gut microbiome, type II diabetes, and schizophrenia
- Molecular and cellular models to study the role of microglia in aging, neurodegenerative diseases, and Alzheimer's disease.

Shawn Gerstenberger- Affiliate Faculty

Dean,
School of Community Health Sciences
and
Professor,
Environmental and Occupational Health
shawn.gerstenberger@unlv.edu
702-895-1565
BHS 514

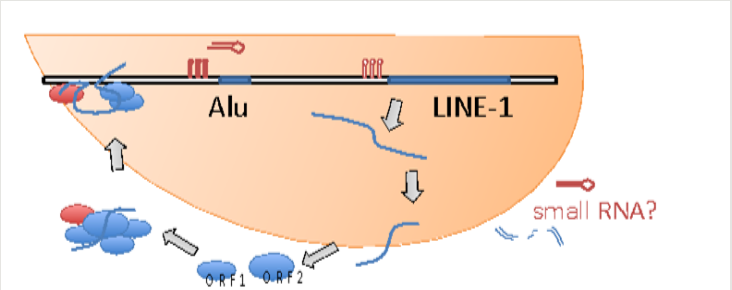
Research Interests:

- Childhood Lead Poisoning and Healthy Homes
- Asthma Triggers and Home Interventions
- Heavy Metal Contamination of food items: candy, hot sauce, fish, etc.
- Currently have several HUD, US FWS and Dignity Health Funded Projects
- Metals analysis, Lead and Mercury
- Portable XRF
- GC-MS
- AA
- Spectrophotometry
- Microwave Digestion

Mira Han - Affiliate Faculty

Assistant Professor
School of Life Sciences
mira.han@unlv.edu
702-774-1503
SEB 3178

- Evolution of genome structure using bioinformatics to investigate how genomes change through gene duplication, loss and gene transpositions.
- Phenotypic effects of Copy Number Variations (CNVs), indels and transposable element polymorphisms.



Variation in transposable element activity in humans

Brian Hedlund - Affiliate Faculty

Greg Fullmer Associate
Professor of Life Sciences
School of Life Sciences
brian.hedlund@unlv.edu
702-895-0809
WHI 101

- "Microbial dark matter": Environmental genomics, systems biology, cultivation & systematics
- Ecology of thermophiles: Biogeochemical cycles & temperature-energy relationships
- Human microbiome: Effects of diet on gut microbial community composition, function, and role in *Clostridioides difficile* infection

Thessa Hilgenkamp – Affiliate Faculty

Assistant Professor
Department of Physical Therapy,
School of Integrated Health Sciences, UNLV
Thessa.Hilgenkamp@unlv.edu

Areas of Research:

- Individuals with intellectual disabilities, Down syndrome and multiple sclerosis
- Physical activity and exercise
- Cardiovascular physiology
- Experimental to epidemiological research

Jefferson Kinney - Affiliate Faculty

Associate Professor
Psychology
jefferson.kinney@unlv.edu
702-895-4766
CBC B426

Research interests:

- Alzheimer's disease-
  - We are currently investigating several candidate targets involved in the development and progression of Alzheimer's disease pathological features and behavioral impairments. These include genetic, immune, molecular, and cellular targets.
- Alterations in inhibitory signaling with relevance to schizophrenia-
  - We are investigating alterations in GABA signaling as it relates to behavioral, cellular, and protein level changes associated with schizophrenia.
- Neurobiology of Learning and Memory-
  - We are examining the role of GABA and glutamate signaling in learning and memory. These projects are directed at understand the interplay between excitation and inhibition in normal learning.

Hyunhwa Lee - Affiliate Faculty

Assistant Professor
School of Nursing
hyunhwa.lee@unlv.edu
702-8953492
BHS 448

Research interests:

- (a) early life adversity and its effect on adulthood mental health (e.g., depression, posttraumatic stress disorder [PTSD]) and disease progress for post-concussive syndrome (e.g., sports concussion
- (b) the role of genetic factors and epigenetic regulation in these health outcomes, using improved methods for evaluating molecular-genetic mechanisms and immune system activation. Especially, the purpose of my project is to better understand the mechanisms involved in the development and perpetuation of persistent post-concussive syndrome, PTSD, and psychological resilience, as compared with traumatized controls without negative mental health outcomes.

- Board Certified Psychiatric and Mental Health Nurse Practitioner

Qian Liu – NIPM Faculty

Assistant Professor of Bioinformatics

Nevada Institute of Personalized Medicine

School of Life Sciences

Email: qian.liu@unlv.edu
Tel: 702-895-1187
Office: HRC 183G

GenLab @ UNLV CENTER OF EXCELLENCE IN PERSONALIZED MEDICINE

Area of Research interests:

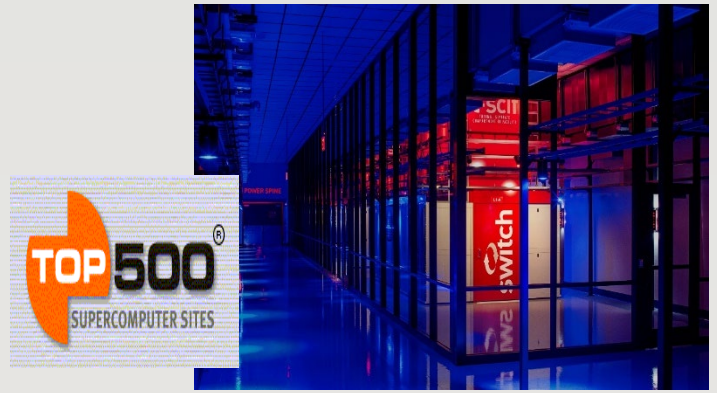
- Development of deep learning tools in computational biology
- Modification detection for both DNA and RNA on Nanopore sequencing
- 3rd generation long-read sequencing
- Identification of methylation biomarkers in neurological/autoimmune disorders
- Protein structural analysis

Joseph Lombardo - Affiliate Faculty

Executive Director, National Supercomputing Center (Cherry Creek)
Lombardo@nscee.edu
702-895-4153
SEB 1218

- Full-service supercomputing facility
- Mission for excellence in education and research in supercomputing and its applications
- Provides supercomputing training and services to academic and research institutions, government and private industry
- Supports medical informatics and health care
- Serves researchers at the University of Nevada Las Vegas and other statewide, nationwide and global research

switch + intel



Sarah Love - NIPM Staff

Program Coordinator, NIPM
sarah.love@unlv.edu

702-895-1297
WHI 117

- Day-to-day operations: budgets, events, human resources related functions, meetings, purchasing, reporting, scheduling, travel

Sarah Love is a true rebel as she received her degree in psychology in 2011 from UNLV and began working in the Student Affairs Division at UNLV in 2012. She later transitioned to the Nevada Institute of Personalized Medicine in 2017.

Sarah Love is the Program Coordinator for NIPM and assists the Executive Director with daily operations. She is experienced at managing complex accounts and confidential records, and comes to NIPM from the UNLV financial aids office.

Fatma Nasoz - Affiliate Faculty

Associate Professor of Computer Science
Director of Data Science, The Lincy Institute
fatma.nasoz@unlv.edu
702-895-0097
GUA 2119

- Machine learning: deep learning analysis of primary and secondary data across domains including health, education, finance, and genomics
- Data visualization: health, education, and social services data collection, visualization, and sharing
- Human-computer interaction: intelligent and adaptive user interfaces for e-learning, driving, and telemedicine

Edwin Oh – NIPM Faculty

Associate Professor,
NIPM/School of Medicine
edwin.oh@unlv.edu
SEB 1176
Phone: (702) 895-0509

Areas of interest:

- Genomic interpretation
- Neurological genetic disease
- Ph.D. in Neuroscience, University of Michigan

Following his postdoc at Johns Hopkins University, Ed served as an Assistant Professor in the Department of Neurology at Duke University. The primary questions for his research program are 1) what are the genetic and structural variants that contribute to human health and disease, 2) how do we interpret such variation to improve the cellular and molecular diagnosis of genetic diseases, and 3) how do we enable the development of therapeutic paradigms. Ed is expert at a variety of molecular and genomic technologies, and animal modeling systems.

Jessica Paje – NIPM Staff

Sr. Administrator
jessica.paje@unlv.edu
702-895-1297

WHI-117

- Establishes and manages best practices for regular operation of the Institute
- Manages the pre- and post-activities for the COBRE grant

Jessica Paje joined NIPM in July 2020 as the Sr. Administrator. Her previous work experience was Program Manager at the John A. Burns School of Medicine, University of Hawaii at Manoa. For five years, she helped manage the IDeA Networks of Biomedical Research Excellence (INBRE), a federally funded grant sponsored by the National Institutes of Health (NIH) and National Institute of General Medical Sciences (NIGMS). Jessica earned her Master's in Public Administration from the University of Hawaii at Manoa in 2018.

Martin R. Schiller – NIPM Director

- Expertise
  - Functional Genomics
  - Structural Biology Bioinformatics
  - Pharamacology

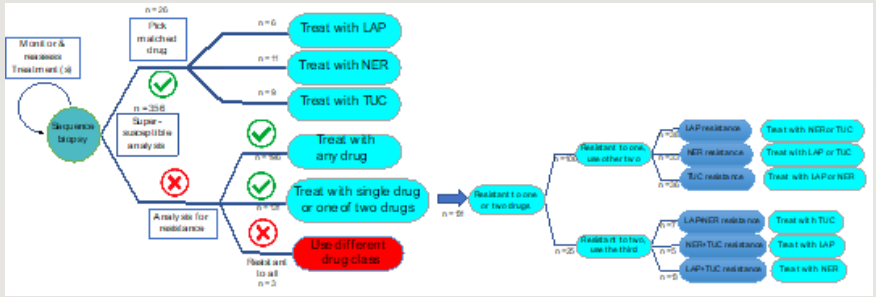
The Schiller Lab invented a high accuracy & throughput molecular function assays system. This GigaAssay has been used to invent new diagnostics and companion diagnostics below), and develop the first High Content Screening for Biologics Drugs in a UNLV spinoff Co. - Heligenics

Executive Director, NIPM
and
Professor, School of Life Sciences
martin.schiller@unlv.edu
WHI 118
Website: www.unlv.edu/news/expert/martin-schiller

heligenics

Next Generation Drug Discovery for Biologics

Comprehensive Clinical Decision Tree for selecting Drugs to Treat Breast Cancer



UNLV

nipm@unlv.edu
www.unlv.edu/NIPM

NIPM

Jay Shen - Affiliate Faculty

Associate Dean, School of Life Sciences
and
Professor, Healthcare Administration & Policy
jay.shen@unlv.edu
702-895-5830
GTW 338

Research areas of focus and interest:

- Access to care and disparities in clinical outcomes/quality of care regarding race/ethnicity, uninsured and socioeconomically disadvantaged populations
- Health services research including comparative effectiveness research, effects of EHR adoption on health organizational performance, clinical outcomes and patient safety, care transition, palliative care and geriatric care, substance use and mental health, dental care access and costs
- Projects in Nevada
  - Factors associated with use of opioid, heroin, and cannabis among ED patients
  - Engaging patients with life-limiting illnesses on receiving palliative care
  - Engaging Asian communities in palliative care
  - Reduction in medication errors among hospitals
  - Economic effects of the smoking restriction law on healthcare
  - Diabetic complications and maternal outcomes

Shirley Shen – NIPM Staff

Laboratory Manager
shirley.shen@unlv.edu
702-895-4550
HRC 422

- Manages the NIPM Sequencing Lab day-to-day operations
- Ensures compliance with UNLV, state, and federal regulations
- Prepares and conducts training sessions for students and faculty.

Shirley joined UNLV in 2001 as a research associate in the department of mechanical engineering and has worked at the School of Medicine, Genomics Core Facility and School of Nursing in UNLV. She earned her Master of Science in medical studies from Nanjing Medical University in China and has earned awards for her work in research including the UNLV Merit Award for Outstanding Research Performance.

Richard Tillett – NIPM Staff

Bioinformaticist
richard.tillett@unlv.edu
702-895-1297

- Bioinformaticist, NIPM Genome Acquisition & Analysis Core
- With 16 years of experience in DNA sequencing, molecular biology, and bioinformatics, Dr. Tillett aims to support and advance genomic studies and projects through bioinformatic support and training. Dr. Tillett obtained his Ph.D. in Biochemistry from the University of Nevada Reno in 2011 and is the author of two recent studies on the genomic identities and spread of SARS-CoV-2 in the state of Nevada. Dr. Tillett is a Data Carpentry-certified Genomics Instructor and advocate for increasing bioinformatic skillsets in research and student communities.
- Dr. Tillett joins the GAA core to support life scientists in genomic study design, sequencing strategy, RNA-seq, genotyping and variant analyses, single-cell sequencing, genome assembly, and bioinformatics training and outreach.

Van Vo – NIPM Faculty

Assistant Research Professor
Nevada Institute of Personalized Medicine, College of Sciences, UNLV
van.vo@unlv.edu

Areas of Research:

- Effects of gene mutations on development
- Induced pluripotent stem cells (iPSCs) as a model system to explore human diseases
- Cancer drug development
- Wastewater surveillance of SARS-CoV-2 and other viruses

Qing Wu – Affiliate Faculty

Professor of Biomedical Informatics
Ohio State University
Qing.wu@osumc.edu
614-688-9752

Area of Research interests:

- Development and validation of personalized clinical risk assessment
- Meta-analysis research
- Machine Learning and statistical modeling for precision prediction
- Bone density and osteoporosis research
- Statistical consulting in biomedical research

Hui Zhang - Affiliate Faculty

Associate Professor
Chemistry and Biochemistry
hui.zhang@unlv.edu
702-774-1489
SEB 4138

Research Interests:

-Biochemical and genetic control of embryonic, fetal, and adult stem cells in development and adult tissue renewal and regeneration through the coordinated regulation between stem cell specific transcriptional factors, epigenetic histone modification, chromatin remodeling, and DNA methylation.

-The cell cycle of embryonic stem cells and other related stem cells are unusual because many somatic cell cycle proteins, such as G1 or S cyclins, and tumor suppressor proteins, such as the retinoblastoma susceptibility gene encoded protein (Rb and Rb family proteins), are either not required or they do not exhibit cell-cycle dependent oscillation in these stem cells. Our ongoing research is trying to elucidate this unique stem cell replication/division mechanism.

-Development of synthetic lethal chemical inhibitors targeting the epigenetic vulnerability of human cancers.

This research not only try to answer the question why stem cells are so unique to maintain their pluripotency/multipotency and self-renewal potential to control the lineage-specific differentiation in development and tissue repair/regeneration, also helps to understand the underlying mechanisms of many human diseases such as cancers and developmental disorders in order to develop novel therapeutics.

NIPM Team paper in Today's Practice

Today's Practice | TECHNOLOGY

PERSONALIZED MEDICINE
IN THE ERA OF GENOMICS:

AN EXCITING TIME FOR TODAY'S PRACTICE

SPECIAL FEATURE: PERSONALIZED MEDICINE IN APPLICATION

BY MICHAEL A. NASIAK, XIANGNING CHEN, QING WU, MIRA HAN, JUSTIN ZHAN, JINGCHUN CHEN, JENICA L. ABRUDAN & MARTIN R. SCHILLER

Already, elements of genomics are being incorporated into standards of care, while continued consumer-driven marketing tactics have been successful in capturing the imagination of the public seeking its potential. Our patients have therefore become acutely aware that their health can be impacted in some positive way. With the nearly daily discoveries heralded in the news – and, at times, with concurrent and possibly misleading hype – of how the knowledge of applying genomics can counteract the afflictions endured by humanity, those seeking guidance will turn to us for clarifying how we can make a real difference in their well-being. Our duty must be ensuring we have a familiarity of the fundamentals concerning what Personalized Medicine can (and can't) promise, as the applications currently available are but a fraction of what is forthcoming.

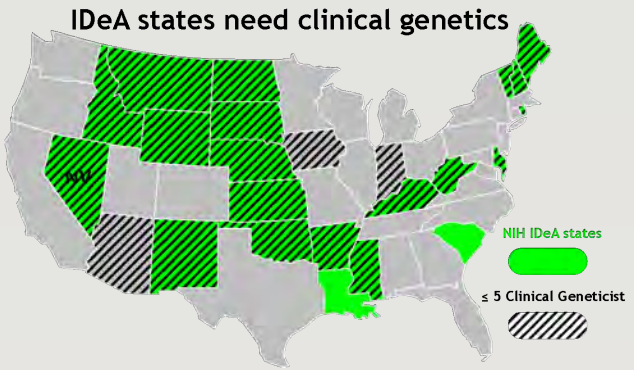
"The genetic blueprint which makes us who we are is almost the exactly the same in all of us. However, our individual genomes contain over a million scattered variations, giving each of us our uniqueness not only in the specialness of our individuality, but also in our vulnerabilities."

NIPM wins $11.4M NIH COBRE award

This peer-reviewed center award has 45 UNLV and national contributing partners, and received support letter from 60 individuals and organizations

COBRE Component	Impact on Health
Overall (Scientific Premise summary)	Advance the use of genomics and genetics in personalized medicine through cutting-edge research discovery and use of genetic markers, building a center of excellence that fosters new investigator independence, and collaborating with the UNLV School of Medicine and other partners in basic and translational research
GAA core	Build computational and genomics research capacity, providing expert analysts to enable population-level genomics research for COBRE researchers, for scientists at UNLV, and for the IDeA network
Research project 1	Develop a new method using multi-omics profiling to identify the tissue of origin for cancers of unknown primaries to increase the accuracy of diagnosis and treatment
Research project 2	Increase the accuracy of osteoporosis diagnosis by using individualized clinical reference ranges based on individual genetic makeup and environment
Research project 3	Understand the functional role of microglia and immune system dysfunction in schizophrenia etiology to help identify new genetic markers for subtyping schizophrenia and to develop new therapeutic strategies
Research project 4	The role of engineered hybrid proteins in the clearance of the most toxic form of amyloid beta, and to test their potential as therapeutics to prevent the progression of Alzheimer's disease in an animal model.
Research project 5	Use advanced deep learning to identify various base modifications in DNA and RNA via Nanopore sequencing, and dissect methylation biomarkers in neurological diseases
Research project 6	The causative role of IMPK in intestinal carcinoids

COBRE=Centers of Biomedical Research Excellence; GAA=Genome Acquisition and Analysis; IDeA=Institutional Development Award; UNLV=University of Nevada, Las Vegas



NIH grant number: P20 GM121325

UNLV

nipm@unlv.edu
www.unlv.edu/NIPM

NIPM

SUGGESTIONS? WANT TO PARTICIPATE?

Would you like to:

- Receive clinical genetics healthcare
- Have your genome sequenced and analyzed
- Partner with NIPM on a project
- Commercialize a NIPM technology
- Discuss Personalized Medicine
- Have a NIPM faculty teach a class or give a seminar
- Donate to NIPM

Contact email: nipm@unlv.edu

VCS-OncoCycle startup from NIPM

VCS-OncoCycle

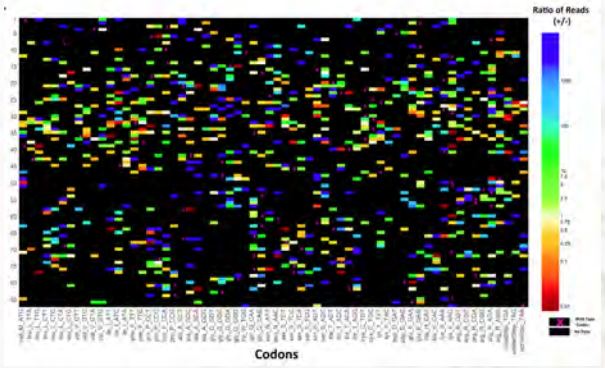
Enabling personalized medicine™

STARTUPNV

SBA

Our company has invented a new single-cell screening technology called the GigaAssay (patent pending) that can rapidly identify the pathogenic potential of **all** mutants in any gene. This company will produce and monetize gene maps for cancer genes that control cell division with several healthcare applications:

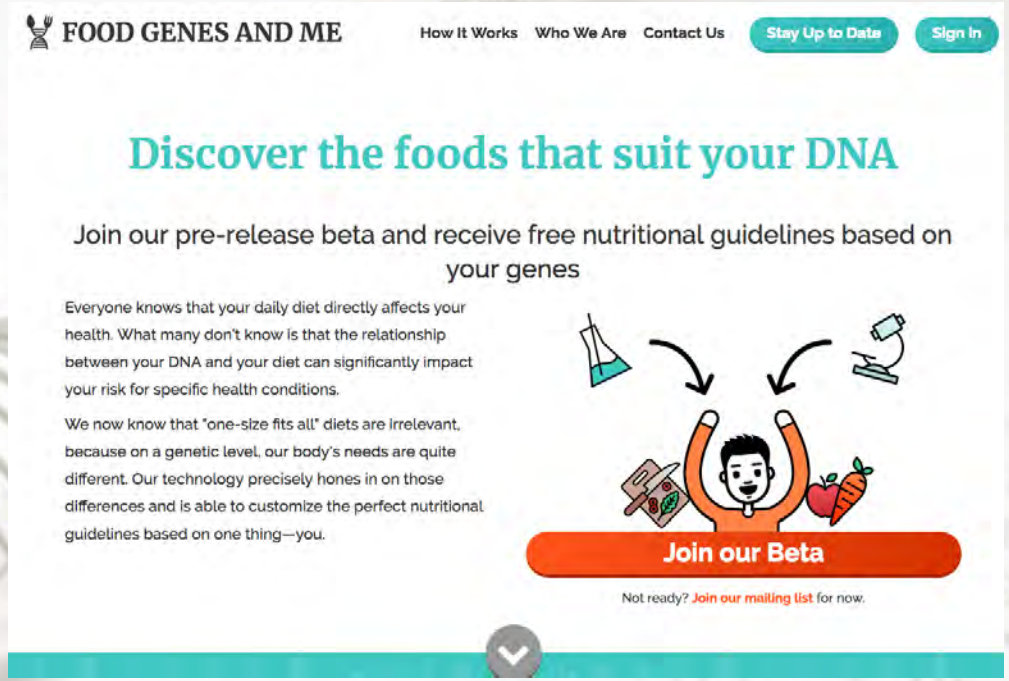
- e-commerce sales of personalized genetic reports to patients
- licensing to diagnostic testing companies,
- licensing to drug development companies
- licensing to carrier screening companies



Food Genes and Me startup from NIPM

Food Genes and Me, LLC

Food Genes and Me is the first technology spinoff company from UNLV with angel investment funding. The companies mission is to recommend foods and supplements based on the highest quality-nutrigenetic studies available



www.foodgenesandme.com