Nevada Institute of Personalized Medicine

University of Nevada, Las Vegas
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MISSION

• 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.
UNLV PARTNERS

- UNLV VPRED, Provost, President
- College of Sciences
- School of Nursing
- School of Community Health
- School of Medicine
- Department of Psychology
- School of Life Sciences
- School of Business
- Advisory Boards
- National Supercomputing Institute
- Office of Economic Development
- NIPM Program Coordinator
- Cleveland Clinic Lou Ruvo Brain Center for Health
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.
Associate Professor of Statistics
Mathematical Sciences
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CBC B422

Amei Amei - Affiliate Faculty

• Solving scientific problems raised in areas of population genetics and mathematical biology using probability theory and statistics methodology

• Developed a time-inhomogeneous Poisson random field to model genetic differences within and between two related species using diffusion approximation to discrete time discrete state Markov chains.

• Working on the application of the model to DNA alignments of two cancer patients to identify possible genes that are related to the cancer
Areas of Research:

• Retinal Degeneration

• Study the role of retinal pigment epithelium (RPE) cell phagocytosis in photoreceptor death that leads to retinal dysfunction

• Obesity

• Exploration of the physiological and pathological roles of tubby in the development of obesity. Multidisciplinary approaches including animal models, molecular, cellular, genetic, biochemical and functional proteomics by phage display in combination with next generation DNA sequencing (NGS) technology to investigate the above diseases.
Jingchun Chen – NIPM Faculty

Area of Research interests:

• Data management
• Genetics, Genome-wide association studies (GWAS),
• Imputation, Meta-analysis, Polygenic analysis,
• Next generation sequencing analysis, and most of the molecular biological techniques

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Professor, Nevada Institute for Personalized Medicine
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HRC 183A
Xiangning Chen – NIPM Alumni

Research Expertise

• Human genetics study
• Genetics of schizophrenia
• Genetics of smoking and nicotine dependence
• Genomics and genomic technology
• Bioinformatics and sequencing analysis
• Molecular biology
Christopher Cochran - Affiliate Faculty

Research Interests

• Enhancing patient safety through electronic medical records
• Using information technology to reduce/eliminate medical errors and improve costs of care
• Using real time hospital data for surveillance to prevent outbreaks of infectious diseases.
• The role of predictive analytics in personalized medicine
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
Allen Gibbs - Affiliate Faculty

- Functional genomics of desert Drosophila
- Experimental evolution of Drosophila melanogaster
Joseph Greenway - Affiliate Faculty

• Greenway is the Director and co-founder of UNLV's Center for Health Information Analysis. His recent projects examine readmission rates, Potentially Preventable Conditions (PPC) and healthcare quality measures.

• His latest efforts include advancing health data transparency in Nevada, including the collection, analysis and public posting of hospital and ambulatory surgery center data.
Mira Han - Affiliate Faculty

• 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

- “Microbial dark matter”: Environmental genomics, systems biology, cultivation & systematics
- Ecology of thermophiles: Nitrogen biogeochemical cycle & temperature-energy relationships
- Human microbiome: Effects of genetics, drugs, and diet on gut microbial community composition & function

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

- Chronic Pain
- Chronic Low Back Pain
- Chronic Illnesses
- Self-management
- Self-management Support
- Biomarkers
Jefferson Kinney - Affiliate Faculty

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.
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
Joseph Lombardo - Affiliate Faculty

- 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

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Sarah Love- NIPM Staff

• 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.
Sheniz Moonie - Affiliate Faculty

• The Southern Nevada Director for the CDC-funded Behavioral Risk Factor Surveillance System survey, which tracks chronic disease risk factors and rates, Moonie specializes in pediatric asthma. She has an active research study with the University of Nevada School of Medicine investigating the relationship between asthma and obesity among children.
Areas of interest:

- Clinical Genetics
- Performance Genetics
- Connective Tissue Disorders
- Traumatic Brain Injury Genomics
- Rare and Undiagnosed Diseases
- Genetics of Common Complex Disorders
- Genetics of Hearing Loss
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.
The Raftery laboratory investigates how cells work together to build and maintain functional tissues.

We use a model organism, *Drosophila*, for genome-wide functional screening and gene discovery.

~75% of known human disease genes have fly functional homologs

We study signaling networks involved in human cancer, fibrosis, hereditary hypertension, neuropathies, and bone growth.
Martin R. Schiller – NIPM Director

- Minimotifs in proteins and human diversity
- HIV virology
- Bioinformatics software tools
- New biotechnologies
  - (gene editing for HIV, chimeric minimotif decoy screen, and GigaAssay)

Executive Director, NIPM and Professor, School of Life Sciences
martin.schiller@unlv.edu
WHI 118
Research Interests:

• Adaptive clinical trials (Proposed the first practically usable one-arm two-stage design after the work of Simon’s optimal designs)

• Exact statistical inference (p-value<0.05 VS p-value over 0.05)

• Biostatistician of the CTR-IN for UNLV
Research areas of focus and interest:

- Access to care and outcomes/quality of care of racial/ethnic groups, uninsured and socioeconomically disadvantaged populations
- Health services delivery including comparative effectiveness research, effects of EHR adoption on hospital’s financial performance, clinical outcomes and patient safety
- Reduction in medication errors among hospitals in Southern Nevada
- ED-based hospitalization among patients with severely mentally illness
- Improvement in communication skills among internationally educated nurses in the Las Vegas valley
- Economic effects of the Clean Air Act in Nevada
- Diabetic complications, maternal outcomes, and palliative care models in Nevada
- Chinese health system and policy
Shirley Shen – NIPM Staff

- 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 in the University of Nevada School of Medicine’s surgery department, the department of chemistry, and the genomics core laboratory. 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.
James Timmins has been the Health Sciences Business Development Officer at UNLV since July 2016, with a focus on supporting the clinical and commercial advancement of the Nevada Institute of Personalized Medicine. Timmins was one of the first scientists and technically-trained MBAs (MIT Sloan School) in the biotech field, with startup roles for Promega and the biotech units of Upjohn, Amoco, and W.R. Grace, resulting in commercialized products and spinoff ventures. His recent career has focused on repeating this process for large nonprofit entities and/or scientists that have biotech assets to license or commercialize into new ventures.

Expert Area: Intellectual Property Assessment and Commercialization, Regulatory Lab Management and Services
• Studying injury response in regenerative animals. Understanding these processes have important implications for developing regenerative therapies for damaged tissues and aging.

• Use powerful and well-characterized vertebrate model, the South African clawed frog, *Xenopus laevis*. Using interdisciplinary approaches (including molecular, chemical-genetic physiological, and in vivo imagining tools), seek to elucidate and integrate the biochemical and bioelectrical control of animal regeneration.

• Goal is to build a blueprint for organ regeneration and to apply this knowledge towards developing novel therapeutics for regenerative medicine.
Research interests:

- Computational modeling of immunological processes
- Comparative genomics and proteomics of Bacteriophage
- Gene regulatory network inference from gene expression data
- Agent-based modeling and simulation
Qing Wu – NIPM Faculty

Area of Research interests:

• Development and validation of personalized clinical normative values

• Meta-analyses of epidemiologic studies, clinical trials and genome-wide association studies

• Statistical methodology development in meta-analysis, clinical trials and analysis of “big data”

• Bone density and osteoporosis research

• Statistical consulting in biomedical research
Building a personalized medicine database

Area of Research Interests and Skills:

- Next-generation sequencing (NGS) data analysis
- Systems biology and systems medicine
- Network modeling and pathway analysis
- Medical informatics and text mining
- Computational microbiome
- Image processing and computer vision
- Artificial intelligence and machine learning
- Complex systems and nonlinear dynamics
Research interests:

• Biochemistry of cell division at the molecular level

• Identification of new molecules that are part of the cell division machine, and investigation of how different proteins work together to make a cell divide.

• This research not only helps answer how and why our body can develop from a single fertilized egg but also addresses the mechanisms of diseases such as cancer. Cancer cells can divide under conditions that a normal cell cannot. Identifying the molecular mechanism that promotes cancer cell division can help us develop chemical inhibitors to treat the disease.
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

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<tr>
<th>COBRE Component</th>
<th>Impact on Health</th>
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<tr>
<td>Overall/Administrative Core</td>
<td>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</td>
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<td>(Martin R. Schiller)</td>
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<td>GASP and HuGE Data cores</td>
<td>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</td>
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<td>(Xianging Chen and Joe Lombardo)</td>
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<tr>
<td>Research project 1</td>
<td>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</td>
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<td>(Mira Han)</td>
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<td>Research project 2</td>
<td>Increase the accuracy of osteoporosis diagnosis by using individualized clinical reference ranges based on individual genetic makeup and environment</td>
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<td>(Qing Wu)</td>
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<td>Research project 3</td>
<td>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</td>
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<td>(Jingchun Chen)</td>
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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.
Welcome

The Nevada Institute of Personalized Medicine (NIPM) is working to improve individual and systemic health care through translational clinical scientific research, education and workforce training, commercialization of technologies, and job creation.