Davidson Research Network Mentors and Sites 2024

1. **Anil K. Sood, M.D. (Davidson Alumnus)**

Professor and Vice Chair for Translational Research
Departments of Gynecologic Oncology, Reproductive Medicine, and Cancer Biology
Director, Ovarian Cancer Research Program
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Research Focus
- Gynecologic Cancer
  - Projects
    - RNA Interference
    - Non-coding RNA work
    - Angiogenesis
    - Influence of stress hormones
  - Techniques
    - RT-PCR
    - Protein analysis
    - Animal work
    - Immunohistochemistry

2. **Tom Patterson, MD**

Division Head-Infectious Disease
Department of Medicine
University of Texas Health Science Center
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(Best contact is Dr. Redding's Email or phone)
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Research Focus

- Medical Mycology (Fungal pathogens that cause human disease)
  - Projects
    - Diagnostic testing
    - Fungal resistance to current treatments
    - Animal models of fungal infections
    - Evaluation of new antifungal agents
  - Techniques
    - In vivo animal studies
    - RT-PCR
    - Antifungal susceptibility testing

3. **Brett Ginsburg, Ph.D.**

Associate Professor of Psychiatry and Pharmacology
University of Texas Health Science Center
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Research Focus
- Biological Psychiatry/Pharmacology
  - Projects
    - Measuring biomarkers for psychiatric disorders
    - Analysis of drugs of abuse
    - Development of drug delivery solutions
  - Techniques
    - Mass spectrometry
    - Drug measurement

4. **Andrew Bazemore MD MPH (Davidson Alumnus)**

Senior Vice President for Research and Policy
American Board of Family Medicine
Co-director Center for Professionalism & Value in Healthcare
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Also, Departments of Family Medicine, Georgetown University, Virginia Commonwealth University and University of Toronto

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Website: https:www.professionalismandvalue.org

Research Focus:

- Professionalism in Health Care
- Equity and Social Accountability in Health Workforce and Training
- Value-Based Payment and Measurement
- Access to Care, Geospatial Analytics
- Integrated Primary Care Practice and Delivery

5. **Neil Alexis**

Professor, Dept. of Pediatrics
Director of the Airway Immunobiology Laboratory at the UNC Center for Environmental Medicine, Asthma, and Lung Biology (CEMALB)
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Research Focus

Biology of the central airways, specifically trying to understand the cellular and biochemical host defense functions that occur in that region of the lung.

Innate and acquired immune responses in normal healthy people as well in individuals with pre-existing airway diseases such as asthma, chronic obstructive pulmonary disease (COPD) and cystic fibrosis (CF).

Immune-inflammatory pathophysiology of lung disease and how inhaled irritants affect patients with lung disease

Environmental exposure studies with the Environmental Protection Agency using state of the art exposure chambers

6. **David Walker, MD (Davidson Alumnus)**

Professor Department of Pathology
Executive Director, Center for Biodefense and Emerging Infectious Diseases
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Research Focus

Pathogenesis of tickborne infectious diseases
Immune function related to these infections with the goal of vaccine development
Techniques
- Western Blot
- ELISA
- PCR
- Animal studies

7. **Clyde Wright MD (Davidson Alumnus)**

Assistant Professor
Section of Neonatology
Department of Pediatrics
Children's Hospital Colorado and
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Research Focus

The contribution of the innate immune response to the pathogenesis of bronchopulmonary dysplasia (BPD) in very low birthweight infants (infants born less than 1500 grams).

BPD, a chronic lung disease of infancy, affects 25% of the very low birthweight infants and leads to significant long term morbidity. BPD results in part from multiple inflammatory and oxidant insults encountered in the perinatal period. The innate immune response to these insults is thought to contribute to the pathogenesis of BPD. The major focus of the research is to further define how the neonatal lung responds to these toxic exposures. Over 100 genes orchestrating the cellular response to these insults are regulated by the transcription factor NF-κB. Clinical studies have correlated NF-κB activation in the preterm lung to an increased risk of developing BPD. This lab is working to define how NF-κB activation contributes to neonatal lung injury and abnormal development.

8. **Kelly Carter Nelson MD. (Davidson Alumnus)**

Associate Professor
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Research Interests: exploring barriers to and options for early melanoma diagnosis, including:
Cost of care impact of provider diagnostic accuracy for melanoma
Barriers to early melanoma diagnosis in the state of Texas
Providing dermoscopy education to enhance provider diagnostic education
Validating non-invasive diagnostic technologies to enhance early melanoma detection

9. **Anna Mandinova, MD, PhD**

Vice-Chair for Research, Department of Dermatology
Associate Director, Cutaneous Biology Research Center
Associate Professor, Harvard Medical School
Broad Institute MIT/Harvard, Associate Member
Harvard Stem Cell Institute, Affiliate Faculty
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In the Mandinova lab, we employ the epidermis as a model system to investigate adult stem cells in both normal and pathological conditions. Our research endeavors revolve around key inquiries:

- We examine the mechanisms governing homeostatic stem cell renewal and its intricate balance with the commitment to differentiation, which is essential for preserving tissue integrity.
- We explore the epidermis's remarkable capacity to endure and repair frequent injuries and insults.
- We study the safeguards that protect genomically damaged stem cells.
- We investigate the factors that underlie infrequent instances of aberrant clonal expansion, which can transform these cells into benign or malignant lesions.

To attain these insights, our attention is directed toward the posttranscriptional regulation of gene expression and its dynamic interaction with cellular metabolism. We posit that this approach offers pragmatic avenues for potential therapeutic interventions and identifying pharmacologically "druggable" targets.

10. Shadmehr (Shawn) Demehri, M.D., Ph.D. (Tom Horn Davidson Alumnus)

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http://www.massgeneral.org/cancer/research/researchlab.aspx?id=1648

Research Focus

The focus of the Demehri laboratory is to determine the role of the immune system in regulating the early stages of cancer development in order to harness its anti-tumor potential for cancer therapy.

Projects

Mechanisms of T cell activation against cancer.
Mechanisms of natural killer (NK) cell recruitment and activation against cancer.
Mechanisms of tumor promotion by the immune system.

Techniques

Immunohistochemistry
Flow cytometry
PCR / qPcr

11. **Kevin O. Saunders, Ph. D. (Davidson Alumnus)**

Assistant Professor
Director, Laboratory of Protein Expression
Associate Director of Research Duke Human Vaccine Institute
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Research Focus
HIV-1 immunity and immunogen design

- Projects
  - Pathogen-specific monoclonal antibody repertoire analysis
  - Antibody engineering
  - Antibody recognition of glycans
  - HIV-1 Envelope design
  - B cell clonal persistence
- Techniques
  - Illumina MiSeq
  - RT-PCR
  - Fast performance liquid chromatography purification
  - Luminex multiplex immunoassays for cytokines and glycans
  - Cell culture and transfection
  - Surface plasmon resonance
  - ELISA
  - Flow cytometry
  - Site-directed mutagenesis

12. **Stokes Peebles, M.D. (Davidson Alumnus)**

Elizabeth and John Murray Professor of Medicine
Division of Allergy, Pulmonary, and Critical Care Medicine
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Research focus:

Lung Inflammation

Projects

Eicosanoid regulation of allergic airway inflammation
Glucagon-like peptide-1 receptor signaling in allergic airway inflammation
Respiratory syncytial virus pathogenesis

Techniques

Flow cytometry
Airway physiology
In vivo animal models of asthma and anaphylaxis
In vivo infection models

13. Richard M. Peek, Jr., M.D. (Davidson Alumnus)

Director, Division of Gastroenterology, Hepatology, and Nutrition
Mina Cobb Wallace Chair in Immunology
Professor of Medicine
Professor of Cancer Biology
Professor of Pathology, Microbiology and Immunology
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Research Focus

- *Helicobacter pylori* and gastric disease
  - Projects
    - Cell signaling/gastric inflammation and cancer
    - Microbial pathogenesis
    - Host pathogen interactions
  - Techniques
    - PCR/RT-PCR
    - Protein analysis
    - Cell and organoid culture
    - Molecular techniques
    - Cell imaging
    - Animal models of gastric cancer

14. **Sallie Permar, M.D., Ph.D. (Davidson Alumnus)**

Nancy C. Paduano Professor and Chair
Weill Cornell Medicine
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WCM Pediatrics Website: https://pediatrics.weill.cornell.edu/
WCM Permar Lab Website: https://www.permarlabwcm.org/

Research focus

The Permar lab focuses on development of immunologic strategies to eliminate neonatal pathogens – with the ultimate goal of providing every child with a healthy start to life. Research projects include:

- Investigating the natural maternal and infant immune responses that contribute to impeding transmission of vertically transmitted viral pathogens, such as HIV, cytomegalovirus (CMV), and Zika, and how these effective immune responses can best be targeted by vaccine approaches.
- Developing and utilizing nonhuman primate models of vertical virus transmission to perform proof of concept studies to determine whether the vaccine approaches that target the naturally protective immune responses are effective.
- Defining both innate and adaptive immune responses at the maternal-fetal interface, including mucosal surfaces and the immunology of breast milk.

Experience may include limited clinical shadowing in pediatrics and infectious diseases, as well as interaction with other trainees in the lab (that may include postbaccalaureate scholars and research technicians, research staff, PhD and MD students, postdoctoral fellows, clinical fellows, and junior faculty) and Dr. Permar in her leadership role as a department chair at an academic medical center.

15. Brad Ellison, MD MS (Davidson Alumnus)

Clinical Director of Orthopedic Adult Reconstruction Operations
OrthoCarolina – Concord
Musculoskeletal Clinical Research Coordinator for Davidson College Pre-Medical Program
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Atrium Musculoskeletal Research Director: Susan Odum PhD
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Orthopedic Surgery is the medical and surgical discipline focused on treatment of musculoskeletal disease and injury. The OrthoCarolina Research Institute is one of the most prolific clinical research programs in the world, producing more publications, presentations and research studies in musculoskeletal sciences than any other single institution (84 publications in 2021). The experience will have two points of focus that will emphasize both clinical and research activity during the two-month opportunity. The first component will be working alongside leading researchers in analyzing data to contribute to research studies in a manner that would hopefully result in opportunity for authorship on a peer-reviewed publication and presentation at a national Orthopedic meeting. The second component will consist of an in-person opportunity to shadow live surgery in the Operating Room, as well as join in the clinic for direct patient interactions. Collectively, this experience will provide a comprehensive opportunity in Orthopedic Surgery that will generate meaningful clinical research, while also engaging in direct patient care experiences in the operating room and office settings.

16. Maria Blasi, Ph. D. (Duke University)

Maria Blasi, PhD
Assistant Professor of Medicine
Division of Infectious Diseases
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Research Focus

- HIV vaccine development using an integrase defective lentiviral vector (IDLV) as delivery platform to induce durable immune responses.
- Coronavirus vaccine development using IDLV.
- Engineering of monoclonal antibodies against HIV and other viral infections
- HIV persistence in the kidney
- Development of therapeutic strategies against HIV and other viral infections

Techniques

Cloning
RT-PCR
Sequencing
Cell culture and transfection
Antibody purification
ELISA
ELISPOT
Flow cytometry
High Containment BSL-3 work for coronavirus research
Processing of human samples (fluids and tissues) from people with HIV and SARS-CoV-2
Animal models (mouse and non-human primate)

17. **William Stoops, PhD (Davidson Alumnus)**

Professor
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Research focus

Development and testing of novel interventions and outcomes for cocaine use disorder using Phase I, II and III clinical trial methods

Human behavioral pharmacology of stimulants, opioids, nicotine and alcohol using tightly controlled human laboratory methods

Identifying risk and vulnerability factors associated with substance use disorders

Understanding psychosocial, immune and cardiovascular consequences of cocaine use

Contact Dr. Spencer Redding for questions: redding@uthscsa.edu