Collaborative Research Training in Thrombosis and Inflammation

T32 Research Training Program

Mentor Catalog

Baylor College of Medicine

CTRID
CENTER FOR TRANSLATIONAL RESEARCH ON INFLAMMATORY DISEASES

v. 101823

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About the Cover

Fibrin Falls (2021)
Justin Courson, Ph.D.
CTRID T32 Trainee

This photograph was captured by CTRID T32 trainee Dr. Justin Courson using scanning electron microscopy. The image displays a small bleed frozen in time.

PROGRAM SUMMARY

CTRID
CENTER FOR TRANSLATIONAL RESEARCH ON INFLAMMATORY DISEASES

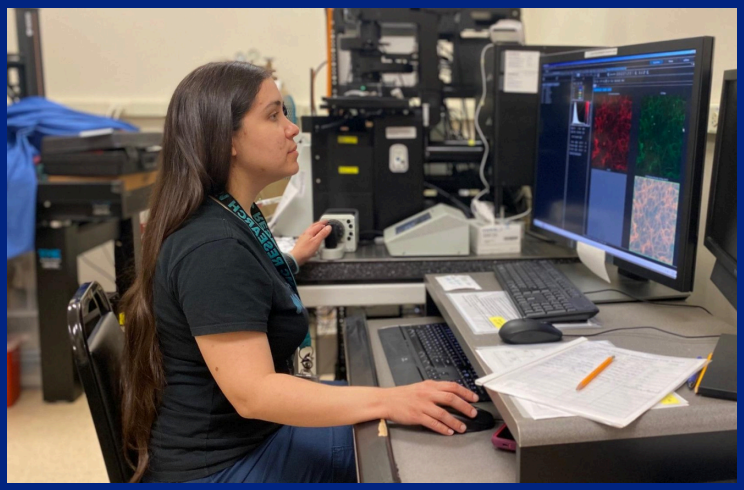
The goal of our **Collaborative Research Training in Thrombosis and Inflammation** NIH/NHLBI T32 research training program at the Center for Translational Research on Inflammatory Diseases (CTRID) is to train clinician-scientists and non-clinician scientists (PhD) for collaborative research careers in two inter-related topics: thrombosis and inflammation.

The program consists of 2-3 years of research training, enriched by didactic courses, an outstanding seminar series and a vibrant scientific environment. In addition to training clinician-scientists in biomedical research, PhD scientists will be trained in translational medicine offering a direct interaction with patients with clinical conditions related to the focus of this T32. Trainees have the opportunity to interact with basic, clinical, translational, and health services research and uniquely investigate both thrombosis and inflammation.

This brochure provides academic information and research interests about the faculty members committed to serving as primary mentors for trainees in our T32 research training program. The faculty mentors in our training program represent a total of 10 academic units within 5 departments at BCM and 3 neighboring Texas Medical Center institutions. The multidisciplinary, cross-departmental, collaborative nature of CTRID provides an outstanding environment for training of future independent clinician and PhD scientists.

Our T32 training program on thrombosis and inflammation continues to pave the way for new biological insights and novel ways of prevention and treatment of diseases accompanied by thrombosis and inflammation by educating future clinician- and non-clinician scientists for collaborative research careers in thrombosis and inflammation.

We encourage you to consider our Collaborative Research Training in Thrombosis and Inflammation T32 Program and our distinguished group of faculty mentors for your early-career research endeavors.



THEMATIC RESEARCH INTERESTS

CTRID
CENTER FOR TRANSLATIONAL RESEARCH ON INFLAMMATORY DISEASES

The thematic research interests of our T32 program mentors, stratified in a simplified manner according to primarily thrombosis, inflammation, and combined topics is shown below. This scheme is used to ensure that the mentoring groups selected for each trainee incorporates concepts relevant to both thrombosis and inflammation.

Collaborative Research Training in Thrombosis and Inflammation

Thrombosis

Platelet Signaling
Dr. Vijayan

Platelet Microvesicles
Dr. Thiagarajan

Markers of Platelet Activation
Drs. Thiagarajan and Vijayan

von Willebrand Factor
Drs. Cruz, Sartain, & Yee

Microvascular Thrombosis
Drs. Nguyen, Rumbaut, & Cruz

3D Ultra-Structure of Thrombi
Drs. Burns and Rumbaut

Thrombosis & Inflammation

Thrombosis & Inflammation in Sepsis
Drs. Cruz, Nguyen, Rumbaut, Viajan, Lam, & Sartain

Thrombosis & Inflammation in Stroke
Drs. Cruz and Marrelli

Thrombosis & Inflammation in Cancer
Drs. Yao and Afshar-Kharghan

Inflammation

Pulmonary Hypertension
Dr. Pandit

Lung & Allergic Inflammation
Drs. Kheradmand, Rodriguez, & Corry

Autoimmunity
Dr. Beeton

Neutrophils & Endothelium
Drs. Lam and Rumbaut

Cancer & Inflammation
Drs. Kheradmand, Rooney, Shin, Vijayan, & Yao

Sarcopenic Obesity & Inflammation
Dr. Villareal

VAHID AFSHAR-KHARGHAN, MD

ACADEMIC APPOINTMENT

Professor,
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PRIMARY DEPARTMENT AND SECTION

PULMONARY MEDICINE - SECTION OF BENIGN HEMATOLOGY

RESEARCH INTERESTS

- Cancer-associated thrombosis
- Role of hemostatic factors in cancer progression
- Role of the complement system in the progression of cancer
- Immunoregulatory role of platelets
- The interaction between the complement system and hemostatic factors

RESEARCH OPPORTUNITIES FOR TRAINEES

- The impact of complement system on tumor growth and antitumor immune response
- Immunoregulatory role of platelets
- Pathogenesis of cancer associated venous thrombosis
- Clonal hematopoiesis and cardiovascular disease
- The impact of platelets on the growth of cancer

RELEVANT PUBLICATIONS

Hu, Q., Hisamatsu, T., ... Afshar-Kharghan, V. (2017). **Role of Platelet-Derived Tgfβ1 in the Progression of Ovarian Cancer.** Clinical cancer research : an official journal of the American Association for Cancer Research, 23(18), 5611–5621. PMID: 28611202.

Cho, M. S., Noh, K., ... Afshar-Kharghan, V. (2017). **Role of ADP receptors on platelets in the growth of ovarian cancer.** Blood, 130(10), 1235–1242. PMID: 28679740.

Haemmerle, M., Taylor, M. L., ... Afshar-Kharghan, V., ... Sood, A. K. (2017). **Platelets reduce anoikis and promote metastasis by activating YAP1 signaling.** Nature communications, 8(1), 310. PMID: 28827520.

CHRISTINE BEETON, PhD

ACADEMIC APPOINTMENT

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PRIMARY DEPARTMENT

INTEGRATIVE PHYSIOLOGY

RESEARCH INTERESTS

- Rheumatoid arthritis
- Autoimmunity
- Microthrombi
- Thrombo-inflammation
- Systemic inflammation
- Ion channels

RESEARCH OPPORTUNITIES FOR TRAINEES

- Phenotype and function of KCa1.1 channel in synoviocytes during rheumatoid arthritis
- Targeting Kv1.3 channels in thrombo-inflammation
- Development of new Kv1.3 blockers and their delivery

RELEVANT PUBLICATIONS

Hu, X., Laragione, T., ... Beeton, C. (2012). **KCa1.1 potassium channels regulate key proinflammatory and invasive properties of fibroblast-like synoviocytes in rheumatoid arthritis.** J Biol Chem. 287(6):4014-22. PMID: 22074915.

Tanner, M. R., Hu, X., ... Beeton, C. (2015). **KCa1.1 inhibition attenuates fibroblast-like synoviocyte invasiveness and ameliorates disease in rat models of rheumatoid arthritis.** Arthritis Rheumatol. 67(1):96-106. PMID: 25252152.

Tanner, M. R., Tajhya, R. B., ... Beeton, C. (2017). **Prolonged immunomodulation in inflammatory arthritis using the selective Kv1.3 channel blocker HsTX1[R14A] and its PEGylated analog.** Clin Immunol. 180:45-57. PMID: 28389388.

ALAN BURNS, PhD

ACADEMIC APPOINTMENTS

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PRIMARY DEPARTMENTS AND SECTIONS

VISION SCIENCES - OPTOMETRY
PEDIATRICS - LEUKOCYTE BIOLOGY

RESEARCH INTERESTS

- Biological imaging
- Electron microscopy
- Inflammation
- Leukocyte biology
- Platelets
- Wound healing
- Obesity
- Metabolic syndrome
- Ocular surface
- Cornea

RESEARCH OPPORTUNITIES FOR TRAINEES

- Mechanisms of platelet extravasation in the injured cornea
- Diet-induced obesity and its effect on corneal wound healing

RELEVANT PUBLICATIONS

Courson, J. A., Landry, P. T., ... Rumbaut, R.E., Burns, A.R. (2021). **Serial block-face scanning electron microscopy (SBF-SEM) of Biological Tissue Samples.** J Vis Exp. (169). PMID: 33843931.

Hargrave, A., Courson, J. A., ... Burns, A.R. (2021). **Corneal dysfunction precedes the onset of hyperglycemia in a mouse model of diet-induced obesity.** Plos One, 15:e0238750. PMID: 32886728.

De La Cruz, A., Hargrave, A., ... Burns, A.R., Rumbaut, R.E. (2021). **Platelet and erythrocyte extravasation across inflamed corneal venules depends on CD18, neutrophils, and mast cell degranulation.** Int J Mol Sci. 22 14:7360. PMID: 34298979.

DAVID CORRY, MD

ACADEMIC APPOINTMENT

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ADDITIONAL TITLE

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PRIMARY DEPARTMENT AND SECTION

MEDICINE - IMMUNOLOGY, ALLERGY AND RHEUMATOLOGY

RESEARCH INTERESTS

- Asthma
- Immunity
- Fungi
- MicroRNAs
- Alzheimer's Disease
- Colitis

RESEARCH OPPORTUNITIES FOR TRAINEES

- Fungal pathogenesis of allergic airway disease
- Fungal pathogenesis of chronic cerebritis and dementia
- MicroRNA-dependent control of inflammatory lung disease
- Design and testing of novel antifungal agents

RELEVANT PUBLICATIONS

Grunig, G., Warnock, M., ... Corry, D.B. (1998). **Requirement for IL-13 Independently of IL-4 in Experimental Asthma.** Science. 282:(5397) 2261-2263. PMID: 9856950.

Lee, S-H., Goswami, S., ... Corry, D.B., et al. (2007). **Anti-Elastin Autoimmunity in Tobacco Smoking-Induced Emphysema.** Nat Med. 13:(5)567-569. PMID: 17450149.

Wu, Y., Zeng, Z., ... Corry, D. B. (2021). **Candida albicans elicits protective allergic responses via platelet mediated T helper 2 and T helper 17 cell polarization.** Immunity, 54(11), 2595–2610.e7. PMID: 34506733.

MIGUEL A. CRUZ, PhD

ACADEMIC APPOINTMENT

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Pediatrics,
Molecular Physiology &
Biophysics,
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PRIMARY DEPARTMENT AND SECTION

MEDICINE - CARDIOVASCULAR RESEARCH: THROMBOSIS RESEARCH

RESEARCH INTERESTS

- Thrombosis
- Inflammation
- von Willebrand factor
- Vimentin Platelet adhesion
- Extracellular hemoglobin and thrombosis

RESEARCH OPPORTUNITIES FOR TRAINEES

- Role of free hemoglobin in thrombosis in ECMO/LVAD
- Molecular mechanisms of thrombo-inflammatory diseases

RELEVANT PUBLICATIONS

Da, Q., Teruya, M., ...Cruz, M.A. (2015). **Free Hemoglobin Increases von Willebrand Factor-Mediated Platelet Adhesion in Vitro: Implications for Circulatory Devices.** Blood. 126(20):2338-41. PMID 26307534.

Da, Q., Behymer, M., ... Cruz, M.A. (2014). **Platelet Adhesion Involves a Novel Interaction between Vimentin and von Willebrand Factor under High Shear Stress.** Blood. 123(17):2715-21. PMID 24642750.

Valladolid, C., Yee, A., Cruz, M.A. (2018). **von Willebrand Factor, Free Hemoglobin and Thrombosis in ECMO.** Front Med (Lausanne). 5:228. PMID 30175099.

FARRAH KHERADMAND, MD

ACADEMIC APPOINTMENTS

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Section of Pulmonary Medicine,
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ADDITIONAL TITLE

Co-Director of Lung Precision Oncology Program (LPOP),
Pulmonary and Critical Care,
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PRIMARY DEPARTMENT AND SECTION

MEDICINE - PULMONARY, CRITICAL CARE, AND SLEEP MEDICINE

RESEARCH INTERESTS

- Immune cells in lung disease: COPD and asthma
- Inflammation and biomarkers in the lungs
- Models of lung cancer

RESEARCH OPPORTUNITIES FOR TRAINEES

- Lung immunity under normal or diseased conditions
- Immune responses to lung tumors

RELEVANT PUBLICATIONS

Le, D.T., Huynh, T.R., ... Kheradmand, F., Tyner, J.J., Paust, S. (2021). **Natural killer cells and cytotoxic T lymphocytes are required to clear solid tumor in a patient-derived xenograft.** JCI Insight. 6(13):e140116. PMID: 34081628.

Wu, Y., Zeng, Z., ... Kheradmand, F., Corry, D.B. (2021). **Candida albicans elicits protective allergic responses via platelet mediated T helper 2 and T helper 17 cell polarization.** Immunity. S1074-7613(21)00339-3. PMID: 34506733.

Madison, M.C., Landers, C.T., ... Kheradmand, F. (2019). **Electronic cigarettes disrupt lung lipid homeostasis and innate immunity independent of nicotine.** J Clin Invest. 129(10):4290-4304. PMID: 31483291.

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ACADEMIC APPOINTMENT

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PRIMARY DEPARTMENT AND SECTION

PEDIATRICS - CRITICAL CARE

RESEARCH INTERESTS

- Platelets
- Neutrophils
- Endothelium
- Sepsis
- Thrombosis

RESEARCH OPPORTUNITIES FOR TRAINEES

- Novel drug/peptide development to combat viral adhesion and inflammation
- Testing novel microfluidic devices for apheresis in vivo and in vitro
- Identifying the role of platelet-leukocyte-endothelial interactions in liver diseases

RELEVANT PUBLICATIONS

Valladolid, C., Martinez-Vargas, M., ... Lam, F., Rumbaut, R.E., Nguyen, T.C., Cruz, M.A. (2020). **Modulating the rate of fibrin formation and clot structure attenuates microvascular thrombosis in systemic inflammation**. Blood advances. 14 (4(7)): 1340-1349. PMID: 32259201.

Gorgis, N.M., Kennedy, C., ... Lam, F. (2019). **Clinical Consequences of Cardiomyopathy in Children With Biliary Atresia Requiring Liver Transplantation.** Hepatology. 69 ((3)): 1206-1218. PMID: 30076624.

Lam, F.W., Da, Q., Guillory, B., Cruz, M.A. (2018). **Recombinant human vimentin binds to P-selectin and blocks neutrophil capture and rolling on platelets and endothelium.** J Immunol. 200 ((5)): 1718-1726. PMID: 29335256.

SEAN MARRELLI, PhD

ACADEMIC APPOINTMENT

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McGovern Medical School,
University of Texas Health Sciences Center at Houston

ADDITIONAL TITLE

Director,
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University of Texas Health Sciences Center at Houston

CONTACT INFORMATION

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PRIMARY DEPARTMENT

NEUROLOGY

RESEARCH INTERESTS

- Vascular biology
- Stroke
- Thrombosis

RESEARCH OPPORTUNITIES FOR TRAINEES

- Regulation of cerebral blood flow in healthy and post-stroke conditions
- Therapeutic targeting of post-stroke thrombosis
- Novel methods of promoting therapeutic hypothermia following stroke

RELEVANT PUBLICATIONS

Kim, G. S., Stephenson, J. M., ... Marrelli, S. P. (2021). **Determining the effect of aging, recovery time, and post-stroke memantine treatment on delayed thalamic gliosis after cortical infarct.** Scientific reports, 11(1), 12613. PMID: 34131204.

Fasipe, T. A., Hong, S. H., ... Marrelli, S. P. (2018). **Extracellular Vimentin/VWF (von Willebrand Factor) Interaction Contributes to VWF String Formation and Stroke Pathology.** Stroke, 49(10), 2536–2540. PMID: 30355099.

Hong, S. H., Herman, A. M., Stephenson, J. M., ... Marrelli, S. P., & Wythe, J. D. (2020). **Development of barium-based low viscosity contrast agents for micro CT vascular casting: Application to 3D visualization of the adult mouse cerebrovasculature.** Journal of neuroscience research, 98(2), 312–324. PMID: 31630455.

TRUNG C. NGUYEN, MD

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PRIMARY DEPARTMENT AND SECTION

PEDIATRICS - CRITICAL CARE

RESEARCH INTERESTS

- Multiple organ dysfunction syndrome
- Thrombosis
- Sepsis
- Immune dysregulation

RESEARCH OPPORTUNITIES FOR TRAINEES

- Sepsis – induced coagulopathy
- Sepsis – induced multiple organ dysfunction syndrome

RELEVANT PUBLICATIONS

Brubaker, L. S., Saini, A., Nguyen, T. C., et al. (2022). **Aberrant fibrin clot structure visualized ex vivo in critically ill patients with severe acute respiratory syndrome Coronavirus 2 infection.** Critical care medicine, 50(6), e557–e568. PMID: 35170535.

Lin, H., Scull, B. P., ... Nguyen, T.C., et al. (2021). **IFN-γ signature in the plasma proteome distinguishes pediatric hemophagocytic lymphohistiocytosis from sepsis and SIRS.** Blood advances, 5(17), 3457–3467. PMID: 34461635.

Valladolid, C., Martinez-Vargas, M., ... Nguyen, T. C., & Cruz, M. A. (2020). **Modulating the rate of fibrin formation and clot structure attenuates microvascular thrombosis in systemic inflammation.** Blood advances, 4(7), 1340–1349. PMID: 32259201.

LAVANNYA PANDIT, MD, MS

ACADEMIC APPOINTMENT

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ADDITIONAL TITLE

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PRIMARY DEPARTMENT AND SECTION

MEDICINE - PULMONARY, CRITICAL CARE, AND SLEEP MEDICINE

RESEARCH INTERESTS

- Physiologic and molecular mechanisms of pulmonary vascular disease
- Pulmonary hypertension
- COVID-19 clinical trials and mechanisms of hypoxemic respiratory failure and inflammation

RESEARCH OPPORTUNITIES FOR TRAINEES

- Anatomic microniches and their contribution to vascular remodeling in pulmonary hypertension
- COVID-19 Therapeutic Interventions and Vaccines
- Neutrophil Exosomes: New Pathogenic Entities in COPD
- Lung precision oncology

RELEVANT PUBLICATIONS

Rajagopal, K., Bryant, A. J., ... Pandit, L. M., et al. (2021). **Idiopathic pulmonary fibrosis and pulmonary hypertension: Heracles meets the Hydra.** British journal of pharmacology, 178(1), 172–186. PMID: 32128790.

Darwiche, T., Collum, S. D., ... Pandit, L. M., et al. (2019). **Alterations in cardiovascular function in an experimental model of lung fibrosis and pulmonary hypertension.** Experimental physiology, 104(4), 568–579. PMID: 30663834.

Salama, C., Han, J., ... Pandit, L., et al. (2021). **Tocilizumab in patients hospitalized with Covid-19 pneumonia.** The New England journal of medicine, 384(1), 20–30. PMID: 33332779.

ANTONY RODRIGUEZ, PhD

ACADEMIC APPOINTMENT

Assistant Professor,
Department of Medicine,
Section of Immunology, Allergy & Rheumatology,
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ADDITIONAL TITLES

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PRIMARY DEPARTMENT AND SECTION

MEDICINE - IMMUNOLOGY, ALLERGY, AND RHEUMATOLOGY

RESEARCH INTERESTS

- COPD
- Interstitial lung disease
- MicroRNAs
- Alveolar type 2 progenitor stem cells
- Lung Inflammation

RESEARCH OPPORTUNITIES FOR TRAINEES

- MicroRNAs regulation in COPD and interstitial lung disease
- Mechanism of microRNAs in Alveolar type 2 progenitor stem cells
- MicroRNAs in interstitial lung disease

RELEVANT PUBLICATIONS

Lu, W., You, R., ... Rodriguez, A., et al. (2015). **The microRNA miR-22 inhibits the histone deacetylase HDAC4 to promote T(H)17 cell-dependent emphysema.** Nature immunology, 16(11), 1185–1194. PMID: 26437241.

Nam, J. W., Rissland, O. S., ... Rodriguez, A., et al. (2014). **Global analyses of the effect of different cellular contexts on microRNA targeting.** Molecular cell, 53(6), 1031–1043. PMID: 24631284.

Gurha, P., Wang, T., ... Rodriguez, A. (2013). **microRNA-22 promotes heart failure through coordinate suppression of PPAR/ERR-nuclear hormone receptor transcription.** PloS one, 8(9), e75882. PMID: 24086656.

CLIONA ROONEY, PhD

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ADDITIONAL TITLES

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PRIMARY DEPARTMENT AND SECTION

PEDIATRICS - HEMATOLOGY AND ONCOLOGY

RESEARCH INTERESTS

- T-cell immunotherapy for virus-associated diseases and malignancies
- Improving the function and survival of T-cell immunotherapies
- Virus-specific T-cells
- Overcoming CAR T-cell mediated toxicity

RESEARCH OPPORTUNITIES FOR TRAINEES

- Enhancement of CAR-modified Epstein-Barr virus-specific T-cells in the patient using epigenetic activation of EBV
- Targeting the tumor environment to enhance therapeutic T-cell functions

RELEVANT PUBLICATIONS

Sharma, S., Woods, M., ... Rooney, C. M. (2023). **Naive T cells inhibit the outgrowth of intractable antigen-activated memory T cells: implications for T-cell immunotherapy.** Journal for immunotherapy of cancer, 11(4), e006267. PMID: 37072346.

Sauer, T., Parikh, K., ... Rooney, C. M. (2021). **CD70-specific CAR T cells have potent activity against acute myeloid leukemia without HSC toxicity.** Blood, 138(4), 318–330. PMID: 34323938.

Quach, D. H., Becerra-Dominguez, L., ... Rooney, C. M. (2019). **A strategy to protect off-the-shelf cell therapy products using virus-specific T-cells engineered to eliminate alloreactive T-cells.** Journal of translational medicine, 17(1), 240. PMID: 31340822.

ROLANDO E. RUMBAUT, MD, PhD

ACADEMIC APPOINTMENT

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ADDITIONAL TITLES

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PRIMARY DEPARTMENT AND SECTION

MEDICINE - PULMONARY, CRITICAL CARE, AND SLEEP MEDICINE

RESEARCH INTERESTS

- Microcirculation
- Inflammation
- Thrombosis

RESEARCH OPPORTUNITIES FOR TRAINEES

- Microvascular thrombosis in experimental sepsis
- Mechanisms of platelet-endothelial interactions in inflammation
- Role of platelets in inflammation

RELEVANT PUBLICATIONS

De La Cruz, A., Hargrave, A., ... Rumbaut, R. E. (2021). **Platelet and Erythrocyte Extravasation across Inflamed Corneal Venules Depend on CD18, Neutrophils, and Mast Cell Degranulation.** International journal of molecular sciences, 22(14), 7360. PMID: 34298979.

Courson, J. A., Hanlon, S. D., ... Rumbaut, R. E. (2020). **Serial block-face scanning electron microscopy: A provocative technique to define 3-dimensional ultrastructure of microvascular thrombosis.** Thrombosis research, 196, 519–522. PMID: 33099176.

Bray, M. A., Sartain, S. E., Gollamudi, J., & Rumbaut, R. E. (2020). **Microvascular thrombosis: experimental and clinical implications.** Translational research : the journal of laboratory and clinical medicine, 225, 105–130. PMID: 32454092.

SARAH E. SARTAIN, MD

ACADEMIC APPOINTMENT

Assistant Professor,
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PRIMARY DEPARTMENT AND SECTION

PEDIATRICS - HEMATOLOGY AND ONCOLOGY

RESEARCH INTERESTS

- Thrombosis
- Inflammation
- Complement
- von Willebrand Factor

RESEARCH OPPORTUNITIES FOR TRAINEES

- Investigating non-canonical mechanisms of alternative complement pathway activation in thromboinflammation
- Investigating the interaction of complement and von Willebrand factor

RELEVANT PUBLICATIONS

Sartain, S. E., Turner, N. A., & Moake, J. L. (2016). **TNF Regulates Essential Alternative Complement Pathway Components and Impairs Activation of Protein C in Human Glomerular Endothelial Cells.** J. Immunol (Baltimore, Md. : 1950). 196(2), 832–845. PMID: 26673143.

Sartain, S. E., Turner, N. A., & Moake, J. L. (2018). **Brain microvascular endothelial cells exhibit lower activation of the alternative complement pathway than glomerular microvascular endothelial cells.** J Biol Chem. 293(19): 7195-7208. PMID: 29555686.

Sartain, S., Shubert, S., Wu, M. F., Wang, T., & Martinez, C. (2020). **The alternative complement pathway activation product Ba as a marker for transplant-associated thrombotic microangiopathy.** Pediatric Blood & Cancer. 67(3), e28070. PMID: 31774252.

DANIEL S. SHIN, MD, PhD

ACADEMIC APPOINTMENT

Senior Faculty,
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ADDITIONAL TITLE

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PRIMARY DEPARTMENT AND SECTION

MEDICINE - HEMATOLOGY AND ONCOLOGY

RESEARCH INTERESTS

- Understand the mechanisms of resistance to immunotherapy in lung cancer and melanoma using mouse model and human clinical data.
- Improve immunotherapy outcome by developing novel combinatorial treatment for patients with lung and head & neck cancer.
- Develop novel CAR T cell therapy for patients with advanced non-small cell lung cancer.

RESEARCH OPPORTUNITIES FOR TRAINEES

- Clinical protocols development for investigator-initiated trial.
- Chart review (retrospective) projects.
- Laboratory (wet bench) research projects.

RELEVANT PUBLICATIONS

Shin, D. S., Zaretsky, J. M., Escuin-Ordinas, H., ... Ribas, A. (2017). **Primary Resistance to PD-1 Blockade Mediated by JAK1/2 Mutations.** Cancer discovery, 7(2), 188–201. PMID: 27903500.

Zaretsky, J. M., Garcia-Diaz, A., Shin, D. S., ... Ribas, A. (2016). **Mutations Associated with Acquired Resistance to PD-1 Blockade in Melanoma.** The New England journal of medicine, 375(9), 819–829. PMID: 27433843.

Shin, D. S., Basak, S., Veena, M. S., ... Srivatsan, E. S. (2024). **Enhanced CTLA-4 Blockade Anti-tumor Immunity with APG-157 Combination in a Murine Head and Neck Cancer.** Cancer medicine, 13(9), e7212. PMID: 38686626.

PERUMAL THIAGARAJAN, MD

ACADEMIC APPOINTMENTS

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Department of Pathology & Immunology,
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PRIMARY DEPARTMENTS AND SECTIONS

PATHOLOGY AND IMMUNOLOGY
MEDICINE - HEMATOLOGY AND ONCOLOGY

RESEARCH INTERESTS

- Hemostasis
- Platelets
- Lupus anticoagulant

RESEARCH OPPORTUNITIES FOR TRAINEES

- Transbilayer movement of anionic phospholipids in hemostasis: causes and consequences
- Mechanism of hypercoagulable state in Lupus anticoagulant/antiphospholipid antibody syndrome
- Utilization of cloned antibodies, patient samples and β2-glycoprotein I-deficient mice
- Investigate unexplained bleeding and thrombotic disorders to understand the control mechanisms in hemostasis
- Testing hypothesis that defective clearance of phosphatidylserine-expressing microvesicles and mitochondria predispose to the procoagulant state

RELEVANT PUBLICATIONS

Dasgupta, S. K., Rivera, S., & Thiagarajan, P. (2020). Lisinopril-**Induced Angioedema in a Patient with Plasma Prekallikrein Deficiency.** TH open : companion journal to thrombosis and haemostasis, 4(1), e33–e35. PMID: 31984307.

Dasgupta, S. K., & Thiagarajan, P. (2020). **Cofilin-1-induced actin reorganization in stored platelets.** Transfusion, 60(4), 806–814. PMID: 32159862.

Thiagarajan, P., Parker, C. J., & Prchal, J. T. (2021). **How Do Red Blood Cells Die?** Frontiers in physiology, 12, 655393. PMID: 33790808.

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PRIMARY DEPARTMENT AND SECTION

MEDICINE - THROMBOSIS

RESEARCH INTERESTS

- Platelets
- Endothelial cells
- Phosphoprotein phosphatase
- Cancer metastasis
- Sepsis

RESEARCH OPPORTUNITIES FOR TRAINEES

- Role of platelet signaling in lung cancer metastasis
- Platelet phosphatases in inflammation

RELEVANT PUBLICATIONS

Lichtenberger, L.M., Vijayan, K.V. (2019). **Are Platelets the Primary Target of Aspirin's Remarkable Anticancer Activity?** Cancer Res. 79(15):3820-3823. PMID: 31300475.

Da, Q., Han, H., ... Vijayan, K.V. (2019). **In vitro phosphorylation of von Willebrand factor by FAM20c enhances its ability to support platelet adhesion.** J Thromb Haemost. 17(6):866-877. PMID: 30864273.

Pradhan, S., Khatlani, T., Nairn, A.C., Vijayan, K.V. (2017). **The heterotrimeric G protein Gβ1 interacts with the catalytic subunit of protein phosphatase 1 and modulates G protein-coupled receptor signaling in platelets.** J Biol Chem. 292(32):13133-13142. PMID: 28615442.

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PRIMARY DEPARTMENT AND SECTION

MEDICINE - ENDOCRINOLOGY, DIABETES AND METABOLISM

RESEARCH INTERESTS

- Sarcopenia
- Sarcopenic obesity
- Frailty

RESEARCH OPPORTUNITIES FOR TRAINEES

- Role of weight loss and exercise therapies in reversing sarcopenic obesity and frailty
- Mechanisms for the reversal of sarcopenic obesity and frailty by intensive lifestyle interventions
- Body composition and bone quality changes in response to intensive lifestyle intervention in older adults with obesity

RELEVANT PUBLICATIONS

Colleluori, G., Aguirre, L., ... Villareal, D.T. (2019). **Aerobic Plus Resistance Exercise in Obese Older Adults Improves Muscle Protein Synthesis and Preserves Myocellular Quality Despite Weight Loss.** Cell Metabolism. 30(2):261-273.e6. PMID 31279675.

Batsis, J. A., & Villareal, D. T. (2018). S**arcopenic Obesity in Older Adults: Aetiology, Epidemiology and Treatment Strategies.** Nat Rev Endocrinol. 14(9):513-537. PMID 30065268.

Villareal, D. T., Aguirre, L., Gurney, A. B., et al. (2017). **Aerobic or Resistance Exercise, or Both, in Dieting Obese Older Adults.** N Engl J Med. 376(20):1943-1955. PMID 28514618.

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PRIMARY DEPARTMENT AND SECTION

SURGERY - SURGICAL ONCOLOGY

RESEARCH INTERESTS

- Pancreatic cancer pathogenesis and therapy
- Virus-like particles (VLPs) vaccine and cancer immunotherapy
- Modulation of pancreatic cancer microenvironment for effective treatment

RESEARCH OPPORTUNITIES FOR TRAINEES

- Stratification of Pancreatic Cancer Subpopulations for Effective Immunotherapy
- Mesothelin mechanism of action in pancreatic cancer tumor microenvironment
- Role of fibrinogen in pancreatic cancer pathogenesis

RELEVANT PUBLICATIONS

Marin-Muller, C., Li, D.,... Yao, Q. (2013). **A Tumorigenic Factor Interactome Connected through Tumor Suppressor MicroRNA-198 in Human Pancreatic Cancer.** Clinical Cancer Research, 19(21):5901-13. PMID: 23989979.

Poteet, E., Liu, D., ... Yao, Q. (2019). **Mesothelin and TGF-α predict pancreatic cancer cell sensitivity to EGFR inhibitors and effective combination treatment with trametinib.** PLoS One. 14(3):e0213294. PMID: 30921351.

Lewis, P. E., Poteet, E. C., ... Yao, Q. (2020). **CTLA-4 Blockade, during HIV Virus-Like Particles Immunization, Alters HIV-Specific B-Cell Responses.** Vaccines. 8(2), 284. PMID: 32517277.

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PRIMARY DEPARTMENT AND SECTION

PEDIATRICS - HEMATOLOGY AND ONCOLOGY

RESEARCH INTERESTS

- Hemostasis
- Thrombosis
- Inflammation
- von Willebrand factor

RESEARCH OPPORTUNITIES FOR TRAINEES

- Functional genomics of von Willebrand factor
- Cell type specific roles of von Willebrand factor
- Role of free hemoglobin in thrombosis
- Non-canonical activation of complement pathways

RELEVANT PUBLICATIONS

Yee, A., Dai, M., ... Ginsburg, D. (2021). **Phage Display Broadly Identifies Inhibitor-reactive Regions in von Willebrand factor.** J Thromb Haemost. 19(11), 2702–2709. PMID: 34255925.

Huttinger, Z.M., Haynes, L.M., Yee, A., ... Ginsburg, D. (2021). **Deep mutational scanning of the plasminogen activator inhibitor-1 functional landscape.** Sci Rep. 11(1):18827. PMID: 34552126.

Cleuren, A., van der Ent, M.A., ... Yee, A., ... Ginsburg, D. (2019). **The in vivo Endothelial Cell Translatome is Highly Heterogeneous across Vascular Beds.** Proc Natl Acad Sci USA. 116(47):23618-23624. PMID: 31712416.