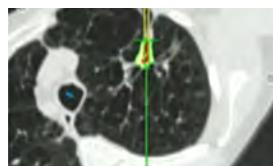




Division of  
Pulmonary, Allergy,  
Critical Care & Sleep  
Medicine



NIA GRANT  
PULMONARY  
FIBROSIS THERAPY



NAVIGATION  
BRONCHOSCOPY  
CAPABILITIES

# LUNG MATTERS

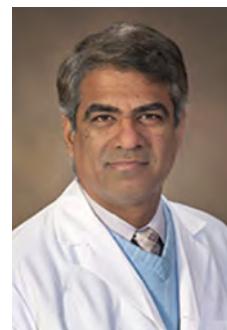
The Division of Pulmonary, Allergy, Critical Care & Sleep Medicine at the University of Arizona College of Medicine- Tucson has a rich history in pulmonary and sleep medicine.



Left to right:  
ROW 1: Billie Birky, MD; Pamela Tongchitnus, MD; Srehal Patel, DO; Tara Carr, MD; Lillian Hansen, NP;  
Janet Campion, MD; Hosai Shab, PA; Brittany Amundson, PA; Heidi Erickson, RN; Monica Kraft, MD;  
Kareem Ahmad, MD; James Knepler, MD; Cameron Hypes, MD; Tiffany Yosencio, MD  
ROW 2: Julie Ledford, PhD; Laura Costanza, NP; Tina Fawcett, DNP; Steven Sears, DO; Ryan Nahapetian, MD;  
Lauren Steep, MD; Joan Machamer, NP; Stefano Guerra, MD, PhD; Saiaram Parthasarathy, MD;  
Sachin Chaudhary, MD; Jarrod Mosier, MD; Joshua Dile, DO; Bhuzinder Natt, MBBs

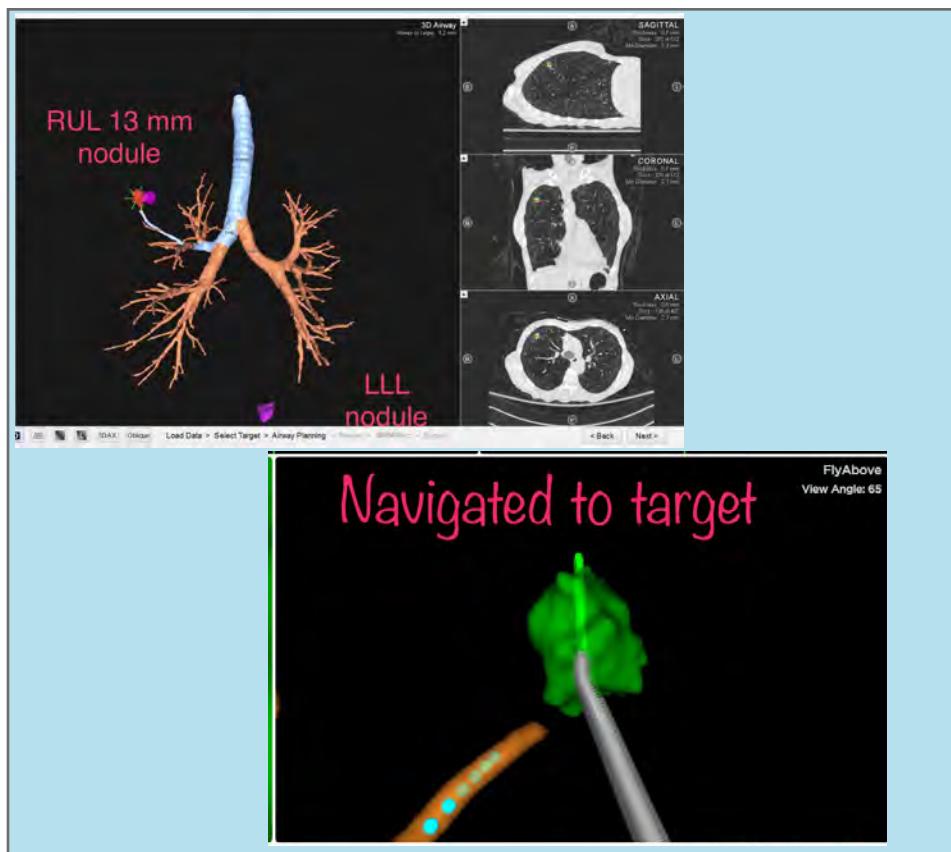
Under the leadership of the inaugural division chief, Dr. Benjamin Burroughs, we emerged as an internationally known program in pulmonary physiology and the longitudinal study of lung function. In the years to follow, Dr. Stuart Quan led the division into the era of sleep medicine and Tucson became known nationally for its sleep research. As interim division chief, Dr. John Bloom sustained a quality training program and advanced our critical care mission followed by Ken Knox, MD who served as Division Chief from 2010-2016 with development of many sub speciality programs and rapid growth. Currently, the division has programs in all areas ranging from asthma, COPD, acute lung injury, lung transplant, pulmonary hypertension, pulmonary fibrosis, critical care, food allergy, interventional pulmonology, ECMO, lung cancer screening and sleep medicine programs. There has been huge growth in research portfolios in various areas within pulmonary, critical care, allergy and sleep medicine enabled by recent clinical and scientific recruits into the Division. We are making significant strides in our tripartite mission of providing patient-centered care, training the future generation, and performing cutting edge research at the bench and bedside. Today, the Division includes 21 faculty, four advanced nurse practitioners, two physician assistants, and 20 fellows in four ACGME accredited fellowship programs -- allergy, pulmonary and critical care, sleep, and critical care medicine. We work closely with centers of excellence such as the UAHS Asthma & Airways Research center and UAHS Center for Sleep & Circadian Sciences as well as translational researchers in pulmonary hypertension and acute lung injury in the health sciences and together are performing innovative research programs that are helping shape healthcare in Arizona and beyond.

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Sai Parthasarathy, MD (Interim Chief, Pulmonary, Allergy, Critical Care & Sleep Medicine)

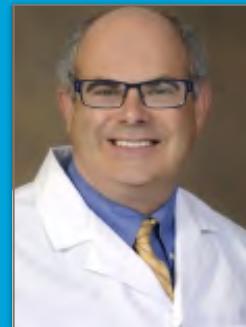


# Interventional Pulmonology

University of Arizona Pulmonary, Allergy, Sleep and Critical Care division at Banner University Medical Center in Tucson provides a comprehensive Interventional Pulmonary program and provides services to patient across the state of Arizona. Electromagnetic Navigation bronchoscopy technology has been adopted to assist the Interventional Pulmonologists with procedures and to provide procedures that reduce the need for thoracic surgery. This technology allows physicians to perform diagnostic, minimally invasive pulmonary procedures with higher diagnostic yield. This technology increases the chance of diagnosing lung cancer in earlier stages and enables the physicians to establish the diagnosis and potentially perform pre-surgical staging in a single procedure. Navigation bronchoscopy can also be used in patients with lung cancer to place radio markers (fiducial markers) that help Radiation Oncologists target radiation to lung tumors (radiosurgery). Markers can also be placed around pulmonary nodules or dye can be instilled to aid in tactile or visual localization by the thoracic surgeon at the time of the nodule resection. The interventional pulmonary program is ably run by Drs. Knepler and Sam. (Images courtesy Dr. Sam).



## Interventional Pulmonology Program



**Dr James L. Knepler, MD**  
Associate Professor,  
Medicine; Program Director,  
Pulmonary & Critical Care  
Fellowship; Associate Chief,  
Division of Pulmonary,  
Allergy, Critical Care & Sleep  
Medicine and Director,  
Interventional Pulmonology,  
Banner – University Medical  
Center Tucson



**Dr Afshin Sam, MD** Assistant  
Professor of Medicine;  
Medical Director, Pulmonary  
Function Testing Laboratory  
Banner – University Medical  
Center Tucson

## Research: Pulmonary Fibrosis

Two University of Arizona investigators, Louise Hecker, PhD, and Heidi Mansour, PhD (at right), were awarded a two-year, \$415,491 research grant from the National Institute on Aging (NIA) of the National Institutes of Health (NIH), to develop an aerosolized version of an oral drug approved to treat multiple sclerosis and evaluate its effectiveness for treating idiopathic pulmonary fibrosis (IPF), an advanced lung disease affecting older people.

The NIH Exploratory/Developmental Research Grant Awards (R21 grant) is intended to encourage exploratory/developmental research by providing support for the early and conceptual stages of project development with high impact potential and paradigm-shifting therapies. The NIA/NIH grant will fund Drs. Hecker and Mansour's work as principal investigators on a project titled "Pre-Clinical Development of a Novel Nrf2-Activator Formulation for the Treatment of Idiopathic Pulmonary Fibrosis."

Dimethyl fumarate (DMF) is approved by the U.S. Food and Drug Administration and is the active ingredient in an oral drug product used for treatment of multiple sclerosis (MS) as an oral drug product to reduce the relapse rate and decrease progression of MS. The drug acts on the same genetic pathway (via the protein Nrf2) which Dr. Hecker has previously shown to be important in disease progression of fibrosis in IPF patients. The goal of this project is to evaluate safety and efficacy of newly designed DMF antioxidant formulations in both oral versus inhaled routes of administration as a novel IPF therapy. The investigators hope the inhaled version, targeted directly to the lung regions affected by IPF patients, will prove more safe and effective as a new drug indication for a critical lung disease with unmet medical needs. This novel approach may provide a first-in-class therapeutic platform for treatment of IPF.

Dr. Hecker is an assistant professor of medicine in the UA Division of Pulmonary, Allergy, Critical Care and Sleep Medicine in the Department of Medicine at the UA College of Medicine – Tucson. She's also a research investigator with the Southern Arizona VA Health Care System. Her work focuses on understanding how normal repair responses "go awry" in aging, and how this contributes to the susceptibility of age-associated lung diseases, as well as the development of novel solutions to treat these age-related disorders. Dr. Mansour is an assistant professor of pharmaceutical sciences and medicine at the UA College of Pharmacy and UA College of Medicine – Tucson. She teaches in the PharmD program and in the graduate program (Pharmaceutics and Pharmacokinetics track). For lung diseases, she specializes in designing and developing inhalable microparticulate/nanoparticulate dry powders that are tailored and optimized for FDA-approved human inhaler devices. Incorporating nanotechnology, bioengineering and aerosol medicine, these are targeted



**Louise Hecker, PhD;**  
**Assistant Professor,**  
**Medicine; Research**  
**Investigator, Southern**  
**Arizona VA Health Care**  
**Systems Tucson**



**Heidi Mansour, PhD** and  
**Louise Hecker, PhD;**



**Hecker Lab**

September 1, 2017

directly to the lung and are biocompatible, biodegradable, mucopenetrating and provide sustained drug release as measured by required FDA/U.S. Pharmacopeia in vitro and in vivo tests. Drs. Hecker and Mansour's grant (Award No. R21AG054766) runs through March 2019.

## Sleep center

The Center for Sleep Disorders recently received reaccreditation from the American Academy of Sleep Medicine for five additional years. The Center was credentialed in July 2012 after initial opening in January 2012. The Center has expanded to 7 beds in addition to a vibrant home sleep study program. The center serves both adults and children. We now have five sleep providers and train future sleep specialists and researchers in the only sleep medicine fellowship program in the state of Arizona. The Center is now accredited through July 2022. The Center is composed of sleep clinics, sleep laboratory and offers opportunities for participation in research studies.



Pictured at top: Leo Bustamante, Safal Shetty MD, Sairam Parthasarathy MD (Medical Director), Richard Hoffman. Middle row: Paulette Miller, Christopher Morton, Suresh Merredy MD, Sejal Jain MD, Jerod Miller RPSGT, Joanie Machamer, NP. Bottom row: Sicily La Rue RPSGT, Anna Vasquez MA, Brenda Lambert, Lanette Coronado MA, Joni Raneri PT DPT, Leticia Vjarro MA. Not Pictured: Daniel Combs MD, Abhishek Pandey MD, Tanya Bailey RPSGT, Brian Gray RPSGT, Colleen Green RPSGT, Elizabeth Harman RPSGT, Samantha Leteff RPSGT, Carlos Ortiz RPSGT, Anna Paschal RPSGT, Brenda Reynolds RPSGT.



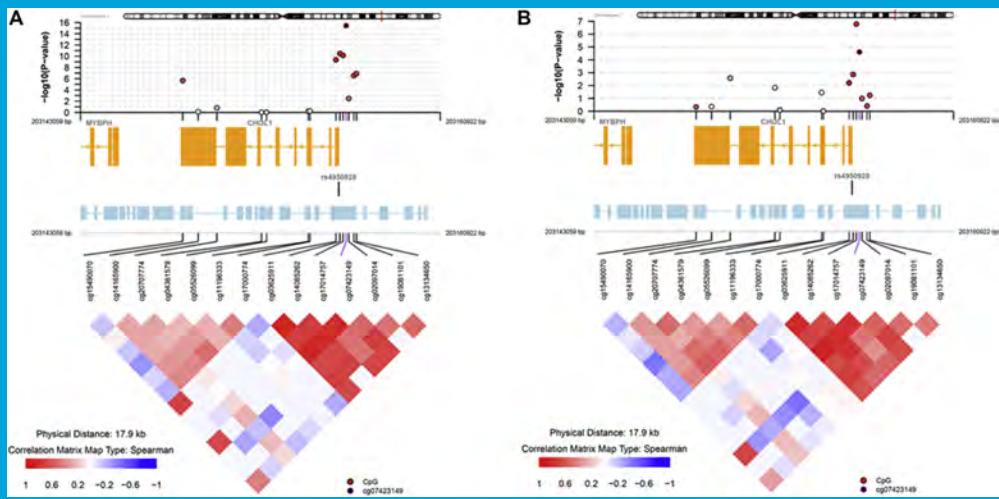
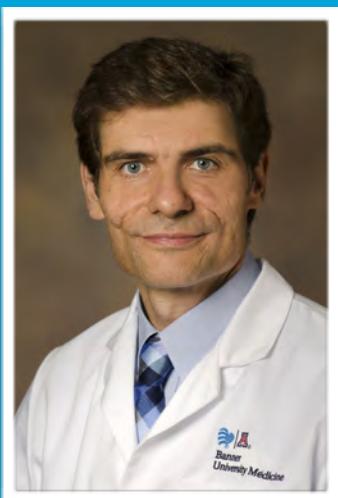
## Awards and Accolades

Banner University Medical Center Tucson (BUMC-T) in Tucson, AZ is ranked nationally in 4 adult specialties including Pulmonary (#42 in the Nation). BUMC-T was ranked #2 in Arizona and is a 451-bed general medical and surgical facility with 20,841 admissions in 2016. With close to 5,000 annual inpatient and 8,800 outpatient surgeries emergency and it's sister hospital a teaching hospital in Phoenix -- Banner University Medical Center Phoenix -- also ranked #2 in the state allows for synergies in the tripartite mission of patient care, research, and training.



Department of Medicine Chair Monica Kraft, MD, has been elected as a Fellow of the European Respiratory Society (FERS). She is one of 17 people and two Americans to receive the honor this year. Dr. Kraft was also selected for the prestigious Hedwig van Ameringen Executive Leadership in Academic Medicine (ELAM) Program as a fellow in the Class of 2017-18. The part-time fellowship is hosted by the Institute for Women's Health and Leadership at Philadelphia's Drexel University. ELAM is a core program of the Institute for Women's Health and Leadership at Drexel University College of Medicine in Philadelphia. The institute continues the legacy of advancing women in medicine that began in 1850 with the founding of the Female Medical College of Pennsylvania—the nation's first women's medical school and a predecessor of today's Drexel University College of Medicine.

**PUBLICATION SPOTLIGHT:** Stefano Guerra, MD, PhD, MPH is a Professor of Medicine at the University of Arizona with appointments in PACCS, Asthma and Airways Diseases Research Center (A2DRC), and BIO5 Institute. In this study, Dr. Guerra and colleagues sought to determine the epigenetic regulation of chitinase-like protein YKL-40 in early childhood. They investigated data from up to 2405 participants from the Spanish Infancia y Medio Ambiente; the Swedish Barn/Children, Allergy, Milieu, Stockholm, Epidemiological survey; and the Dutch Prevention and Incidence of Asthma and Mite Allergy birth cohorts. Associations between 68 CHI3L1 SNPs, methylation levels at 14 CHI3L1 CpG sites in whole-blood DNA, and circulating YKL-40 levels at 4 years of age were tested by using correlation analysis, multivariable regression, and mediation analysis. They found that YKL-40 levels were significantly associated with 7 SNPs and with methylation at 5 CpG sites. Consistent associations between these 7 SNPs (particularly rs10399931 and rs4950928) and 5 CpG sites were observed. Alleles linked to lower YKL-40 levels were associated with higher



methylation levels. Participants with high YKL-40 levels (defined as the highest YKL-40 tertile) had increased odds for asthma compared with subjects with low YKL-40 levels (meta-analyzed adjusted odds ratio, 1.90 [95% CI, 1.08-3.36]). In contrast, neither SNPs nor methylation levels at CpG sites in CHI3L1 were associated with asthma. They concluded that the effects of CHI3L1 genetic variation on circulating YKL-40 levels are partly mediated by methylation profiles. Moreover, in the same study YKL-40 levels, but not CHI3L1 SNPs or methylation levels, were associated with childhood asthma. This manuscript is in press in the Journal of Allergy and Clinical Immunology (<https://www.ncbi.nlm.nih.gov/pubmed/28739286>).

## Update from Allergy & Immunology



In 2016, Dr Tara Carr (Assistant Professor of Medicine) established our clinical and research center as an inaugural member of the Food Allergy Research and Education Clinical Network (FARE-CN), with full and ongoing membership, and this continues to be the only site in Arizona with this designation. As a part of this network, the center is a member of an elite group of academic centers who have the position and ability to make great strides in food allergy research. Food allergy is a life-threatening disease that claims lives of children and adults every year for which the incidence is rising and effective treatments are lacking. The center, as part of its research effort, is engaged in national and international clinical trials developing therapies for food allergy that would provide previously unavailable treatments to these patients. All BUMC-T Allergy/Immunology faculty actively participate in recruitment and assessments of patients in these

clinical trials. The site has three clinical trials for peanut oral desensitization ongoing, and anticipate starting a peanut patch immunotherapy trial in the next year. The FARE organization is also highly motivated to provide patient advocacy and community outreach aimed at improving awareness and education. To this end, the center is contributing expertise and training for nurses in schools in the Tucson area regarding food allergy and epinephrine autoinjector training.



## New Faculty

PACCS welcomes Dr. Sarah N Patel who joins us from the University of Washington, Seattle. Dr. Patel is an Assistant Professor of Medicine and specializes in Sleep Disorders. She completed her training at Banner University Medical Center in 2016 and her Sleep Medicine fellowship from University of Washington in 2017. Dr. Patel's research interests are in understanding improved management of sleep-disordered breathing with various therapeutic modalities. She is a clinician-educator and is interested in innovative approaches to educating sleep medicine fellows. She is accepting new patients at the Banner University Medical Center in Tucson. Appointments and referrals can be sought at 520-694-4647.