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Dr. Joe G.N. "Skip" Garcia

UA Health Sciences Study of Devastating Lung Disorders in the Critically Ill Receives \$11.4 Million Boost

Five-year National Heart, Lung, and Blood Institute program project grant led by UA Vice President for Health Sciences Dr. Joe G.N. "Skip" Garcia

Cutting-edge research investigating the genetic basis for devastating disorders in the critically ill – **acute respiratory distress syndrome (ARDS)** and **ventilator-induced lung injury (VILI)** – will receive a major boost thanks to an **\$11.4 million**, five-year program project grant.

The prestigious program project award from the National Heart, Lung, and Blood Institute of the National Institutes of Health has been awarded to researchers at the [University of Arizona Health Sciences](#) and is led by [Joe G.N. "Skip" Garcia, MD](#), UA senior vice president for health sciences, the Dr. Merlin K. DuVal Professor of Medicine and an elected member of the prestigious National Academy of Medicine.

Acute respiratory distress syndrome (ARDS) is a rapidly progressive disease that occurs in critically ill patients affecting more than 200,000 patients in the United States with mortality ranging from 30 to 50 percent. Patients with significant trauma, gastric acid aspiration and severe pneumonia or sepsis (a blood infection) are commonly at risk for ARDS. However, it is not clear why some patients at risk develop ARDS and VILI whereas others do not. Key to the elevated mortality in ARDS is the profound inflammation-associated leakiness of the lung's blood vessels that results in flooding of the lungs and respiratory failure. This mandates the need for life-saving mechanical ventilation to support the patient. Unfortunately, the mechanical stress produced by the ventilator also is a stimulus for inflammation (ventilator-induced lung injury or VILI), and is a significant contributor to poor outcomes in ARDS.

"Throughout my career, as a pulmonologist in the intensive care unit, I observed firsthand the unacceptable mortality rates that occur in the critically ill with ARDS, particularly in patients of color. I realized the necessity to develop greater insights into the mechanisms for development of ARDS and VILI and to identify novel therapeutics for this huge unmet medical need. Our program project team is designed to do just that," said Dr. Garcia, who has been conducting research in this area for more than three decades. "We have sequenced a number of key genes involved in risk for ARDS and VILI and have a better understanding of genetic variants



Mechanical ventilation supports patients with ARDS but can cause VILI, a contributor to poor outcomes in ARDS.

in African Americans and Latinos who are at increased risk for developing ARDS and succumbing to the disease. This study will advance a more personalized medicine approach to ARDS and VILI, giving physicians the ability to incorporate the genetic basis behind susceptibility into their medical decision-making as well as potentially offering new ARDS therapeutics that are based on our research," Dr. Garcia added.

"ARDS is life threatening and occurs in our most vulnerable patients in the intensive care unit, yet there remains no specific treatment for this condition. This grant will allow the Garcia lab, the leading scientific authority worldwide in the field of ARDS, to predict who will get ARDS and to bring novel therapies to patients with this devastating syndrome," said **Ken Knox, MD**, chief of the UA Division of Pulmonary, Adult Allergy, Critical Care and Sleep Medicine, and professor of medicine in the UA Department of Medicine.

Program Project Grants (PPGs) are among the most highly competitive, scientifically peer-reviewed funding mechanisms awarded by the National Institutes of Health, funding collaborative research programs in differing areas of expertise to achieve results not attainable by investigators working independently. Joining Dr. Garcia on the UAHS PPG is **Anne E. Cress, PhD**, deputy dean for research affairs and professor of cellular and molecular medicine and radiation oncology at the [UA College of Medicine – Tucson](#). "It is an exciting opportunity to work with the assembled research team on the UAHS PPG led by Dr. Garcia. PPGs are critical for spawning innovative basic research that impacts patient care and very few exist across the UA. We are fortunate to have his leadership and vision to choose the PPG mechanism to build our research portfolio in the health sciences," said Dr. Cress.

"I am so very pleased that Dr. Skip Garcia and his team have been awarded this grant from the NIH," said UA President **Ann Weaver Hart**. "The UA and Arizona are fortunate to have a research leader of Dr. Garcia's caliber driving an effort to better understand devastating lung conditions in the critically ill. Coming shortly after the announcement of the largest NIH grant ever awarded in the state of Arizona, this award is another reminder of the strength of the UA Health Sciences and the impact our faculty researchers, clinicians and teachers are creating in our state and around the world."

(On July 6, the [University of Arizona Health Sciences](#) and [Banner Health](#) were awarded a five-year, \$43.3 million grant from the National Institutes of Health to participate in the [Precision Medicine Initiative® Cohort Program](#), further expanding the impact of research and innovation at the University of Arizona.)

The program project, "Cytoskeletal Regulation of Lung Endothelial Pathobiology," is supported by the National Heart, Lung, and Blood Institute of the NIH under award number P01HL126609.

About the University of Arizona Health Sciences

The University of Arizona Health Sciences is the statewide leader in biomedical research and health professions training within the UA Colleges

of Medicine (Phoenix and Tucson), Nursing, Pharmacy and Mel and Enid Zuckerman College of Public Health. From these vantage points, the UA Health Sciences reaches across the state of Arizona and the greater Southwest to provide cutting-edge health education, research, patient care and community outreach services, fueling more than \$125 million in research, employing more than 5,000 people, and improving the health of Arizona and beyond.

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