

Intellectual Development Statement
Paige Turner, MD, MHS

Currently an Associate Professor of Medicine with Tenure in the Department of Medicine, I am honored to be considered for promotion to Professor of Medicine with Tenure. In this intellectual statement and teaching summary, I will outline my education and training, teaching contributions, academic achievements and scholarship, grant support, leadership and institutional service in support of my promotion. I conclude with my vision and goals for continuing professional development.

Educational Background: I graduated with *summa cum laude* honors from DePauw University, Greencastle, Indiana, in 1996 with a BA in Biology and minor in Mathematics. During medical school at Duke University School of Medicine (1996-2000), I was awarded the Sarnoff Cardiovascular Research Award. This award allowed me to spend one year in basic science research at University of California, San Francisco, and fostered a desire to pursue an academic career combining research, medicine, and teaching. In 2012, I completed a Masters of Health Sciences in Clinical Research through the Duke University School of Medicine. This degree included formal training in clinical research design, statistical analysis, and research management.

Training, Educational Activities: After my internal medicine residency at University of California, San Francisco, I completed pulmonary and critical care fellowship training at Duke University Medical Center. During fellowship, I trained at Toronto General Hospital, one of the premier lung transplant centers in the world. In July 2006, I joined Duke Faculty as an Instructor in Medicine. I was promoted to Assistant Professor of Medicine in 2008, Associate Professor of Medicine, without Tenure in 2015 and Associate Professor of Medicine, with Tenure in 2019.

Teaching Contributions (including mentoring): My teaching contributions at Duke are focused in pulmonary medicine. I have provided formal didactic lectures for the internal medicine house staff and pulmonary and critical care fellowship noon conferences. As part of the core teaching faculty for the pulmonary division, I round on the inpatient pulmonary transplant medicine with interns, residents and fellows and have outpatient clinic with pulmonary fellows. Specific to the lung transplant inpatient service, I was the supervising physician for the Advanced Practice Providers group (2011-2019). In that capacity, I led monthly meetings to review clinical care and specific patient cases as well as to ensure appropriate credentialing and training for our seven lung transplant advanced practice providers.

Over the last few years, I have served as both teaching faculty and faculty mentor in the Duke University Clinical Research Training Program in the School of Medicine. I provide lectures on site-based research to the combined Duke and NIH classes through the master's level program. I have participated on the thesis defense committee for several graduates of the program.

Given my positive mentee experience, I have a strong commitment to mentoring. Within our clinical research group, I provide formal mentoring to our clinical research coordinators, residents, fellows and medical students. As the pulmonary transplant fellowship director (2011-2018), I provided formal mentoring to the fellows during the fellowship year and as they transitioned to academic transplant positions. All of the fellows presented their transplant research at international meetings. Over the last year, I have mentored the new pulmonary transplant fellowship director (Dr. Simon Sais) in this role.

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My current mentees include Dr. John Doe (internal medicine resident, now pulmonary fellow), Dr. Lee A. Sun (lung transplant fellow, now faculty at University of Pennsylvania) and Dr. Rita Book (previously junior faculty at Duke, now at the University of Toronto). Dr. Doe's work led to a house staff travel grant to present at the 2018 American College of Chest Physicians Meeting in San Antonio. He is currently working on a manuscript on his work. Dr. Sun is in her first year as faculty and on a faculty grant from the Cystic Fibrosis Foundation for which I am the primary mentor. Dr. Book is in the final stages of her Masters in Health Sciences degree for which I am her clinical mentor. Dr. Book received a NIH ancillary grant related to this work and has submitted her results for publication. I truly enjoy the rich and diverse clinical and research mentoring environment at Duke so was honored to be nominated for the Internal Medicine Housestaff Mentoring Award for Faculty in 2013 and again in 2019.

My teaching commitments extend beyond Duke as I have given lectures for community physicians as well as colleagues at national and international meetings. Through an invitation from one of my patients, I was the invited speaker at the 25th Annual High Country Respiratory Care meeting, a combined patient and provider meeting and was invited to speak there again in February 2020. On an international scale, I have been the invited speaker at several American Thoracic Society (ATS) international conferences through postgraduate courses, Sunrise Seminars and Meet the Professor lectures. Specific to transplant, I have been the invited expert lecturer in cytomegalovirus and in chronic rejection at the International Society of Heart and Lung Transplantation (ISHLT) international conference and the American Transplant Congress. In 2017, I was invited to give the plenary lecture at ISHLT on transplant clinical research. Through the Duke Clinical Research Institute (DCRI), I have served as the Activity Medical Director for the CME programs titled "A New Era in IPF: Bringing New Diagnosis and Treatment Options to Clinician" and "Idiopathic Pulmonary Fibrosis: New Diagnostic and Treatment Paradigms for Disease Control." I developed and edited the proposal, curriculum and lectures for these web-based CME programs.

Academic achievements and scholarship: I am a translational investigator in the field of pulmonary medicine. My academic achievements and scholarship are focused in lung transplantation and advanced lung disease. My three primary areas of interest are 1) cytomegalovirus (CMV) after transplantation, 2) the management and prognosis of antibodies before and after transplant, and 3) pulmonary fibrosis diagnosis and treatment.

CMV is one of the most common opportunistic infections after transplant despite the use of prophylaxis. Given controversies on the importance of CMV contributing to chronic rejection, I conducted the definitive study of over 1800 prospective transbronchial biopsies, correlating them to clinical outcomes of chronic rejection and survival. The analysis utilized time dependent modeling and concluded that CMV pneumonitis was a risk factor for rejection and worse survival (*AJRCCM*, 2010). Once we identified this risk factor, I sought ways to prevent CMV disease by understanding CMV specific immunity detected through polyfunctional flow cytometry (*AJT*, 2011) by collaborating with the Duke Translational Research Institute Immune Monitoring Core. We developed a polyfunctional cytokine signature that was strongly predictive of subsequent CMV once prophylaxis ended (*AJT*, 2016). This biomarker signature was awarded a U.S. patent and the publication has been widely cited. Our research group subsequently obtained a multi-site NIH grant to validate this signature in lung transplant recipients. We have completed enrollment ahead of schedule and are in the process of follow-up now on these patients and are currently analyzing this data with submission for publication

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in mid- 2021. I truly believe this assay could change the way we prescribe CMV prophylaxis after lung transplantation.

My antibody research has spanned both pretransplant and posttransplant phases. Using detailed single center data, I conducted the largest study at the time of antibody detection after lung transplantation (*CHEST*, 2013). I correlated the time dependent detection of antibodies to chronic rejection and worse survival after transplant. In addition, I identified specific risk factors for these posttransplant antibodies. This paper has been widely cited and led to more aggressive protocols to decrease antibodies after transplant. In addition, our program started a multi-modal (immunomodulatory, plasmapheresis and chemotherapy) desensitization protocol for pre-transplant patients with antibodies. In a repeated measures model with careful attention to the timing of treatment and antibody detection, I demonstrated this multi-modal therapy was not effective in decreasing the number of antibodies, though it may have some impact on the strength of antibodies (*AJT*, 2014). In addition to changing clinical practice at Duke, this paper has also been widely cited and led to invited lectures. In addition, I was invited to the steering committee of the International Society for Heart and Lung Transplantation for antibody mediated lung transplant rejection and helped develop the definitive guidelines for diagnosing antibody mediated rejection (*JHLT*, 2016). In addition, I was invited to represent lung transplant in the joint American Society for Histocompatibility and Immunogenetics and the American Society of Transplantation committee of immunologists and transplant physicians the defined sensitization in transplant (*AJT*, 2018).

My third area of academic achievement and scholarship focuses on pulmonary fibrosis management and treatment. This work is exclusively conducted within the realm of the DCRI, which I joined in 2012 as Type A pulmonary faculty. Specific to pulmonary fibrosis, I have served as Medical Monitor for several studies, the DCRI publications committee lead for a large registry and the faculty advisor for 7 different projects. Given my experience in pulmonary fibrosis clinical research, I was recently invited to join a novel project at the DCRI to investigate a synthetic control arm for pulmonary fibrosis trials where this artificial control group might function as a placebo control for future trials. This synthetic control approach could be a paradigm shift for pulmonary fibrosis trials.

Grant Support: Beginning in fellowship, I have had consistent grant support for my research. As a fellow, I was awarded the first ever American Society of Transplantation/CHEST award. As faculty in 2006, I was awarded the Sarnoff Scholar award. However, I declined this award to accept a position on the Duke CTSA/KL2 training grant. After 3 years on the KL2 grant, I was awarded the prestigious American Society of Transplantation Career Development Award in Clinical Research. During this time, I was also awarded a Duke internal pilot project grant through the Center for Comparative Biology of Vulnerable Populations and one of the first Duke Translational Medicine Institute (DTMI) Voucher Pilot Project grants. Based on work from the DTMI grant, I was then named a key investigator on two larger team grants (LabCorp/Biomarker Factory grant and NIH funded Center for Advanced Diagnostic and Experimental Therapeutics in Lung Disease grant) to investigate cytomegalovirus as well as chronic rejection after lung transplant. I continue to participate in multi-site NIH trials (Lung Transplant Outcomes Group and Lung Transplant Clinical Trials Network). I am also the lead site investigator at Duke for the multi-center Cystic Fibrosis Lung Transplant Consortium (CFLTC) funded through the Cystic Fibrosis Foundation. Just as meaningful to me is that my mentees have secured

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funding for travel grants to present their work (Drs. Doe, Blossom, and Decco) and for a junior career development award (Clausen, Cystic Fibrosis Foundation Fellowship Grant).

National and International Leadership: I have been active in the ATS, ISHLT and AST societies. I have chaired over 15 transplant and pulmonary sessions at international meetings. As detailed in my curriculum vitae, I have been an invited speaker at pulmonary and transplant international meetings and postgraduate courses. I have served on the Clinical Problems Program Committee for the ATS, the annual meeting planning committee of the ISHLT, the annual meeting planning committee the AST, and the ISHLT Grants and Awards Committee. Given my research experience, I was invited to the Antibody Mediated Rejection working group steering committee and the Connective Tissue Disease in Lung Transplant steering committee, both are international guideline committees for the ISHLT. I am a journal reviewer for five major journals in pulmonary and transplant medicine. In 2013, I became Associate Editor for the journal *Clinical Transplantation* and in 2015, I became an Associate Editor at *Transplantation*.

Administrative Leadership: In March 2019, I became the Medical Director of the Medicine Clinical Research Unit (CRU) for the Department of Medicine, reporting to the Chair of the Department of Medicine. I participate in research meetings across the Department and the School of Medicine. The position oversees an associate director, a research practice manager, and 4 associate research practice managers who then oversee all of the clinical research coordinators in the CRU. I am responsible for regulatory oversight, financial plans, policy development, and integration of the CRU with the Department, Health System and School of Medicine. The Medicine Clinical Research Unit includes approximately 1200 active clinical research projects led by faculty in the Department of Medicine.

In January 2020, the Duke Office of Scientific Integrity initiated a school-wide Research Quality Management Program. The Chair of the Department of Medicine and the Vice Chair for Research in the Department of Medicine asked me to be the departmental Research Quality Officer for clinical research. In this capacity, I work closely with Dr. Rose Bush (Research Quality Officer for Basic Research) and Rhoda Report (Research Quality Administrator) to incorporate the Research Quality Management Program for the department. In the past year, we have updated the Scientific Culture Accountability Plan for the department, worked with all faculty and staff in the department to attest to it, developed data management plans with Core Laboratories, and participated in invited lectures and roundtables for the department and leadership regarding research quality.

Institutional Service: I serve in several different institutional leadership positions at Duke. I am the Associate Medical Director for the Duke Lung Transplant Program, one of the largest in the world and consistently recognized for short wait times and excellent outcomes. I also serve as the lung transplant lead for the Quality and Compliance Committee for the Duke Transplant Center and oversee the quality and compliance issues of the lung transplant program including leading morbidity and mortality conferences, providing peer review for the other solid organ transplant programs at Duke and leading Quality Improvement initiatives. As noted above, I served as the Lung Transplant Fellowship director until September 2018 and the supervising physician for the Advanced Practice Providers of the Lung Transplant program until March 2019, when I became the Medical Director of the Medicine Clinical Research Unit.

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Outside of Duke, I have served as an external scientist on the NIH/National Institute of Environmental Health Sciences (NIEHS) Institutional Review Board. Through monthly meetings, this board reviews research protocols, amendments and deviations for the NIEHS as well as the National Institute on Aging. In June 2019, I traveled to the University of Toronto to be an external reviewer for their Respiriology Division. My report was part of their strategic planning for their next Division Chief search.

Vision and goals for continuing professional development within the academic environment: Since joining Duke faculty in 2006, I been incredibly fortunate to have a nurturing environment to develop my teaching, mentoring, patient care and research interests. I have benefitted from the ongoing faculty workshops, mentoring and lectures which enrich my career and challenge me to grow in new ways. It has been particularly rewarding the last few years to see my mentees dive into a project, discover their own interests, present their work and receive funding for their research. One of my goals is to continue this mentorship and support from residency to fellowship and ultimately to faculty, as now with several mentees have taken academic faculty positions. The School of Medicine is embarking on dedicated educational series for mentors through the School of Medicine, Office for Faculty. I participated in the course for the fall 2020. I look forward to additional courses and developing as a mentor.

In my research development, I am increasingly recognizing that I value “team science” and thrive in a group that brings different strengths to a project. As one of my goals, I want to continue to grow in this multidisciplinary approach to clinical and translational research. I have started to build collaborative teams with colleagues at other institutions both within and parallel to my areas of primary interest. As I build these collaborations, I am finding that my expertise is valued and I am becoming more independent. My goals for the future also include a continued balance between clinical medicine and my clinical research. I am fortunate that my clinical work and research seem to stimulate each other, which provides considerable work satisfaction for me.

With the acceptance of the Medical Director of the Medicine Clinical Research Unit, the Department Chair offered to support a leadership training opportunity of my choosing outside of Duke. I believe this is an incredible opportunity for me to build on my Duke LEADER (leadership development program for researchers) and the Department of Medicine Faculty Development Academy experiences, both of which I completed in 2012. I plan to select and enroll in a leadership program outside of Duke in the next 1-2 years.

In summary, I have demonstrated excellence in teaching, academic achievement, grant support, leadership and institutional service since joining faculty at Duke. I have enjoyed the rich and challenging academic environment in the pulmonary division and the Department of Medicine. I believe I am in a unique position to capitalize on my prior success and plan to further grow as a mentor, researcher, and leader. I look forward to the privilege of continuing my academic career at Duke University.