



An Interview with Sook Hyeon Park, MD, MSCI, the first-place winner of the 2021 CJASN Trainee of the Year competition.

CJASN Editor-in-Chief Rajnish Mehrotra interviewed Sook Hyeon Park on the findings from her CJASN article, "[Combining Blood Gene Expression and Cellfree DNA to Diagnose Subclinical Rejection in Kidney Transplant Recipients](#)," as well as her outlook on the field and advice for trainees. [Listen now!](#)

Sook Hyeon Park, MD, MSCI, is a transplant nephrologist and an assistant professor in the Division of Nephrology and Hypertension at Northwestern University Feinberg School of Medicine. Before joining as a faculty, Park completed the NIH T32 postdoctoral fellowship (NUKIDS: Scientist Training Program In Kidney Disease) at Northwestern University at Chicago. Her research focus is on improving kidney transplant long-term outcomes. Park is passionate about developing noninvasive biomarkers for kidney allograft rejection and predictive models using artificial intelligence to provide personalized medicine.

RM: Can you introduce yourself to the CJASN audience?

SP: My name is Sook Park, a transplant nephrologist and assistant professor at the Northwestern University Feinberg School of Medicine. Before joining as a faculty, I did a NIH T32 postdoctoral fellowship when I did the work that has been published at CJASN.

RM: What sparked your interest in research in the noninvasive diagnosis of subclinical rejection? I understand the goal is to eliminate the potential need for surveillance biopsies.

SP: I got the opportunity to understand this area in depth when I wrote a review article about borderline changes in kidney allograft with my research mentor Dr. John Friedewald. It is then that I learned that noninvasive biomarkers have great potential to diagnose rejection and predict prognosis without invasive biopsies. This means fewer complications and less burden for the patients. This is what interested me to do further research in this thematic area.

RM: What is the gap in knowledge that you hoped to bridge with your work?

SP: We hoped to improve performance of noninvasive biomarkers to diagnose or exclude subclinical acute rejection by combining gene expression profiling and donor-derived cellfree DNA. The main research question was whether the two different technologies could be complementary, and we found that they are.

RM: Can you elaborate a bit more. What did you find?

SP: Considering the results of both tests together gave us higher predictive value. With two negative tests, we had a negative predictive value of 88% compared to 82% and 84% for the tests alone. That means that 88% of people with both tests that are negative do not have subclinical rejection. Accurately ruling out subclinical acute rejection allows clinicians to accurately monitor for rejection and avoid surveillance biopsies in many cases. Conversely, when both tests are positive, the positive predictive value was 81%, well above the 47%–56% each test alone. That means that 81% of people that have both tests positive, they have subclinical rejection. We also showed the combined tests performed better in predicting rejection than either test alone using AUROC in a multivariable logistic regression.

An additional important finding was that the Gene Expression Profile was significantly better than donor-derived cellfree DNA in detecting acute cellular rejection. Conversely, donor-derived cellfree DNA was significantly better at detecting antibody-medicated rejection than it was at detecting acute cellular rejection.

Taken together, these findings help frame the clinical context of use of these different biomarkers.

RM: Very interesting! Of course, this not my area of work. I do know, however, that there are several different blood and urinary biomarkers that people have tested as potential tools to diagnosis rejection noninvasively. Just taking a step back, how does your work fit into that larger body of work?

SP: Our work builds the body of noninvasive biomarkers studies to diagnose acute rejection. Most of the studies were done on patients with allograft dysfunction. However, we focused on diagnosing or excluding subclinical acute rejection in stable kidney transplant patients with high negative predictive value. Our publication also provides the first substantial data using donor-derived cellfree DNA to monitor stable patients.

This allows for immune reaction monitoring for silent subclinical rejection, which cannot otherwise be done without surveillance biopsies. For example, when we are lowering immunosuppressants, double biomarker monitoring ensures we have the earliest warning of rejection.

RM: That makes sense. Your work is a meaningful advance in our knowledge. What do you plan to do as next steps in your research? And more broadly, where should the field be headed?

SP: I would like to investigate further how, and how often, to use these biomarkers to diagnose or exclude rejection and predict prognosis. Eventually, I want to build a comprehensive predictive model incorporating pretransplant biomarkers, clinical imaging, and pathologic data to provide personalized medicine using artificial intelligence.

RM: Thank you, this is very important work. Congratulations again! What words of advice or wisdom do you have for people that are contemplating or just starting their research training with a focus on kidney diseases?

SP: Patience and perseverance are key. Failure is a part of research. Keep an open mind—you can find collaborators in nephrology and beyond it.