Get to know members of the RSF Assembly

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Is your research clinical, basic science or translational?
Translational

Tell us about your research?
I am an MRI physicist, with research interests in the development and application of pulmonary MRI methods. One of my areas of emphasis is the use of hyperpolarized $^{129}$Xe MRI to better understand diseases of the pulmonary parenchyma and vasculature, such as PAH, ILD, and post-acute COVID-19.

Where do you see yourself in 5 years?
I aim to continue the growth of the hyperpolarized $^{129}$Xe MRI program at the University of Kansas Medical Center, with a goal of becoming a center of excellence for the technology. I hope to continue developing my research lab toward creating new imaging technologies and applying imaging toward a better understanding of respiratory health.

What do you find is the major benefit of RSF Assembly Membership?
The RSF Assembly provides me a “home” in the ATS. As a physicist, my research is often far afield from traditional pulmonary biology research. In the RSF assembly, I have a community of like-minded scientists with whom I can network, share my research, and receive mentorship.

If you or someone you know would like to be featured as an ATS RSF ECP please email Katrina Tonga (katrina.tonga@sydney.edu.au)
Objective: In this study, we aim to quantify the regional pulmonary functional impairment of patients with respiratory post-acute sequelae of COVID-19 (PASC) that are poorly explained by pulmonary function testing and CT imaging.

Methods: We imaged 11 patients with post-acute COVID-19 using hyperpolarized $^{129}$Xe ventilation and gas exchange imaging. These patients have included 9 patients recovering from mild/moderate COVID-19 and 2 recovering from severe COVID-19 at variable time from resolution of acute illness (288 ± 155 days from acute COVID-19 resolution). Imaging results were compared to a cohort of 6 healthy volunteers.

Results: There was no significant difference in hyperpolarized $^{129}$Xe ventilation defect percentage (VDP) between healthy and PASC subjects (p = 0.19), though ventilation heterogeneity was significantly different between groups (p = 0.04). PASC patients exhibited significantly reduced RBC/Barrier ratio (p = 0.006) and mean xenon signal dissolved in RBCs (p < 0.001).

Conclusion: Hyperpolarized $^{129}$Xe MRI appears to be sensitive to functional impairment in patients with respiratory PASC. Patients with respiratory PASC exhibit elevated ventilation heterogeneity, reduced signal dissolved in red blood cells, and reduced RBC/Barrier ratio.