

ATS 2017 Highlights

Respiratory Structure and Function Early Career Professionals

Get to know members of the RSF Assembly

Is your research clinical, basic science or translational?

Basic and translational science.

Tell us about your research?

My main focus is the application of nonlinear optical microscopy (NLOM) to understand the 3-dimensional morphological changes in collagen and elastic fibers during the remodeling process in asthma. The ultimate goal of this research is to develop medications to repair collagen/elastin fibers and prevent lung scarring.

Where do you see yourself in 5 years?

I see myself in academia leading a lab with state-of-the-art imaging technology. I aspire to build a multidisciplinary work environment, which will challenge and inspire the next generation of scientists.

What do you find is the major benefit of RSF Assembly Membership?

By networking with excellent researchers in the field, by listening to talks, by sharing my findings and receiving feedback, it has been a great and invaluable experience. It is very comforting knowing you are not “alone” in this challenging journey called science; the RSF community is a safety net for early career investigators, where we can always find collaborations, mentorship, and friendship.



Leila Mostaço-Guidolin, PhD

Postdoctoral Fellow

Centre for Heart Lung Innovation

University of British Columbia

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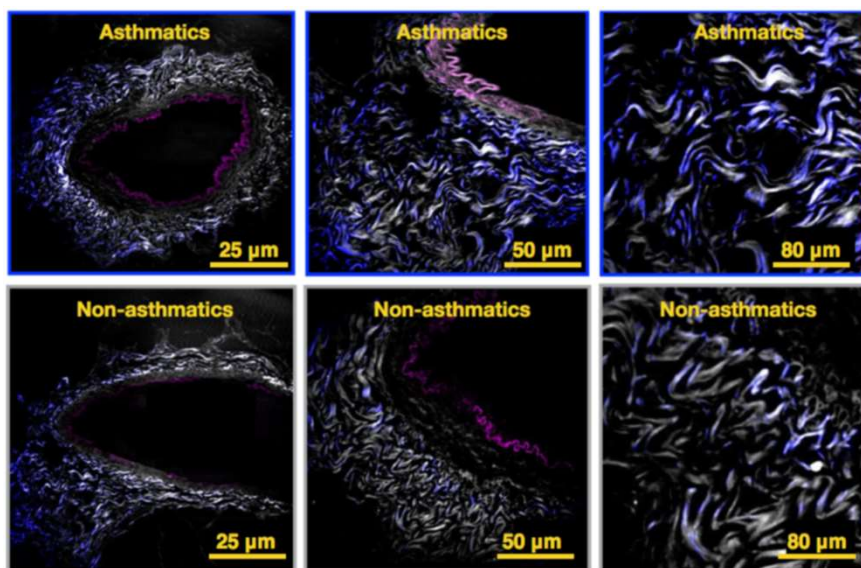
Shinning light inside of airways: characterization of airway remodeling in asthma

Background: Current methods for measuring morphological changes within the airways are performed by staining tissue sections, which is time-consuming and not always effective. Although most of these methods can provide valuable information to pathologists and researchers, they cannot accurately resolve the biochemical composition of airways at specific tissue layers. An optical modality, multimodal nonlinear optical (NLO) microscopy, has shown utility in label-free visualization of key extracellular molecules involved in airway remodeling.

Hypothesis: Collagen and elastin undergo structural changes during asthma development with inflammatory cell recruitment, but mesenchymal cells in asthmatic subjects are unable to repair leading to airway remodeling.

Results: Representative images showing this region under the NLO microscope is presented in the figure. Changes in collagen and elastin fibers morphology are tracked by texture analysis of second harmonic generation (SHG) and two-photon excited fluorescence (TPEF) images. SHG and TPEF microscopic images reveal a highly-directional and organized collagen and elastin fiber morphology in the non-asthmatics compared to a less-organized collagen/elastic structure characterized by shorter but denser fiber bundles in the asthmatic airways.

Conclusion: The main outcome of this study are the novel insights regarding the physical changes of collagen and elastin fibers within asthmatic airways. The development and the application of methods to objectively track these changes is relevant to better understanding clinical aspects of asthmatic remodeling within different regions of airway. Using our unique imaging data set and analytical methods, we have the possibility to see for the first time how collagen and elastin fibers are altered in asthma.



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