

### Danielle Peress, MD Memorial Fund Award

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2019 Recipient

Final Report



Prematurity and its sequelae are the leading cause of worldwide infant morbidity and mortality. Premature cervical remodeling is thought to represent a precursory event on the pathway to spontaneous preterm birth. This process likely results from interactions between the cervicovaginal microbiota and host immune response. As a first year MFM fellow at the University of Pennsylvania, I sought to clarify our understanding of these pathologic events and better identify women at greatest risk. I was fortunate to be the inaugural recipient of the Danielle Peress, MD Memorial Fund Award for my project entitled, “Epithelial-mesenchymal transition in the cervicovaginal space: possible biomarkers of spontaneous preterm birth.”

This award supported completion of a project unveiling a potential role for matrix metalloproteinase-9 (MMP-9) in cervical remodeling and preterm birth. Second trimester cervicovaginal MMP-9 levels were elevated in women colonized by a non-optimal microbiota, diagnosed with short cervix, and among those who had a spontaneous preterm birth when compared to controls. Findings from this study have begun to ascribe a biological link between known clinical risk factors and preterm birth through increased expression of MMP-9. This protease may function to degrade the cervical matrix, thereby promoting cervical remodeling. Incorporating cervicovaginal MMP-9 levels into risk stratification may have clinical utility in preterm birth prevention.



As a second-year fellow, I presented this work at SMFM's 40<sup>th</sup> Annual Pregnancy Meeting in an abstract entitled "Cervicovaginal MMP-9 is associated with high-risk microbial communities and spontaneous preterm birth." Data from this project are currently being written into a manuscript. While the funding period for the Danielle Peress, MD Memorial Fund Award has ended, this project generated preliminary data that motivated ongoing experiments at the bench and larger clinical cohorts. Importantly for my career, this funding opportunity served as a pivotal stepping-stone – as the next Foundation for SMFM/AOOGF Scholar (2020-2023), I am delighted to embark upon my proposed research this summer defining the cervicovaginal microbiome-metabolome interface in preterm birth.



I am grateful to the generosity of the Foundation for their ongoing support, and for the incredible mentorship of Dr. Michal Elovitz, while pursuing this path as a perinatal physician-scientist. As a new fellow transplanted from Boston in 2018, I recall early meetings with Dr. Elovitz, the empty shelves of my now overflowing bench in the lab and acclimating to a new clinical environment. The last two years have provided great clarity about the importance of mentorship, and I am so fortunate to have a mentor who invests in me both professionally and as a person.

Finally, I am honored to follow in Dani's footsteps at Penn, where she began her MFM fellowship in 2016. I met Dani during fellowship interviews and share her passion for clinical medicine and translational research. Well-known to the MFM community, Dani passed away during her second year of fellowship after a hard-fought battle with lung cancer. I share a clinical office where Dani's desk as a fellow remains and am reminded daily that her legacy endures in all of us at Penn and through the Danielle Peress, MD Memorial Fund established in her memory.