What do you hope to/do you learn through this research?
The goal of this project is to better understand how upregulation of caveolin-1 (Cav1) in diabetic foot ulcers regulates two hallmarks of non-healing chronic wounds: wound infection and wound closure. Our lab and others have previously shown Cav1 to be involved in cell migration as well as pathogen internalization. Thus, we hope that disruption of Cav1 can target healing outcomes on two levels: 1) by restoring cellular migration that is necessary for successful wound closure and 2) by inhibiting wound colonization of opportunistic bacterial pathogens.

How can this research help patients, clinicians and/or scientists?
We are hoping that this study will help advance the field not only at the basic science level, but will have a significant translational impact. At the basic science level, we are hoping it will provide a novel understanding regarding the mechanisms that guide wound healing and its inhibition in patients, i.e. how Cav1 orchestrates cytoskeletal rearrangement downstream of EGF signaling to affect cellular migration, as well as how Cav1 contributes to internalization and persistence of S. aureus infection. At the translational level, this will provide 1) a better understanding of the mechanism by which Cav1 contributes to pathogenesis of chronic wounds, 2) possibility to use Cav1 as a biomarker of non-healing outcomes. At the clinical level it will provide a new therapeutic avenue as it focuses on 1) how caveolae can serve as potential therapeutic targets in shifting non-healing into healing wounds; 2) insights regarding mechanisms that limit clinical efficacy of previously tested therapies and 3) provide new approach to limit wound infection. If our hypothesis is correct, accumulation of Cav1 in chronic wounds may serve to sequester/inhibit growth factor receptors, rendering growth factor therapies ineffective.

How did this award help your career?
I look forward to receiving the WHF Medline Research Grant Innovation Award that will fund my research for the next year and provide me the opportunity to obtain the answers to fundamental questions that I outlined in the proposal. As a junior faculty, this award will provide support at the very important point in my career development towards becoming an independent scientist as I plan to pursue an academic career.

What are your future plans for your work in wound healing?
My future plans for this project involve continuing to understand the role of Caveolin 1 in chronic wounds. We will continue to study how Cav1 regulates two hallmarks of non-healing chronic wounds: wound infection and wound closure. We will also explore how Cav1 may contribute to pathogenesis of chronic wounds at the cellular and molecular levels. We will also continue to study how Cav1 regulates the wound healing process and its inhibition in patients. We will also continue to study how Cav1 regulates the wound healing process and its inhibition in patients.

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