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Project Title: Enzymatic Protein Glycosylation During Normal and Diabetic Wound Healing

Year Awarded: 2017 WHF 3M Fellowship

What do you hope to/did you learn through this research? I hope to gain a more thorough understanding of the role that protein glycosylation plays in wound healing including the pathogenesis involved in wound development and the impaired healing that is observed in diabetic wounds. Additionally, I hope to apply the findings from these experiments towards predictive measures and targeted treatment options for those with chronic wounds.

What can you tell us about the progress made in this area since you first began your research? Previous studies have found that there are some glycosylation related enzymes, including GM3 synthase, that are implicated in the pathology of diabetic wounds. However, to date, no one has performed a time course analysis on an array of glycosylation related enzymes to identify critical shifts in the pattern of glycosylation related enzyme expression. Additionally, no one has examined how critical shifts in the pattern of glycosylation impact the wound healing process. While it will be important to analyze the baseline expression changes in diabetic wounds, it will be vital to understand how the pattern of expression shifts between diabetics and non-diabetics as well.

How can this research help patients, clinicians and/or scientists? I hope that this research will lead to additional scientific discoveries that can have an impact on clinical practice, including prediction tools for wound healing and new targeted treatment options for chronic diabetic wounds. These future discoveries will help to improve clinicians understanding of what is occurring within the wound bed and provide better treatment options for our patients based on the biology of the wound.

How did this award help your career? This award has helped me to attain recognition within the wound healing research community and will allow me to conduct a more in depth analysis of the role of glycosylation during wound healing.

How did you get interested in wound healing and this area in particular? My interest in wound healing began while I was a DPT student at Marquette University where I was blessed to have amazing professors including Luther Kloth, P.T., M.S., CWS. I found the complex nature of the wound healing process to be intriguing and gained particular interest in addressing the poor outcomes that are observed in Diabetic Foot Ulcers (DFU). While working as a wound care therapist I became frustrated with the poor prognosis of the DFUs that occurred despite having access to a multitude of therapeutics that exist to expedite the wound healing process. During my transition from clinical practice into research my focus has been on understanding the

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molecular and biochemical mechanisms that contribute to differences in wound healing and the regenerative capacity of chronic wounds. After observing the significant impact that changes in protein glycosylation have had in research and biomarker discovery related to cancer and retinal healing, I realized that this is an underexplored field in the realm of cutaneous wound healing and decided to focus on this area of study. I am very grateful to Dr. Luisa DiPietro and Dr. Karen Colley for helping me to explore this field of interest further.

What are your future plans for your work in wound healing? In the future I hope to continue this line of research while working on clinical applications for glycobiological discoveries in wound healing.

Who do you consider your mentors and your close associates in this project? How did you start working with them? Dr. Luisa DiPietro and Dr. Karen Colley have been fundamental mentors throughout this project. I started working with Dr. DiPietro after a colleague in the wound care clinic at UIC recommended that I seek out an opportunity to participate in a summer laboratory rotation while I was a graduate student at Marquette University. I had a very positive research experience working with Dr. DiPietro and with her expertise in the molecular mechanisms that contribute to wound healing I knew that I wanted to permanently join her lab. Soon after, I contacted her to see if there was an opportunity to transfer to a graduate program at UIC that would allow me to develop a research project under her direction. Upon transferring to UIC and expressing my interest in understanding the glycobiological mechanisms that contribute to differences in wound healing and the regenerative capacity of acute and chronic wounds, she introduced me to Dr. Colley, a renown glycobiologist, who has been an amazing resource throughout this journey.

Tell us about your life away from the lab and/or clinic? During my time away from the clinic and lab, I try to spend as much time as I can with my family and close friends.

