Name: Piul Rabbani
Position: Research Assistant Professor
Institution: New York University School of Medicine
Project title: Enhanced Nrf2 signaling in mesenchymal stem cells for therapeutic exosomes
Year Awarded: 2019

What do you hope to learn through this research? I hope to develop and optimize a safe reliable method that can yield a large and available exosome resource for treatment of chronic diabetic ulcers. Exosomes from bone marrow derived multipotent stromal cells package the best therapeutic parts of these cells. As part of our work we hope to discover the precise components that promote wound closure when applied to a large wound. We anticipate that by modulating one specific pathway in the source cells, we will be able to specify the exosome cargo.

What can you tell us about the progress made in this area since you first began your research? A few other labs and commercial vendors have been publishing their improved analytical tools tailored specifically for exosomes. These developments validate and improve our approach. A few trials using exosomes as therapy are in place. However, the cellular and molecular mechanisms mediating the effects in tissues are barely understood. Parsing that information out is critical to ensure the therapy we're developing is targeted.

How can this research help patients, clinicians and/or scientists? Though chronic non-healing ulcers are one of the most widespread complications of diabetes, current clinical care involves wound management only, such as weight off-loading, antibiotics, debridement and frequent dressings. Improving the quality of life of patients with diabetic ulcers is always our motivation. Discussions with clinicians have helped us learn of the deficit and need for effective therapeutics for chronic ulcers. Our approach addresses the underlying pathology of the chronic diabetic wounds, so that we can develop an effective therapy. Our work also introduces opportunities for collaborating biomaterials research groups to create products that can help clinicians, patients and caregivers.

How did this award help your career? This award came at a critical time in my career, when I was in the process of establishing my lab and building our resources. The support from Foundation has been incredible, and being part of a community with similar goals of improving lives of patients is wonderful. This award will help me secure further funding and create a sustainable research program.

How did you get interested in wound healing and this area in particular? I'm a problem solver by nature and love taking care of people, be it my personal or lab family. Throw in a love for skin biology, and wound healing seems to be the natural progression. The room for interdisciplinary innovation to address a widespread problem like diabetic ulcers keeps me and my team motivated.

What are your future plans for your work in wound healing? We are extending our investigation into pathology of non-diabetic chronic wound types as well, to find similarities and differences in the pathology, all with the goals of customizing therapy for patients.

Tell us about your life away from the lab and/or clinic? I am a long-time volunteer with Biobus, a science outreach and education non-profit on wheels. The children who we teach are amazing and sometimes stump us with their questions. I'm an ardent advocate for women in the STEAM fields and that's a constant part of me, whether it is in or out of lab. I'm an avid reader, gardener and baker (the experiments have higher success rates).