Key questions defining research program:

1) Phenotype and functional characterization of cytokine-producing T cells in fibrotic skin and lung from patients with systemic sclerosis.

2) Molecular mechanisms of cytokine dysregulation in T cells from patients with systemic sclerosis.

3) Development of ex vivo organ skin culture to evaluate fibrosis in SSc and its inhibition.

Key words describing research program:

1) Human inflammatory skin diseases
2) Systemic sclerosis
3) Human T-cell differentiation
4) Cytokines
5) Fibrosis

Titles for shovel-ready research projects:

1) Functional studies of immune cells in the skin of patients with scleroderma. Primary cells purified from skin and ex vivo skin explant assays will be employed.

2) Identify the signaling pathways activated in immune cells in the blood and skin of scleroderma patients using biochemical and biophysical techniques.

3) Preclinical studies testing novel therapeutics for systemic sclerosis in human skin and lung explant, and murine models

4) Discovery of altered immune cell and vascular cell phenotypes in scleroderma skin using single cell RNA-seq