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Key questions defining research program:

- Phenotype and functional characterization of cytokine-producing T cells in fibrotic skin and lung from patients with systemic sclerosis
- Molecular mechanisms of cytokine dysregulation in T cells from patients with systemic sclerosis
- Molecular pathways of IL-13-induced proliferation in Cutaneous T Cell Lymphoma (CTCL)
- Development of *ex vivo* organ skin culture to evaluate fibrosis (SSc) or tumor cell proliferation (CTCL) and its inhibition

Key words describing research program:

- Human inflammatory skin diseases
- Systemic sclerosis
- Cutaneous T Cell Lymphoma
- Human T-cell differentiation
- Cytokines
- Fibrosis
- Tumor cell proliferation

Titles for shovel-ready research projects:

- 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.
- Identify the signaling pathways activated in immune cells in the blood and skin of scleroderma patients using biochemical and biophysical techniques.
- Preclinical studies testing novel therapeutics for systemic sclerosis in human skin and lung explant, and murine models
- Discovery of altered immune cell and vascular cell phenotypes in scleroderma skin using single cell RNA-seq.
- Identify and block the IL-13 signaling pathways involved in proliferation of CTCL tumor cells
- Transcriptome profiling by single cell RNA-seq of malignant lymphocytes and cells of the tumor microenvironment in CTCL skin tumors.