

**Institute for Regenerative Medicine**

**WFIRM Summer Scholars Program 2015**  
**Joshua Frase Foundation Namesake Scholar**



**Ivy Shen**

*Dartmouth College, Neuroscience*

I am a rising senior at Dartmouth College, and I am pursuing a neuroscience major with a minor in Global Health. I keep busy as the president of Relay for Life, Colleges against Cancer, and Students Fighting Hunger. In my spare time I enjoy playing the violin in the Dartmouth Symphony Orchestra and competing for the Club Tennis team. In my off terms, I learned classical French cooking and worked as a Tucker Foundation Fellow at Boston Healthcare for the Homeless. At the Neurological Rehabilitation Unit of Rhode Island I conducted a study on improving neurological signals and was published in the Northeast Biomedical Conference. At Dartmouth College I enjoy research in a neuroengineering lab that studies mechanisms of childhood obesity.

This summer I will be a part of Dr. Frank Marini's team at the Comprehensive Cancer Center. As a summer scholar, I will study tumor microenvironments as well as tissue and wound repair and regeneration. Dr. Marini and his team study tumor stroma interactions at the cellular level. One sub project focuses on the interactions of mesenchymal stem cells and their interaction and transition into tumor-associated fibroblasts, one of the most prevalent non-cancerous cell type found in tumors. TAFs have been clinically associated with poor prognosis and clinical outcome in cancer patients. Dr. Marini and others have shown that TAFs support tumors through a variety of mechanisms, such as rapid vascularization, production of tumor-supportive cyto/chemokines, up regulation of tissue digesting proteins, etc. Given this, the lab studies the generation of TAFs from MSC, and has cataloged the various subtypes of TAFs and demonstrated the benign to aggressive phenotypes, but importantly, studying why and how TAFs support tumors and why TAFs up regulate the tumor microenvironment to be more aggressive. We do this through various cell biological studies in vitro and in vivo and utilize a number of sophisticated –omit discovery platforms, as well as devolving deeply into the transcriptional regulation of TAFs. The second prong of the attack is through the use of sophisticated imaging modalities in which we can visualize these interactions. Additional projects involves complex image analysis, and confocal, multi photon, and multispectral microscopy.

After graduation, I plan to go to medical school to become a neurosurgeon and study neurodegenerative diseases. As a future physician, I hope to treat patients with compassion and insight of clinical aspects with the skills I have developed through research.