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My Research:

Our lab studies the multi-protein complex termed the inflammasome, which is responsible for processing the pro-inflammatory cytokine IL-1 β from its inactive precursor form, to its biologically active form. My research focused on the inflammasome adaptor protein ASC (Apoptosis associated speck-like protein containing a CARD domain), and its subcellular distribution in inflammatory cells. Using immunofluorescence, I found that in resting cells, ASC is predominantly localized in the nucleus. However, upon induction with inflammatory stimuli, such as *E. coli* RNA, it is rapidly translocated to the cytoplasm, where it forms characteristic aggregates in the perinuclear space. The formation of these structures does correlate with the secretion of active IL-1 β as measured by ELISA. Also, other key inflammasome components including caspase-1 and the cytosolic receptor NLRP3 were also found to co-localize with ASC in these structures. Furthermore, using cells in which ASC was stably knocked-down, and subsequently reconstituted with ASC, which was restricted to the nucleus by the fusion of an NLS sequence, I demonstrated that the nuclear to cytoplasmic redistribution of ASC was necessary for IL-1 β processing and release.

Future Plans:

I am now in the process of completing the 3rd and 4th years of the medical school curriculum. In the future, I plan to complete my residency in Internal Medicine and ultimately complete a fellowship in Oncology. I hope to find both a residency and a fellowship program, which highly value research so that I can continue to incorporate research with medicine as I become a physician-scientist.