



## Undergraduate Summer Internship in Systems Biology

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### Internship Project Description: Summer 2018

**Project Title:** How do viruses undermine our innate immune response?

**Supervisor Name:** Erika Olson

**Lab PI Name:** Pamela Silver

**Project Description:** Our bodies are in a constant arms race with viral pathogens. In order to replicate viruses must evade or impede our defenses, which range from innate, broad-spectrum intracellular defenses and specialized cells to adaptive, focused offenses created by the adaptive immune system. The most dangerous human viral pathogens, such as influenza and Ebola, employ a multi-pronged approach towards immune evasion, and pathogenicity of an emerging virus is expected to correlate with the variety and efficacy of immune evasion strategies. However, while only 20% of viruses with vertebrate hosts contain immune suppressing proteins, within that 20% the genomes contain on average 2 known immunosuppressors per genome, which implies that we have only begun to characterize viral immunosuppression. In order to discover new biology and protect against the growing threat of emerging viral pathogens, we are developing robust, quantitative, high-throughput assays to screen both annotated and unannotated viral proteins for their ability to impede intracellular antiviral defenses. Depending on the candidate skills and interests, the project will involve mammalian cell culture, immunofluorescence microscopy, molecular biology, and/or computational image processing and analyses.