“Taking a leap: evolving de novo antiviral functions”

We study how the mammalian innate immune system evolves to defend against viral infection. Innate immunity is the body’s first line of defense against infection, and its activation is essential for triggering adaptive immune responses like antibodies. How innate immune proteins recognize invading viruses and act to block their infection cycle is not yet understood at a mechanistic level. We seek to fill that gap by studying innate immunity through multiple lenses: biochemical, biophysical, structural, and evolutionary. We are particularly interested in the mechanistic and biochemical insights that can be gleaned from evolution, both historical and prospective, as innate immune proteins compete with viruses in evolutionary arms races.