In my doctoral project, I studied the evolution of retroviruses and long-term interactions with their hosts. Retroviruses infect a broad range of species including possibly all vertebrates. They are unique in their ability to efficiently create endogenous retroviruses (ERVs) - viral copies integrated into the host genomes and consequently inherited by successive generations as usual genomic locus. ERVs represent a significant portion of vertebrate genomes and play an important role in a variety of cellular processes and pathologies; however, their sequences are still largely unexplored.

The results of my work contributed to the uncovering of ancient evolutionary history of retroviruses. In this regard, I employed the ERV sequences, as they represent “genetic fossils” of viral infections that occurred throughout entire retroviral evolution. By discovery and analysis of ancient ERV lineages, I shed light on the deep history of retroviruses and revealed how the past infections shaped the evolution of vertebrate antiviral defense.

In addition to the investigation of retroviral evolution, I also studied process of ongoing endogenization and fixation of newly emerged ERVs in a mammalian host population. In this part of my work, I focused on a unique model of ERV that have been recently invading mule deer genome.