Most human cancers exhibit genomic instability and an increased mutation rate due to defects in DNA repair. Cancer cells are often defective in one of six major DNA repair pathways: mismatch repair, base excision repair, nucleotide excision repair, homologous recombination, nonhomologous endjoining and translesion synthesis. Since the specific DNA repair pathway affected is predictive of the kinds of mutations, the tumor drug sensitivity, and the treatment outcome, understanding control mechanisms and the specifics of these pathways is highly important. My research focuses on examining the fidelity of DNA replication to understand how genomic stability is maintained by studying how induced and spontaneous mutation is avoided by the various replicative polymerases and DNA repair pathways. I assess mutation accumulation and avoidance in the model organism *Saccharomyces cerevisiae* by using gene ablation strategies to study the loss of specific gene function or alteration and the effects on genome maintenance.

As an assistant professor in Biology at Reinhardt University, my research has focused on how different environmental conditions induce the accumulation of mutations in *S. cerevisiae*. I am interested in comparing the accumulation of mutations in *S. cerevisiae* cells with all DNA repair systems intact with cells that have one or more DNA repair systems lacking. Currently, I am in the process of assessing water quality and mutagenic potential from water samples taken from local streams in and around Reinhardt University at various seasonal times. I have mentored several undergraduate independent research projects on this topic. The latest undergraduate project involved assessing whether combining different food dyes was mutagenic. We were interested in testing whether the combination of different dyes displayed a synergistic affect on mutation accumulation. In the future, I am planning to assess the loss of function of different DNA repair pathways and the role that this loss will have on induced mutation accumulation from various environmental samples and exposures.