Endogenous and exogenous factors are constantly threatening the integrity of our genomes. Cells respond to genetic insults by mounting a complex signaling system collectively termed the DNA damage response (DDR), a network of proteins that function to detect, signal and repair damaged DNA. Many DDR activities take place within chromatin, the protein-DNA complexes that organizes the eukaryotic nuclear genome and regulates both epigenome and genome functions. The structure and function of chromatin are regulated by histone modifications and chromatin modifying enzymes, which can markedly influence the DDR. Therefore, determining the interplay between the DDR and chromatin is fundamental for elucidating how cells maintain both epigenetic and genome integrity. These issues are critical in diseases including cancer where genome and epigenome instability are hallmarks of this disease. In addition, many cancer therapies function through damaging DNA and drugs that target the cancer epigenome are being developed as innovative therapeutic strategies. Therefore, the research in the Miller lab aims to understand genome maintenance and the DNA damage response in the context of chromatin, cancer and anticancer therapies. We employ genetics, genomics, cell biology and molecular biology in both mouse and human tissue culture systems to gain insights into these areas of research. The lab applies a multifaceted and diverse approach to these questions in hopes of defining the relationship between chromatin and DNA damage responses, as well as gaining insights into the mechanisms of cancer therapeutic drugs that act at the chromatin and DNA level.

Note :
Prière d’avisier vos étudiants gradués et stagiaires postdoctoraux afin d’avoir la participation de tous.