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Selected Publication

A Kakarougkas, A Ismail, AL Chambers, E Riballo, AD Herbert, J Kunzel, M Lobrich, PA Jeggo, and JA Downs (2014) Requirement for PBAF in transcriptional repression and repair at DNA breaks in actively transcribed regions of chromatin. *Molecular Cell*, 55(5): 723-732.

Research Aims and Interests

In eukaryotes, genomic DNA is packaged into the nucleus primarily by association with histone proteins to form chromatin. This structure, while necessary for compaction and chromosome segregation, is inhibitory to most processes that require access to DNA, such as transcription, replication and repair. For this reason, cells have two powerful mechanisms for manipulating the structure of chromatin; covalent modification of histones and ATP-dependent chromatin remodeling activities. We and others have identified multiple chromatin modifying activities involved in DNA double-strand break repair. Our recent work has focused on two complexes: PBAF (also called SWI/SNF-B) and INO80. Both of these complexes contribute to cellular functions that promote and maintain genome stability, but by different mechanisms. Our aim is to investigate the molecular mechanisms underpinning these activities and to explore the potential interplay between these complexes in the cell. These approaches will yield insights into how chromatin remodeling activities contribute to genome stability and prevent tumorigenesis.