

YAF2 Protein Interaction with Polycomb Group Proteins

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The Polycomb group proteins play an influential role in cell fate determination. They are transcriptional repressors that function by altering chromatin structure. Polycomb group proteins are recruited to specific regions of chromatin by its recognition of methylated histones. However, Polycomb group proteins will also bind to DNA without methylated histones, suggesting alternate modes of recruitment to chromatin. A protein called YAF2 may provide the alternative mode of Polycomb group recruitment to chromatin as it can bind both a Polycomb group protein, RING2, as well as the specific DNA binding protein, YY1. RING2 is also responsible for binding a protein called Polycomb (Pc), the protein that recognizes the methylated histones. The RING2 domain that recognizes Pc also binds YAF2 suggesting that either Pc or YAF2 but not both can bind RING2 at one time. This hypothesis is appealing because it suggests DNA recognition by the Polycomb group can be regulated by the identity of RING2's binding partner. We will use structural and biochemical tools to study the interaction between YAF2 and the Polycomb group proteins. We have identified a 50 amino acid region in YAF2 that binds RING2 and have grown crystals of this peptide bound to RING2. The growth of these crystals is the first step toward ultimately solving the three dimensional structure of the RING2/YAF2 complex.