Trimeric interaction of Antp-Ubx with TBP and homeoprotein EXD in the genetic control of development in *D. melanogaster.*

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Homeoproteins specify body segments along the anteroposterior axis during embryo development; they bind DNA through the homeodomain (HD). Homeoproteins bind to similar and repetitive target sequences on DNA, raising the question of how they achieve functional specificity. Homeoproteins form complexes with proteins through the HDs or other regions. Antennapedia (Antp) and Ultrabithorax (Ubx) have an important role in conferring thorax identity; also they are involved in a repression transcriptional mechanism: Ubx binds to Antp promoter repressing its expression. We analyzed if Ubx and Antp perform protein-protein interaction as a regulation mechanism and if the complex Antp-Ubx are involved in trimeric interaction with other transcription factors. Using Bimolecular Fluorescence Complementation (BIFC) we showed Antp-Ubx interaction in cell culture and *in vivo* in embryos and imaginal discs of *Drosophila melanogaster.* Also, we detected the Antp HD importance as well as the E19G residue in the interaction. We next analyzed if dimer Antp-Ubx affected Antp function in head involution on larvae, showing 80% of larvae with homeosis. In adult flies dimer Antp-Ubx caused a partial antenna to leg transformation. Additionally, using BiFC-based FRET, we showed that Antp-Ubx form trimeric complexes with TBP and EXD in cell culture and we test the trimeric complexes function *in vivo* in head involution on larvae, showing 80% of homeosis expressing Antp-Ubx/TBP complex and 66% of homeosis expressing Antp-Ubx/EXD complex. We conclude that Antp-Ubx is involved in trimeric interaction with TBP and EXD and both trimeric complexes are important for Antp function *in vivo.*