

The Bi-functional Role of BMP in *mid* Regulation in *Drosophila*

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During early embryogenesis, intracellular signals determine whether follicle cells differentiate towards anterior or posterior fate. Bone Morphogenetic Protein (BMP) is one of the regulatory proteins repressing *mid*, a transcription factor induces the posterior pattern formation in *Drosophila*. BMP regulates *mid* expression via binding to the intron segment of the *mid* gene, known as *mid*-in. Previous work using the lacZ reporter in *mid*-in has shown that *mid*-, requires BMP expression in some cases, presenting a potential bi-functional role of BMP. We hypothesize that such a property might be determined by the availability of *schnurri*, a well-known co-repressor of BMP. We examined lacZ fused with *mid*-in in three groups of *Drosophila* (over expression of BMP, knock-down of *schnurri*, and the combination of both genotypes). Each group contained 40 samples and was analyzed using genetic mosaic analysis. We found that reporter expression decreased substantially when *schnurri* was present and BMP was over expressed. In contrast, the reporter was ectopically expressed when *schnurri* was absent and BMP signalling was overactivated. However, because *schnurri* was only knocked down using *schnurri* RNAi in this experiment, the activation phenotype was not strong. Future experiments could repeat this analysis using *Drosophila* a with *schnurri* gene mutation instead. Overall, these results demonstrate the bifunctional property of BMP pathway in the regulation of the *mid*-in reporter. Future work may focus on identifying the locations of the BMP activation and repression motif within the *mid*-in sequence.

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