
MODULE TSS1: INTRODUCTION

Q1. What is the genomic location of isoform E of the *Antp* gene in the *D. melanogaster* genome?

Q2. How many isoforms does the *Antp* gene have in *D. melanogaster*? List the isoforms below.

Q3. Is the *Antp* gene on the plus or minus strand?

Q4. Open a new tab on your browser. Navigate to [FlyBase](#) and type “Antp” into the “Jump to Gene” text box to obtain more information about the *Antp* gene.

What is the full name of the *Antp* gene?

According to the “Gene Summary” section of the *Antp* gene record, what are the biological functions of the *Antp* gene?

Based on the description of the *Antp* gene in FlyBase, do you expect this gene to be expressed ubiquitously throughout development, or expressed only in specific tissues and developmental stages?

Q5. Scroll to the "Genomic Maps" section and click on the "JBrowse" button. Upon analyzing the different isoforms of the *Antp* gene, do you expect that all isoforms will utilize the same TSS? Explain.

Q6. Analyze the "FlyBase Genes" and the "TSS (Celniker) (R5)" data tracks. Which coordinate does the "TSS (Celniker) (R5)" data predict is the TSS?

Q7. How many DHS Positions and Read Density peaks are located in this region? Where is/are the DHS Read Density Peaks located relative to the TSS of *Antp* isoforms E, G, I, M, and N? Do you think this DNase I-sensitive region is part of the core promoter?

Q8. How many DHS Positions and DHS Read Density peaks are located in this region? Where is/are the DHS Read Density Peaks located relative to the TSS of *Antp* isoforms D, F, H, J, K, and L? Do you think the DNase I-sensitive regions are part of the core promoter for these isoforms?

Q9. What does the data in the BG3 and S2 9-state tracks tell you about the chromatin landscape in the region of chromosome 3R in which the *Antp* gene is located?

Q10. *Antennapedia* encodes a transcription factor that is expressed in the thorax during *Drosophila* development. Why is the gene repressed in S2 and BG3 cells?

Q11. Based on the criteria listed in Table 1 below, how would you classify the promoter for the longer isoforms of *Antp*?

Q12. Perform a similar analysis for the shorter isoforms of *Antp* (i.e., isoforms D, F, H, J, K, L). What is the coordinate for the putative TSS, and how would you classify the promoter for these isoforms?