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**](https://flybase.org/) **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?**