



Investigating the Autogenous Regulation of bS21 Homologs in *Francisella tularensis*

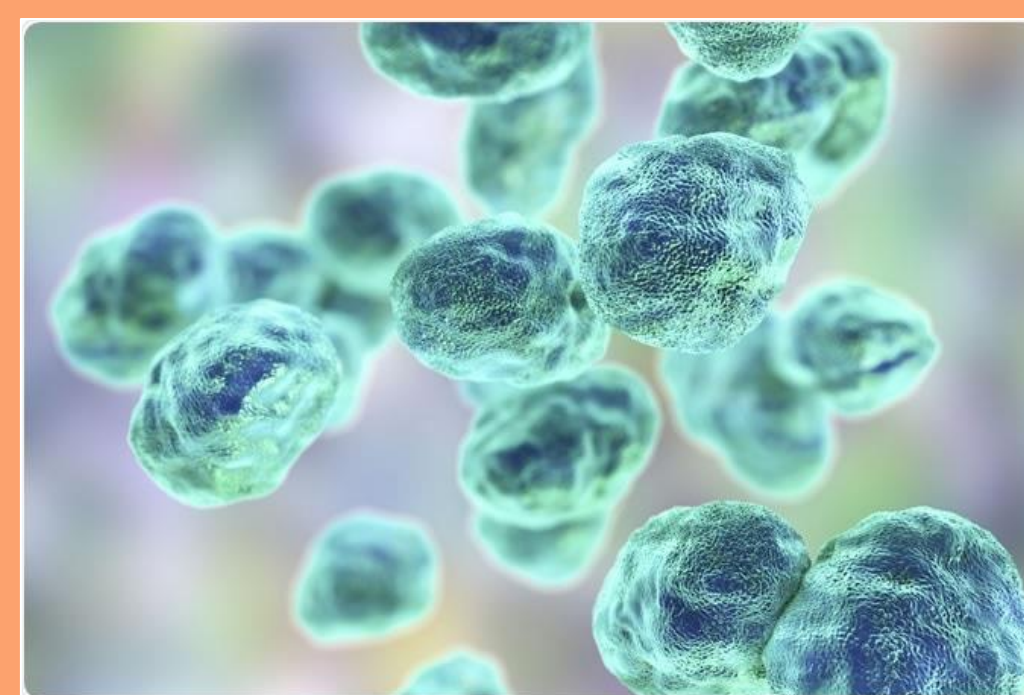
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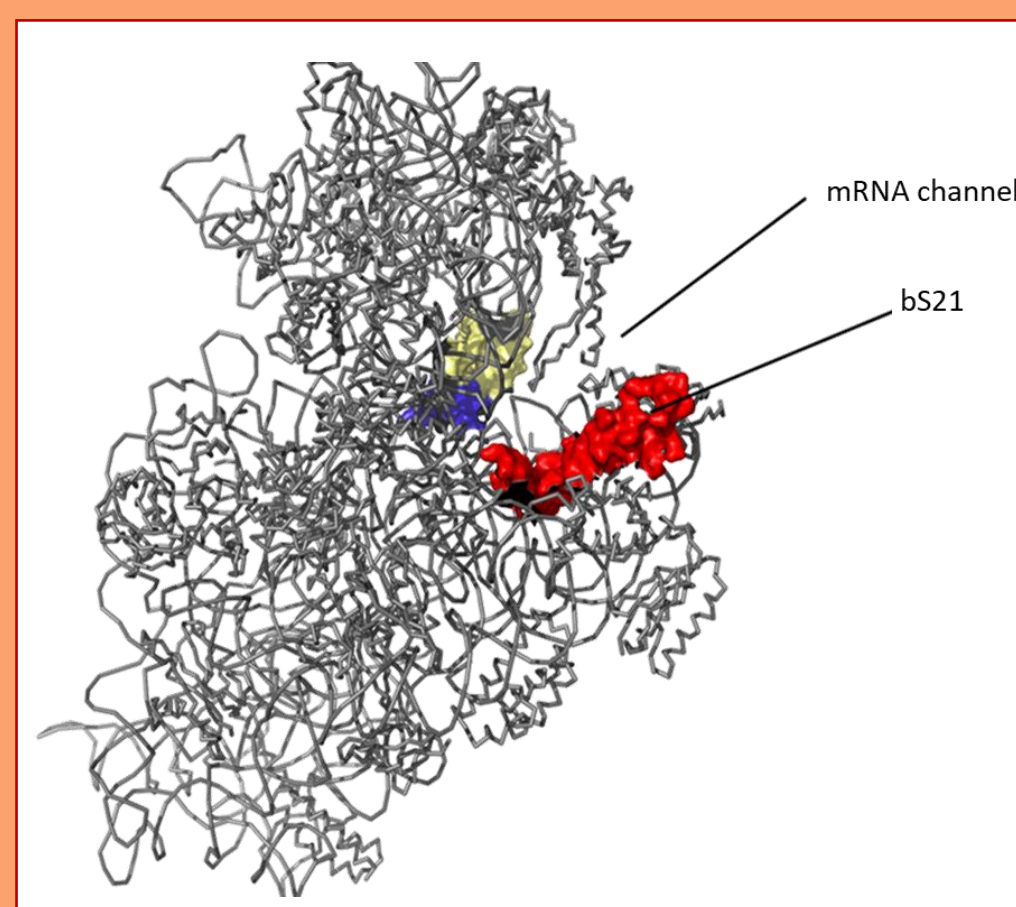
Introduction

Francisella tularensis

- Gram-negative
- Intracellular pathogen
- Causes tularemia
- Potential bioweapon



bS21: a small subunit ribosomal protein involved in translation initiation



Three homologs in *F. tularensis*

- Leads to ribosome heterogeneity
- Loss of bS21-2
- Influences virulence factors and intramacrophage growth

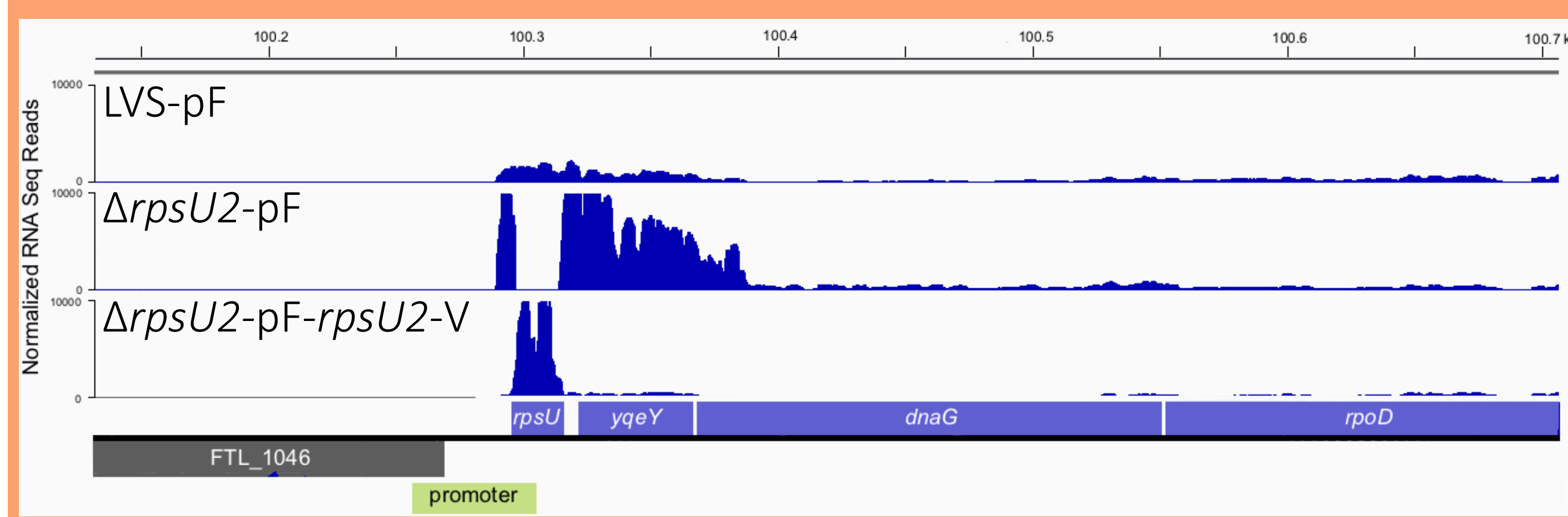
Location of bS21 in the small subunit of the *E. coli* ribosome.

Study Goals

Understand the regulation of the bS21 homologs

- How does bS21-2 affect its own production?
- How do bS21-1 and bS21-3 affect bS21-2 production?

bS21-2 Represses its Own Expression

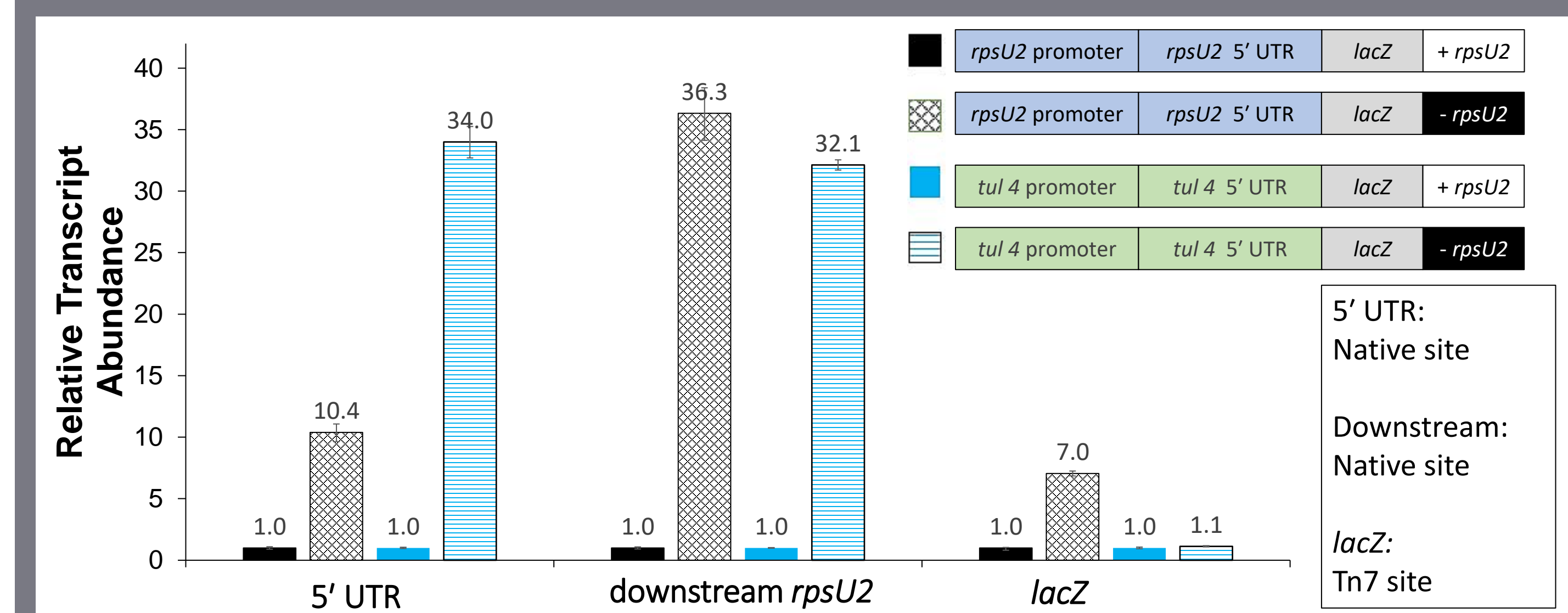


Results

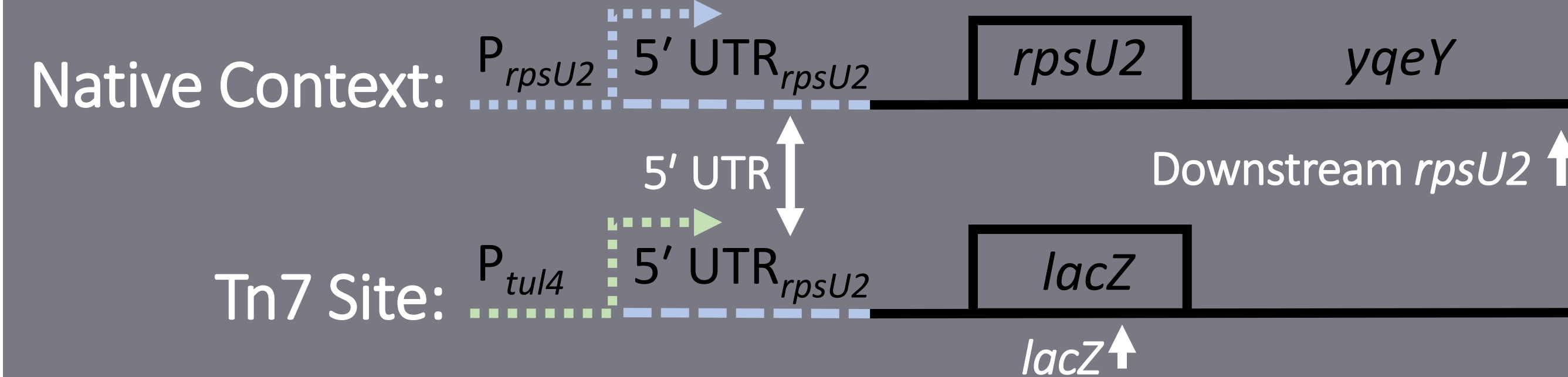
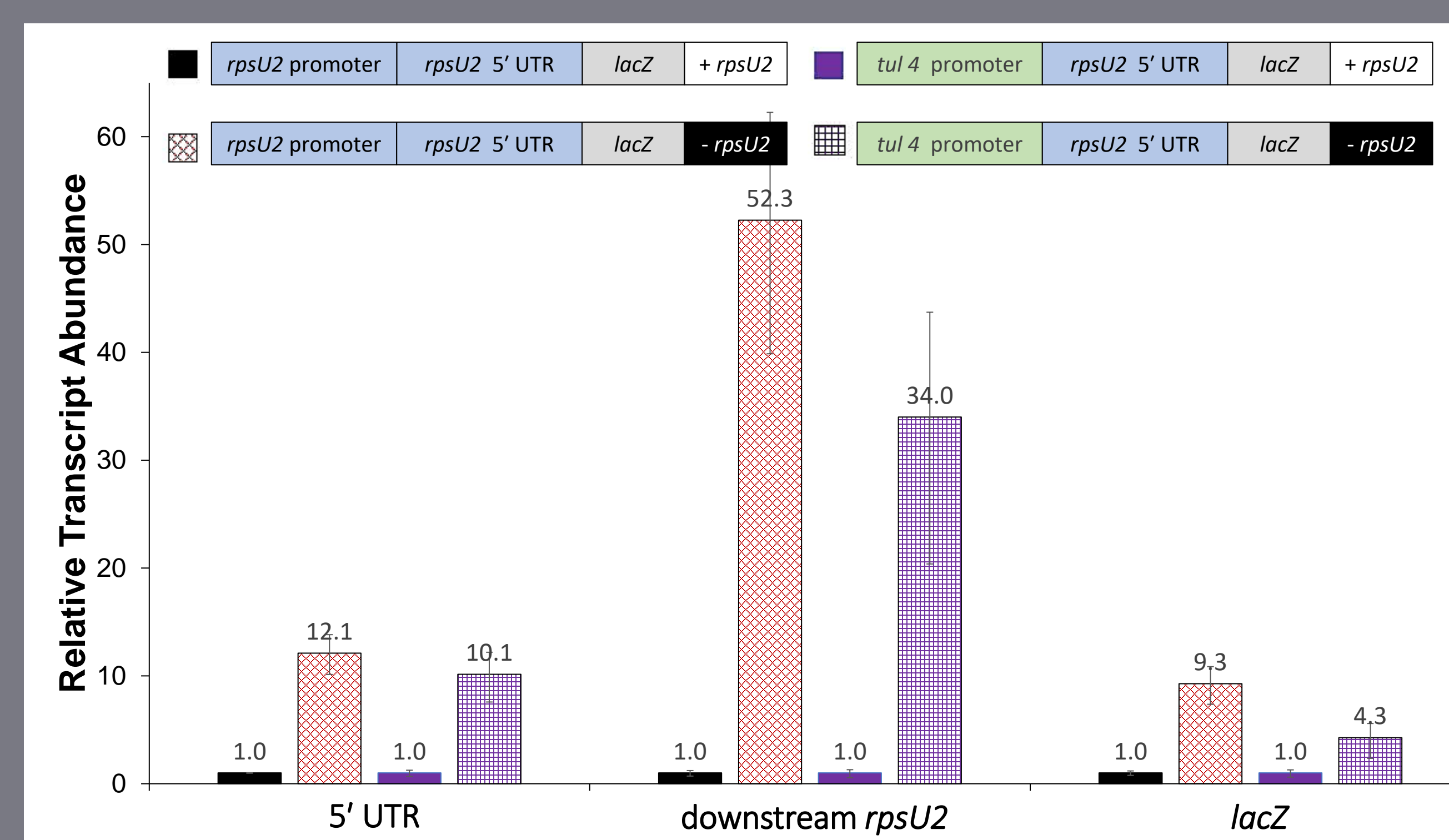
Constructs and Predictions

Construct	Cells with bS21-2 (WT)	Cells without bS21-2 ($\Delta rpsU2$)
<i>tul4</i> promoter, <i>tul4</i> 5' UTR, <i>lacZ</i>	⊕⊕⊕	⊕⊕⊕
<i>rpsU2</i> promoter, <i>rpsU2</i> 5' UTR, <i>lacZ</i>	⊕	⊕⊕⊕⊕⊕
<i>rpsU2</i> promoter, <i>tul4</i> 5' UTR, <i>lacZ</i>	?	?
<i>tul4</i> promoter, <i>rpsU2</i> 5' UTR, <i>lacZ</i>	?	?

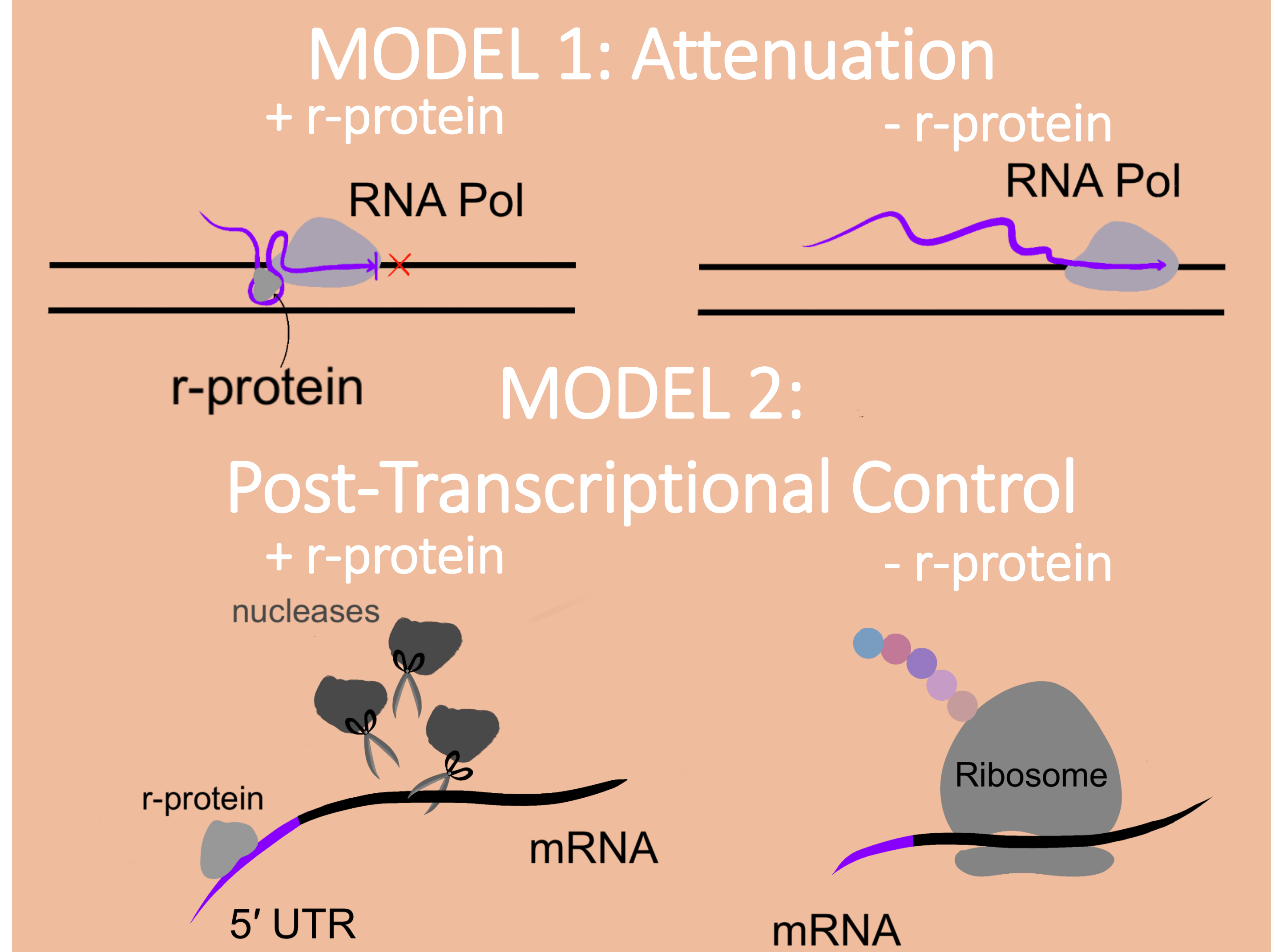
tul4 5' UTR is Not Regulated by bS21



rpsU2 5' UTR Permits Regulation by bS21



Ribosomal Protein Regulation



Conclusions

- The 5' UTR of the *rpsU2* gene is sufficient to permit regulation by bS21

Future Directions

- Test the *rpsU2* promoter's contribution to the regulation of bS21-2
- Assess the relationship between transcript and protein abundance with *lacZ*
- Examine post-transcriptional model via degradation assays

References

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