

**Table S3:** Prior distributions of the parameters for the transcription model.

Parameter	Meaning	Prior interval
$k_{\text{on}}$	promoter binding rate	$[10^{-5}, 100]$
$k_{\text{off}}$	promoter unbinding rate	$[10^{-5}, 100]$
$k_{\text{r}}$	mRNA transcription	$[0.1, 500]$
$\lambda$	transcription rate	$[2, 8]$

For the transcription model inference problem presented in this paper, each parameter was assigned an independent uniform log prior distribution in the interval listed in the table.