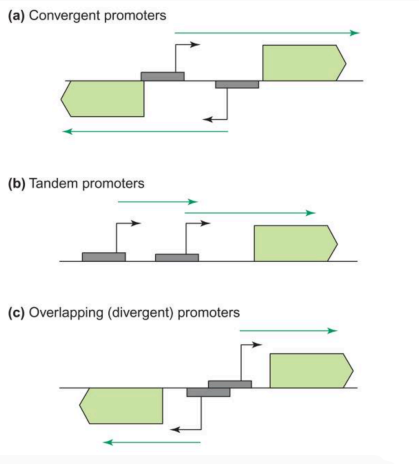


TRANSCRIPTIONAL INTERFERENCE

Definition: The suppressive, direct and in cis influence of one transcription process by a secondary transcriptional process.



Why does Transcriptional Interference occur?

- 2 promoters: Strong (aggressive) promoter that decreases the expression of the Weak (sensitive) promoter
- Arrangement of the promoter

a) **Convergent Promoters**

Converging transcript with overlapping transcripts

b) **Tandem Promoters**

One upstream of the other

Transcripts may/not overlap

c) **Overlapping Promoters**

2 RNAP-binding sites share a common DNA sequence

Can be convergent, divergent or in tandem

How does Transcriptional Interference work?

- Can be implemented at both the initiation and the elongation phases

a) **Promoter Competition**

RNAP occupies one of the promoters

Occupation of the other promoter inhibited

2 promoters could also share the same enhancer site

TF on the enhancer site interacting with promoter 1, x promoter 2

b) **Sitting Duck Interference**

RNAPs slow to initiate from promoter 2

Removed by elongating RNAP from promoter 1

Able to dislodge long-lived PICs, persisting for multiple rounds of initiation

*PICs: pre-initiation complexes

c) **Occlusion**

RNAP passes over a promoter/TF binding sites

Prevents the recruitment of RNAPs/TF by steric hindrance

d) **Collision**

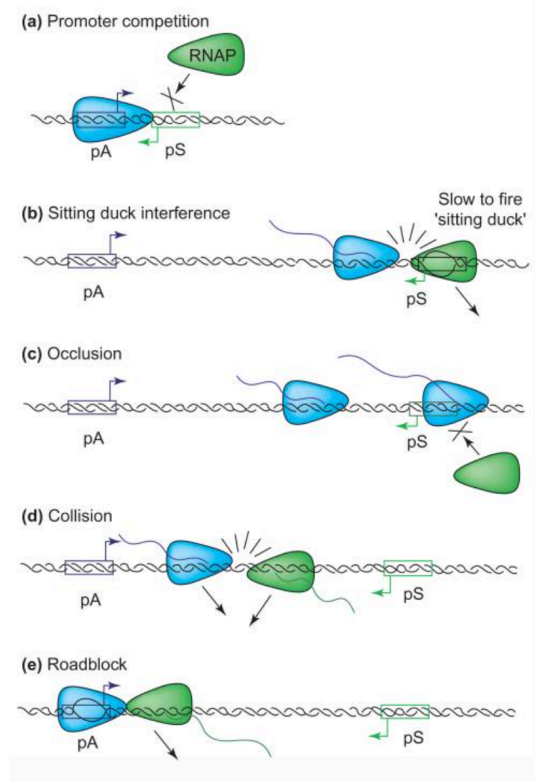
Converging elongation complexes

Premature termination of transcription of one or both complexes

e) **Roadblock**

DNA bound complex (eg. lac repressor)

Block progress of RNAP initiating upstream



TRANSCRIPTIONAL INTERFERENCE

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