Case 1: First position is unpaired.

$$p_{a'} = x^{\#\mathsf{gc}(a')} \cdot \mathcal{Z}_{\mathsf{F},S'}^{[a',b]} / \mathcal{Z}_{\mathsf{T},S}^{[a,b]}$$
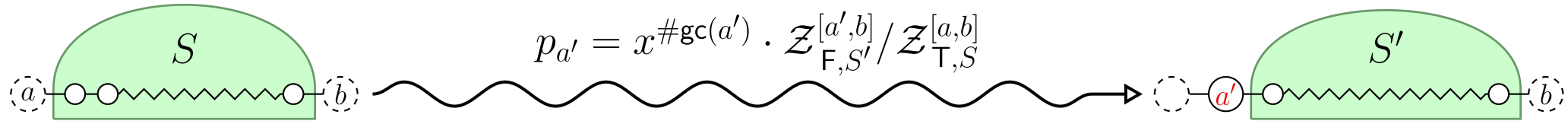
Case 2: Extremities are paired, surrounded by another base-pair, forming a stacking base-pair.

$$p_{a',b'} = x^{\#\mathsf{gc}(a'.b')} \cdot e^{\frac{-E_{ab \to a'b'}^{\beta}}{RT}} \cdot \mathcal{Z}_{\mathsf{T},S'}^{[a',b']} / \mathcal{Z}_{\mathsf{T},S}^{[a,b]}$$
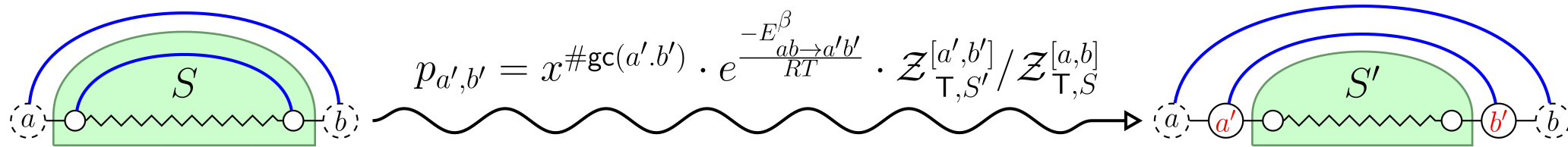
Case 3: First position in paired to some position, but not involved in a stacking pair.

$$p_{a',b'} = x^{\#\mathsf{gc}(a'.b')} \cdot e^{\frac{-E_{\varnothing \to a'b'}^{\beta}}{RT}} \cdot \mathcal{Z}_{\mathsf{T},S'}^{[a',b']} \cdot \mathcal{Z}_{\mathsf{F},S''}^{[b',b]} / \mathcal{Z}_{N,S}^{[a,b]}$$