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Supplemental Information

**DNA Occupancy of Polymerizing Transcription Factors: A Chemical
Model of the ETS Family Factor Yan**

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Supporting Material

DNA occupancy of polymerizing transcription factors: a chemical model of the ETS family factor, Yan

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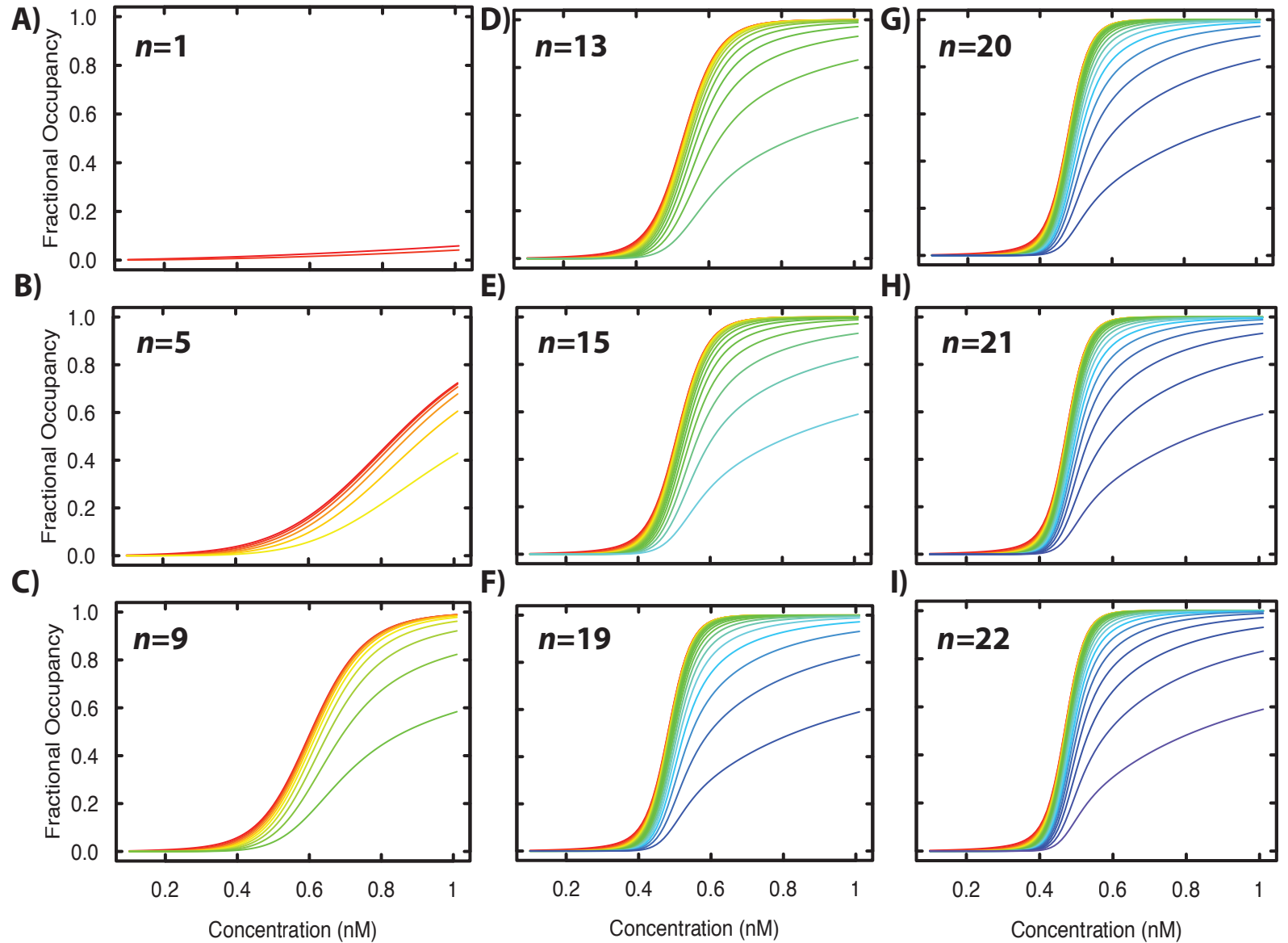
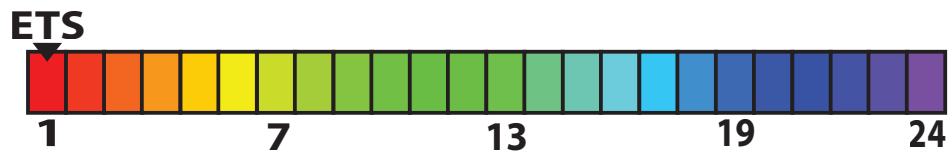


Figure S1:

Yan binding profiles for elements of increasing size. The value of n is labeled for each calculation, and Yan fractional occupancy was plotted across the element using the wild type parameters for α , β , and γ . Fractional occupancy is plotted as a function of concentration for all positions within the element, as shown in the key.

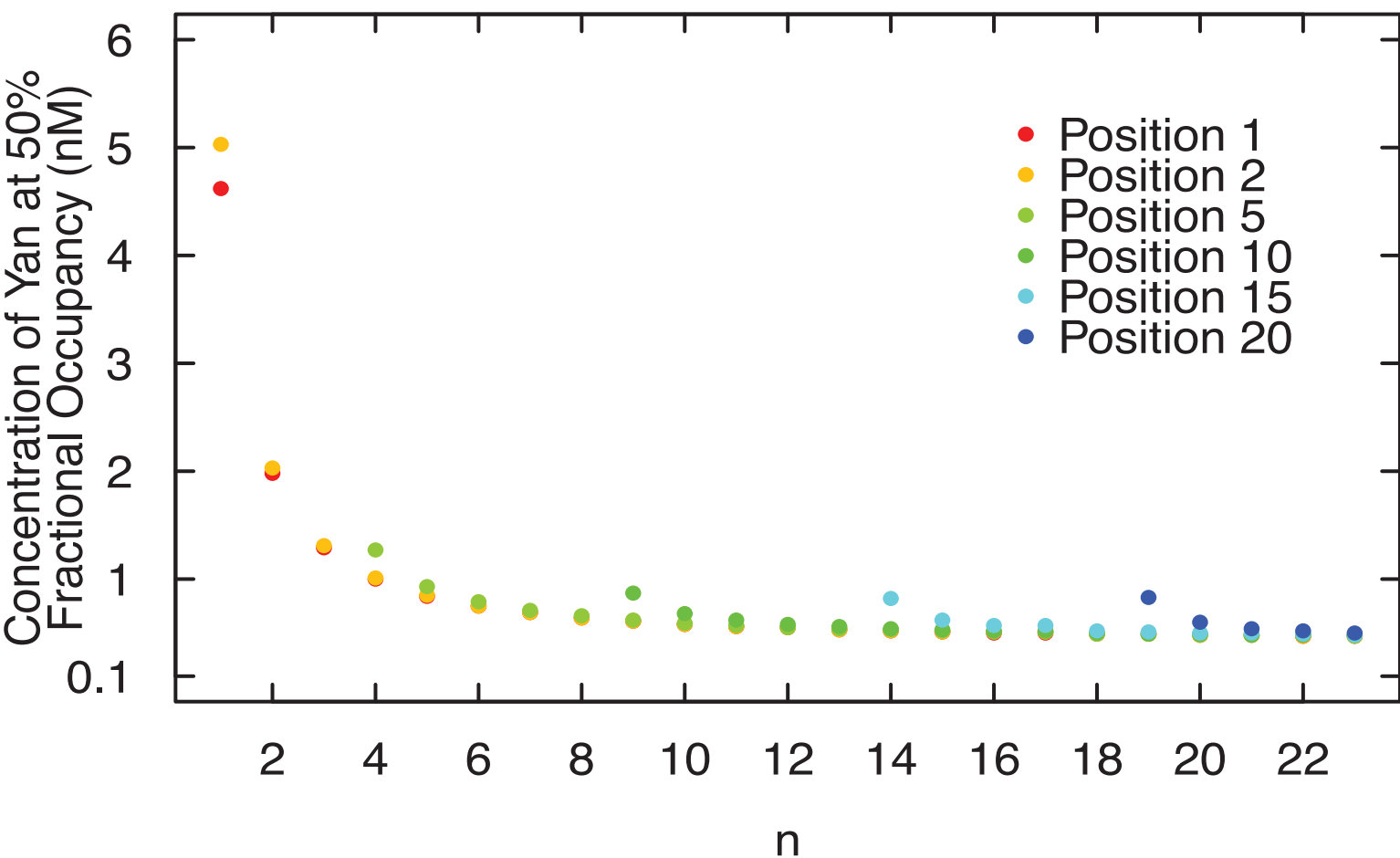


Figure S2:

Yan binding profiles converge as n increases. The concentration at which 50% fractional occupancy is achieved is plotted as a function of element size, and displayed by position within the element. If an element is too small to encompass a given position, it is not plotted. Note data points are plotted on top of one another.

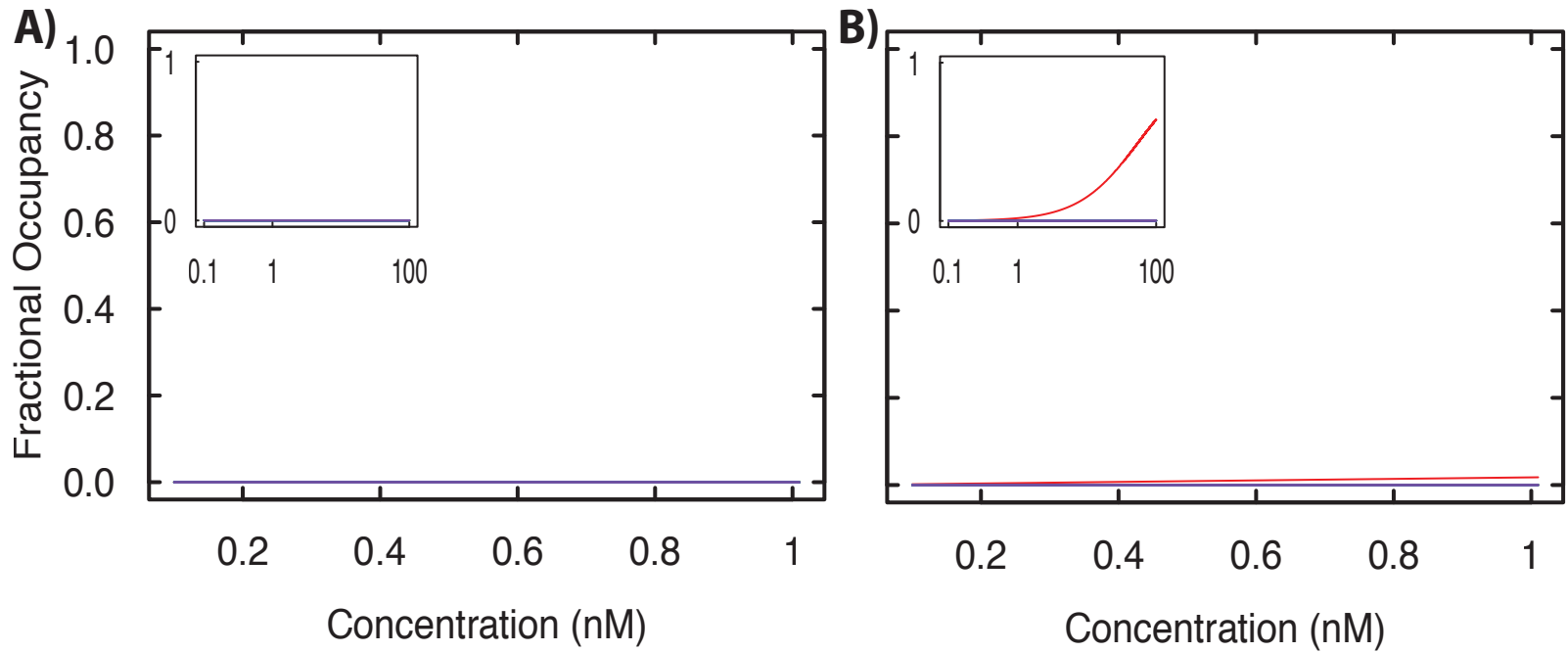
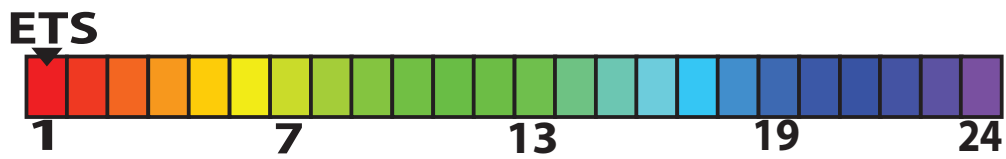


Figure S3:

Yan fractional occupancy depends on protein-DNA and protein-protein interactions. Fractional occupancy is plotted as a function of concentration for all positions within the element, as shown in the key. Note that lines are plotted on top of one another. Insets represent log scale concentration. A) Yan binding profile for an element where α and β are set to 0 kcal/mol.

B) Yan binding profile for an element where γ is set to 0 kcal/mol.

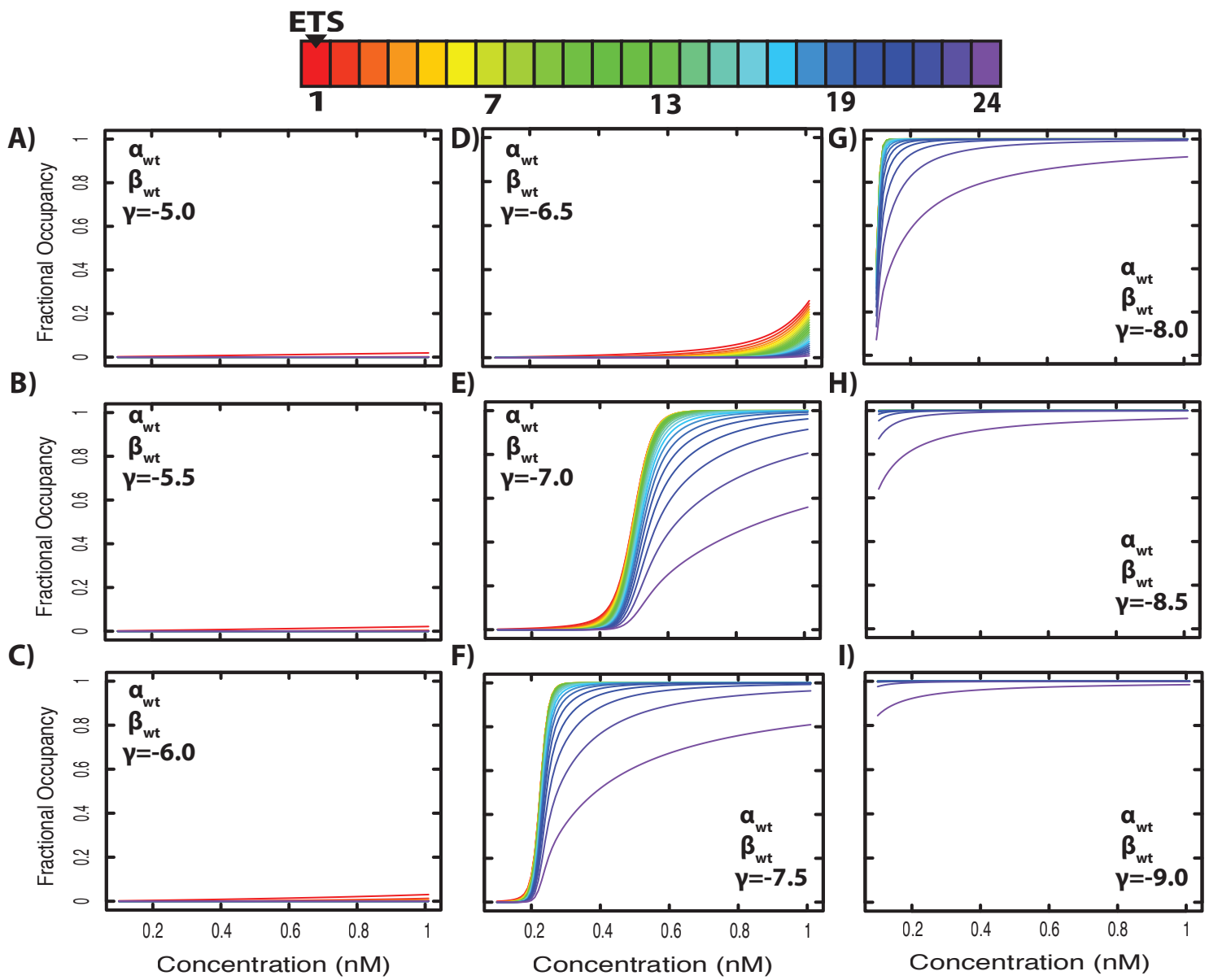


Figure S4:

Protein-protein interactions strongly influence Yan occupancy. Yan occupancy was calculated using the wild type values of α and β , while decreasing γ from -5.0 to -9.0 kcal/mol in 0.5 kcal/mol increments (A-I). Fractional occupancy is plotted as a function of concentration for all positions within the element, as shown in the key.

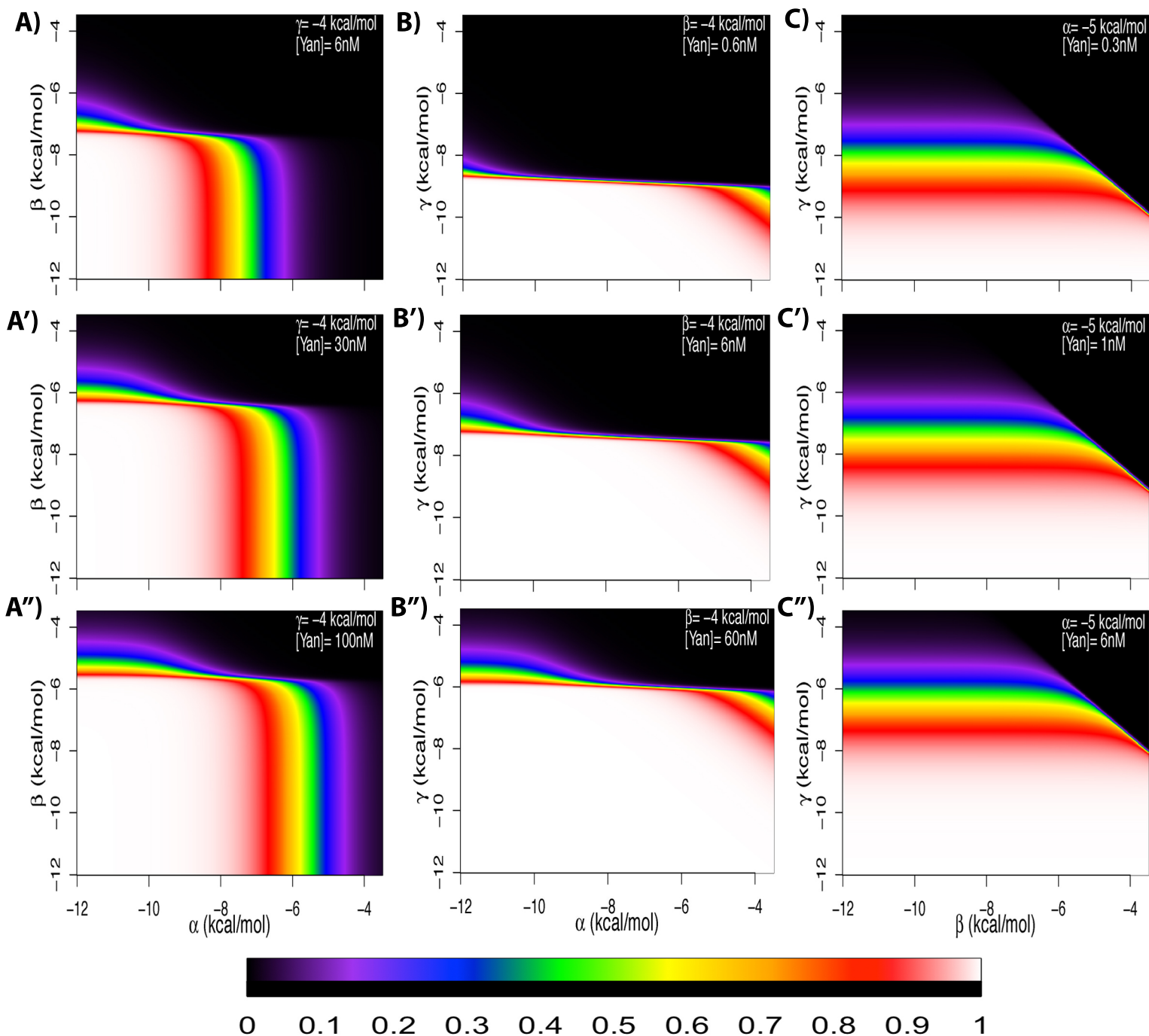


Figure S5:

Increasing Yan concentration translocates spectral heat maps of nucleated Yan fractional occupancy. All nucleated fractional occupancies are plotted on a spectral scale, as shown in the key below. A-A'') α versus β , with [Yan] at 6nM, 30nM, and 100nM. B-B'') α versus γ , with [Yan] at 0.6nM, 6nM, and 60nM. C-C'') β versus γ , with [Yan] at 0.3nM, 1nM, and 6nM.

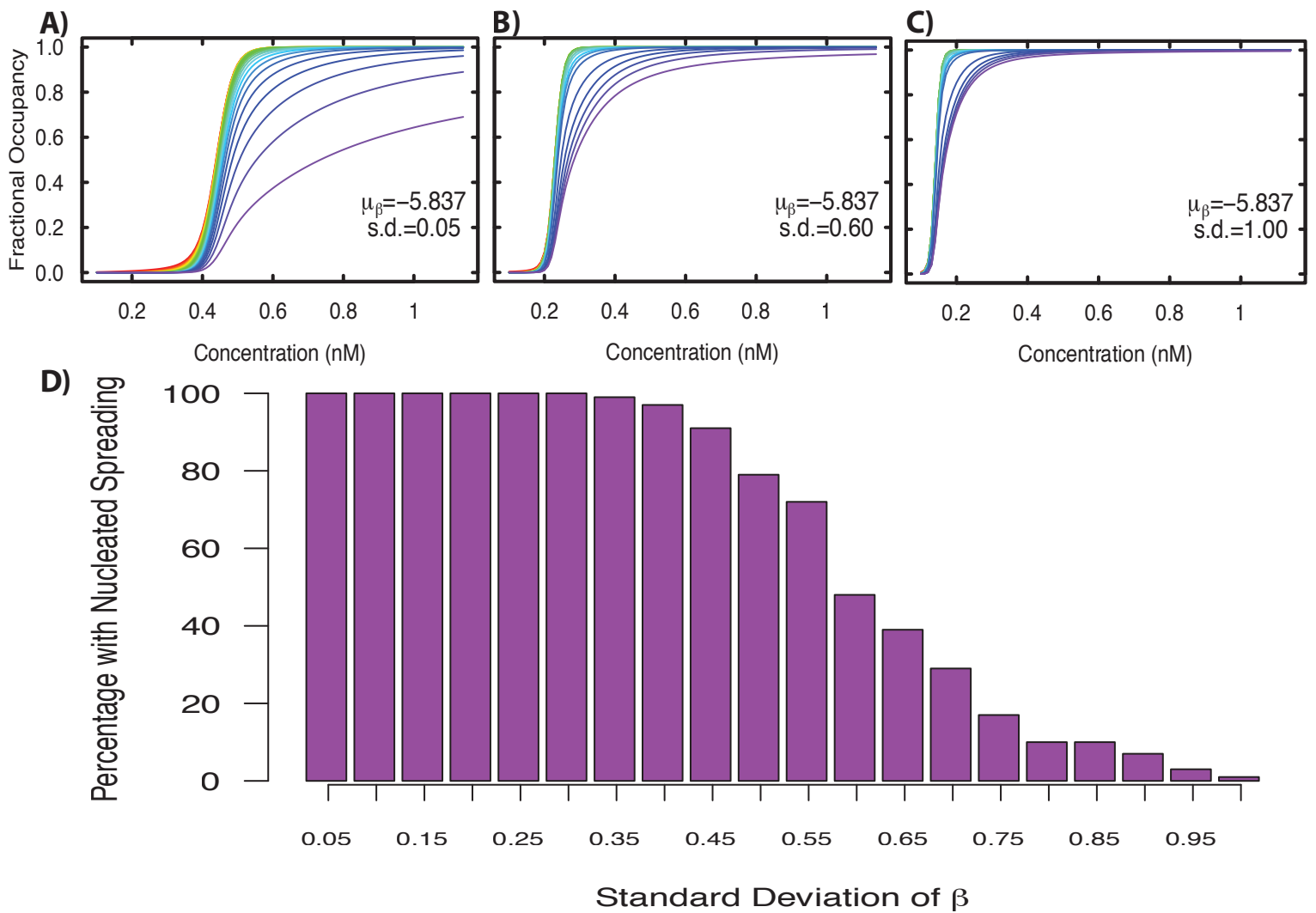


Figure S6:

The Yan spreading profile is robust to variation in β . A-C) Fractional occupancy by position versus Yan concentration, with the ETS site in red, progressing through the visible color spectrum to the most distal site in purple. Values of β for each position were selected from a half Gaussian distribution with mean μ_β and a standard deviation (s.d.). A) Standard deviation of 0.05 B) Standard deviation of 0.60 C) Standard deviation of 1.00 D) Percentage of elements with nucleated spreading profiles, as a function of the standard deviation in values of β . Random elements were generated and scored as demonstrating nucleated spreading if the ETS site had higher occupancy than any other site, measured at the concentration of half-maximal occupancy for the ETS. 100 random elements were generated and scored for each standard deviation value.