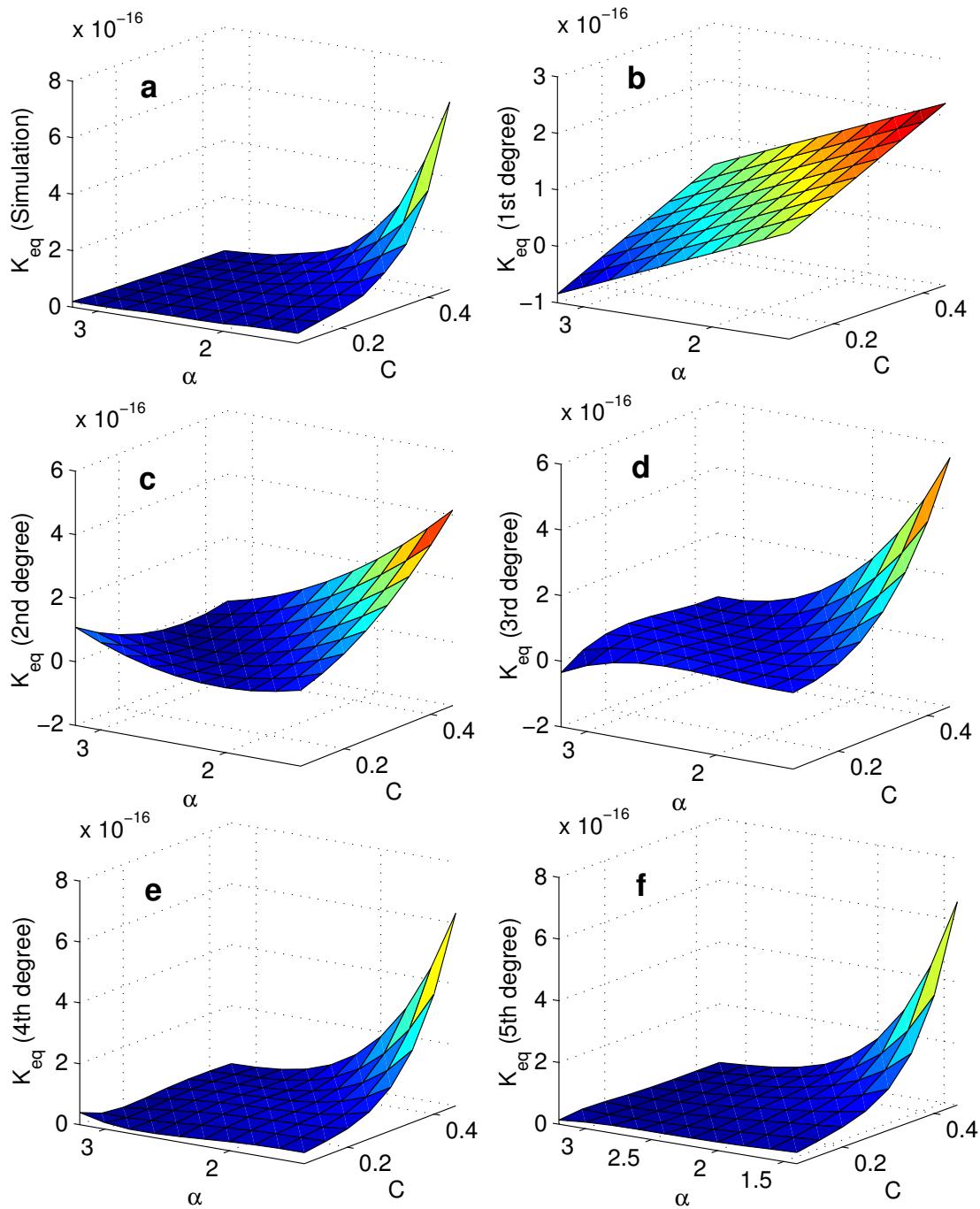


**Supplementary information:**

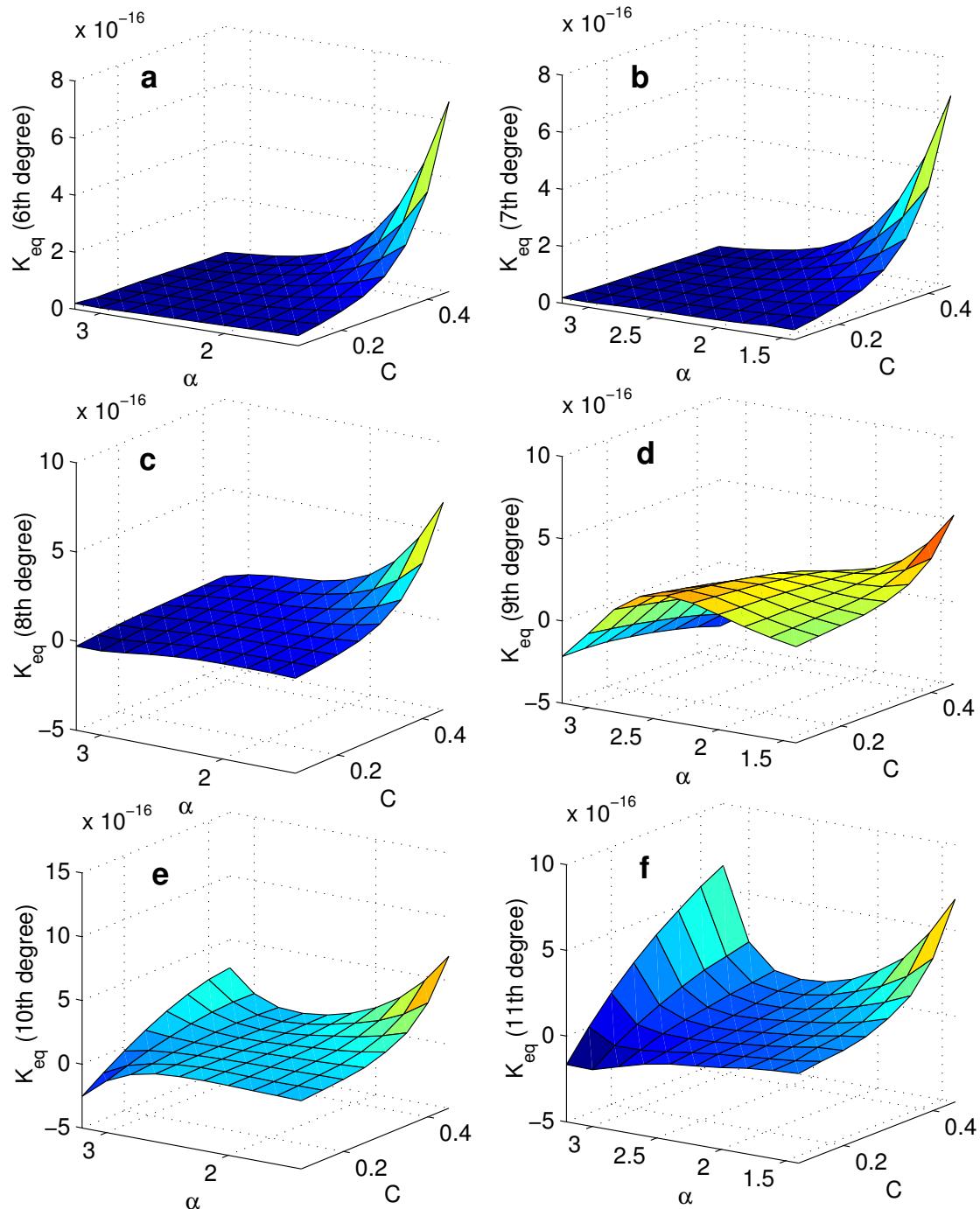
**Unified Regression Model of Binding Equilibria in Crowded Environments**

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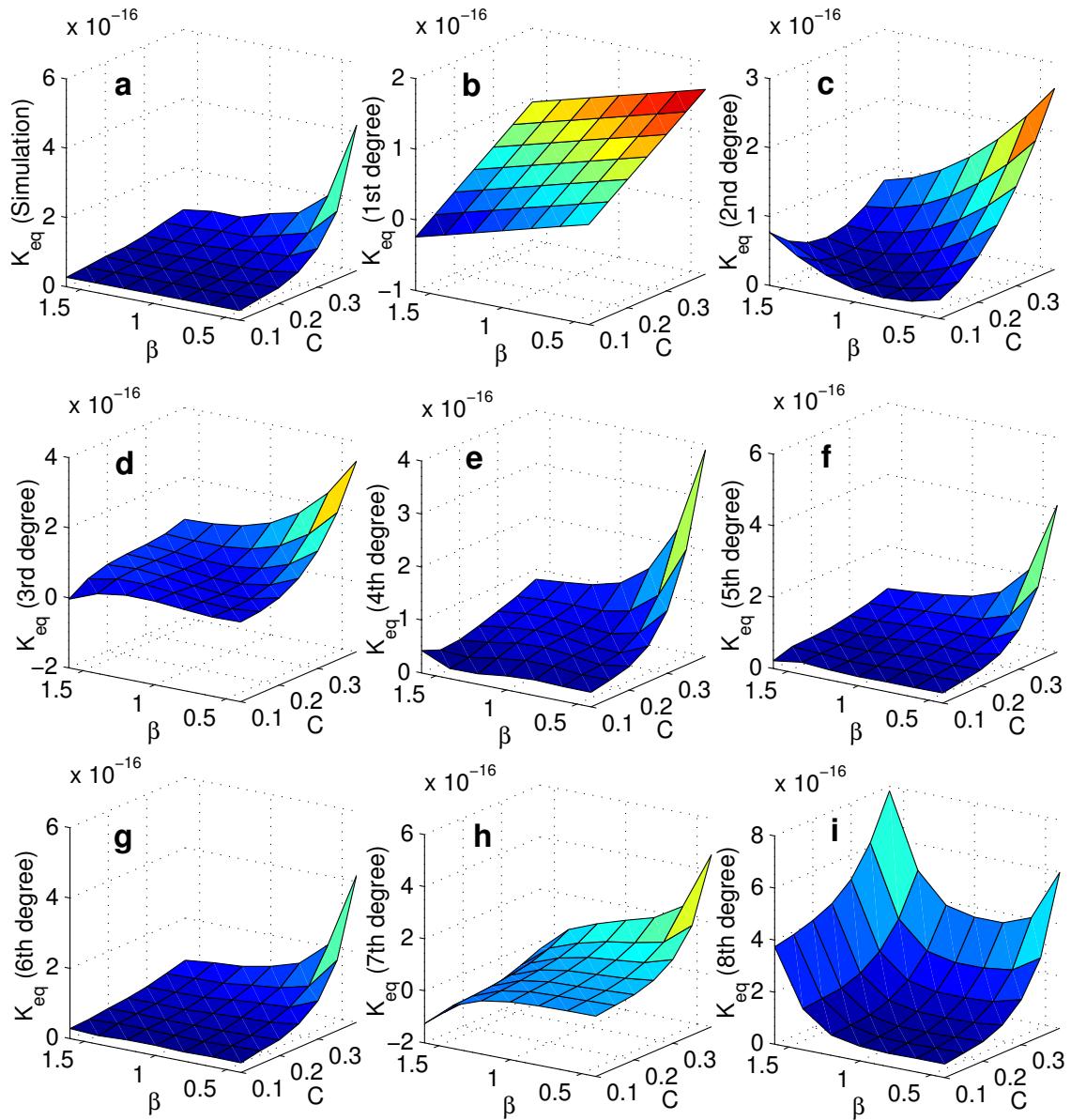
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**Figure S1| Surface plots of  $K_{eq}$  for pairwise parameter variations.** (a-f):  $\alpha$  and Concentration( $C$ ). **a**, average value from simulation data. **b**, 1<sup>st</sup>. **c**, 2<sup>nd</sup>. **d**, 3<sup>rd</sup>. **e**, 4<sup>th</sup>. **f**, 5<sup>th</sup> degree polynomial regression model fit to the data of part (a), respectively.



**Figure S2| Surface plots of  $K_{eq}$  for pairwise parameter variations.** (a-f):  $\alpha$  and Concentration( $C$ ). **a,** 6<sup>th</sup>. **b,** 7<sup>th</sup>. **c,** 8<sup>th</sup>. **d,** 9<sup>th</sup>. **e,** 10<sup>th</sup>. **f,** 11<sup>th</sup> degree polynomial regression model fit to the data of part (Fig. S1a), respectively.



**Figure S3| Surface plots of  $K_{eq}$  for pairwise parameter variations.** (a-i):  $\beta$  and Concentration( $C$ ). **a**, average value from simulation data. **b**, 1<sup>st</sup>. **c**, 2<sup>nd</sup>. **d**, 3<sup>rd</sup>. **e**, 4<sup>th</sup>. **f**, 5<sup>th</sup>. **g**, 6<sup>th</sup>. **h**, 7<sup>th</sup>. **i**, 8<sup>th</sup> degree polynomial regression model fit to the data of part (a), respectively.