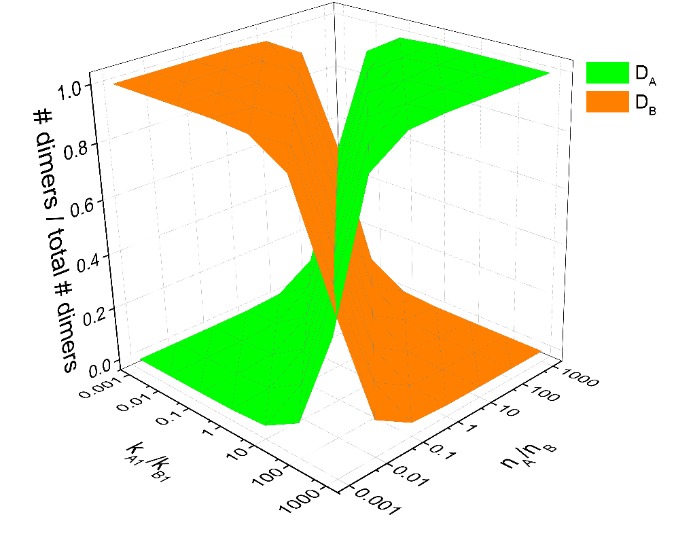
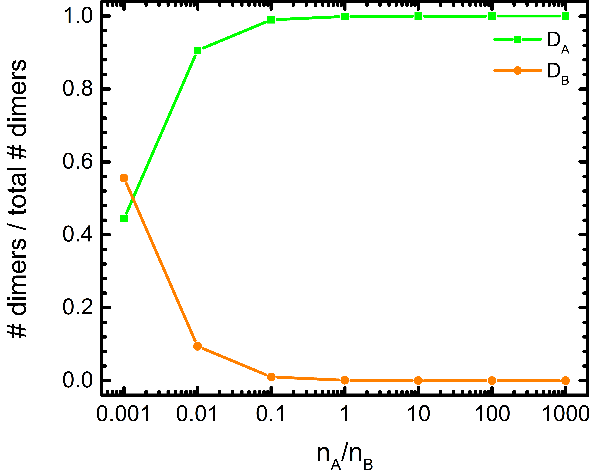
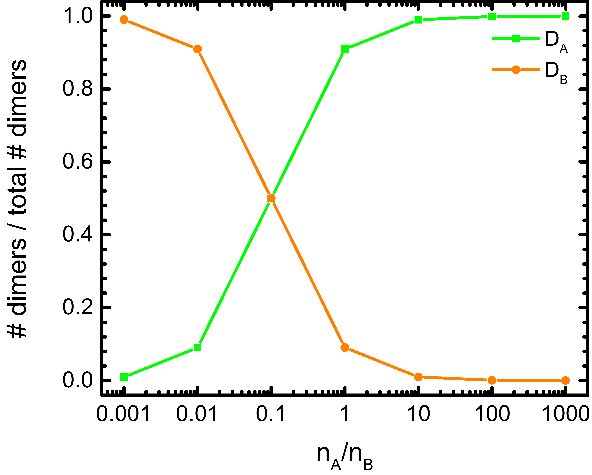
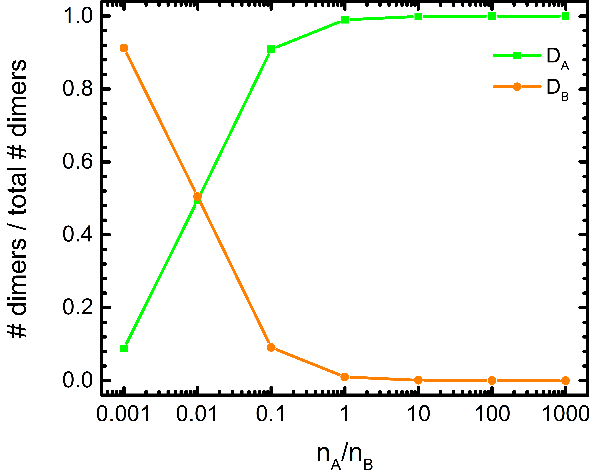
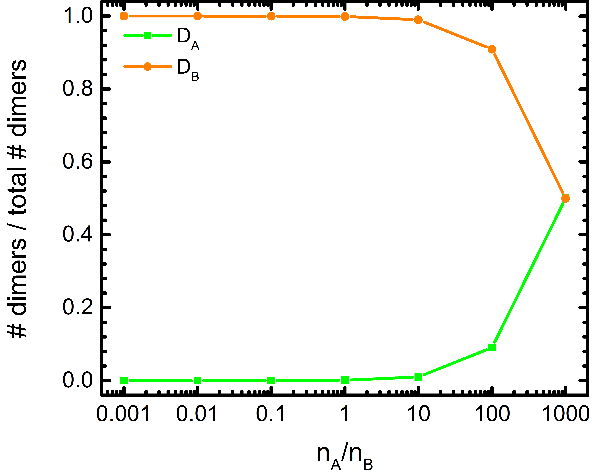
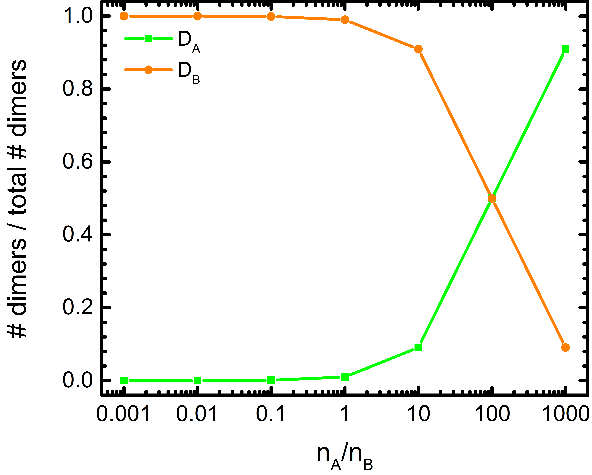
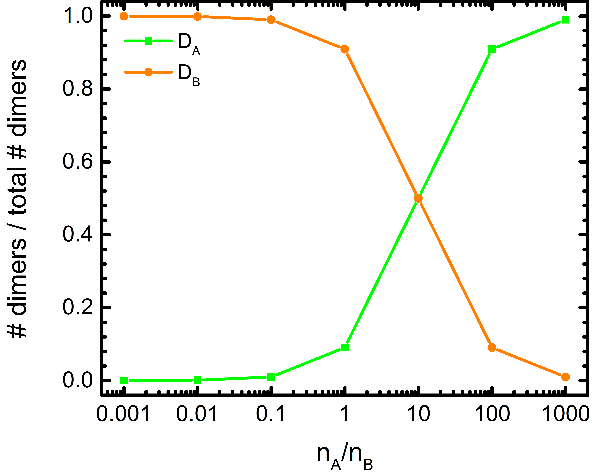
**Supplementary Figure S1.** **Comparison of dimerization regimes at higher order models.** Plots depict steady state dimer levels for the (A) – (C) three receptor and (D) – (F) four receptor models varying kinetic rate parameters under different initial receptor level configurations.



A

B

C

F

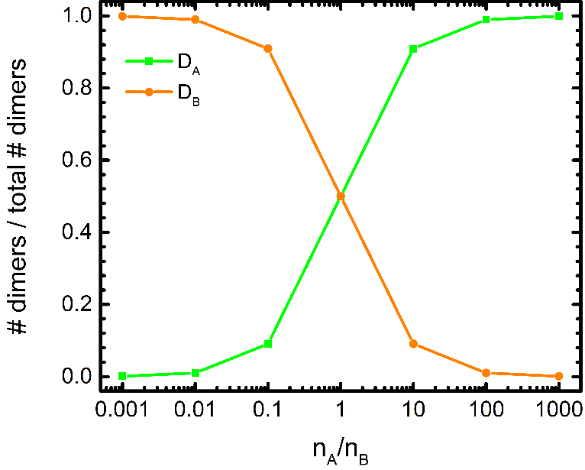
D

**Supplementary Figure S2. One receptor model.** Compares fractional dimers activated by ligand A with dimers activated by ligand B across different ligand concentrations while varying the ratio of the binding constants. (A) 1 kA1:1000 kB2, (B) 1 kA1:100 kB2, (C) 1 kA1:10 kB2, (D) 1 kA1:1 kB2, (E) 10 kA1:1 kB2, (F) 100 kA1:1 kB2, (G) 1000 kA1:1 kB2

1:1000

1:100

1:10



1:1

E

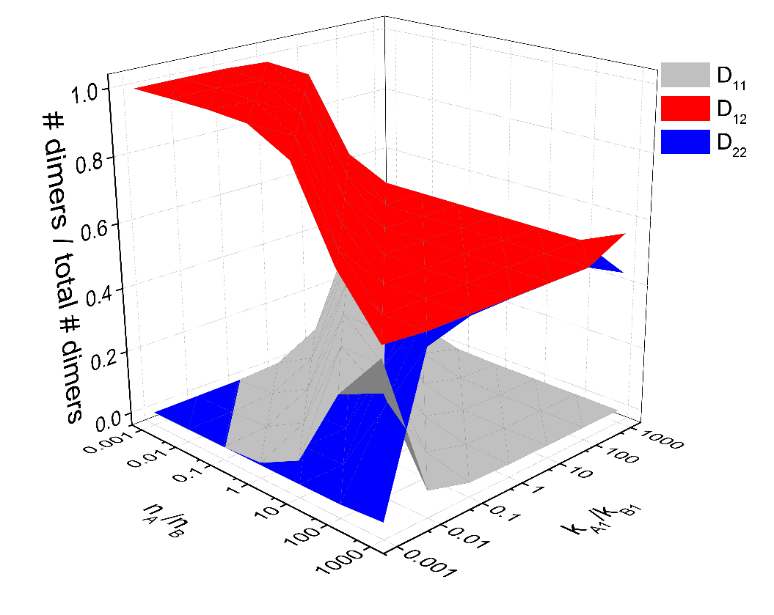
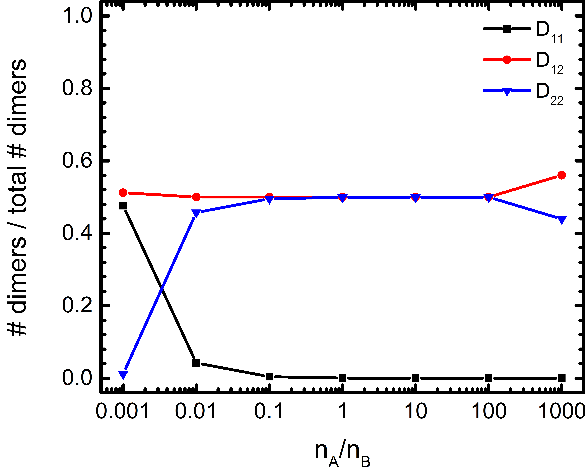
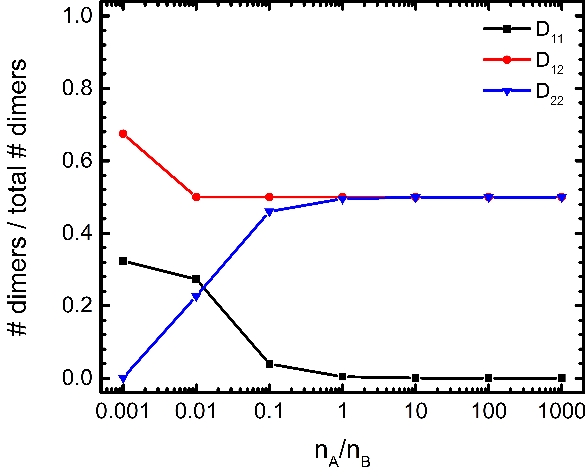
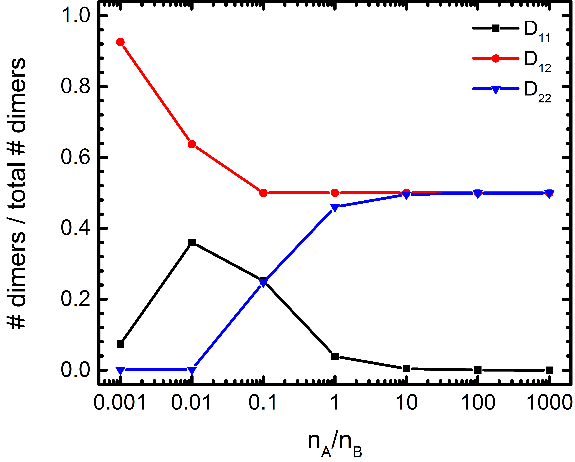
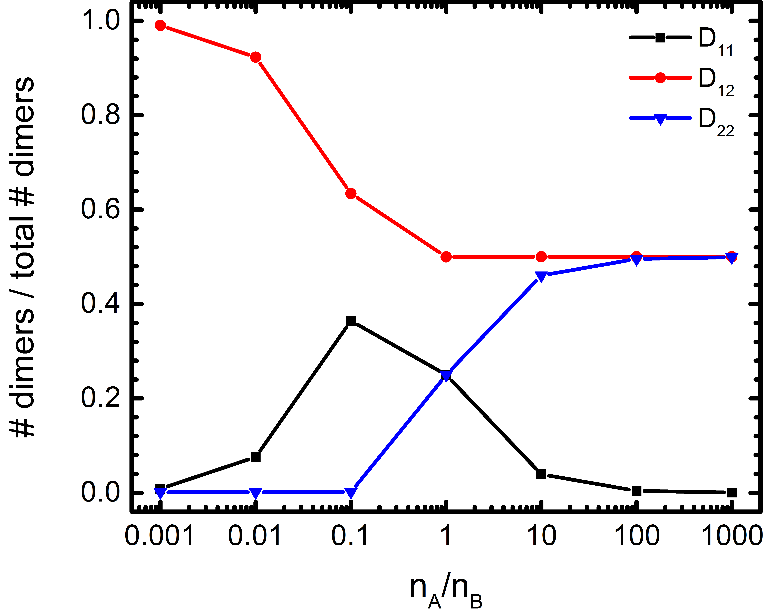
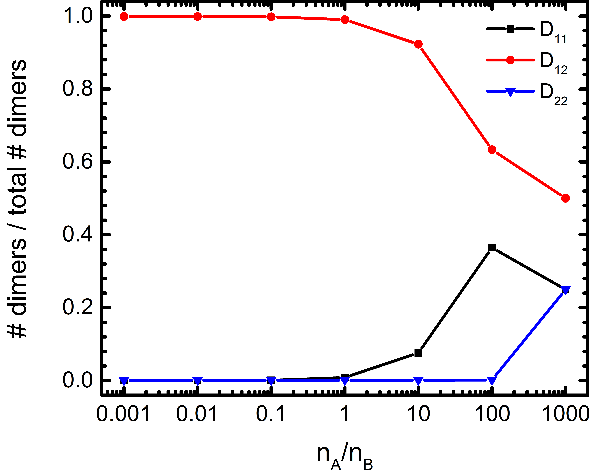
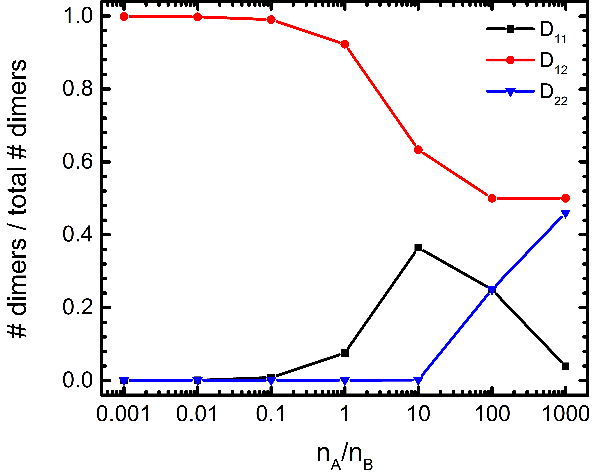
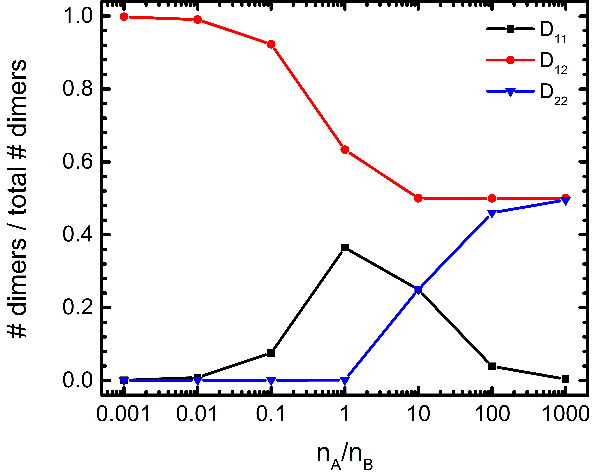
10:1

100:1

G

1000:1

D



A

B

C

E

F

G

D

**Supplementary Figure S3. Two receptor model with no overlap.** Compares the fractional dimers of homodimers made with receptor 1 and receptor 2, as well as heterodimers made with receptors 1-2 across different ligand concentrations while varying the ratios between the binding rates. (A) 1 kA1:1000 kB2, (B) 1 kA1:100 kB2, (C) 1 kA1:10 kB2, (D) 1 kA1:1 kB2, (E) 10 kA1:1 kB2, (F) 100 kA1:1 kB2, (G) 1000 kA1:1 kB2

1:1000

1:100

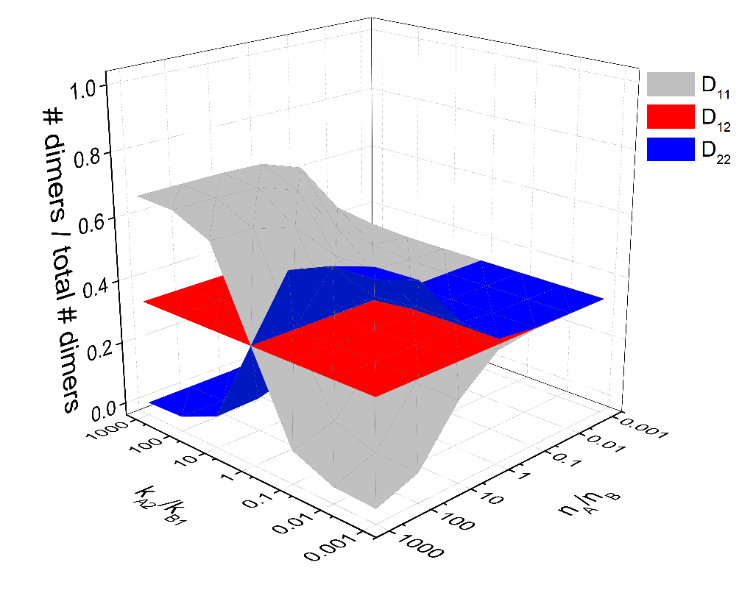
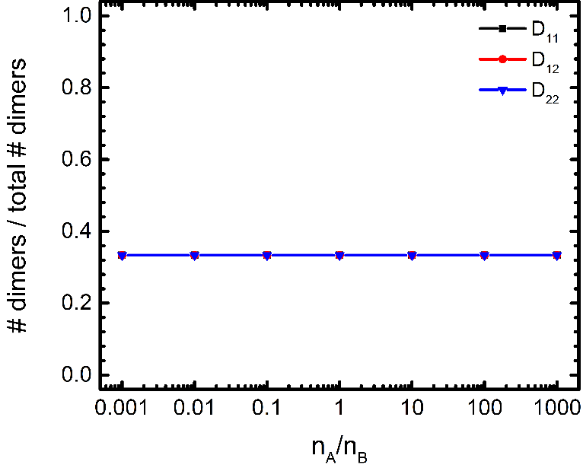
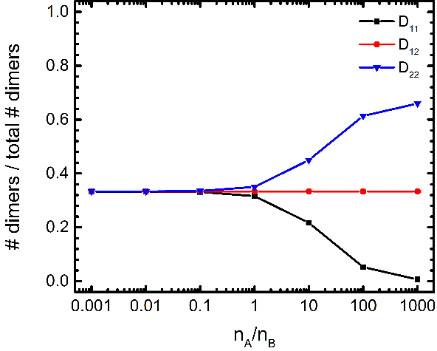
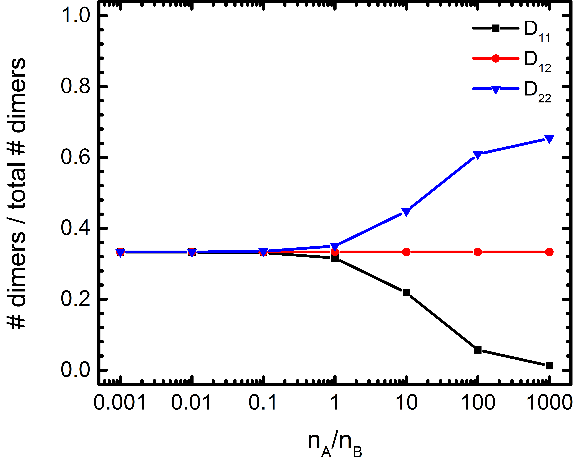
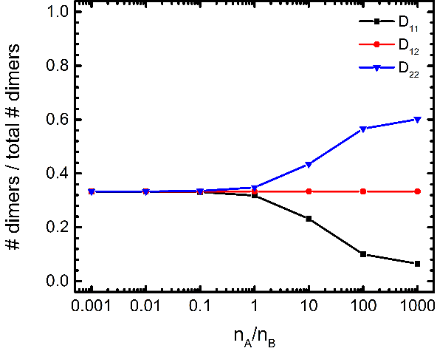
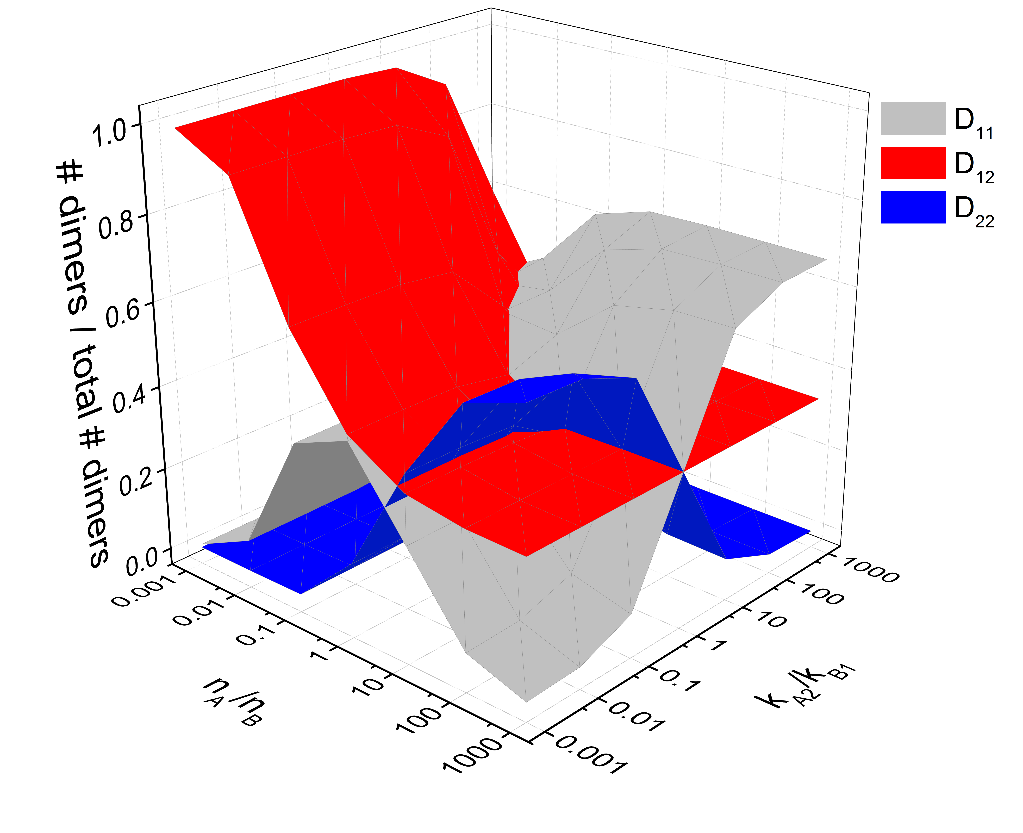
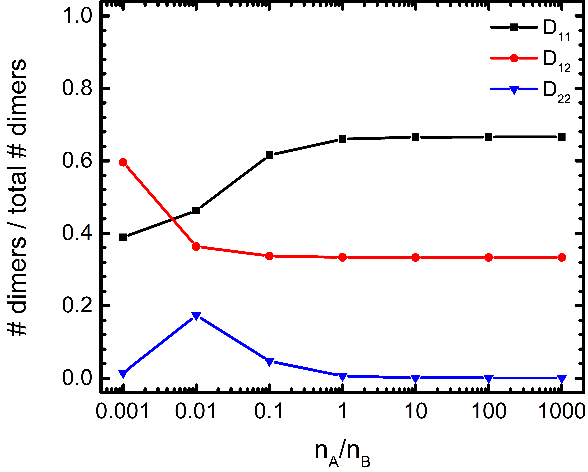
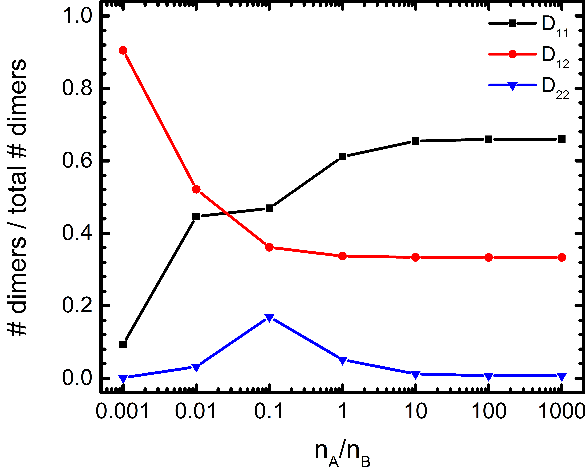
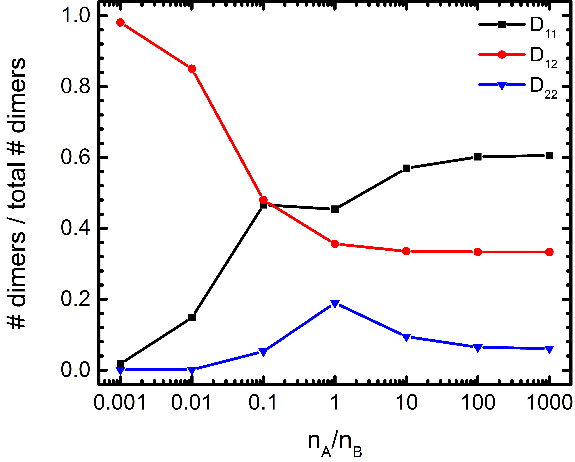
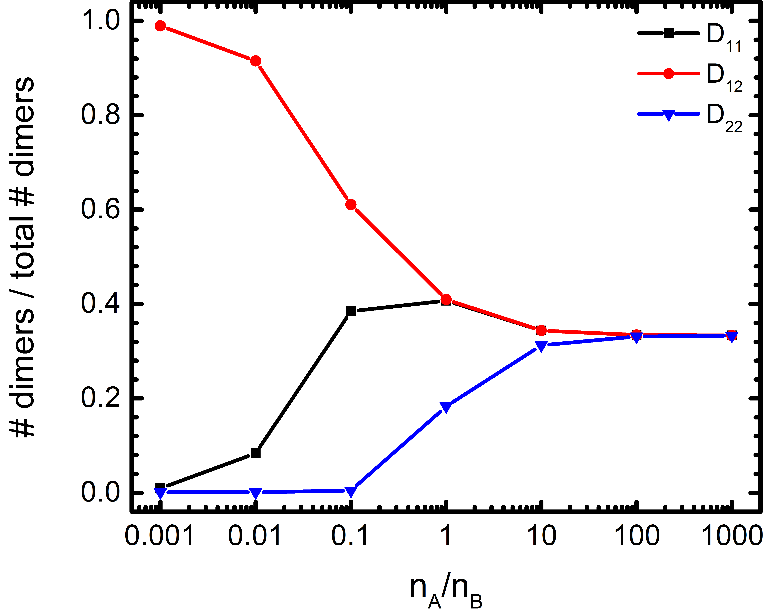
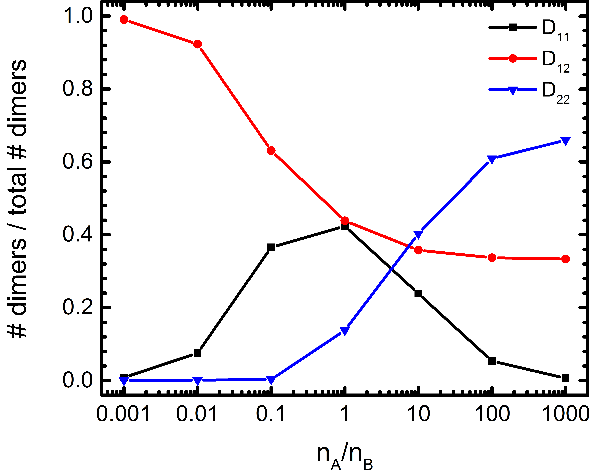
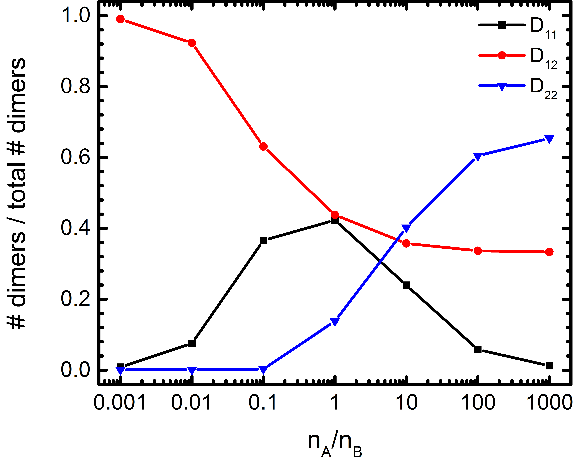
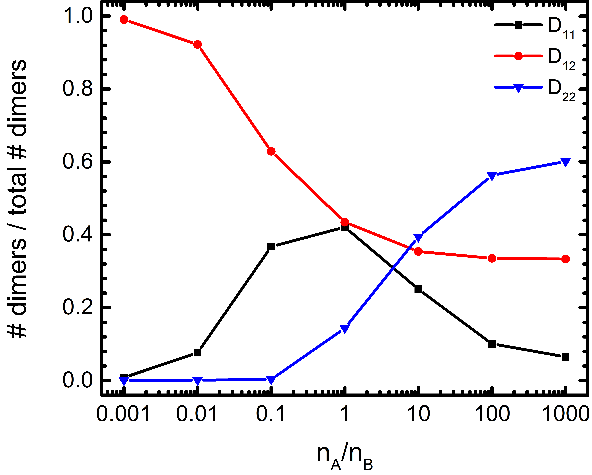
1:10

1:1

10:1

100:1

1000:1



A

B

C

E

F

G

D

**Supplementary Figure S4. Two receptor model with one overlap.** Compares the fractional dimers of homodimers made with receptor 1 and receptor 2, as well as heterodimers made with receptors 1-2 across different ligand concentrations while varying the ratios between the binding rates. (A) 1 kA1:1000 kB2, (B) 1 kA1:100 kB2, (C) 1 kA1:10 kB2, (D) 1 kA1:1 kB2, (E) 10 kA1:1 kB2, (F) 100 kA1:1 kB2, (G) 1000 kA1:1 kB2

1:1000

1:100

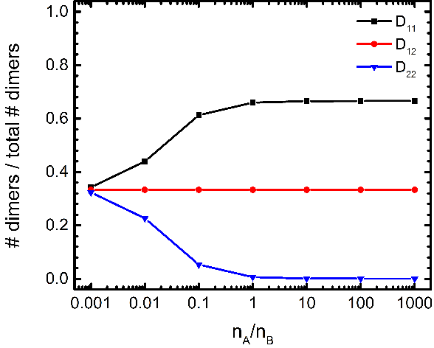
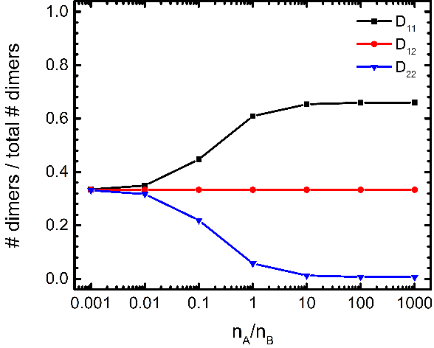
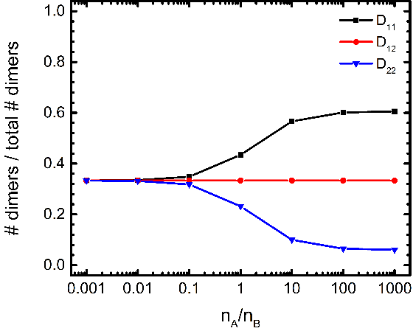
1:10

1:1

10:1

100:1

1000:1



A

B

C

E

F

G

D

**Supplementary Figure S5. Two receptor model with two overlaps.** Compares the fractional dimers of homodimers made with receptor 1 and receptor 2, as well as heterodimers made with receptors 1-2 across different ligand concentrations while varying the ratios between the binding rates. (A) 1 kA1:1000 kB2, (B) 1 kA1:100 kB2, (C) 1 kA1:10 kB2, (D) 1 kA1:1 kB2, (E) 10 kA1:1 kB2, (F) 100 kA1:1 kB2, (G) 1000 kA1:1 kB2

1:1000

1:100

1:10

1:1

10:1

100:1

1000:1