**S1 Table.** *Original model parameters and their relationship to the simplified parameters after applying the model assumptions.*

| Original | Simplified | Best Fit Value | Units |
|---|---|---|---|
| $k_{on,Toci-6R}$ | $k_{on,6R}$ | $5.92 \times 10^{-6}$ | $nM^{-1}s^{-1}$ |
| $k_{on,Toci-6R^*}$ | $k_{on,6R^*}$ | $8.11 \times 10^{-8}$ | $\left(\frac{\#}{cell}\right)^{-1} s^{-1}$ |
| $k_{off,Toci-6R}$ | $k_{off,6R}$ | $5.61 \times 10^{-5}$ | $s^{-1}$ |
| $k_{off,Toci-6R^*}$ | $k_{off,6R}$ | $5.61 \times 10^{-5}$ | $s^{-1}$ |
| $k_{on,H2-8R}$ | $k_{on,8R}$ | $9.03 \times 10^{-6}$ | $nM^{-1}s^{-1}$ |
| $k_{on,H2-8R^*}$ | $k_{on,8R^*}$ | $1.24 \times 10^{-7}$ | $\left(\frac{\#}{cell}\right)^{-1} s^{-1}$ |
| $k_{off,H2-8R}$ | $k_{off,8R}$ | $6.38 \times 10^{-5}$ | $s^{-1}$ |
| $k_{off,H2-8R^*}$ | $k_{off,8R}$ | $6.38 \times 10^{-5}$ | $s^{-1}$ |
| $k_{on,BS1-6R}$ | $k_{on,6R}$ | $5.92 \times 10^{-6}$ | $nM^{-1}s^{-1}$ |
| $k_{on,BS1-8R}$ | $k_{on,8R}$ | $9.03 \times 10^{-6}$ | $nM^{-1}s^{-1}$ |
| $k_{on,BS1-6R^*}$ | $k_{on,6R^*}$ | $8.11 \times 10^{-8}$ | $\left(\frac{\#}{cell}\right)^{-1} s^{-1}$ |
| $k_{on,BS1-8R^*}$ | $k_{on,8R^*}$ | $1.24 \times 10^{-7}$ | $\left(\frac{\#}{cell}\right)^{-1} s^{-1}$ |
| $k_{off,BS1-6R}$ | $k_{off,6R}$ | $5.61 \times 10^{-5}$ | $s^{-1}$ |
| $k_{off,BS1-8R}$ | $k_{off,8R}$ | $6.38 \times 10^{-5}$ | $s^{-1}$ |
| $k_{off,BS1-6R^*}$ | $k_{off,6R}$ | $5.61 \times 10^{-5}$ | $s^{-1}$ |
| $k_{off,BS1-8R^*}$ | $k_{off,8R}$ | $6.38 \times 10^{-5}$ | $s^{-1}$ |