Table S5. Table of the main equations.

Key Equations	Description
$\mathrm{FRET_R} = \frac{I_{\mathrm{FRET}}}{S_{\mathrm{tot}}}$	Experimental definition of $\mathrm{FRET_R}$.
$p(M\|D,I) \propto\ p(D\|M,I) \cdot p(M\|I)$	Posterior probability from Bayes theorem.
$f(X, I_{da}, k_{da}) = 1 + \frac{k_{da} \cdot \{[D] - g(X)\}}{I_{da} \cdot g(X) + [A]}$	Microscopic model of $\mathrm{FRET_R}$. Referred to as the $\mathrm{FRET_R}$ forward model.
$f(\{X_k, w_k\}, I_{da}, k_{da}) = 1 + \frac{k_{da} \cdot \{[D] - \langle g(X) \rangle\}}{I_{da} \cdot \langle g(X) \rangle + [A]}$	Solution of $\mathrm{FRET_R}$ generalized to take into account multiple states. Referred to as the (multi-state) $\mathrm{FRET_R}$ forward model.
$p(d_n\|\{X_k, w_k\}, I_{da}, k_{da}, \sigma_n) = \frac{1}{d_n\ \sigma_n\sqrt{2\pi}} \cdot \exp\left[-\frac{\log^2(d_n / f(\{X_k, w_k\}, I_{da}, k_{da}))}{2\sigma_n^2}\right]$	Data likelihood for data point *n*.
$p(\sigma_n\|\sigma_0) = \frac{2\sigma_0}{\sqrt{\pi}\sigma_n^2} \exp\left(-\frac{\sigma_0^2}{\sigma_n^2}\right)$	Prior distribution for the uncertainty σ_n associated to data point *n*.
$p(d_n\|\{X_k, w_k\}, I_{da}, k_{da}, \sigma_0) = \frac{\sqrt{2}\sigma_0}{\pi d_n} \cdot \frac{1}{\log(d_n / f(\{X_k, w_k\}, I_{da}, k_{da}))^2 + 2\sigma_0^2}$	Marginal data likelihood for data point *n*.
$p(\{X_k, w_k\}, I_{da}, k_{da}, \sigma_0\|\{d_n\}) \propto p\left(I_{da}\|I_{da}^{exp}, \sigma_{da}^{exp}\right) p(k_{da}) \prod_{k=1}^{N} p(X_k) p(w_k) \prod_{n=1}^{N_F} p(d_n\|\{X_k, w_k\}, I_{da}, k_{da}, \sigma_0)$	Multi-state posterior probability.