Steady-State Model for Histone Sliding

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Here we describe the loss of histone due to sliding out of the damage region by using a Michaelis-Menten type of modeling. The total loss of histone will be given as the steady-state of this model, after loss has reached saturation.

We set $[P]$ to be the free repair protein in the system, $[D]$ the number of damage sites unbound by repair protein, the complex $[PD]$ as the number of damage sites bounded to repair protein (or DDB2), the number of histones lost are considered as the eventual product of the complex $[PD]$, and U is the UVC dose. In the Michaelis-Menten formulation we have

$$P + D \rightleftharpoons_{k_r}^{k_f} [PD] \rightarrow^{k_{cat}} P + h \tag{1}$$

With the rate constant k_f describing the rate of binding, k_r describes the rate of detachment from a repair site not wrapped on histones, k_{cat} the rate at which histone are slided out of the damage region.