Supplemental Figure S2.

Stern – Volmer relationship for fluorescence quenching by oxygen

$$Ix = \frac{Io}{1 + Ksv * [O_2]}$$

Io – initial fluorescent intensity

Ix – observed fluorescent intensity

Ksv - Stern-Volmer coefficient

[…] - concentration

Diffusion is modeled by Fick's 2nd Law

$$\frac{\partial C(x,t)}{\partial t} = D \times \frac{\partial^2 C(x,t)}{\partial x^2}$$

Boundary Conditions
$C(x,0) = 0$; $C(0,t) = Cs$; $C(\infty,t) = 0$

Solution based on boundary conditions:

$$C(x,t) = Cs \times Erfc\left[\frac{x}{2\sqrt{D \times t}}\right]$$

D – diffusivity;

x – PDMS thickness;

t – time (sec)

Combining Stern Volmer & Fick's 2nd Law

$$Ix = \frac{Io}{Ksv \times Cs \times Erfc\left[\frac{x}{2\sqrt{D \times t}}\right] + 1}$$