Supplemental information

$$I_0 = \frac{Imax\,[S]}{KM + [S]}\ ; I_{max} \sim V_{max};\ I_0 \sim V_0 \qquad (S1)$$

Equation S1. Relationships between luminescence intensity (I) and Velocity (V) used in Michaelis-Mentem equation.

$$I_{max} = QY \cdot\ k_{cat} \cdot\ [E_t];\ I_0 = QY \cdot\ kcat \cdot\ [ES] \qquad (S2)$$

Equation S2. Relationships between Luminescence Intensity, catalytic constant and quantum yield: (Imax) maximum intensity; (I_0) Initial intensity; (QY) Bioluminescence quantum yield; (k_{cat}) catalytic constant; ([Et]) total enzyme concentration; ([ES]) enzyme-substrate complex concentration.

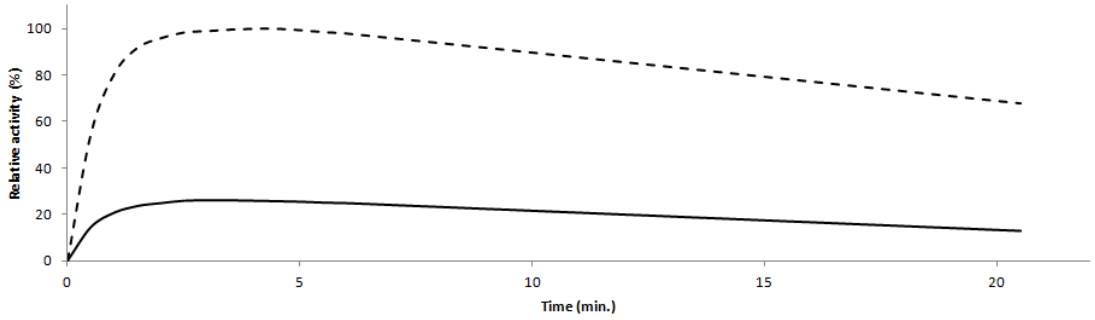

Figure S1. In vivo bioluminescence kinetics of *E.coli* expressing PxRE R215K mutant luciferase: (line) upon addition of 10 µL of 1 mM D-luciferin at pH = 5.0 and (dashed line) upon addition of 10 µL of 1 mM N5 at pH = 5.0.