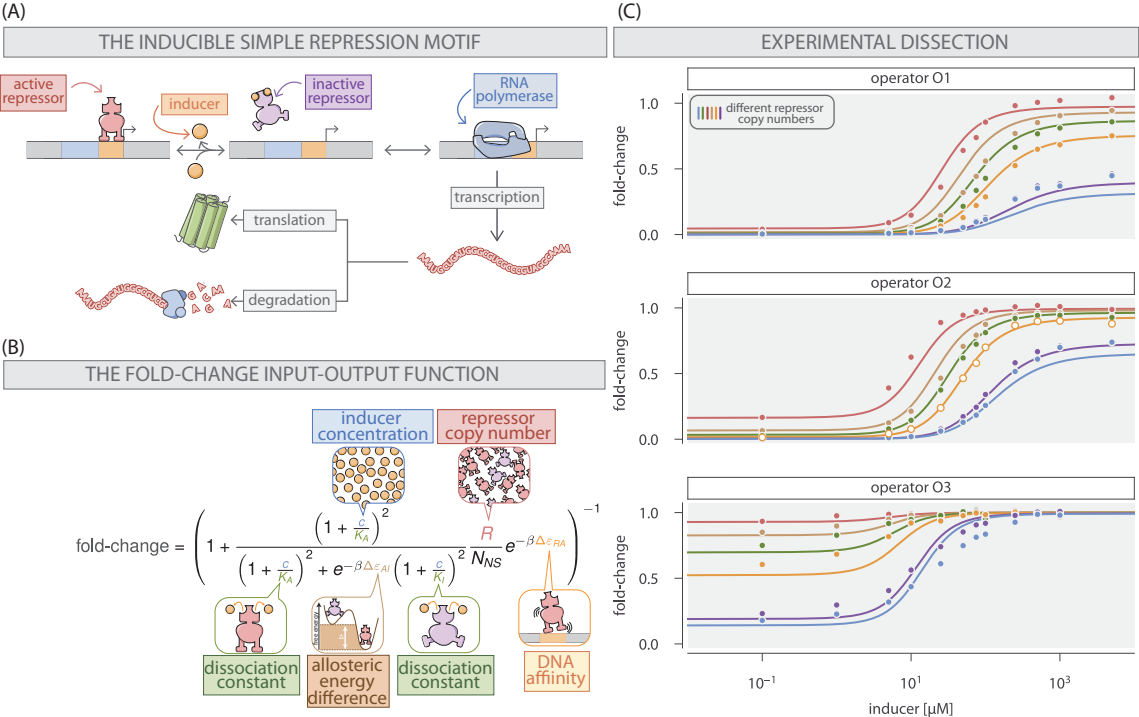
(A)
THE INDUCIBLE SIMPLE REPRESSION MOTIF
active repressor
inducer
inactive repressor
RNA polymerase
translation
transcription
degradation
(B)
THE FOLD-CHANGE INPUT-OUTPUT FUNCTION
inducer concentration
repressor copy number
fold-change = $\left(1 + \frac{\left(1+\frac{c}{K_A}\right)^2}{\left(1+\frac{c}{K_A}\right)^2 + e^{-\beta\Delta\varepsilon_{AI}}\left(1+\frac{c}{K_I}\right)^2} \frac{R}{N_{NS}} e^{-\beta\Delta\varepsilon_{RA}}\right)^{-1}$
dissociation constant
allosteric energy difference
dissociation constant
DNA affinity
(C)
EXPERIMENTAL DISSECTION
operator O1
operator O2
operator O3
different repressor copy numbers
fold-change
1.0
0.5
0.0
10^{-1}
10^{1}
10^{3}
inducer [μM]