

Figure S6. Related to Figure 1: A) Heat map of probability that for a given toxin-antitoxin pairing, the expression rate of the antitoxin is greater than or equal to the expression rate of the toxin.

Assuming that transcription rate per generation is Poisson distributed with λ equal to the Antitoxin(λ) or Toxin(λ). Stochasticity due to transcription is expected to contribute much more to overall noise than stochasticity in translation, so the latter is ignored in this analysis. In addition, we assumed for simplicity that equal amounts of toxin and antitoxin transcription result in equal amounts of product, but in reality antitoxins are generally unstable and need to be expressed at a higher level to achieve equal amounts of product during steady-state expression. **B)** Graph displaying the values at which the expression rate of the antitoxin is greater than or equal to the expression rate of the toxin in any given generation, with given probability thresholds. These probability thresholds are directly translated into selection coefficients (s) which are displayed for each region of the graph. For example, if the probability that the [toxin] > [antitoxin] for any particular generation, then there will be a selection coefficient of 0.1 against the presence of the kill switch. It is important to note that for high transcription rates, the ratio between the maximal 'non-evolving' ratio and the minimal 'lethal' ratio can be as little as about threefold.

