



Figure S5: Invasibility of autoregulatory binding sites. The response time of mutant (left) homozygotes and (right) heterozygotes are shown. Different values of the binding strength of the resident allele, in units of p_{max}/K (x-axis), are plotted against mutations to binding site strength ϵ of different size (y-axis). Thus the graphs compare a resident allele, K_1 with a mutant allele, $K_2 = K_1 \exp[-\epsilon]$. Mutations falling into white region result in decreased response time in the carrier compared to resident genotype and are favoured by selection; mutations falling into the gray region result in increased response time and are not favoured by selection. Weak binding occurs when $p_{max}/K \gtrsim 10^0$ [10, 11]. Response times were calculated by numerically integrating Eq. 1 from zero protein concentration to 99% of the equilibrium. The optimal binding strength in these graphs is $p_{max}/K = 1250$, corresponding to a background transcription rate $k_l/\gamma_p = 10^{-3}$.