

These are the simulation results that are sufficient to reproduce the figures and tables in our paper. Each zip file contains the simulation replicates under a given condition; the name of the zip file indicates the selection condition and whether the signal is allowed to directly regulate the effector. In each zip file, the names of sub-folders are the random number seeds used to initialize simulation.

For each simulation replicate, we provide *accepted_mutation_x.txt*, which can be used to reproduce the genotype at any evolutionary step (see readme of the program for instructions). Except for the selection condition “no selection”, we also provide *evo_summary_x.txt*, which records the fitness of the genotype at each evolutionary step. We have found that, in *evo_summary_x.txt*, the standard error of fitness under environment 1 and 2 is the same as the standard error of the average fitness, which is caused by an error in the code (now fixed). The zip file *spurious_signal_direct_regulation.7z* contains an extra file *all_mutations.txt*, which can be used to reproduce Table S3 of our paper.

Other output files, e.g. *N_motifs.txt* and *networks.txt*, are not included due to their large size, and are available at request.