Mathematical Modeling of the Heat-Shock Response in HeLa Cells

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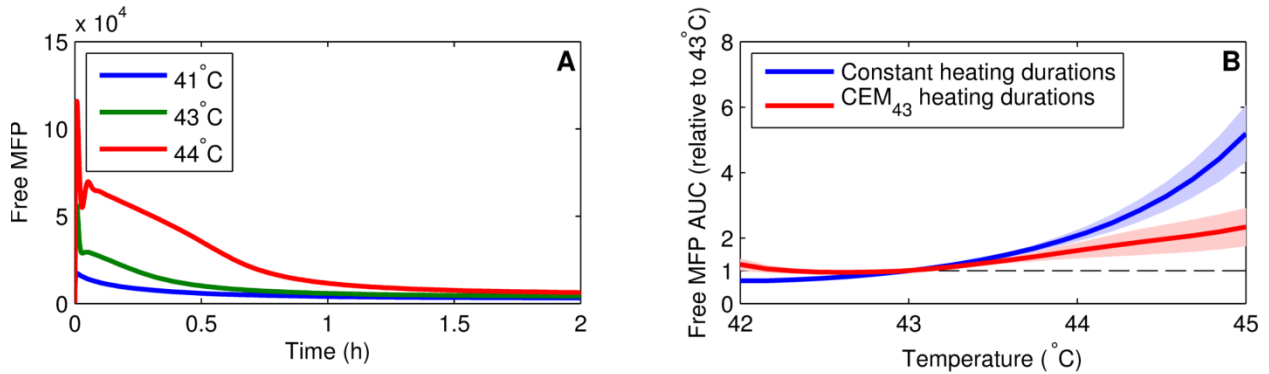
Figure S1. Analysis of protein misfolding as a function of temperature and duration of exposure for the model of Petre et al. Figure 5 shows the equivalent results for our model. *A*: MFP versus time for three different temperatures. *B*: AUC for 800 simulations similar to those in *A* for a variety of heating duration and temperature combinations. The blue curve represents the ratio of MFP AUC at a particular temperature to that at 43°C for the same duration. The red curve represents the ratio of MFP AUC at a particular temperature and duration to that at 43°C for the corresponding CEM_{43} duration. The shaded regions are the standard deviation over multiple different heating durations.
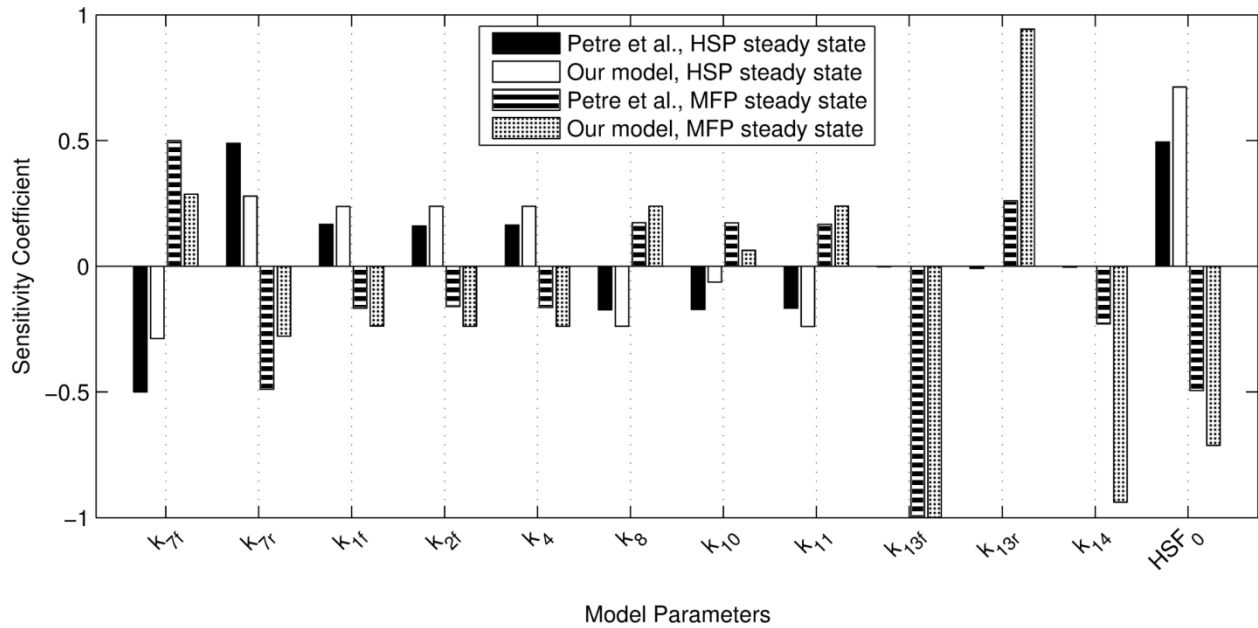
Figure S2. Sensitivities of steady-state values and stress responsiveness of the heat-shock response for our model and the model of Petre et al. The parameter names correspond with those in our model, which are sometimes different than those of Petre et al. because the models do not have exactly the same reactions. However, the comparisons shown are for the equivalent parameters in both models. The selected parameters and order of display are the same as in Table 5 of Petre et al. (1).
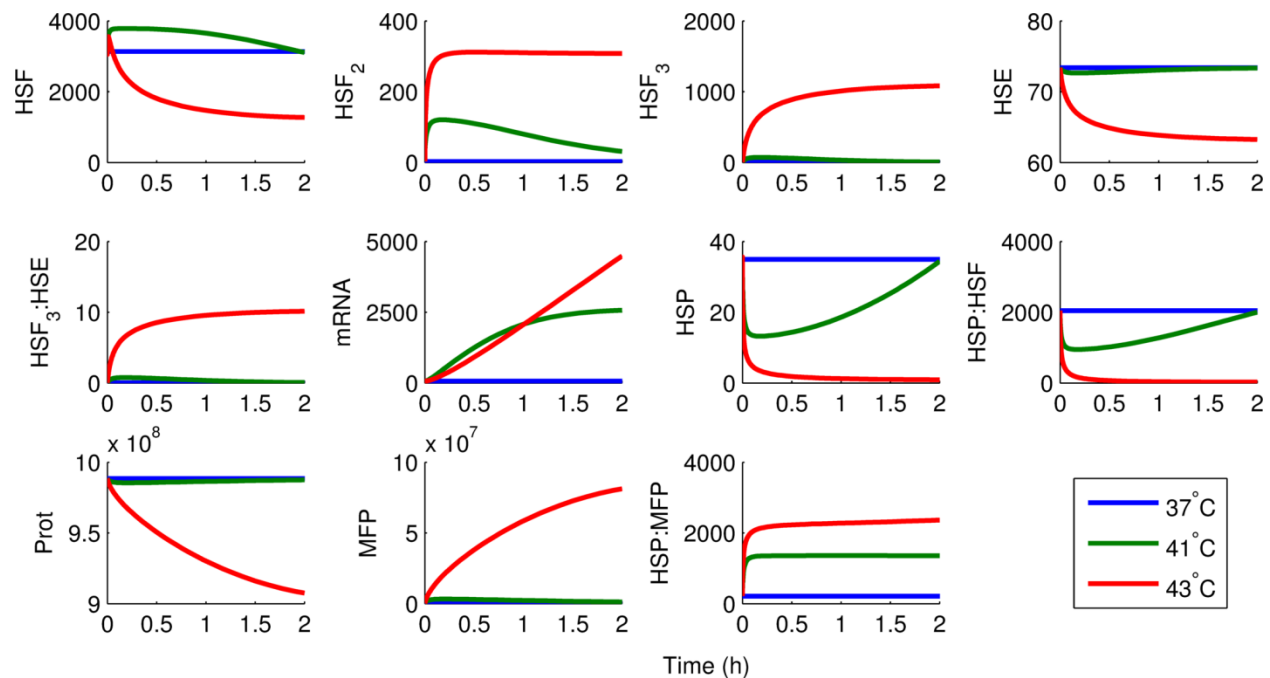
Figure S3. Full model simulation output for continuous heating at 37, 41, and 43°C.

SUPPORTING CITATION

1. Petre, I., A. Mizera, C. L. Hyder, A. Meinander, A. Mikhailov, R. I. Morimoto, L. Sistonen, J. E. Eriksson, and R. J. Back. 2011. A simple mass-action model for the eukaryotic heat shock response and its mathematical validation. *Nat. Comput.* 10:595-612.