Universally Sloppy Parameter Sensitivities in Systems Biology Models
Supporting Text 1: Stiffest Eigenvectors

Ryan N. Gutenkunst, Joshua J. Waterfall, Fergal P. Casey,
Kevin S. Brown, Christopher R. Myers, and James P. Sethna

The following figures show the four stiffest eigenvectors of H^{χ^2} (corresponding to the four largest eigenvalues) for each model in our collection. In each eigenvector the five parameters with the largest contributions are labeled. With few exceptions, the eigenvectors tend to be inscrutable combinations of many parameters.

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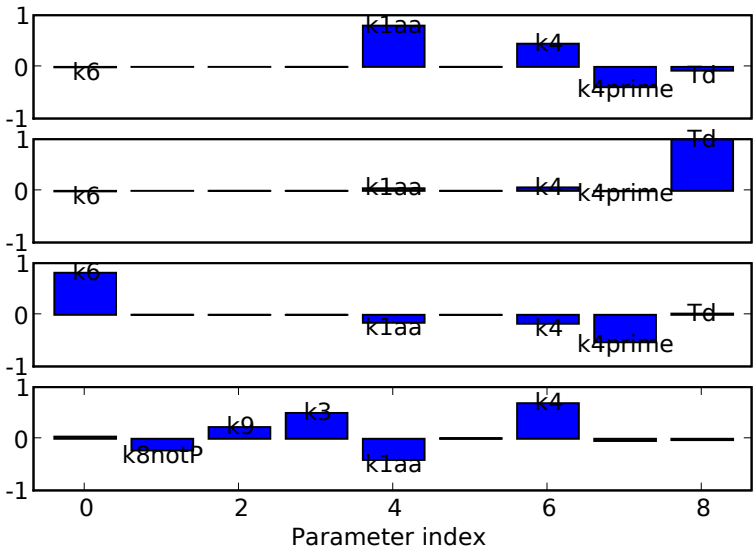

FIG. 1: Model (a): Tyson's model of the eukaryotic cell cycle [1].

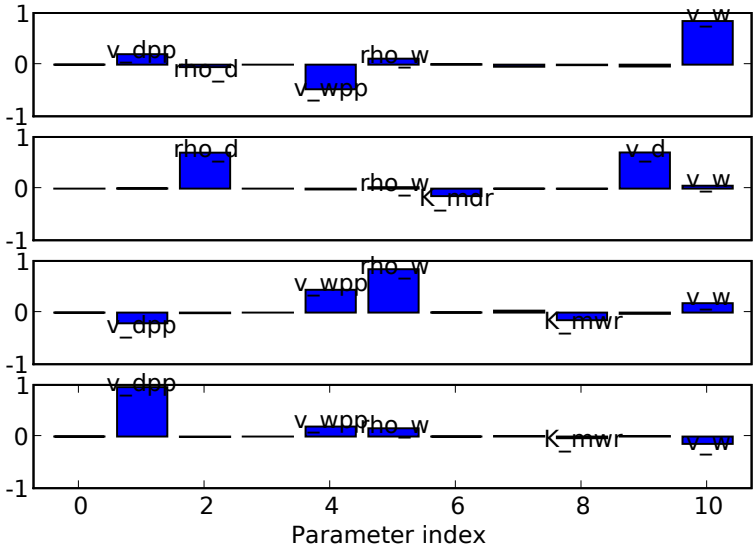

FIG. 2: Model (b): Zwolak *et al.*'s model of the Xenopus egg cell cycle [2].

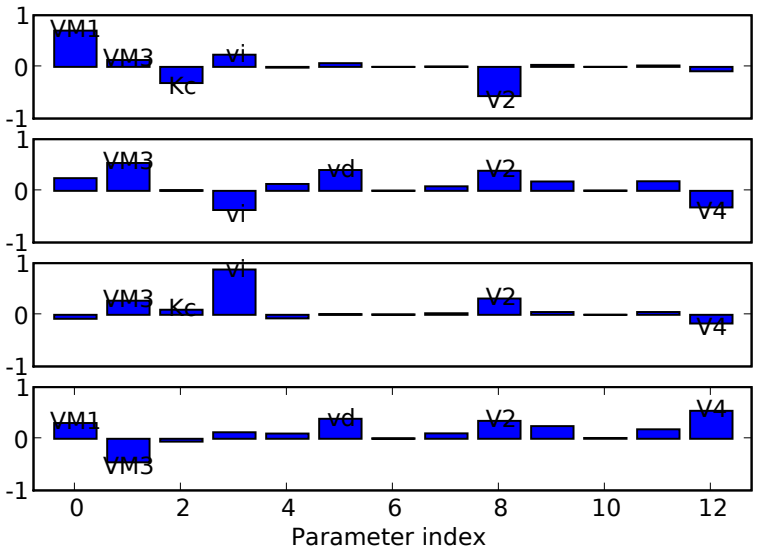

FIG. 3: Model (c): Goldbeters's model of eukaryotic mitosis [3].

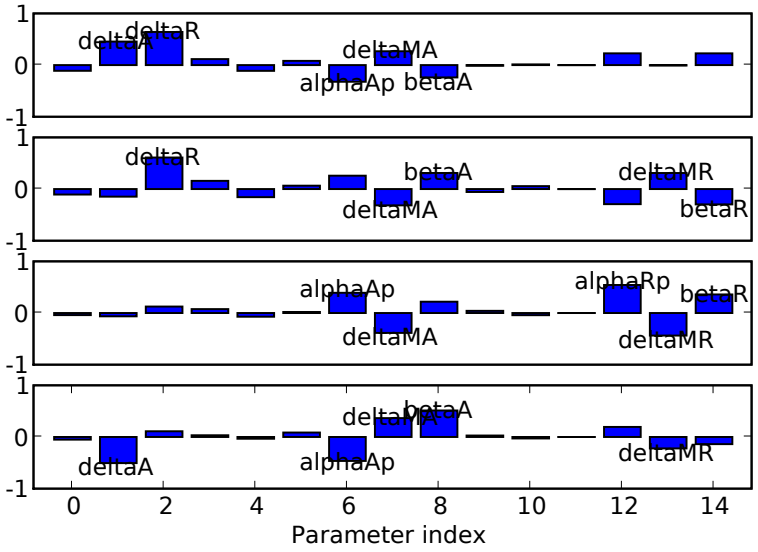

FIG. 4: Model (d): Vilar *et al.*'s generic circadian rhythm model [4].

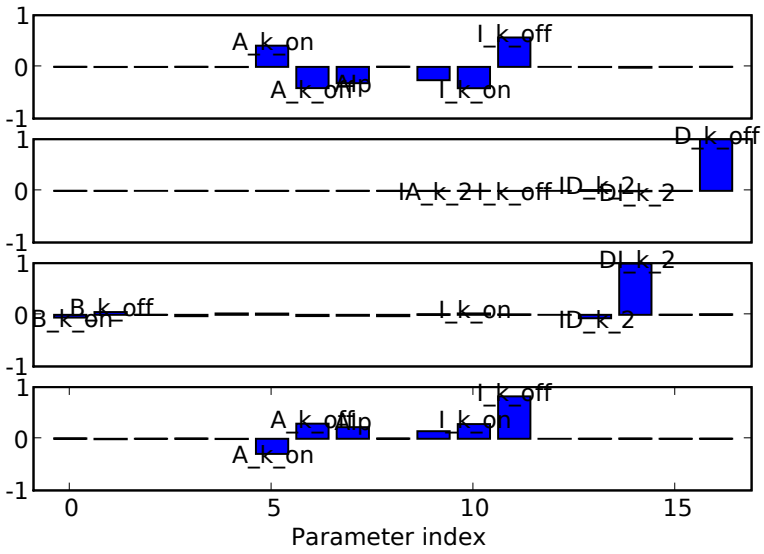

FIG. 5: Model (e): Edelstein *et al.*'s model of nicotinic acetylcholine intra-receptor dynamics [5].

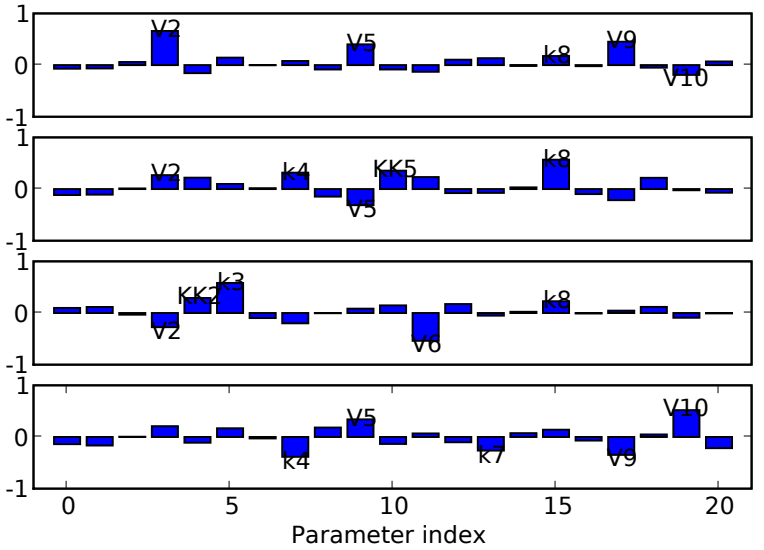

FIG. 6: Model (f): Kholodenko's model of a generic kinase cascade [6].

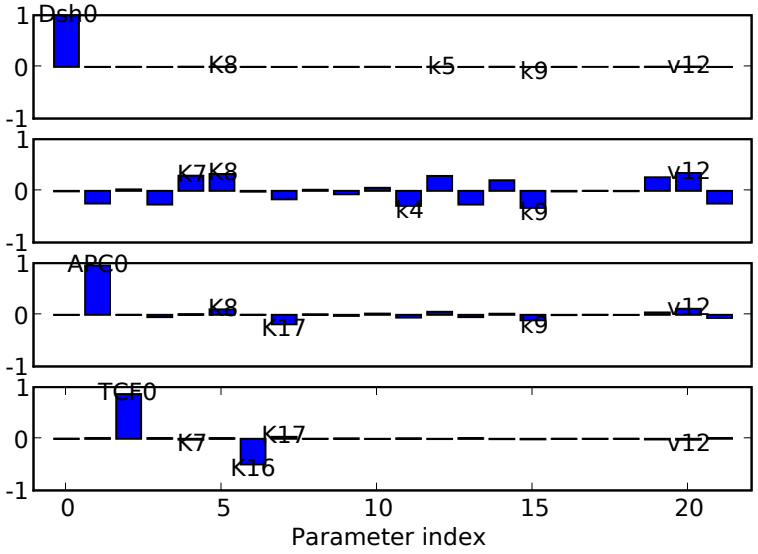

FIG. 7: Model (g): Lee *et al.*'s model of Xenopus Wnt signaling [7].

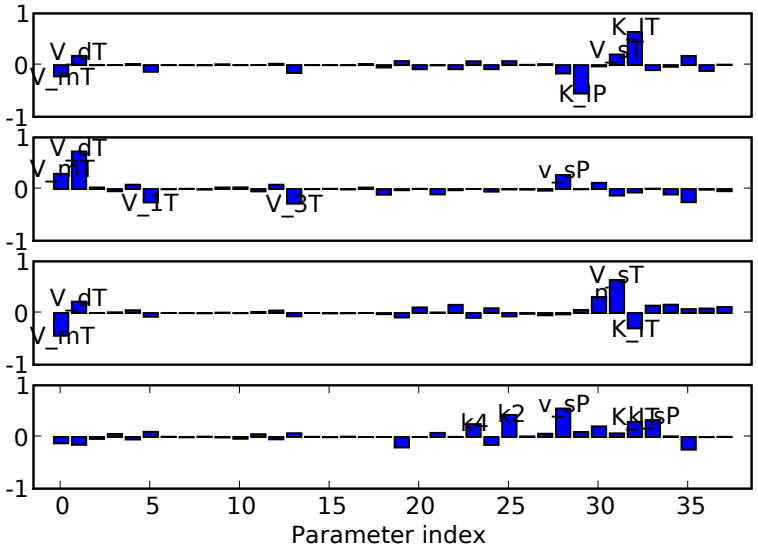

FIG. 8: Model (h): Leloup and Goldbeters's model of Drosophila circadian rhythm [8].

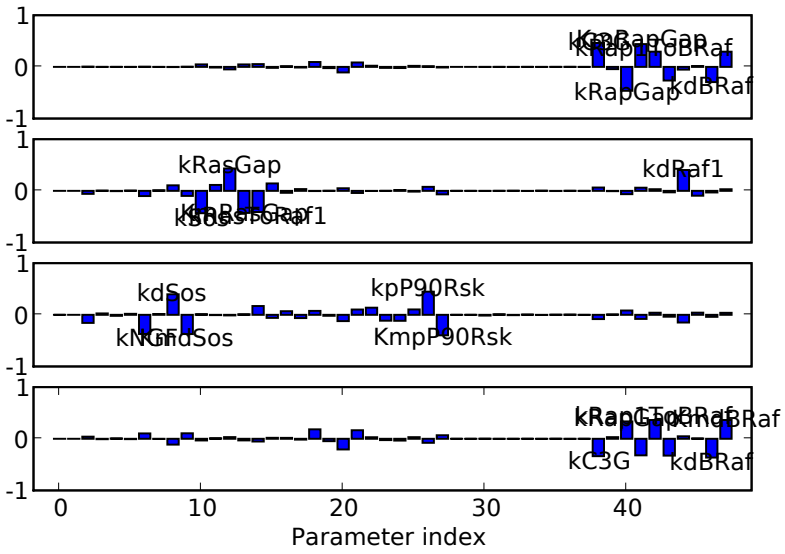

FIG. 9: Model (i): Brown *et al.*'s model of rat growth-factor signaling [9].

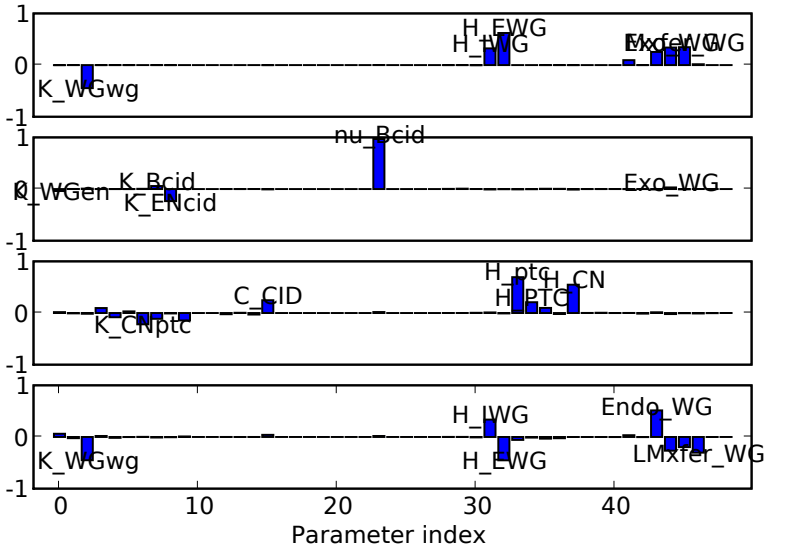

FIG. 10: Model (j): von Dassow *et al.*'s model of the Drosophila segment polarity network [10].

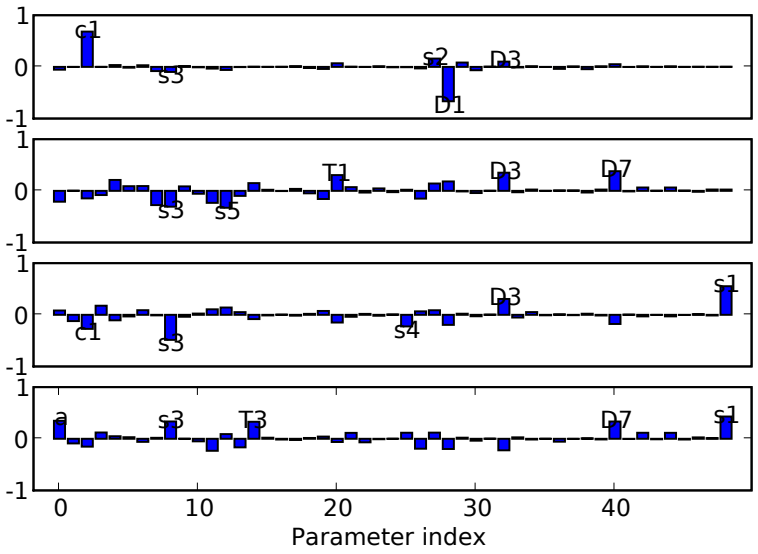

FIG. 11: Model (k): Ueda *et al.*'s model of Drosophila circadian rhythm [11].

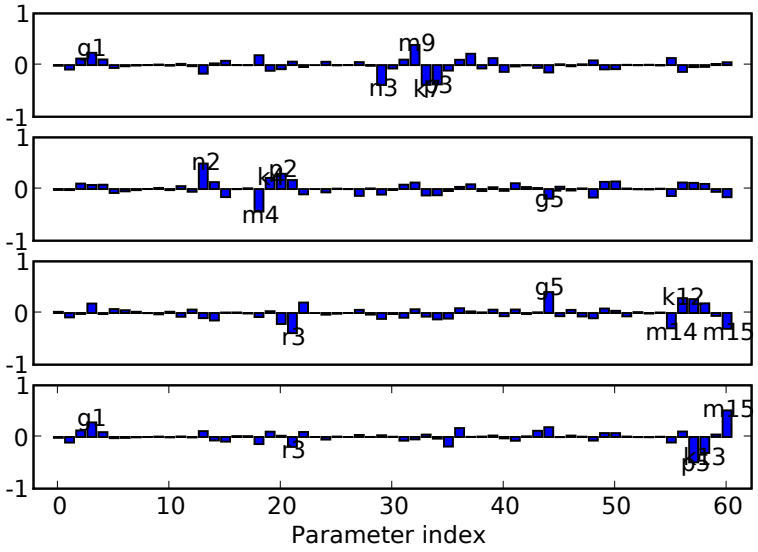

FIG. 12: Model (l): Locke *et al.*'s model of Arabidopsis circadian rhythm [12].

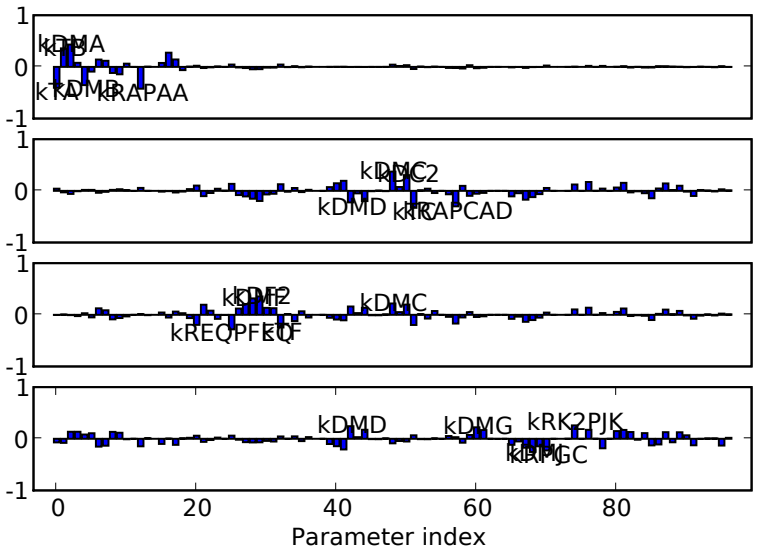

FIG. 13: Model (m): Zak *et al.*'s model of an *in silico* regulatory network [13].

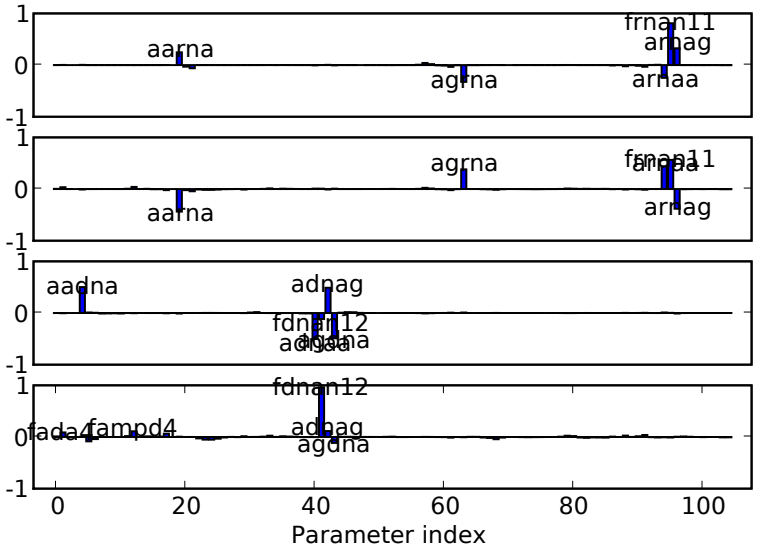

FIG. 14: Model (n): Curto *et al.*'s model of human purine metabolism [14].

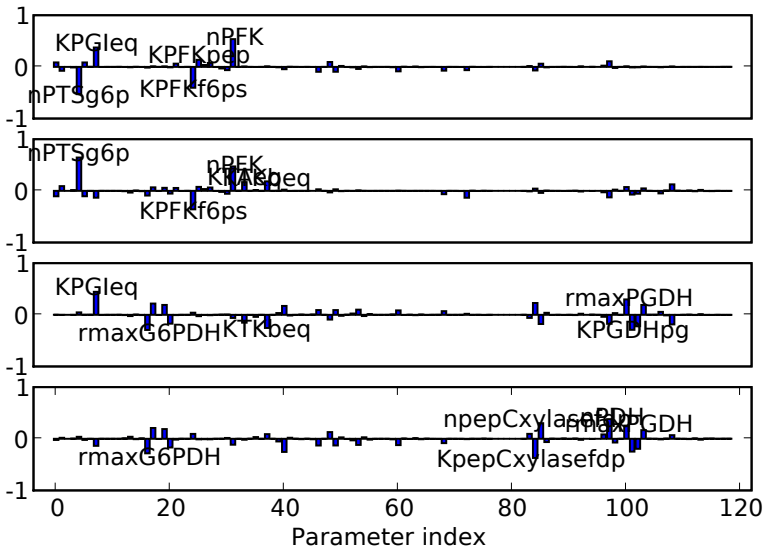

FIG. 15: Model (o): Chassagnole *et al.*'s model of E. coli carbon metabolism [15].

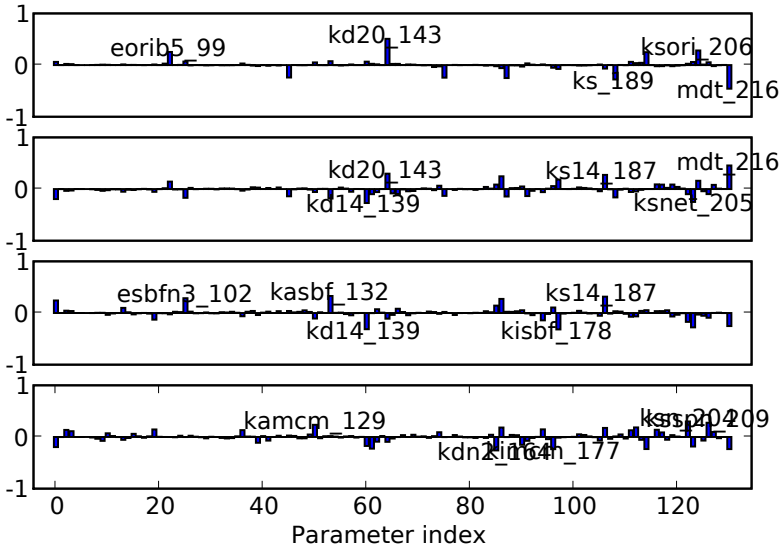

FIG. 16: Model (p): Chen *et al.*'s model of the budding yeast cell cycle [16].

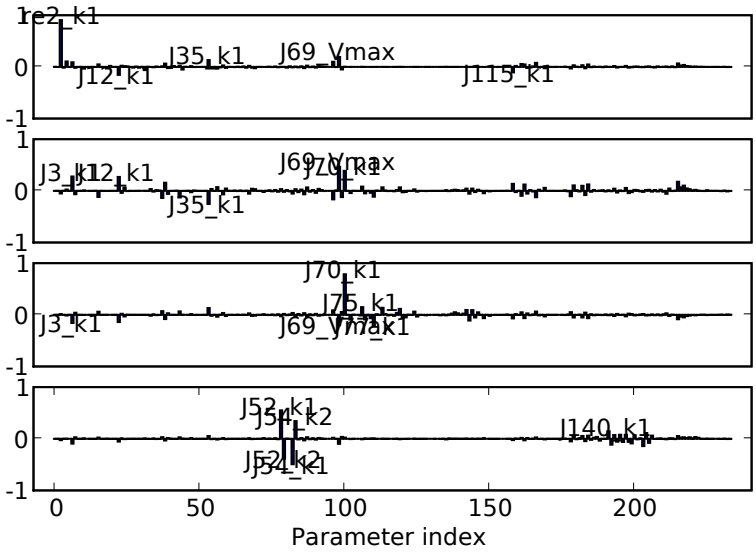

FIG. 17: Model (q): Sasagawa *et al.*'s model of rat growth-factor signaling [17].