

Protocol S3. Estimated Parameter Values

Estimated parameter values for the best-scoring Unc-GC, Unc-Logic, RPJ-GC and RPJ-Logic models are shown below. Parameters in *italics* are considered to have been eliminated by optimization. Regulatory weights in gene circuit models are considered eliminated if the weight is less than or equal to 0.0001 in absolute value. Terms in the logical models are considered eliminated if removing them from the rule results in no change in simulated expression. The production and decay rates have units min^{-1} , and the diffusion rates have units $(1\% \text{ embryo length})^2 \text{ min}^{-1}$. To obtain the diffusion rates in the more traditional units of $\text{cm}^2 \text{ sec}^{-1}$, one should multiply by 1.5×10^{-9} . This assumes an embryo 0.3mm long.

Unc-GC

Gene	Max prod. rate (R^a)	regulatory weights (T^{ab})							Bias (h^a)	Decay (λ^a)	Diff. (D^a)
		Bcd	Cad	Hb	Kr	Gt	Kni	Tll			
Hb	32.03	0.1114	-0.0054	0.0293	-0.0124	0.0553	-0.3903	0.0144	-3.5	0.136	2.25
Kr	16.70	0.1173	0.0215	-0.0498	0.0755	-0.0141	-0.0666	-1.2036	-3.5	0.072	0.55
Gt	25.15	0.0738	0.0180	-0.0008	-0.0758	0.0157	0.0056	-0.0031	-3.5	0.109	0.17
Kni	16.12	0.2146	0.0210	-0.1891	-0.0458	-0.1458	0.0887	-0.3028	-3.5	0.065	0.51

Unc-Logic

Gene	Max prod. rate (R^a)	Production Rule	Decay (λ^a)	Diff. (D^a)
Hb	31.3	(Bcd $\geq$ 19 or Hb $\geq$ 49 or Tll $\geq$ 121) and Cad $\leq$ 122 and Kr $\leq$ 139 and Kni $\leq$ 4	0.146	2.16
Kr	16.1	(Bcd $\geq$ 9 or Cad $\geq$ 151 or Kr $\geq$ 103) and Hb $\leq$ 169 and Gt $\leq$ 4 and Kni $\leq$ 115 and Tll $\leq$ 20	0.067	0.67
Gt	16.3	(Bcd $\geq$ 35 or Cad $\geq$ 133 or Gt $\geq$ 85) and Hb $\leq$ 208 and Kr $\leq$ 15 and Tll $\leq$ 102	0.087	0.4
Kni	17	(Bcd $\geq$ 5 or Cad $\geq$ 152 or Kni $\geq$ 94) and Hb $\leq$ 7 and Kr $\leq$ 141 and Gt $\leq$ 70 and Tll $\leq$ 18	0.067	0.9

RPJ-GC

Gene	Max prod. rate (R^a)	regulatory weights (T^{ab})							Bias (h^a)	Decay (λ^a)	Diff. (D^a)
		Bcd	Cad	Hb	Hb ² /255	Kr	Gt	Kni			
Hb	41.0319	0.1678	.	0.0317	.	-0.0342	.	.	-3.5	0.1650	2.963
Kr	12.6054	0.7879	.	0.3923	-1.0593	.	-0.1644	-0.0775	-3.5	0.0547	0.421
Gt	10.3065	0.6292	0.0277	.	.	-0.3716	.	-0.0001	-3.5	0.0670	0.122
Kni	7.9349	0.0000	0.1222	-0.4368	.	0.0001	-0.5568	.	-3.5	0.0135	0.130

RPJ-Logic

Gene	Max prod. rate (R^a)	Production Rule	Decay (λ^a)	Diff. (D^a)
Hb	30.7	(Bcd $\geq$ 23 or Hb $\geq$ 58 or Tll $\geq$ 125) and Kr $\leq$ 148	0.141	1.65
Kr	16.4	(Bcd $\geq$ 6 or Hb $\geq$ 1) and Hb $\leq$ 149 and Gt $\leq$ 8 and Kni $\leq$ 123 and Tll $\leq$ 4	0.071	0.67
Gt	18	(Bcd $\geq$ 38 or Cad $\geq$ 128) and Kr $\leq$ 16 and Kni $\leq$ 156 and Tll $\leq$ 69	0.062	0.5
Kni	17.1	(Bcd $\geq$ 6 or Cad $\geq$ 175 or Kr $\geq$ 187) and Hb $\leq$ 4 and Gt $\leq$ 109 and Tll $\leq$ 6	0.073	0.85