



# QM1 Qualitative model

Type	Label
Description	“Summary of feedback loops and posttranslational regulations among components involved in vertebrate segmentation clock.”
Reference	Fig. 3
Species	Axin2 mRNA, Hes1/7 mRNA, Lfng mRNA, Axin2, Hes1/7, Wnt3a, Dvl, Notch, Lfng, Delta
Compartments	Cell, Nucleus, Golgi apparatus
Study	Rida et al. 2004

# SM1 Simulation model

Type	Label
Description	“her1/her7 heterodimer oscillator model”
Reference	Not available
Study	Lewis 2003

# SM1 Simulation model

Type	Label
Description	“Delayed Hes1 feedback loop”
Reference	Not available
Study	Monk 2003

# SM1 Simulation model

Type	Label
Description	Direct autorepression model of the Hes7 oscillator
Reference	Not available
Study	Hirata et al. 2004

# SM1 Simulation model

Type	Label
Description	Mathematical model for the regulatory pathway of Hes1
Reference	Not available
Study	Bernard et al. 2006

# RQ1 Research question

Type	Label
Description	Can the Axin2 feedback loop constitute a clock? Could a decreasing Wnt3a signaling constitute the wave front, where phase is recorded and the spatial pattern laid down? What is the master oscillator?
Study	Rodriguez-Gonzales et al. 2007

# QM1 Qualitative model

Type	Label
Description	“Schematic representation of the segmentation-clock model proposed by (Rida et al., 2004) for mice.”
Reference	Figure 1B
Species	Axin2 mRNA, Hes1 mRNA, Lfng mRNA, Axin2, Hes1, Lfng, Notch intracellular domain (Ncd) molecules, Dvl, Wnt3a
Compartments	Cytosol
Study	Rodriguez-Gonzales et al. 2007



# A1 Assumption

Type	Label
Description	“a gradient plays an essential role in the segmentation process”
Category	Diffusion coefficient (491)
Study	Rodriguez-Gonzales et al. 2007

# A2 Assumption

Type	Label
Description	“Since we could not find data for the Axin2 and Lfng half lives, we assumed similar degradation rates”
Category	Decay constant (356)
Study	Rodriguez-Gonzales et al. 2007

# A3 Assumption

Type	Label
Description	“ $K_{AD}=K_{ND}=K_D$ and that the value of $D_e$ that satisfies Eq. (6) is such that the Michaelis–Menten-like factors in the equation left-hand side are in their linear regime”
Category	Henri-Michaelis-Menten rate law (29)
Study	Rodriguez-Gonzales et al. 2007

# A4 Assumption

Type	Label
Description	“that production of Notch proteins is regulated in such a way that the concentration of these proteins remains constant”
Category	Concentration Conservation Law (362)
Study	Rodriguez-Gonzales et al. 2007

# A5 Assumption

Type	Label
Description	" $N \gg K_{NS}$ "
Category	Concentration of Reactant (509)
Study	Rodriguez-Gonzales et al. 2007

# A6 Assumption

Type	Label
Description	“quasi-steady assumptions for Eqs. (10) and (11)”
Category	Equilibrium or steady-state constant (193)
Study	Rodriguez-Gonzales et al. 2007

# A7 Assumption

Type	Label
Description	“these interactions can be modelled via Hill-type equations”
Category	Hill-type rate law (192)
Study	Rodriguez-Gonzales et al. 2007

# A8 Assumption

Type	Label
Description	“the corresponding regulatory function is also a Hill-type function”
Category	Hill-type rate law (192)
Study	Rodriguez-Gonzales et al. 2007



# A9 Assumption

Type	Label
Description	“Assume that all mRNA species are immediately transported out of the nucleus as soon as they are completely processed”
Category	Transport (655)
Study	Rodriguez-Gonzales et al. 2007

# A10 Assumption

Type	Label
Description	“normalized transcription rate of genes Hes1 and Lfng is regulated identically is underlying the normalized model”
Category	Transcription (183)
Study	Rodriguez-Gonzales et al. 2007

# BSM1 Building simulation model

Type	Label
Description	Development of equations of model
Study	Rodriguez-Gonzales et al. 2007

# SM1 Simulation model

Type	Label
Description	“six differential delay equations and three algebraic equations”
Reference	Table 1
Study	Rodriguez-Gonzales et al. 2007

# BSM2 Building simulation model

Type	Label
Description	Development of equations for uncoupled subsystems
Study	Rodriguez-Gonzales et al. 2007

# SM2 Simulation model

Type	Label
Description	Submodel 1: Axin2 subsystem
Reference	Not available
Study	Rodriguez-Gonzales et al. 2007

# ASM1 Analyzing simulation model

Type	Label
Description	Simulation model analysis
Study	Rodriguez-Gonzales et al. 2007

# SE1 Experiment

Type	Label
Description	“We found that Hill exponents of the order of 7 were necessary for each of the three subsystems to oscillate spontaneously”
Reference	Not available
Category	Parameter scan
Study	Rodriguez-Gonzales et al. 2007



# SD1 Data

Type	Label
Description	Simulation results of SE1
Reference	Not shown
Related to	SE1
Study	Rodriguez-Gonzales et al. 2007

# SE2 Experiment

Type	Label
Description	Parameter scan with parameters “for which sustained oscillations are observed in each case”, change in oscillation period observed
Reference	Not available
Category	Parameter scan
Study	Rodriguez-Gonzales et al. 2007

# SD2 Data

Type	Label
Description	Simulation results of SE2
Reference	Table 2
Related to	SE2
Study	Rodriguez-Gonzales et al. 2007

# SM3 Simulation model

Type	Label
Description	Submodel 2: Hes1 subsystem
Reference	Not available
Study	Rodriguez-Gonzales et al. 2007

# ASM2 Analyzing simulation model

Type	Label
Description	Simulation model analysis
Study	Rodriguez-Gonzales et al. 2007

# SE3 Experiment

Type	Label
Description	“We found that Hill exponents of the order of 7 were necessary for each of the three subsystems to oscillate spontaneously”
Reference	Not available
Category	Parameter scan
Study	Rodriguez-Gonzales et al. 2007

# SD3 Data

Type	Label
Description	Simulation results of SE3
Reference	Not shown
Related to	SE3
Study	Rodriguez-Gonzales et al. 2007

# SE4 Experiment

Type	Label
Description	Parameter scan with parameters “for which sustained oscillations are observed in each case”, change in oscillation period observed
Reference	Not available
Category	Parameter scan
Study	Rodriguez-Gonzales et al. 2007



# SD4 Data

Type	Label
Description	Simulation results of SE4
Reference	Table 3
Related to	SE4
Study	Rodriguez-Gonzales et al. 2007

# SM4 Simulation model

Type	Label
Description	Lfng subsystem with negative OR positive feedback
Reference	Not available
Study	Rodriguez-Gonzales et al. 2007

# ASM3 Analyzing simulation model

Type	Label
Description	Simulation model analysis
Study	Rodriguez-Gonzales et al. 2007

# SE5 Experiment

Type	Label
Description	“We found that Hill exponents of the order of 7 were necessary for each of the three subsystems to oscillate spontaneously”
Reference	Not available
Category	Parameter scan
Study	Rodriguez-Gonzales et al. 2007

# SD5 Data

Type	Label
Description	Simulation results of SE5
Reference	Not shown
Related to	SE5
Study	Rodriguez-Gonzales et al. 2007

# SE6 Experiment

Type	Label
Description	Parameter scan with parameters “for which sustained oscillations are observed in each case”, change in oscillation period observed
Reference	Not available
Category	Parameter scan
Study	Rodriguez-Gonzales et al. 2007

# SD6 Data

Type	Label
Description	Simulation results of SE6
Reference	Table 4
Related to	SE6
Study	Rodriguez-Gonzales et al. 2007

# BSM3 Building simulation model

Type	Label
Description	Combination of submodels 1 and 2
Study	Rodriguez-Gonzales et al. 2007



# SM5 Simulation model

Type	Label
Description	Combination of submodels 1 and 2 (interaction between the Axin2 and the Hes1 subsystems)
Reference	Not available
Study	Rodriguez-Gonzales et al. 2007

# ASM4 Analyzing simulation model

Type	Label
Description	Simulation model analysis
Study	Rodriguez-Gonzales et al. 2007

# SE7 Experiment

Type	Label
Description	Analyze spontaneous oscillation of coupled system
Reference	Not available
Category	Time course analysis
Study	Rodriguez-Gonzales et al. 2007

# SD7 Data

Type	Label
Description	Simulation results of SE7
Reference	Not shown
Related to	SE7
Study	Rodriguez-Gonzales et al. 2007

# SE8 Experiment

Type	Label
Description	“test whether Axin2 is capable of recruiting the Hes1 subssystem”
Reference	Not available
Category	Parameter scan
Study	Rodriguez-Gonzales et al. 2007

# SD8 Data

Type	Label
Description	Simulation results of SE8
Reference	Not shown
Related to	SE8
Study	Rodriguez-Gonzales et al. 2007

# SE9 Experiment

Type	Label
Description	“repeated the numerical experiments described in the previous paragraph considering the new degradation rates”
Reference	Not available
Category	Parameter scan
Study	Rodriguez-Gonzales et al. 2007

# SD9 Data

Type	Label
Description	Simulation results of SE9
Reference	Not shown
Related to	SE9
Study	Rodriguez-Gonzales et al. 2007



# CSM1 Calibrating simulation model

Type	Label
Description	Adjusting all parameter values for complete model
Study	Rodriguez-Gonzales et al. 2007

# SM6 Simulation model

Type	Label
Description	“six differential delay equations and three algebraic equations with choice of parameters”
Reference	Table 1 and Table 5
Study	Rodriguez-Gonzales et al. 2007

# ASM5 Analyzing simulation model

Type	Label
Description	Simulation model analysis
Study	Rodriguez-Gonzales et al. 2007

# SE10 Experiment

Type	Label
Description	“With these parameter values, both Axin2 and Hes1 subsystems oscillate spontaneously with a period of about 120 min, while the Lfng subsystem does not show sustained oscillations, even if it is subject to negative feedback”
Reference	Not available
Category	Time course analysis
Study	Rodriguez-Gonzales et al. 2007

# SD10 Data

Type	Label
Description	Simulation results of SE10
Reference	Not shown
Related to	SE10
Study	Rodriguez-Gonzales et al. 2007

# SE11 Experiment

Type	Label
Description	“model dynamic behaviour was analysed by setting $n_d=1$ ( $n_h=4$ ) to avoid spontaneous oscillations in the Axin2 (Hes1) subsystem”
Reference	Not available
Category	Time course analysis
Study	Rodriguez-Gonzales et al. 2007

# SD11 Data

Type	Label
Description	Simulation results of SE11
Reference	Figure 2 A (B)
Related to	SE11
Study	Rodriguez-Gonzales et al. 2007

# SE12 Experiment

Type	Label
Description	“we tested that Axin2 oscillation arresting can be fully accounted for by reduction of Dvl levels—concomitant with Wnt3a-concentration decrease”
Reference	Not available
Category	Time course analysis
Study	Rodriguez-Gonzales et al. 2007



# SD12 Data

Type	Label
Description	Simulation results of SE12
Reference	Figure 2 C (D)
Related to	SE12
Study	Rodriguez-Gonzales et al. 2007