

## Supplementary Materials for

### **A Mathematical Model of Cell Cycle Dysregulation Due to Human Papillomavirus Infection**

Anna K. Miller\*, Karl Munger, Frederick R. Adler

\*Corresponding author

Department of Mathematics, University of Utah  
E-mail: amiller@math.utah.edu

Submitted to the *Bulletin of Mathematical Biology*  
September 20, 2016

**This PDF file includes:**

Table S1: The relative sensitivity of the limit point ratio for all parameters

Table S2: The relative sensitivity of the  $G_1/S$  transition time for all parameters

**Table S1** Relative sensitivity of limit point ratio

Parameter	$E7 = 0$	LR $E7 = 5 \times 10^{-5} \mu\text{M}$	HR $E7 = 5 \times 10^{-5} \mu\text{M}$
$E7$	0.000	-3.106	-2.636
$k_1$	11.210	6.387	0.818
$k_{-1}$	-12.861	-4.881	-0.547
$k_2$	5.009	1.576	0.026
$k_{-2}$	-5.878	-1.015	-0.011
$k_3$	0.000	-0.532	-0.487
$k_{-3}$	0.000	0.887	1.320
$k_4$	0.000	-0.118	-0.009
$k_{-4}$	0.000	0.288	0.036
$k_5$	0.000	-1.891	-1.743
$k_{-5}$	0.000	0.955	0.130
$k_6$	0.000	-0.482	-0.043
$k_{-6}$	0.000	0.225	0.003
$k_{-7}$	0.000	-1.348	-0.492
$k_{-8}$	0.000	-0.324	-0.010
$\rho_{1u}$	-3.981	-1.972	-0.112
$\rho_{1c}$	4.211	2.116	0.072
$\rho_{2u}$	-5.633	-2.396	-0.073
$\rho_{2c}$	0.780	1.345	0.306
$\rho_{i1u}$	0.000	-0.084	-0.005
$\rho_{i1c}$	0.000	0.082	0.006
$\rho_{i2u}$	0.000	-0.236	-0.220
$\rho_{i2c}$	0.000	0.018	0.011
$\rho_{d1c}$	-4.757	-2.510	-0.328
$\rho_{d1u}$	3.642	1.849	0.070
$\rho_{d2u}$	4.293	1.237	0.011
$\rho_{di1c}$	0.000	-0.028	-0.010
$\rho_{di1u}$	0.000	0.168	0.229
$\alpha_{2u}$	-9.048	-2.105	-0.004
$\delta_D$	0.0004	-0.0007	-0.0002
$\delta_E$	4.719	1.359	0.002
$K_E$	8.564	3.518	0.257
$RE_0$	-50.865	-6.935	-1.897
$R_0$	20.471	8.819	2.018

**Table S2** Relative sensitivity of G1/S transition time for  $GF = 0.1 \mu\text{M}$ 

Parameter	$E7 = 0$	LR $E7 = 5 \times 10^{-5} \mu\text{M}$	HR $E7 = 5 \times 10^{-5} \mu\text{M}$
$E7$	0.000	-0.324	-0.880
$k_1$	0.133	0.127	0.120
$k_{-1}$	-0.114	-0.085	-0.040
$k_2$	0.886	0.662	0.200
$k_{-2}$	-1.276	-0.493	-0.080
$k_3$	0.000	-0.014	-0.080
$k_{-3}$	0.000	0.014	0.160
$k_4$	0.000	-0.042	-0.080
$k_{-4}$	0.000	0.127	0.400
$k_5$	0.000	-0.042	-0.160
$k_{-5}$	0.000	0.014	0.000
$k_6$	0.000	-0.211	-0.400
$k_{-6}$	0.000	0.113	0.000
$k_{-7}$	0.000	-0.028	-0.040
$k_{-8}$	0.000	-0.155	-0.120
$\rho_{1u}$	-0.048	-0.028	0.000
$\rho_{1c}$	-0.095	-0.085	-0.120
$\rho_{2u}$	-0.400	-0.268	0.000
$\rho_{2c}$	-0.867	-0.634	-0.360
$\rho_{i1u}$	0.000	-0.014	-0.040
$\rho_{i1c}$	0.000	-0.014	0.000
$\rho_{i2u}$	0.000	-0.042	-0.120
$\rho_{i2c}$	0.000	-0.014	0.000
$\rho_{d1c}$	0.067	0.042	0.040
$\rho_{d1u}$	0.029	0.014	0.000
$\rho_{d2u}$	0.267	0.141	0.040
$\rho_{di1c}$	0.000	0.014	0.000
$\rho_{di1u}$	0.000	0.014	0.000
$\alpha_{2u}$	-1.895	-1.282	-0.600
$\delta_D$	0.105	0.085	0.080
$\delta_E$	0.876	0.620	0.200
$K_E$	1.067	0.845	0.440
$RE_0$	-9.400	-2.761	-1.720
$R_0$	1.781	1.296	0.880