Table 2. Model Reactions

Reaction	Equation	Units
Receptor Activation		
add_Ligand	((t > t_Ladd) * (L_pipette - L_cell) / tauL)	uM.s-1
bind_L_b1AR	(((Kf * L_cell) * b1AR_cell) - (Kr * L_b1AR_cell))	uM.s-1
bind_Lb1AR_Gs	(((Kf * Gs_cell) * L_b1AR_cell) - (Kr * L_b1AR_Gs_cell))	uM.s-1
bind_L_b1ARGs	(((Kf * b1AR_Gs_cell) * L_cell) - (Kd * L_b1AR_Gs_cell))	uM.s-1
bind_b1AR_Gs	(((Kf * b1AR_cell) * Gs_cell) - (Kr * b1AR_Gs_cell))	uM.s-1
Receptor inhibition/desensitization		
add_propranolol	((t > t_propadd) * (Propranolol_pipette - Propranolol_cell) / tauPropranolol)	uM.s-1
bind_b1AR_propranolol	(((Kf * Propranolol_cell) * b1AR_cell) - (Kr * b1ARinhib_cell))	uM.s-1
desens_bark	(k_barkp * (L_b1AR_cell + L_b1AR_Gs_cell))	uM.s-1
resens_bark	(k_barkm * b1AR_S464_cell)	uM.s-1
desens_pka	((kpkap * PKAC_cell * (L_b1AR_Gs_cell + b1AR_cell + L_b1AR_cell)) - (kpkam * b1AR_p_cell))	uM.s-1
Gs activation		
LRG_activation	(k_gact * L_b1AR_Gs_cell)	uM.s-1
RG_activation	(k_gact * b1AR_Gs_cell)	uM.s-1
Gs_gtp_hydrolysis	(khyd * Gsa_gtp_cell)	uM.s-1
Gs_reassociation	(k_reassoc * Gsa_gdp_cell * Gsbg_cell)	uM.s-1
cAMP synthesis		
bind_Gs_AC	(((Kf * Gsa_gtp_cell) * AC_cell) - (Kr * GsAC_cell))	uM.s-1
cAMP_synthesis_GsAC	(Vmax * ATP_cell / (Km + ATP_cell))	uM.s-1
bind_FskAC	(((Kf * AC_cell) * Fsk_cell) - (Kr * FskAC_cell))	uM.s-1
cAMP_synthesis_FskAC	(Vmax * ATP_cell / (Km + ATP_cell))	uM.s-1
cAMP_photolysis	(kphot * light * DMNB_cAMP_cell) where light = (((t > ton_global_light) * (t < toff_global_light)) + ((t > ton_local_light) * (t < toff_local_light) * light_spot_cell))	uM.s-1
cAMP degradation		
bind_PDEcAMP	(((Kf * PDE_cell) * cAMP_cell) - (Kr * PDEcAMP_cell))	uM.s-1
cAMP_degradation	(kpde * PDEcAMP_cell)	uM.s-1
inhibit_PDE	(((Kf * PDE_cell) * IBMX_cell) - (Kr * PDE_IBMX_cell))	uM.s-1
PKA activation		
bind_RC_cAMP	(((Kf * RC_cell) * cAMP_cell) - (Kr * ARC_cell))	uM.s-1
bind_cAMP_ARC	(((Kf * ARC_cell) * cAMP_cell) - (Kr * A2RC_cell))	uM.s-1
bind_A2R_PKAC	((Kf * A2RC_cell) - ((Kr * A2R_cell) * PKAC_cell))	uM.s-1
inhib_PKAC	(((Kf * PKAC_cell) * PKI_cell) - (Kr * PKAC_PKI_cell))	uM.s-1
AKAR phosphorylation		
bind_PKAC_AKAR	(((Kf * AKAR_cell) * PKAC_cell) - (Kr * PKAC_AKAR_cell))	uM.s-1
AKAR_phosph	(kpka_akar * PKAC_AKAR_cell)	uM.s-1
bind_AKARp_PP	(((Kf * PP_cell) * AKARp_cell) - (Kr * PP_AKARp_cell))	uM.s-1
AKARp_dephosph	(kcat_PP_AKARp * PP_AKARp_cell)	uM.s-1