

Descriptions of MATLAB Codes and Data Files for simulating steady-state cardiac energetics of the control and left ventricular hypertrophy (LVH) hearts

Reference: Wu F, Zhang J, & Beard DA (2009) Experimentally observed phenomena on cardiac energetics in heart failure emerge from simulations of cardiac metabolism. PNAS 106(17):7143-7148.

Version 1.0 (Updated on December 15, 2010)

File Names	Descriptions
<i>Main driver programs</i>	
steady_states_Normal.m	simulating steady-state CrP/ATP and Pi/CrP signals in the physiological hearts at different work rates
steady_states_mLVH.m	simulating steady-state CrP/ATP and Pi/CrP signals in the early-stage LVH hearts at different work rates (Figure 1C and D)
steady_states_LVH.m	simulating steady-state CrP/ATP and Pi/CrP signals in the moderate LVH hearts at different work rates (Figure 1E and F)
<i>Functions</i>	
Cell_dXdT.m	computing time derivatives of state variables in the cell-level model
Cell_Flux.m	computing reaction fluxes in the cell-level model
define_global.m	defining global variables
setup.m	loading experimental data, certain model parameters, and initial conditions for simulation
plot_steady_states.m	plotting simulations of steady-state cardiac energetics for the control (Figure 1A and B), early-stage LVH (Figure 1C and D), and moderate LVH hearts (Figure 1E and F)
<i>Data files</i>	
param14.mat	model parameters
OptVar_mLVH.mat	data file containing certain initial metabolite concentrations required for adjusting key metabolic pools in early-stage LVH hearts
OptVar_LVH.mat	data file containing certain initial metabolite concentrations required for adjusting key metabolic pools in moderate LVH hearts
steady_states_control.mat	data file containing results generated by steady_states_Normal.m
steady_states_mLVH.mat	data file containing results generated by steady_states_mLVH.m
steady_states_LVH.mat	data file containing results generated by steady_states_LVH.m
HEP_MVO2.txt	³¹ P-NMR spectroscopy experimental data measured from in vivo normal dog hearts
HEP_MVO2_LVH.txt	³¹ P-NMR spectroscopy experimental data measured from in vivo LVH dog hearts