**Repository of MATLAB Files to reproduce figures from:**

A computational model of induced pluripotent stem-cell derived cardiomyocytes incorporating experimental variability from multiple data sources

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**Guide to file types:**

**Green Bolded**: main files to generate the corresponding paper figure

**Red bolded**: function files required for main files (differential eqns, analysis, etc.)

Orange: parameter vectors/matrices to parameterize a model/population

Purple: initial conditions matrices

*Folder:* **fig3\_Ina**

* Ma\_ina.mat
* Jalife\_Immature\_ina.mat
* Jalife\_Mature\_ina.mat
* Baseline\_ina.mat
* **Ina\_main.m**: main function to generate plots for Figure 3

*Folder:* **fig4\_ICaL**

* Ma\_ical.mat
* Veerman1\_ical.mat
* Veerman2\_ical.mat
* EsSalahLamoureux\_ical.mat
* Baseline\_ical
* **ICaL\_main.m**: main function to generate plots for Figure 4

*Folder:* **fig5\_IKr**

* Ma\_ikr.mat
* Wu\_ikr.mat
* EsSalahLamoureux\_ikr.mat
* Bellin\_ikr.mat
* Baseline\_ikr.mat
* **IKr\_main.m**: main function to generate plots for Figure 5

*Folder:* **fig6\_Ito**

* Ma\_ito.mat
* Veerman\_ito.mat
* Cordeiro\_ito.mat
* Baseline\_ito.mat
* **Ito\_main.m**: main function to generate plots for Figure 6

*Folder:* **fig7\_IKs**

* Ma\_iks.mat
* MaWei\_patient\_iks.mat
* MaWei\_icell\_iks.mat
* Baseline\_iks.mat
* **Iks\_main.m**: main function to generate plots for Figure 7

*Folder:* **fig8\_If**

* Kurokawa\_if.mat
* Ma\_if.mat
* Baseline\_if.mat
* **If\_main.m**: main function to generate plots for Figure 8

*Folder:* **fig9\_IK1**

* Jalife\_Immature\_ik1.mat
* Jalife\_Mature\_ik1.mat
* Ma\_ik1.mat
* Kurokawa\_ik1.mat
* Baseline\_ik1.mat
* **Ik1\_main.m**: main function to generate plots for Figure 9

*Folder****:* fig10\_fig11\_Baseline\_Model**

* Baseline\_parameter\_inputs.mat: parameters for baseline model formulation
* ICs\_baseline.mat: initial conditions for baseline model at steady state
* **Ca\_analysis.m**: function to analyze calcium (transient and contributions to flux)
* **ipsc\_function.m**: function file containing differential equations for iPSC model
* **Main\_ipsc\_baseline.m**: main file to run baseline iPSC-Cm model and produce Fig 10-11

*Folder:* **fig12\_fig13A\_SingleCurrent\_Populations**

* Param\_INa.mat: parameters for Ina single-current-variation population
* ICs\_INa.mat: initial conditions for Ina single-current-variation population
* Param\_ICaL.mat: parameters for ICaL single-current-variation population
* ICs\_ICaL.mat initial conditions for ICaL single-current-variation population
* Params\_IKr.mat: parameters for IKr single-current-variation population
* ICs\_IKr.mat initial conditions for IKr single-current-variation population
* Params\_If.mat: parameters for If single-current-variation population
* ICs\_If.mat: initial conditions for If single-current-variation population
* Params\_Ik1.mat: parameters for IK1 single-current-variation population
* ICs\_IK1.mat: initial conditions for IK1 single-current-variation population
* **ipsc\_function.m**: function file containing differential equations for iPSC model
* **Main\_INA\_kinetics\_variation.m:** main file to generate Fig 12A for INa
* **Main\_ICaL\_kinetics\_variation.m:** main file to generate Fig 12Bfor ICaL
* **Main\_IKR\_kinetics\_variation.m:** main file to generate Fig 12C for IKr
* **Main\_If\_kinetics\_variation.m:** main file to generate Fig 12D for If
* **Main\_IK1\_kinetics\_variation.m:** main file to generate Fig 12E for Ik1
* **Main\_singlecurrent\_pop\_APS.m:** main file to run APs for single-current variation populations and produce Fig 13A

*Folder:* **fig13\_fig15\_MultiCurrent\_Population**

* 5var\_param.mat: parameters for 5-current-variation population
* 5var\_ICs.mat: initial conditions for 5-current-variation population
* **ipsc\_function.m**: function file containing differential equations for iPSC model
* **Main\_5current\_pop\_APS.m:** main file to run APs for five-current variation populations and produce Fig 13B-F
* **Main\_5current\_Mature\_Immature.**m: main file to analyze immature and mature subpopulations in five-current-variation population, and produce Fig 15

*Folder:* **fig14\_Mature\_Model**

* Baseline\_parameter\_inputs.mat: parameters for baseline (immature) model formulation
* ICs\_baseline.mat: initial conditions for baseline (immature) model at steady state
* ICs\_mature.mat: initial conditions for mature model at steady state
* **ipsc\_function.m**: function file containing differential equations for iPSC model
* **Main\_immature\_mature\_AP.m**: main file to run baseline iPSC-Cm model and produce Fig 14