

Luo-Rudy Mammalian Ventricular Model II (dynamic), 1994-2000

v. 1.3

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1. Description

The model is used to simulate guinea pig ventricular action potentials. It formulates ionic current gating in terms of Hodgkin-Huxley type equations. This model contains description of fourteen ionic currents and pumps. In addition, it describes the process of calcium release from the sarcoplasmic reticulum and detailed dynamics of intracellular calcium concentration changes (hence the name, "dynamic"). The original formulation of this model was subsequently updated (see References) and is being widely used as a foundation for the new cardiac myocyte model development.

2. References

- A Dynamic Model of the Cardiac Ventricular Action Potential - Simulations of Ionic Currents and Concentration Changes, Luo, C. and Rudy, Y., 1994, *Circulation Research*, 74, 1071-1097.
- Two Components of the Delayed Rectifier K⁺ Current in Ventricular Myocytes of the Guinea Pig Type, Zeng, J., Laurita, K.R., Rosenbaum, D.S., and Rudy, Y., 1995, *Circulation Research*, 77, 140-152.
- Electrophysiological effects of acute myocardial ischemia: a theoretical study of altered cell excitability and action potential duration, Shaw, R.M. and Rudy, Y., 1997, *Cardiovascular Research*, 35, 256-272.
- Effects of IKr and IKs Heterogeneity on Action Potential Duration and Its Rate Dependence: A Simulation Study, Viswanathan, P.C., Shaw, R.M., and Rudy, Y., 1999, *Circulation*, 99, 2466-2474.
- Action Potential and Contractility in [Na⁺]_i Overloaded Cardiac Myocytes, Faber, G.M. and Rudy, Y., 2000, *Biophysical Journal*, 78, 2392-2404.

3. Download

This model is part of the stable CESE distribution.

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