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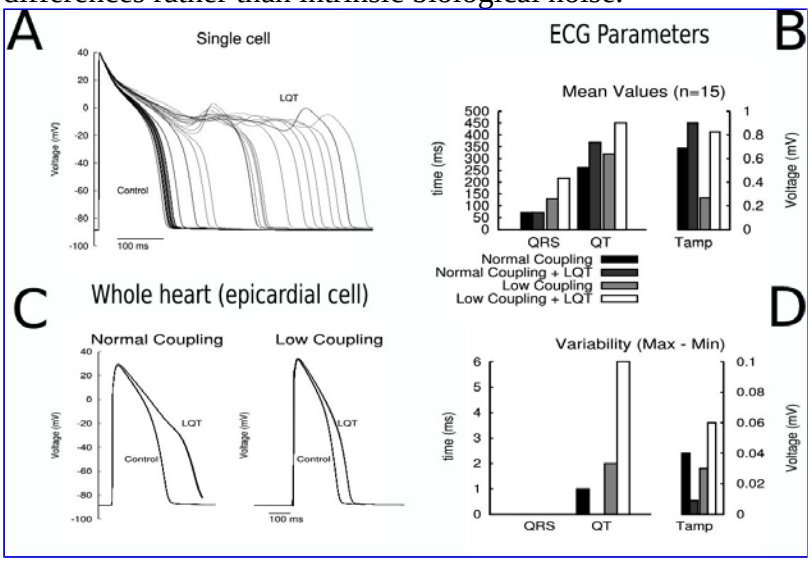
Presentation Abstract

Session:	Poster Session 3
	Thursday, May 13, 2010, 2:00 PM - 5:00 PM
Presentation:	PO3-90 - Causes Of Variability In Repolarization: From Isolated Cells To Ecg
Location:	Exhibit Hall
Author(s):	Alberto Corrias, Esther Pueyo, PHD, Kevin Burrage, PhD and Blanca Rodriguez, PhD. Oxford University, Oxford, United Kingdom, University of Zaragoza, Zaragoza, Spain
Abstract:	Introduction: Pro-arrhythmic repolarization abnormalities are investigated clinically using the ECG and experimentally often with isolated cells AP recordings. Both clinical ECG parameters and AP in isolated cells exhibit high spatial and temporal variability but the sources are unknown. Our goal is to investigate how intercellular coupling and intrinsic biological noise contribute to variability in repolarization metrics in isolated cells versus whole ventricular preparations. Methods: A rabbit whole ventricular model was developed to bridge the gap from ion channel stochastic gating to ECG. Electrical activity was simulated for control and LQT conditions in isolated cells and in whole ventricles for normal and low (4-fold decrease) intercellular coupling. For each case, 15 stochastic simulations were run and mean and variability in APD and ECG parameters were computed. Results: In isolated cells, stochastic IKs gating results in significant APD variability in control (25 ms) and early after depolarizations (EADs) in 85% of LQT simulations (Fig. A). However, in the whole ventricles, intercellular coupling significantly reduces APD variability (1 ms) and no EADs are observed (Fig C). Low coupling decreases mean epicardial APD and T wave amplitude but increases both mean value and variability of QRS and QT intervals (Fig B and D). Variability in all parameters is increased under low coupling and LQT conditions (Fig D). Conclusions: Variability in clinical ECG parameters is more likely to originate from intercellular coupling and ion channel properties

differences rather than intrinsic biological noise.



Disclosures: **A. Corrias**, None; **E. Pueyo**, None; **K. Burrage**, None; **B. Rodriguez**, None.