

Abstract Submitted  
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**Electrical Heart Defibrillation with Ion Channel Blockers** ERIN FEENEY, COURTNEY CLARK, STEFFAN PUWAL, Oakland University — Heart disease is the leading cause of mortality in the United States. Rotary electrical waves within heart muscle underlie electrical disorders of the heart termed fibrillation; their propagation and breakup leads to a complex distribution of electrical activation of the tissue (and of the ensuing mechanical contraction that comes from electrical activation). Successful heart defibrillation has, thus far, been limited to delivering large electrical shocks to activate the entire heart and reset its electrical activity. In theory, defibrillation of a system this nonlinear should be possible with small electrical perturbations (stimulations). A successful algorithm for such a low-energy defibrillator continues to elude researchers. We propose to examine in silica whether low-energy electrical stimulations can be combined with antiarrhythmic, ion channel-blocking drugs to achieve a higher rate of defibrillation and whether the antiarrhythmic drugs should be delivered before or after electrical stimulation has commenced. Progress toward a more successful, low-energy defibrillator will greatly minimize the adverse effects noted in defibrillation and will assist in the development of pediatric defibrillators.

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