The Simulogic solution

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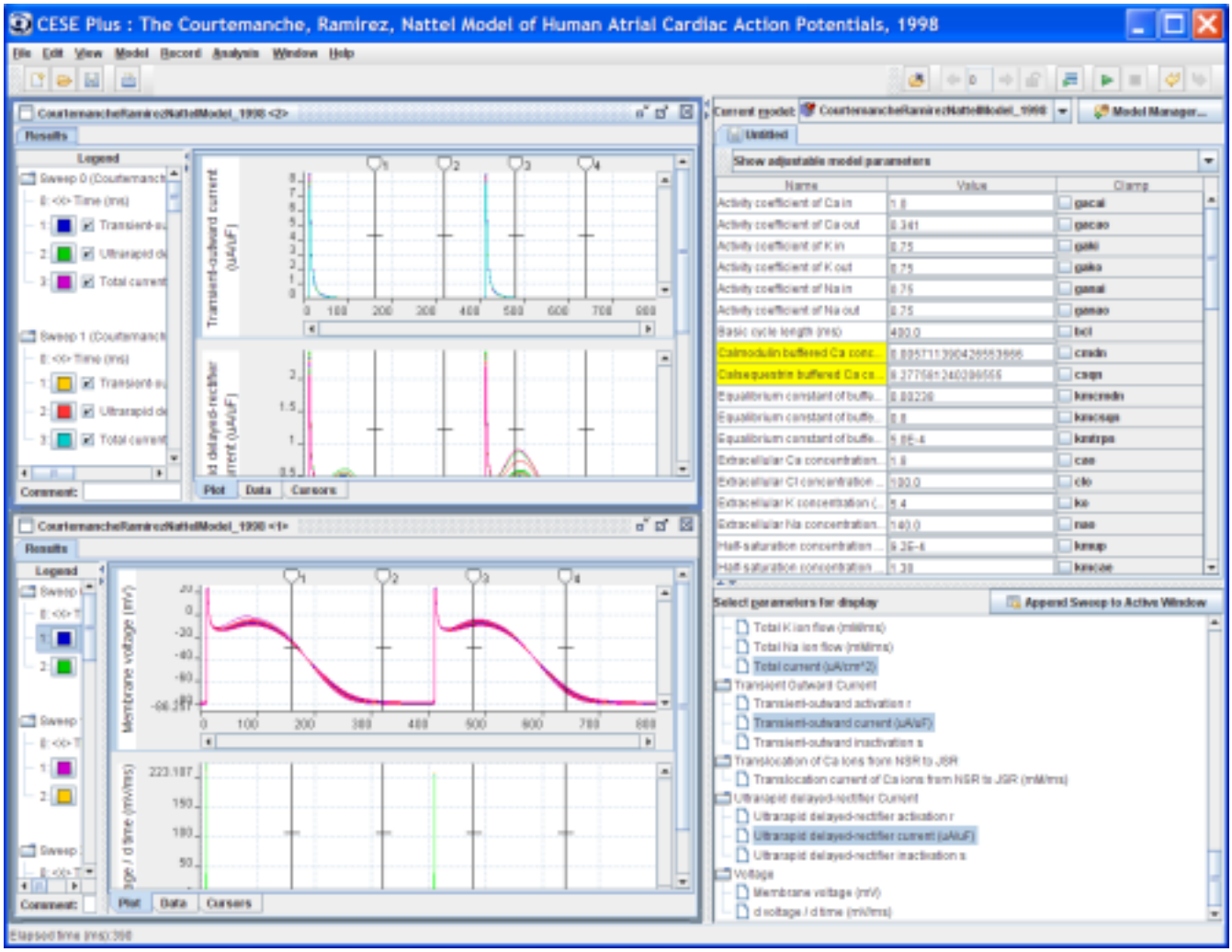
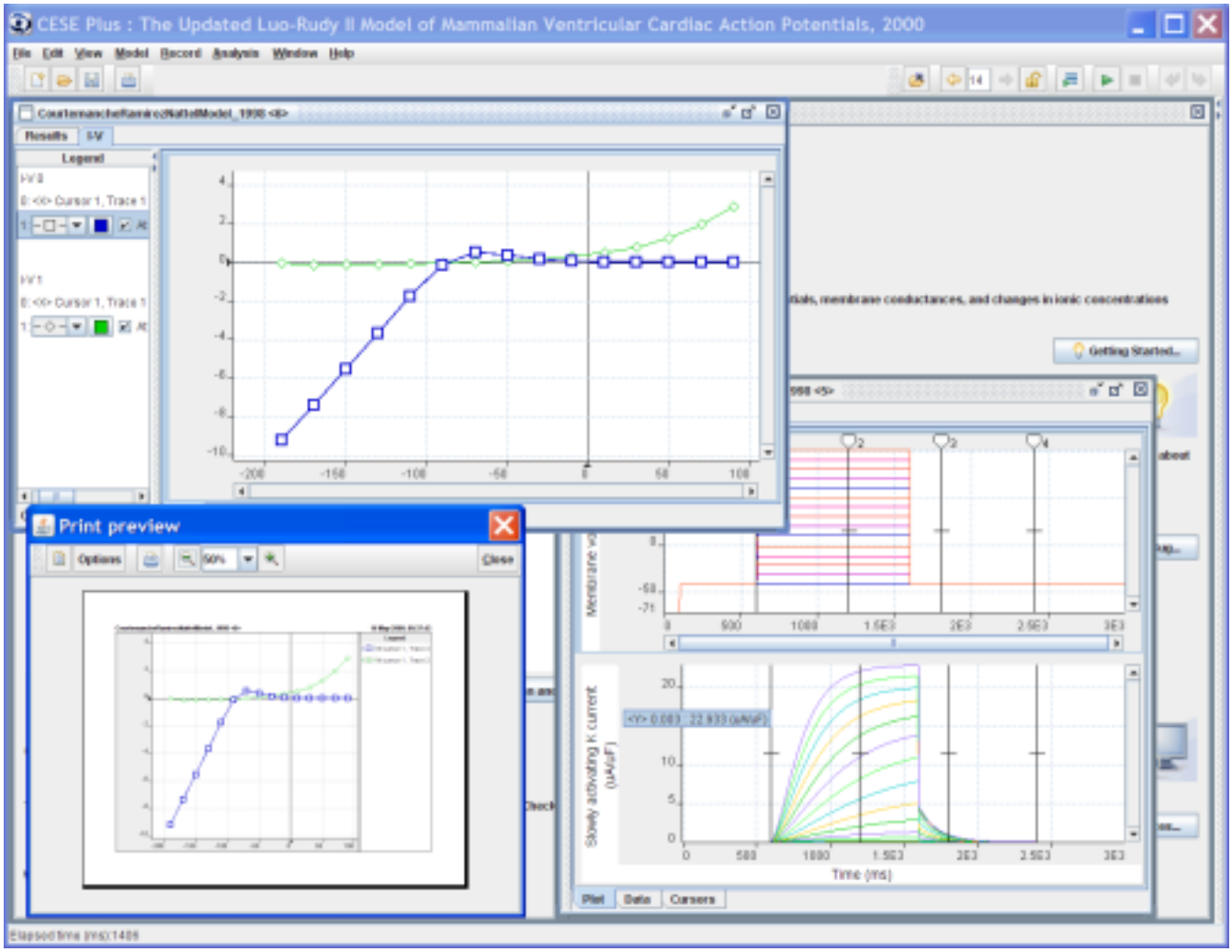
1 Basic ion channel research



The CESE electrophysiology simulation platform and Simulogic models allow scientists to perform complex ion channel and action potential simulations. The system provides the user with full control over model parameters, flexible data visualization options, appropriate data analysis parameters, and powerful data export capability. CESE gives researchers the ability to vary the degree of block or stimulation of the ion channels in the models, change ionic concentrations, and manipulate pacing rate. Action potentials can be simulated using CESE and Simulogic models, and traces can be imported into patch-clamp acquisition software, such as HEKA Pulse/PatchMaster™ or Molecular Devices Clampex™. This allows the scientist to anticipate action potential profiles from limited available data, and follow-up with the experiments to support those predictions.

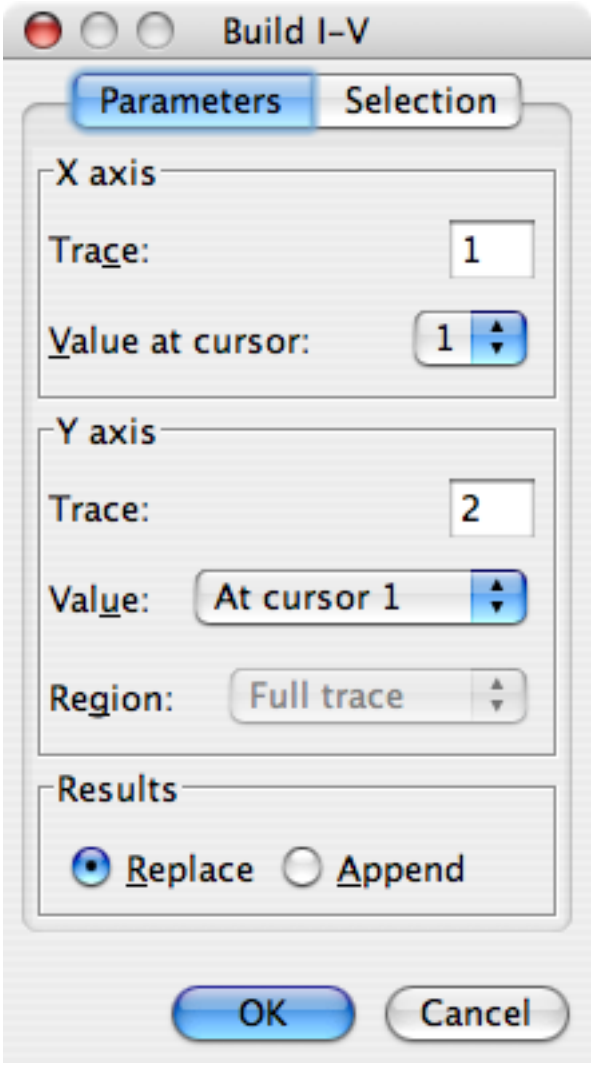
2 In-silico cardiac safety assessment



The ability to screen early drug candidates for cardiac safety can be a prime criterion for identifying lead compounds. In many cases, drugs are known to affect properties of many different types of ion channels. This provides the scientist with limited capacity to infer safety from the evaluation of individual channels under specific experimental conditions. Stock or custom-designed Simulogic models can be used to quickly recreate the conditions of a specific set of experiments and manipulate additional variables, such as pacing rate, temperature, or ionic concentrations. This capability can allow the retrospective evaluation and standardization of unconventional early screens performed under varied conditions and across different species and cell models. Similarly the researcher may translate this

information into human cardiac cell models. Ultimately, variations in action potential may be identified and flagged for the potential to produce arrhythmogenic effects.

3 Ion channel and action potential educational tool



Contemporary learners are more dependent upon active learning tools to understand complex concepts and draw the relationships with real life application. Simulogic CESE and corresponding models are uniquely positioned to support the active learning style of basic physiology students, nursing, and medical students. By manipulating various channels, ion concentrations, and physical variables, students can dissect the action potential and draw

the relationship to the fully integrated heart. CESE can be an excellent complement to any classic lecture based course, teaching lab, textbook, or distance learning program.