

Intracellular Heart Modeling and Parameter Optimization

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Intracellular Heart Model Simulation

- Developed mathematical models of intracellular heart cell dynamics.
- Simulated calcium flux, ion channel gating, and drug response mechanisms.
- Compared candidate drugs based on simulated substrate efficiencies and time-course responses.
- Applied sensitivity analysis and parameter optimization to tune simulation fidelity.

IBM Collaboration: DREAM8 Challenge

- Participated in DREAM8 whole-cell modeling parameter estimation challenge.
- Collaborated with IBM Computational Biology to test high-throughput model evaluation pipelines.
- Benchmarked parameter estimation infrastructure and stress-tested inference workflows.
- Supported infrastructure validation across a consortium of systems biology researchers.

Summary

- Combined simulation, optimization, and drug modeling to advance intracellular modeling.
- IBM collaboration ensured reproducibility and scalability in systems pharmacology pipelines.
- Work provided groundwork for global sensitivity and estimation strategies used in modern QSP workflows.

Questions or ideas for collaboration?

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