The Bidomain problem

A Julia implementation with VoronoiFVM.jl

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Contents

What is the bidomain problem?

The bidomain problem is a system of partial differential equations modeling the propagation of electric signals throughout cardiac tissue. [2] According to [1], this system is given by:

Bidomain problem

$$\begin{aligned}
\frac{\partial u}{\partial t} &= \frac{1}{\varepsilon} f(u, v) + \nabla \cdot (\sigma_i \nabla u) + \nabla \cdot (\sigma_i \nabla u_e) \\
0 &= \nabla \cdot (\sigma_i \nabla u + (\sigma_i + \sigma_e) \nabla u_e) \\
\frac{\partial v}{\partial t} &= \varepsilon g(u, v).
\end{aligned}$$

Bibliography


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