Upscaling of reaction-diffusion problems in composites with imperfect interfaces

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The homogenization of some reaction-diffusion problems in a highly heterogeneous composite medium formed by two connected constituents separated by an imperfect interface is analyzed. The main feature of our setting is represented by the fact that, across this imperfect interface, both the solution and its flux are assumed to exhibit jumps. Several models arise at the limit. In particular, a modified bidomain model is obtained and compared to some existing models in the literature (see [1]-[4]). Our results can serve as a tool for biochemists interested in studying the complex mechanisms involved in the calcium dynamics in living cells.

References

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