

## **Numerical Simulation of Diffusion through Permeable Membrane using an Unconformable Mesh**

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Developing numerical methods of membrane with selective permeability is important in association with understandings of mass transport of biological tissues and designs of filtration devices. Moreover, numerical approaches using an unconformable mesh are required because of large deformation and interactions between the multiple cells enclosed by the membrane. Therefore, we developed a method for diffusion restricted by permeable membrane using an unconformable mesh based on a finite element formulation. The advantage of our approach is that the amount of the jump in concentration across the membrane is treated as an independent variable, and it is treated implicitly together with the diffusion equation and a permeable condition simultaneously. Therefore, interpolations do not required to compute the diffusion jump on membrane. Our numerical results show good agreements compared with analytical solutions for both permeable and no-permeable membranes in one and two dimensional problems.

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