

June 3, 2020

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Dear referee,

I am pleased to submit an original research article entitled “Characterization and validation of a membrane mimetic with magnetic orienting capabilities and high phospholipid content” to be considered in publication in the Journal of Molecular Liquids.

In this manuscript we develop a membrane mimetic which imitates the permeability of a natural cellular membrane, this property was tested by confirming that Benzocaine, a local anesthetic that is proven to permeate the cellular membrane, does permeate the membrane mimetic proposed; and by confirming that Levodopa, an amino-acid that is unable to permeate the cellular membrane via passive mechanisms, cannot permeate the membrane mimetic. We also provide a molecular dynamics simulation model calibrated to reproduce experimental ^2H -NMR results on the mimetic.

We believe this manuscript is appropriate for publication in the Journal of Molecular Liquids because our membrane mimetic can be of interest to the readers of the journal seeking advances in lyotropic liquid crystals and biomolecules in solution.

This manuscript is an original work that has never been published before, and is not under consideration by any other journal. We have no conflicts of interest to disclose.

Sincerely,

Diego Muñoz-Gacitúa