Lipid Biomimetic Models as an Alternative Platform to Guide the Drug Design Process

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In a rational drug design, the modulation of the chemical structure based on its pharmacokinetic profile could be the solution to avoid bigger investments in non-promising drugs. The transport of drugs across cell membranes is a highly complex biological process involving the interaction of drugs with lipid barriers. The need to understand this interaction is often neglected when the drugs' effects are studied, since systematic investigations are hindered by the complexity and dynamic nature of membranes.[1] Biomimetic membrane models provide an alternative platform with very well defined and controlled conditions to help researchers from the drug discovery field to predict drugs' pharmacokinetic properties with therapeutic efficacy implications, such as their transport, biodistribution, bioaccumulation, toxicity.[2-4] In this regard, biophysical techniques have emerged as essential tools to unveil such interactions.[2-4] In the present study several biomimetic membrane models (cell membrane and epithelial membrane of blood-brain barrier) were used and different biophysical techniques (derivative spectroscopy; quenching of steady-state and time-resolved fluorescence; dynamic light scattering; differential scanning calorimetry and small and wide angle x-ray diffraction) were applied to characterize the pharmacokinetic profile of a newly synthesized drug in order to support drug screening process decisions.

REFERENCES

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FIGURES

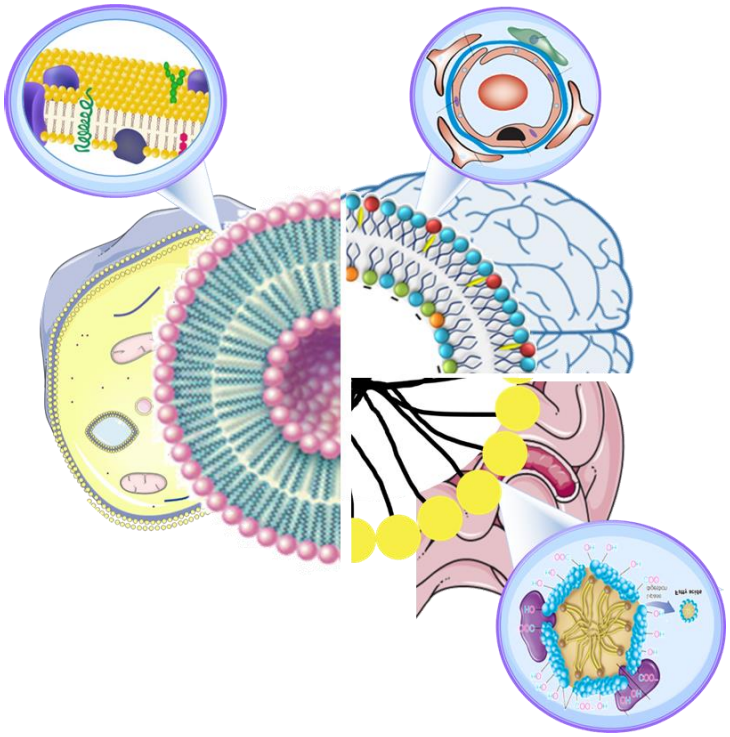

Figure 1: Figure illustrating the several biomimetic models used to predict drug pharmacokinetic profiling