The effect of antimalarial drug – cyclosporin A on model biological membranes

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Abstract

Cyclosporin A (CsA), a hydrophobic peptide, mainly known for its immunosuppressant properties, has shown a broad range of biological activities, including antimalarial action. Since CsA was found to be active on membrane level, it was subjected for investigations involving membrane models, such as vesicles or Langmuir monolayers. Our former studies on interactions between CsA and different membrane lipids indicated its affinity to sphingomyelin (SM).

Inspired by this finding we have extended our experiments on multicomponent systems and performed systematic investigations of CsA behavior towards artificial membranes containing different mutual proportion of SM and Chol, modeled with Langmuir monolayer technique. Monolayer results have been complemented with films structure visualization, applying Brewster angle microscopy (BAM) and atomic force microscopy (AFM). The obtained results of our experiments show that CsA interacts preferentially with SM-rich membranes, which suggests that SM may play a key role in antimalarial effect of CsA and can provide binding sites on the membrane surface.

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