Supramolecular systems for enhancing solubility of new arylquinolinones in aqueous solution

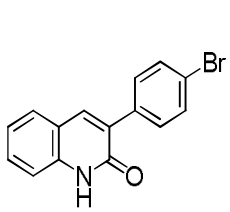
Alla Mirgorodskaya[1,2] , Farida Valeeva[2], Vera Mamedova[2], Vakhid Mamedov[1,2] , Lucia Zakharova[1,2], Oleg Sinyashin [1,2]

[1]Kazan National Research Technological University, Kazan, Russia
[2] *A.E. Arbuzov Institute of Organic and Physical Chemistry, Kazan Scientific Center, Russian Academy of Sciences, Kazan, Russia*

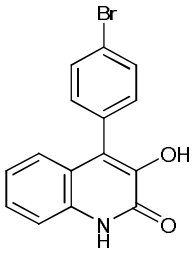
mirgoralla@mail.ru

Quinoline derivatives are characterized by a wide spectrum of biological activity, play important role in a variety of biochemical processes and act as the basis of a number of drugs. Along with the design of new compounds of this series, manufacturing of their biocompatible formulated preparations is an important problem. Surfactant application opens the possibility of solving this problem. Surfactants solubilize hydrophobic organic compounds, which increases their content in aqueous systems, thereby enhancing their bioavailability.

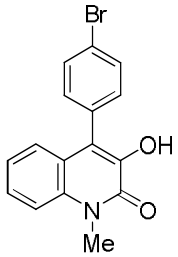
In the present study we characterized the solubilization effect of micellar solutions and quaternary oil-in-water microemulsions toward a series of new arylquinolinones **1-4**.



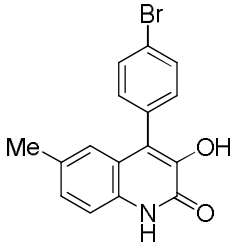
1



2



3



4

Systems based on non-ionic micelles approved for the medical and pharmacological practice, Tween 80, Pluronic F127, and Tyloxapol, as well as ionic surfactants have been used. The solubilization capacity of the systems was quantify by spectrophotometry. It was shown that micellar solutions of Tween 80 allow us to reach the 20-fold increase in the compound concentration in water. Microemulsions exhibit even higher effect, but their composition contains significant amounts of butanol as a co-surfactant, which limits their application in pharmaceutical practice. The solubilization processes are accompanied by a marked change in the acid-base properties of the arylquinolinones: for example pK value of compound **2** is equal to 6.2, 8.5 and 10.4 in micellar solutions of cetyltrimethylammonium bromide, Tween 80 and sodium dodecyl sulfate, respectively.

Acknowledgement. This work is supported by Russian Scientific Foundation, grant no. 14-23-00073.