QUINOLINE DERIVATIVES: CANDIDATE MEDICINES FOR RESPIRATORY SYNCYTIAL VIRUS TREATMENT

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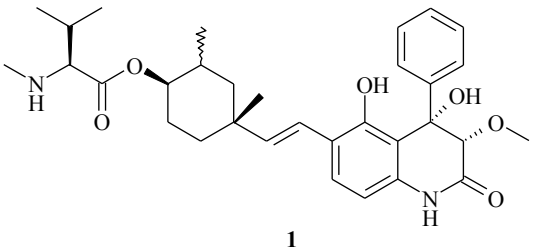
Introduction. Respiratory viruses are responsible for significant global morbidity and mortality. Nearly half of pediatric community acquired pneumonia and a quarter of adult cases have evidence of viral infection. The World Health Organization predicted that lower respiratory tract infections will be the third leading cause of death in 2016. Respiratory syncytial virus (RSV) accounts for 17.19% of viral disease outbreaks in neonatal units (2013), being one of the five most frequent viral agents. RSV conferred higher fatality than influenza, and was the second killer among hospitalized elderly.

Aim. The study is dedicated to analysis of resent progress in anti-RSV small molecule fusion inhibitors development, and design of quinolone derivatives as perspective new agents against RSV.

Materials and methods. Scientific data analysis, drug design strategy, methods of organic synthesis.

Results and discussion. Small molecule inhibitors for RSV identified to date belong to benzimidazoles, benzodiazepines, and some other nitrogen containing heterocycles. In 2014-2015, their bioisosteres, e.g. quinazoline, quinoline and isoquinoline derivatives, were studied for the same activity, and some active compounds (for example, structures **1** and **2**) were revealed.



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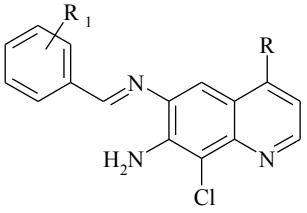

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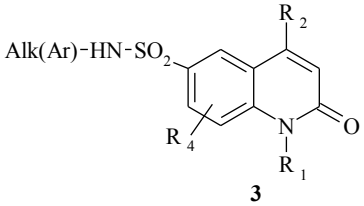

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Being involved in quinoline medicinal drug development, we have suggested structures **3** that include quinolone-2 cycle and sulfonamide moiety as main pharmacophore fragments for antiviral study. It has been already shown that sulfonamide group presence in anti-RSV substances has proved its efficacy and negligible toxicity.

Conclusions. Despite the fact that modern medicine still has no treatment for RSV infection, some recent progress has been made in the development of RSV fusion inhibitors and its results have been reviewed. The new molecular scaffold based upon quinolin-2-one heterocycle has been proposed for further investigation.