

## Sodium Oleate Increases Kanamycin Sensitivity Against *Methylophilus quaylei* Biofilms

Научный руководитель – Pshenichnikova Anna Borisovna

*Mohamed Abir Mohamed*

Аспирант

Московский технологический университет, Институт тонких химических технологий,  
Кафедра биотехнологии и промышленной фармации, Москва, Россия

E-mail: [aber.mohamed@yandex.ru](mailto:aber.mohamed@yandex.ru)

*Mohamed A M H A<sup>1,2</sup> and Pshenichnikova A B<sup>1</sup>*

*phd student, associate professor*

<sup>1</sup>*MIREA - Russian Technological University, M.V. Lomonosov Institute of Fine Chemical Technologies, Moscow, Russian Federation*

<sup>2</sup>*Fayoum University, Faculty of Agriculture, Microbiology Department, Fayoum, Egypt*

E-mail: <mailto:aber.mohamed@yandex.ru>

**Keywords:** biofilms, kanamycin sulfate, sodium oleate, methylotrophic bacteria.

Biofilms are complex communities of microbes that attached to a surface and encased within the exopolymeric matrix. These structures play a special role in the persistence of bacterial infections. The biofilm lifestyle exhibit more resistant to antibiotics, compared with planktonic form. Therefore, studying biofilm and the strategies for eliminating them is one of the most important fields of research nowadays.

Here we are focusing on novel strategies that target biofilm inhibition by the combination of anti-biofilm compounds with antibiotics to restore their effectiveness towards combating the biofilm form [1].

The aim of this work was the use of a bacterial model system which is a gram-negative obligate methylotrophic bacterium *Methylophilus quaylei* [2], characterized by resistance to streptomycin that can utilize methanol as sole carbon source.

Bacterial biofilms were established on polypropylene coupons for 24 h then the planktonic suspension was removed and a fresh mineral medium was added (control), medium supplemented with kanamycin sulfate or in combination with sodium oleate. Then they were kept for another 24 h. The effect on the established biofilms was assessed by crystal violet staining and determination of colony forming unit (CFU).

In case of the control of *M. quaylei* biofilm CFU/ml was  $9.8 \times 10^7$  and for 0.01 mg/ml kanamycin sulfate alone and in combination with 0.003 mg/ml sodium oleate were  $6.4 \times 10^4$  and  $3.6 \times 10^2$  respectively. Results indicated that there was an inhibitory effect about 175.7 times higher when sodium oleate was combined with kanamycin sulfate against *M. quaylei* biofilms.

### References

- 1) Estrela, A. B. Abraham, W. R. Combining Biofilm-Controlling Compounds and Antibiotics as a Promising New Way to Control Biofilm Infections. *Pharmaceuticals* 2010, 3 (5), 1374-1393.
- 2) Pshenichnikova, A. B. Gavrilova, E. S. Shvets, V. I. Influence of physico-chemical properties of the gram- negative bacteria cell surface on the resistance to streptomycin // *Vestnik MITHT*. 2011, 6 (2), 43-50.