

28th International Conference on

CHEMISTRY & DRUG DESIGNING

December 05-06, 2018 | Vancouver, Canada

The effect of glycerol on shape, size, and growth rate of *Escherichia coli*.

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Carbohydrate is a decisive factor in the growth of bacteria. Studies showed the importance of glucose as the most common carbon source of bacteria in the bacterial growth. However, the role of glycerol on bacterial growth remained to be clear. In the current study, we examined the effects of glycerol on the two strains (HF19, MC1061) of *Escherichia coli* growth. To this aim, we measured the optical density and colony formation unit per milliliter of cultured media. In addition, the cell dry mass of the cultured media has been assessed. Furthermore, in order to directly study the effect of glycerol on the *E. coli* cell proliferation, we used hemocytometer. Here we found strong correlation between optical density and CFU/ml in the all incubation period in the control groups. Surprisingly, our data showed very weak correlation between optical density and CFU/ml in the glycerol-treated group after 24-hour incubation. Our data also indicated that glycerol increased the optical density, colony formation unit and cell dry mass of the sample. Although our data indicated strong relation in the control groups, in all incubating period, in the glycerol-treated group, we observed strong relation only in 6-hour and 12-hour incubation period, not in 24-hour incubation. This data suggest that in long time glycerol incubation, glycerol induced changes in shape and/or size of *E. coli* in both strains.

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