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Analysis of Changes in Envelope Cell of *Escherichia coli* Pathogenic After Exposure to Stress Conditions Using FTIR

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Abstract: *Escherichia coli (E. coli)* pathogenic strains are causing foodborne illness, which represent a public health threat that must be confronted. Since bacterial cells react to different conditions of stress inducing physiological and structural changes, causing cells death. The aim of this study was to evaluate infrared spectral changes after exposure to different concentrations of detergent, metanol, polimixina B and proteinase K like factors of stress in the cell envelope of *E. coli.* For detergent, marked changes in profile of band PO_2- at 1251-1319 cm^{-1} were observed. Spectral variations corresponding to *E. coli* treated with methanol are observed at 1300 and 900 cm^{-1} and are associated to damage of the wall and cell membrane, when this cell was treatment with polimixina B, shows significant changes in the two sugar bands at 1070 to 1090 and 1030 to 1060 cm^{-1}. Finally, the effects of proteinase K on *E. coli* are observed mainly in amide I group and amide II groups, at 1800 and 1500 cm^{-1}, belonging to the proteins and peptides, which give us comprehensive information about proteins structure. Infrared results show that is possible to determine the effect of several stress concentrations associated to changes in the infrared absorption bands.

Keywords*: E.coli*, stress, infrared, cell, envelope, changes.

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