In vitro cytotoxicity assessment of a biosurfactant isolated from *Vibrio* sp.df on MCF-7 and HT-29 human cancerous cells

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Aim and Background: Biosurfactants (Bs) are amphipathic and surface-active molecules, produced by some microorganisms. They moderate surface and interfacial tension of liquids, affect on cell adhesion and increase membrane permeability which leads to cell disruption. In comparison to synthetic ones, biosurfactants are non-toxic, biocompatible and safe for environment. Moreover, this the anti-cancer potential of these molecules is being studied. The purpose of present study was to determine whether the extracted biosurfactant could affect the viability of breast cancer (MCF-7) and colorectal cancer (HT-29) cell lines.
Methods: In this study, a native bacterial isolate *Vibrio* sp. df was used to investigate its potential for biosurfactant production, which was confirmed by hemolytic and emulsification activity and oil spreading assay. The produced biosurfactant was purified and then characterized using Fourier transform-infra red spectroscopy (FTIR) and Zeta potential measurements. Furthermore, the cytotoxicity study against MCF-7 and HT-29 cells was investigated by MTT assay.
Results and Discussion: The characterization results confirmed the validity of Bs production. The cytotoxicity evaluation indicated that the Bs did not have a significant effect on the viability of targeted cell lines for the applied Bs concentrations.
Conclusion: The native strain *Vibrio* sp .df can produce biosurfactant. Although produced Bs did not have significant cytotoxic effects on selected cancer cell lines but, the results may be used for its further application on the biosafety of Bs based drug development.
Keywords: Biosurfactant, *Vibrio* sp. df, cytotoxicity, cancer cell lines