

IS32. THE EFFECT OF ARSENIC ON HUMAN CELLS AND PROTEINS INVESTIGATED USING SPECTROSCOPIC TECHNIQUES

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An understanding of the molecular details of the interaction between arsenic compounds and human cells and macromolecules is important for countering the harmful effects of arsenic and developing new drugs. Unfortunately, studies in this area is limited. We have been applying spectroscopic techniques such as FTIR spectroscopy and MALDI-TOF spectroscopy to investigate the effects of different arsenic compounds on human cell lines. Large changes in the spectra of cells were seen in the presence of some arsenic compounds that could be attributed to alterations in proteins and lipids. Our findings suggest that MALDI-TOF spectroscopy and FTIR spectroscopy can be useful tools for monitoring toxic effects of arsenic on human cells. This approach could be utilised for drug discovery projects and also for understanding the molecular basis of the effects of arsenic on human cells. We have also used FTIR and fluorescence spectroscopy to study the effect of arsenic compounds on the conformation of proteins such as human transferrin. These studies reveal that arsenic can interact with transferrin altering its conformation. This may modulate the function of transferrin in populations exposed to high levels of arsenic. The implications of these findings on human health will be presented.

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