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DNA–Protein Cross-link Formation in Burkitt Lymphoma Cells Cultured with Benzaldehyde and the Sedative Paraldehyde

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Exposure to aldehydes represents potential risks to human and animal health. Cyclic aldehydes such as benzaldehyde, 2-furaldehyde, and paraldehyde were found to induce formation of stable DNA–protein cross-links (DPXs) in cultured human lymphoma cells. A relationship between increased cytotoxicity and DPX formation was observed with each aldehyde. Paraldehyde is a sedative drug used predominately in treatment of ethanol withdrawal. Paraldehyde was the most potent cross-linking aldehyde studied, yet least cytotoxic. Although DPX formation by aliphatic aldehydes is well-known, this study confirms the potential for cyclic aldehydes to cause formation of DPXs in cultured cells at therapeutically relevant doses.

Keywords Aldehyde, Benzaldehyde, DNA–protein cross-link, Formaldehyde, Furfural, Paraformaldehyde, Paraldehyde.