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Detection of Microbial-Derived Components in Dental Unit Water Lines using NMR. C. SMITH, H. AL SHORMAN, L. ABU-NABA'A, M. GROOTVELD, C. SILWOOD and E. LYNCH. Oral Research Centre, School of Dentistry, QUB, United Kingdom

Objectives: to examine the ability ofhigh resolution proton nuclear magnetic resonance (NMR) spectroscopy through a multicomponent evaluation of biomolecules to provide useful molecular information regarding the nature and level of microbial contamination in DUWLs. **Methods**: Water samples were collected from 16 independent dental units. Each sample was divided into two halves. The first half was subjected to ozone for 10 seconds. The other half was saved as control. Samples were thoroughly centrifuged, and the supernatants subjected to proton NMR analysis using a Bruker AMX-600 spectrometer. **Results**. Results acquired revealed many prominent, sharp resonances ascribable to a wide range of low-molecular-mass biomolecules. Indeed, the most intense signals present are those ascribable to microbial-derived organic acid anions, notably acetate, formate , lactate, propionate and succinate. Further biomolecules detectable included the amino acid glycine, a number of aromatic compounds and occasionally ethanol. Treatment of DUWLs with the powerful microbicidal agent ozone gave rise to a substantial reduction in many of the microbial fermentation products detectable in samples collected 18 hr. after treatment ($p < 0.01$). Multicomponent ^{1}H NMR investigations of DUWLs provide much valuable information regarding their chemical composition. Indeed, since many of the components detectable in these samples represent chemotaxonomic 'markers' of microorganisms (e.g. acetate, formate and propionate). **Conclusions**: ^{1}H NMR spectroscopy provides much valuable information regarding the chemical composition of DUWLs, data which are likely to reflect the nature and level of their microbial contamination, and the ability of microbicidal agents to diminish such befouling.