

---

# DEVELOPMENT OF AN ON-LINE LC-MS/MS METHOD FOR THE DETERMINATION OF BASIC PESTICIDES (PPB) IN EFFLUENT WASTEWATERS

Michael G. Cahill (1), Giovanni Caprioli (2), Mary Stack (3), Sauro Vittori (2) and Kevin J. James (1)

(1) PROTEOBIO, Cork Institute of Technology, Rossa Avenue, Bishopstown, Co., Cork, Ireland

(2) Dipartimento di Scienze Chimiche, Facoltà di Farmacia, Università di Camerino, via S. Agostino 1, 62032 Camerino, Italy

(3) Environment Directorate, Cork County Council, Inniscarra, County Cork, Ireland

The contamination of wastewater with pesticides has been recognised as an area of increasing concern by the European Commission. Effluent from wastewater treatment plants have been identified as an important source of pesticides in the environment. An on-line high performance liquid chromatography- heated electrospray ionization tandem mass spectrometric (LC-MS/MS) method was developed and validated for the determination of pesticides in effluent wastewaters. Currently available methods for pesticide analysis in wastewater samples are time-consuming and require complex clean-up steps. The main objective of this study was the development of a simple solid phase extraction (SPE) procedure for matrix removal and an on-line sample pre-concentration step to permit the detection of target analytes at  $\mu\text{g/l}$  concentration levels in wastewater samples. Wastewater (1 ml) was pre-concentrated on a  $\text{C}_{18}$  trapping column with a CTC autosampler and backflushed onto an analytical column ( $\text{C}_8$ ) with detection using triple quadrupole MS/MS. The MS method exploited mass resolution (0.6 – 0.15) to improve the signal/noise and detection limits for pesticides. This method was applied to the determination of methoxytriazine, chlorotriazines, chloroacetanilides, phenylurea and carbamate pesticides, with consistent linear calibration data within the target analyte concentrations of 1-10  $\mu\text{g/l}$ . Using this method, simazine, atrazine, atrazine desethyl, prometon and diuron were determined in wastewater samples throughout County Cork, Ireland. Analyte conformation was carried out using high resolution mass spectrometry (Orbitrap XL).