ADVANCES IN PROFILING OF NATURAL PRODUCTS BY TRIPLE DETECTION TECHNIQUES COMBINED WITH SUPER CRITICAL CO₂ MOBILE PHASES AND SUB-2µM STATIONARY PHASES

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Convergence chromatography (CC) is a separation technique that utilizes both super and sub-critical carbon dioxide (CO₂) and sub-2 µm stationary phases to achieve unique selectivity, low solvent usage and high efficiencies. The use of supercritical fluid as a mobile phase provides higher diffusivity and lower viscosity than liquid mobile phases, thereby providing higher throughput and chromatographic efficiencies as compared to liquid chromatography.

The analysis of natural products has typically been challenging, not only because of the complex matrices but also the numerous components with varying physical and chemical properties. To address these difficulties, multiple detectors are typically used during a single analysis whereas each detection technique is based on a different physical or chemical property of the molecule. For example, mass detectors and PDA are commonly combined to obtain both mass and UV-spectral information. Evaporative light scattering, a more universal technique, addresses compounds without ultraviolet absorbance (no chromophore) and poor ionization by MS. The combination of these three detection techniques allows for analysis of a wide range of compounds. In this presentation, we will investigate the analysis of a number of natural products using triple detection in combination with CC. Identification and quantitation of compounds will also be illustrated. Guidance combining triple detection with CC will be provided based on the observations attained throughout the analysis. This approach when combined with sub-2 µm column chemistries will allow for the detection of compounds with a wide range of physical and chemical properties.