

S007 Analysis of eicosanoids and related lipid mediators using mass spectrometry

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Eicosanoids are a diverse group of lipid mediators formed by enzymatic oxidation of arachidonic acid. Drugs that target eicosanoid-generating pathways are used for treatment of pain, inflammatory and autoimmune disease and there is significant current interest in their anti-cancer properties. Biological levels of eicosanoids can be assayed in numerous ways. ELISAs are commercially available and easy to use, but are subject to significant problems with non-specificity. HPLC combined with UV detection is useful for certain lipids, but not all. The gold standard is mass spectrometry. GC/MS was primarily used for many years but suffered from complexities in sample preparation and analysis. Increasingly, this is being replaced by LC/MS/MS which provides almost equivalent sensitivity but with much less sample manipulation. Although LC/MS/MS is more accessible to new users, the overall cost and time investment of this technology is still prohibitive to many groups. This talk will focus on analysis of eicosanoids and related mediators using LC/MS/MS. In a single assay, multiple species can be quantified based on their retention time and unique mass spectrometric fragmentation pattern, where they decompose on collision induced dissociation to generate unique daughter ions. Limits of detection down to 1 pg on column can be achieved with newer instruments, more than sufficient for most samples. Methods of sample extraction will be described, followed by the principles of MS analysis, including electrospray and tandem mass spectrometry.