Sacks, G.L. *Facilitating grape breeding through flavor analysis*. Cornell University – Kyoto University Joint Symposium on Bioactive Compounds, Ithaca, NY, March 5, 2013.

Although wine chemistry is widely acknowledged to be dependent on grape chemistry, blending vodka with grape juice is a poor substitute for wine. Many of the critical flavor compounds in both grapes and wines are altered during fermentation, which creates a challenge for grape breeders interested in selecting for desirable (or against undesirable) flavor traits. Breeding efforts would be facilitated by development of grape analysis methods that accurately predict concentrations of key compounds in finished wines. This talk will discuss the application of 1-D (GC) and comprehensive 2-D (GCxGC) gas chromatography coupled to time-of-flight-mass-spectrometry (TOF-MS) for quantification of trace and ultra-trace concentration aroma compounds in grapes and wines. In particular, the talk will consider the practical interest and analytical challenges in measuring compounds responsible for herbaceous and vegetal aromas in grapes and wines. Strategies for comprehensive, "-omics" type measurements of volatile compounds based on uniformly labeled (e.g. U-13C or U-15N) isotopic standards will also be discussed.