Sacks, G.L. *Trials in grape and wine flavor chemistry*. Penn State University Food Science Seminar Series, State College, PA, January 17, 2013.

Although wine quality is widely acknowledged to depend on grape quality, blending vodka with grape juice is a poor substitute for wine. Many of the critical flavor compounds in finished wines are produced from precursors in grapes that are transformed into sensorially active compounds during fermentation, although there are a few prominent exceptions. As a result, there is considerable interest among viticulturalists, enologists, and grape breeders in understanding the relation of grape chemistry to eventual wine flavor chemistry. The first part of this talk will discuss the application of comprehensive 2-D gas chromatography (GCxGC) coupled to time-of-flight-mass-spectrometry (GCxGC-TOF-MS) to quantification of trace and ultra-trace concentration aroma compounds in grapes in 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 uniformally labeled (e.g. U-13C or U-15N) isotopic standards will also be discussed.