COURSE GOALS

• Gain an introductory *understanding* of the fundamentals of ion mobility spectrometry and its analytical capabilities.

• Describe the various types of IMMS instrument that are commercially available.

• Appreciate the *value-added* aspect of coupling IMS with MS.

• Explore the figures of merit required to *evaluate* different instruments and determine which best suits your analytical needs.

• Highlight the range of applications of IMMS.
Ion Mobility Mass Spectrometry
Fundamental Characteristics

\[ K_0 = \frac{L^2}{t_d V} \times \frac{P}{760} \times \frac{273.15}{T} \]

http://bowers.chem.ucsb.edu/theory_analysis/ion-mobility/index.shtml
Biomolecular Class Separations

(Analytical Selectivity from Prevailing Structural Characteristics)

Gas-Phase Protein Conformations
Enhanced Data Interpretation Enabled by IMMS

- Improved Sensitivity & Increase Confidence in Feature

Only 3 features discerned without drift time dimension (*)
Separation of Isobaric Species

1. (Hesperidin + Ag)$^+$
   Drift Time: 45.41 ms
2. (Neohesperidin + Ag)$^+$
   Drift Time: 46.57 ms
3. (Rutin + Ag)$^+$
   Drift Time: 48.84 ms

(a) 571/573 (-R)
(b) 717/719 (M+Ag)
(c) 409/411 (-D)
(d) 415/417 (-A)
(e) 415/417 (-A)
(f) 571/573 (-R)

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J. Mass Spectrom. 2006; 41: 339–35100