**Flow Injection Analysis**

Flow Injection Analysis (FIA)

Typical FI detection response output: S is sample injection; W is peak width; A is peak areas; H is peak height and T is residence time.
Flow Injection Analysis

Sample injection

Sample injection

Flow Injection Analysis

Sample injection

Flow Injection Analysis
Flow Injection Analysis
Flow Injection Analysis

Flow Injection Analysis

Acid -> Buffer -> Sample -> column -> ICP-MS -> Waste

Waste
Flow Injection Analysis

Reproducibility
**Flow Injection Analysis**

- $r^2 = 0.998$
- LOD = 0.67 µM PO$_4$-P
- Linear Range = 0.8 - 50 µM
- Sample throughput = 40 samples h$^{-1}$
Flow Injection Analysis – Capillary Electrophoresis

**Flow Injection-Capillary Electrophoresis (FI-CE)**

- CE: Excellent tool for examining many types of species including proteins, DNA, sugars, cations and anions and drugs.

  “Achilles Heel” – sample introduction

- FI: Powerful sample introduction/manipulation tool

**FI-CE**

Potential in clinical and forensic, biological, environmental and pharmaceutical analysis.

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**Flow Injection Analysis**

Figure provided in part by: Dr. Gomez
Figure 1. Four direct injections of NADH (0.5 mg/mL) and vancomycin (0.5 mg/mL) in Tris-glycine (pH 8.3). The total time of analysis was 10 minutes (each 200 counts is equal to one minute) at a voltage of 10 kV. The length of the uncoated, fused silica (i.d. 50 um) capillary from the inlet to the detector is 36 cm.
In Class Questions

1. What are the key components to Flow Injection (FI)?
2. How does sample movement within the tubing affect the shape of an FI peak?
3. What are the advantages of combining FI with other instrumentation (e.g. FI-CE)?