

Biopharmaceutical affinity profiling of antibody and antibody-drug-conjugate preparations by on-line post-column surface plasmon resonance biosensing & mass spectrometry



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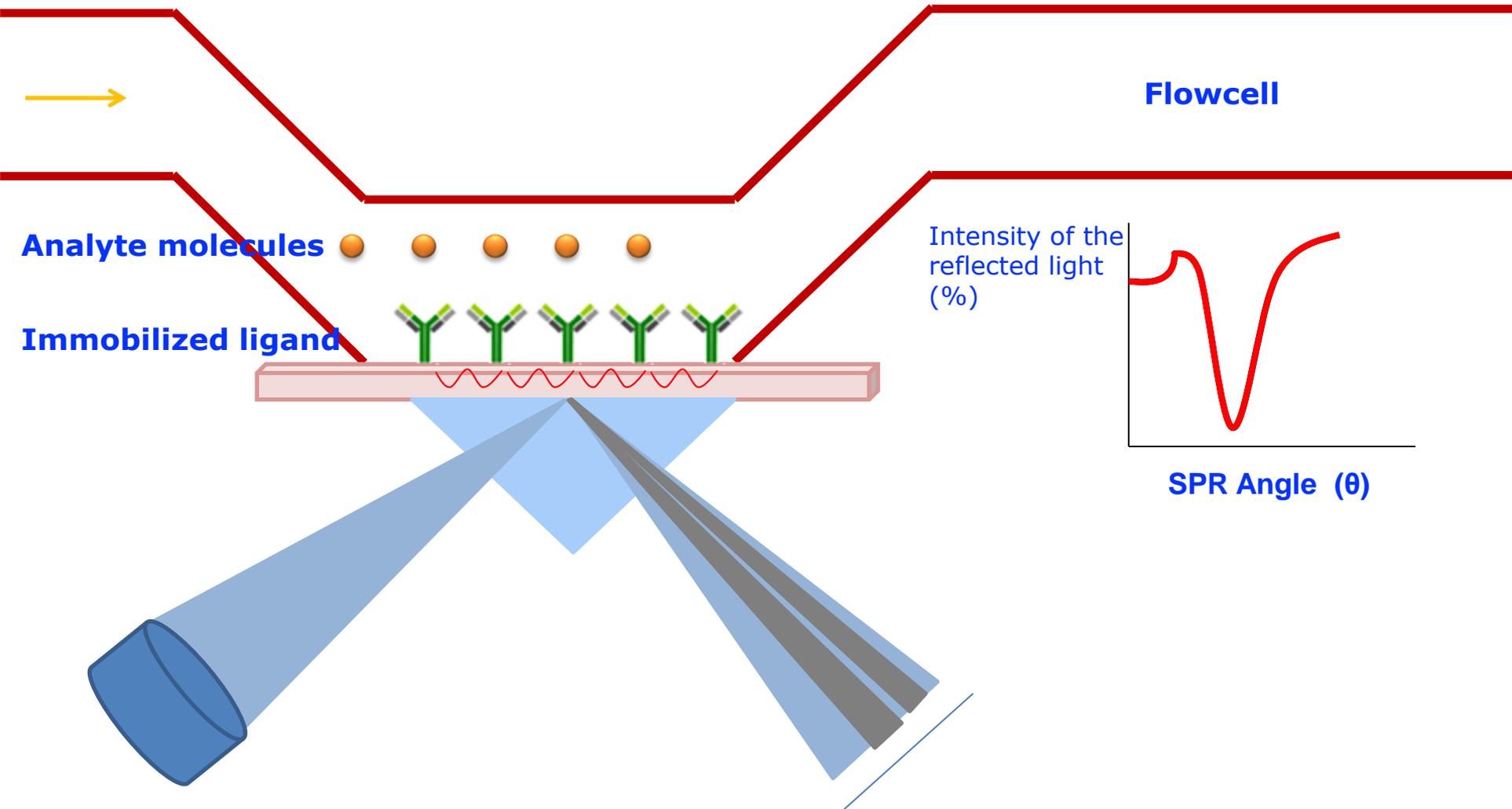


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Surface Plasmon Resonance



Biopharmaceuticals and their breakdown products

Biopharmaceuticals can degrade under various conditions such as heat, oxidation and/or long term storage

Biopharmaceuticals can differ from batch to batch during the production process

Upon entering the body, biopharmaceuticals are metabolized, degraded and digested by the body

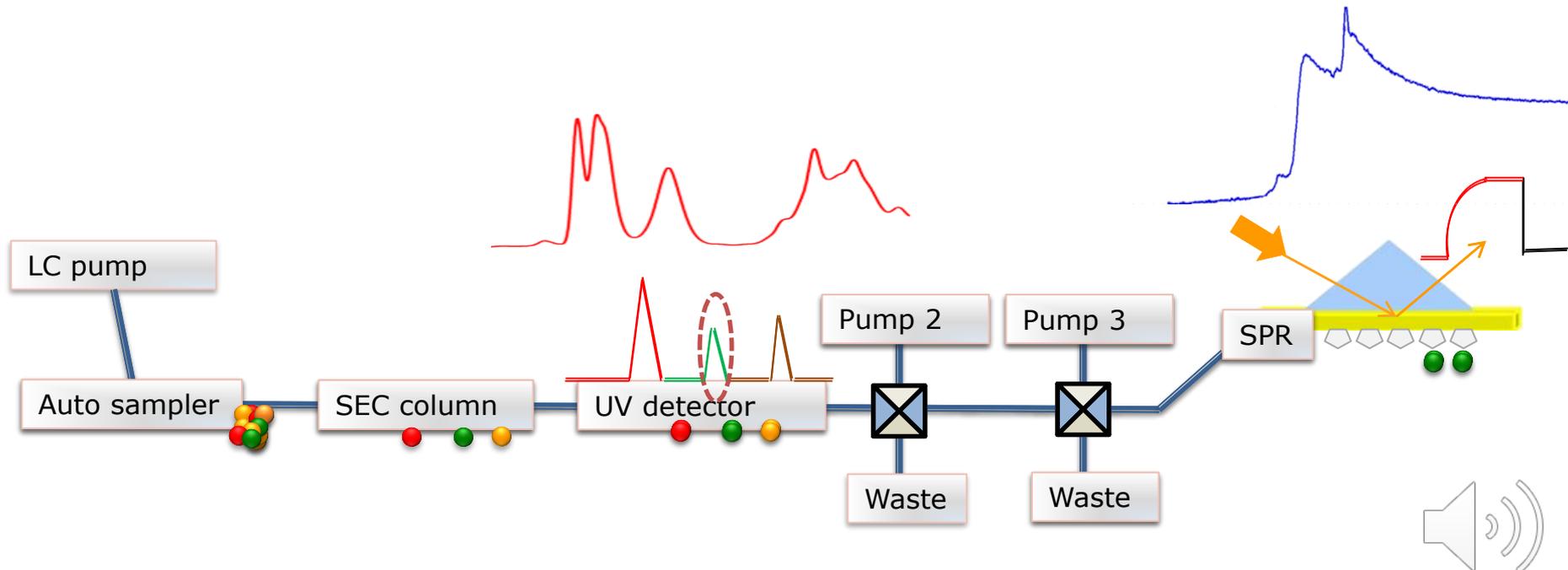
Biopharmaceutical antibodies are always mixtures; i.e. 'biopharmaceutical preparations'

So we are looking at mixture analysis



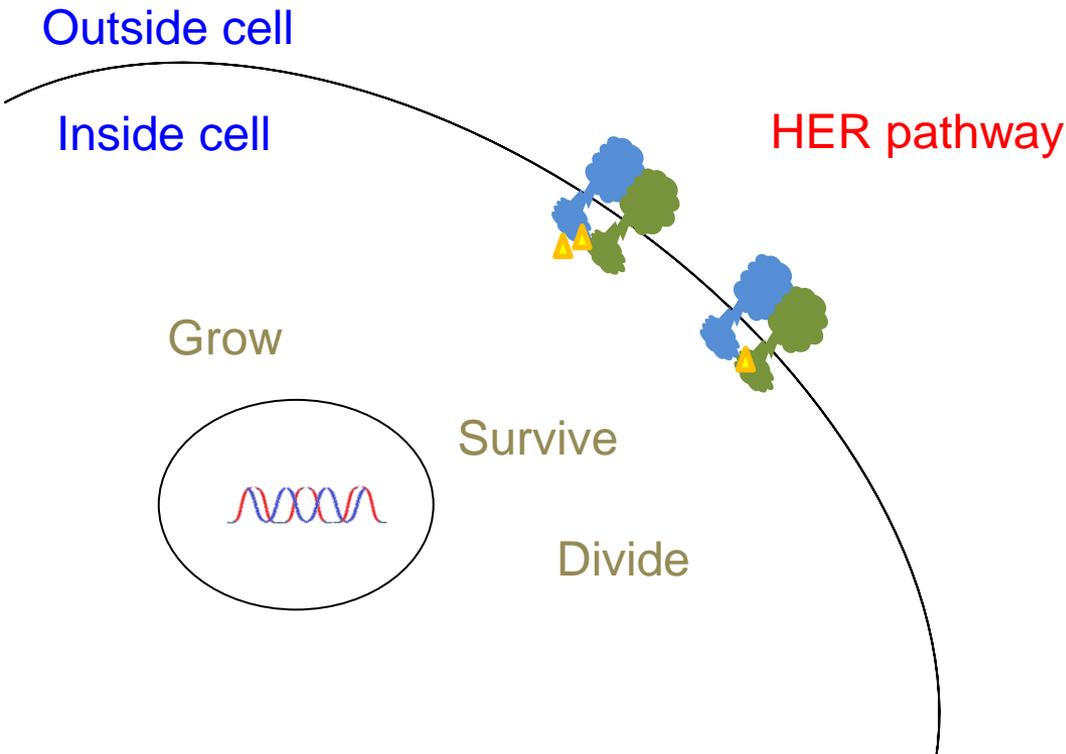
LC-SPR Hyphenation

Biopharmaceutical breakdown products



TRASTUZUMAB AS BIOPHARMACEUTICAL EXAMPLE

- 20,000 HER2 receptors are typically expressed on the surface of **healthy cell**
- **Cancer cell:** HER2 proteins are over expressed, **2 million** receptors on the tumor cell surface

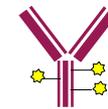


TRASTUZUMAB AS BIOPHARMACEUTICAL EXAMPLE

Drug development



Trastuzumab



TDM-1

Apoptosis of the target cell



AFFINITY DETERMINATION - SIZE VARIANTS

Size Exclusion Chromatography (SEC)

LC pump

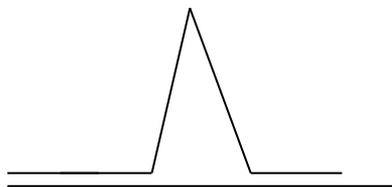
Auto sampler

SEC column

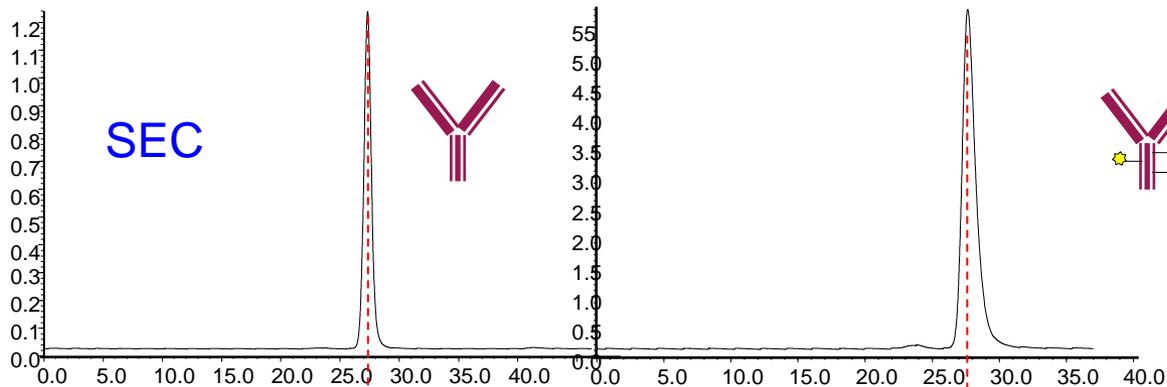
UV detector

SPR

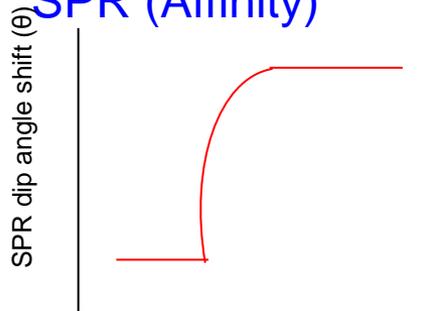
LC (Concentration)



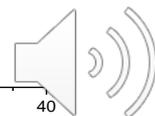
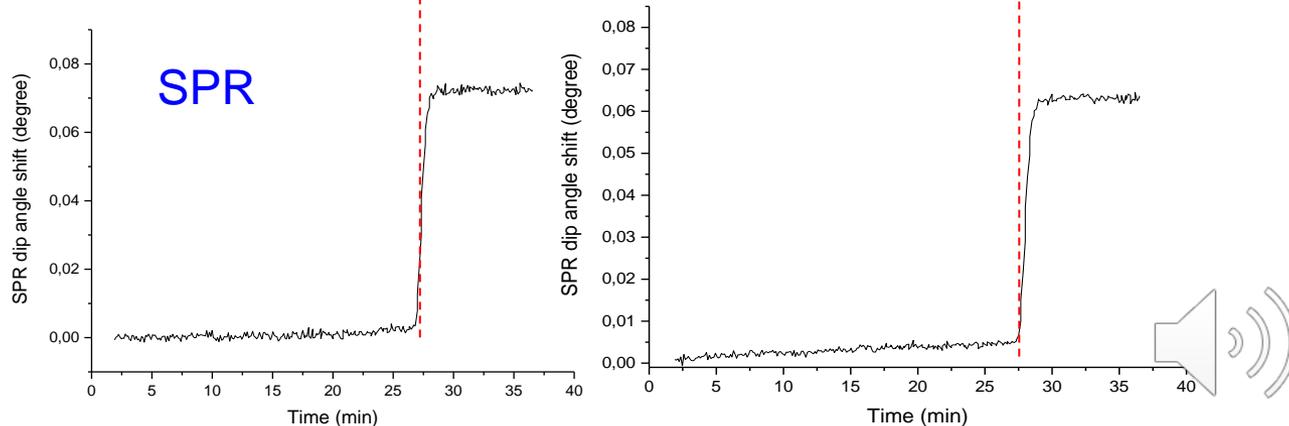
SEC



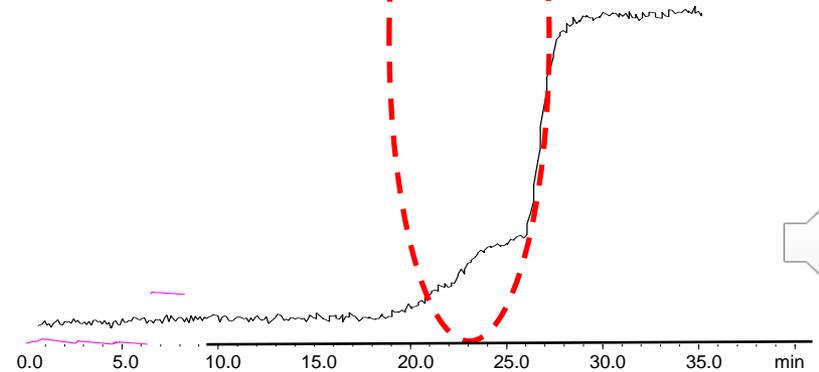
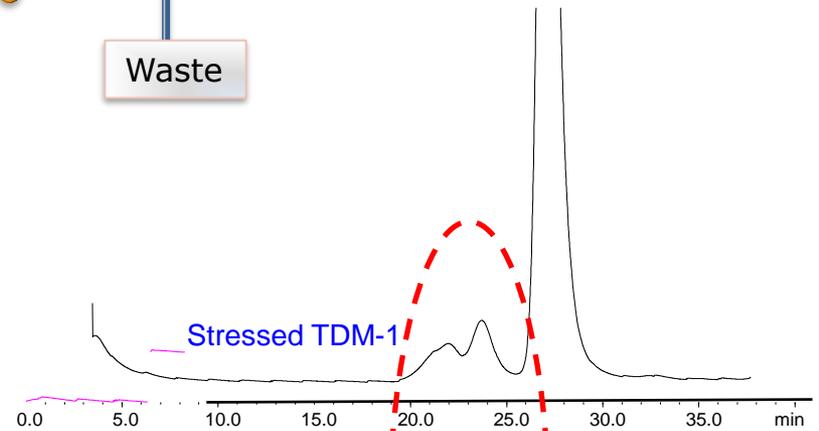
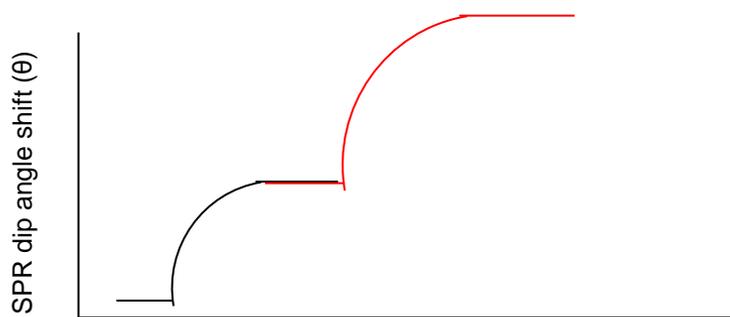
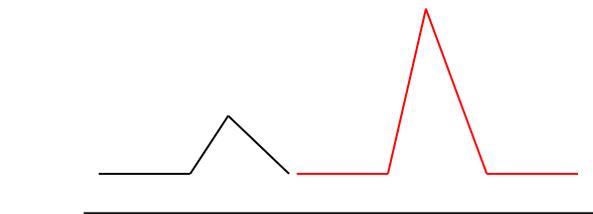
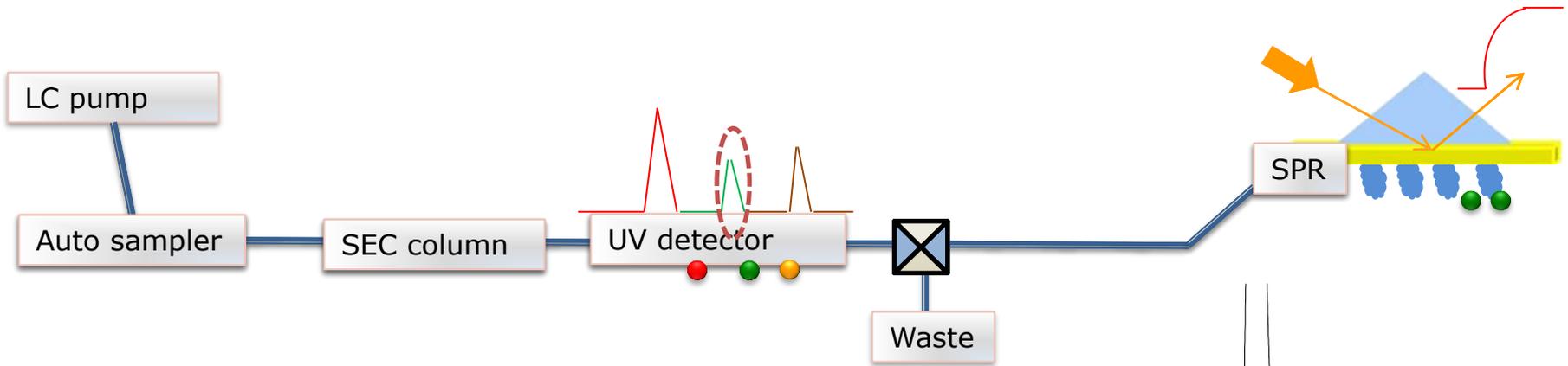
SPR (Affinity)



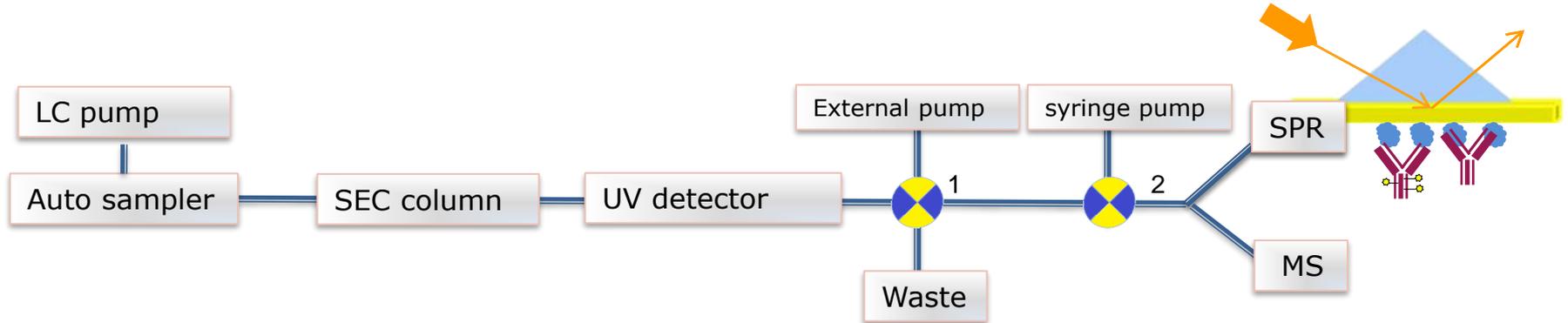
SPR



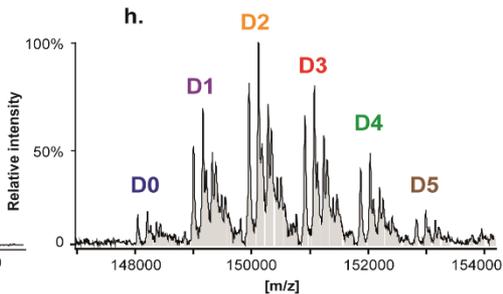
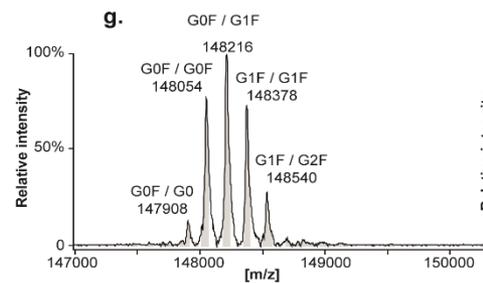
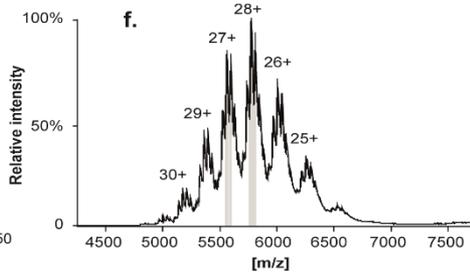
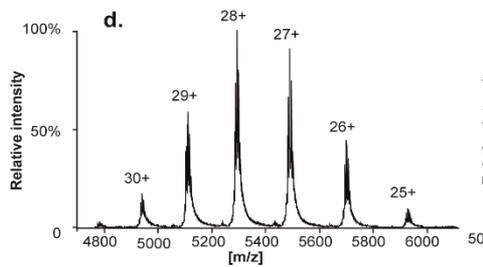
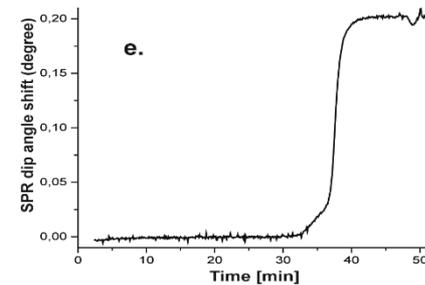
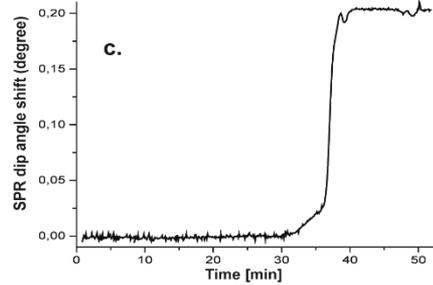
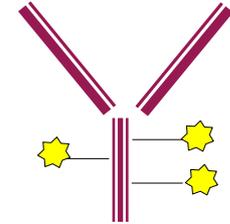
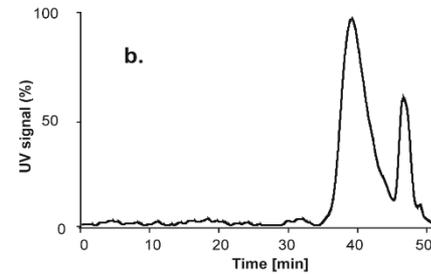
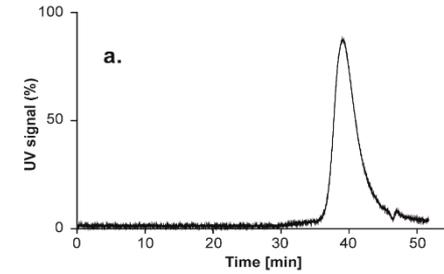
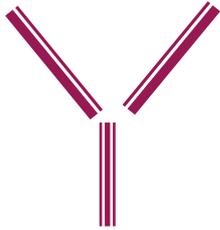
SEC-SPR ANALYSIS, STRESSED SAMPLES



LC-SPR-MS



LC-SPR-MS - RESULTS



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