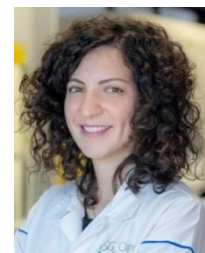


<b>Session</b>	<b>Materials Science in Glass (I)</b>
Date	APRIL 10, 2025
Time (CET)	13:45 - 14:00
Chair	Dr. İlkay Sökmen



## Advanced Surface Analysis Meets Chemical Functional Techniques to Study Glass in Pharmaceutical Packaging

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### Biography

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### Abstract

The pharmaceutical industry relies heavily on secure and effective packaging to ensure the integrity, safety, and efficacy of its products. Glass containers have long been a staple in pharmaceutical packaging, thanks to their unique attributes, such as transparency and chemical resistance. Nevertheless, there have been reports glass quality issues, such as corrosion/delamination.

In this study, advanced glass surface analysis techniques, namely, dynamic secondary ion mass spectrometry (D-SIMS) and x-ray photoelectron spectroscopy (XPS), were used in tandem with more consolidated chemical functional techniques for pharmaceutical products. The aim is to characterize the inner vial surface after the converting process and under stress conditions. Different vials obtained from distinct converting process parameters have been investigated by XPS and SIMS to evaluate at nanoscale level the surface composition that may be difficult to assess by other methods. Afterward, the evaluation of vial quality attributes was performed using chemical durability testing platform: pH shift, hydrolytic and corrosion resistance. The purpose is to correlate chemical and physical properties to better define the risk evaluation in assessing common failure modes of pharmaceutical containers.

In conclusion, this work provides a novel overview of the outlook of surface analysis techniques for glass containers in pharmaceutical packaging. By embracing these innovations, the pharmaceutical industry can continue to deliver safe and efficacious products and meet the evolving needs of patients and healthcare providers.

