

IS THIS WHY I'M HAVING A BAD HAIR DAY? INVESTIGATING SCALP TRANSDERMAL DIFFUSION IN POPULAR HAIR PRODUCTS USING INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY (ICP-MS). **Syrine Belaïd** and Nausheen Sadiq. Mount Royal University, Department of Chemistry and Physics, 4825 Mt Royal Gate SW, Calgary, AB T3E 6K6, Canada. (sbela250@mtroyal.ca)

The global hair care market is forecasted to hit \$94 billion USD [1]. This highlights the widespread use of hair products, incorporated into daily, bi-weekly, or weekly routines. Despite their prevalent use, the regulatory framework surrounding the commercialization of these products is lacking in many countries. This study aims to address this regulatory gap by sourcing popular hair products dedicated to hair care and styling, such as shampoo, conditioner, hair gel, and mousse, for comprehensive elemental analysis. The primary focus will be on quantifying heavy metals present in these products using ICP-MS, providing foundational data to inform regulatory bodies in Canada, and around the world. Additionally, the extent to which these metals permeate through a chitosan-based membrane, designed to mimic human skin, will be measured. Elevated levels of heavy metals such as lead, mercury, and cadmium have been linked to adverse health effects ranging from skin irritation to neurological disorders. By elucidating whether these metals remain on the scalp or are rinsed away during normal use, we can better evaluate the safety and efficacy of these products for consumer use.

[1] M. Alda, Statista, (2024)