



A60 Myth Busting: Can Lip Balm Aid in DNA Transfer?

Annamaria Crescimanno, BA, Elena M. Madaj, BA, and Kara Woodlee, University of Indianapolis, Archeology and Forensics Laboratory, 1400 East Hanna Avenue, Indianapolis, IN 46227; and Krista E. Latham, PhD, University of Indianapolis, Biology Department, 1400 East Hanna Avenue, Indianapolis, IN 46227*

The goal of this presentation is to demonstrate to the forensic community how the quality and quantity of DNA extracted from epithelial cells transferred from the lips to a drinking vessel can be impacted by the use of lip balm.

This presentation will impact the forensic science community by adding to the current knowledge base regarding the transfer of epithelial cells from an individual to an inert surface. Though much research has been conducted on saliva as a vector for DNA transfer, this research has expanded upon the available information by systematically analyzing an additional element: lip balm.

The media portrays DNA analysis as a relatively quick and easy forensic tool that can serve as the silver bullet that magically solves any forensic investigation. However, practicing forensic scientists know that extracting analyzable DNA from crime scene evidence is not as straightforward as the media portrays it to the general public. While several studies in published academic journals have demonstrated that epithelial cells from both saliva and the skin surface will transfer to a touched object, no research has been systematically undertaken to test if common skin and lip protection, such as lip balm, will help or hinder the recovery of DNA profiles from inert surfaces such as aluminum cans and ceramic mugs. The goal of this research is to conduct a pilot study to

assess how lip balm will influence the transfer of DNA from an individual's mouth to a drinking vessel. Data is also presented that compares DNA quality, based on PCR amplification success, and DNA quantity, based on agarose gel amplicon intensity, among vessels contacted with lip balm coated lips versus bare lips.

Original Chapstick brand lip balm was employed in this research due to its unisex use, and aluminum soda cans and coffee mugs were selected as the drinking vessels in this project due to their prevalent use by the general public. DNA was extracted from three aluminum cans and three coffee mugs from which the participant drank without the use of lip balm. DNA was also extracted from three aluminum cans and three coffee mugs from which the participant drank with the use of lip balm. Appropriate positive and negative controls were used to monitor for contamination during the research analysis. The authors chose to test for the presence of amplifiable nuclear DNA because of its individualizing nature in forensic investigations. The authors also employed the HUMTHO1 primers because of their common use in forensic genetic investigations, primarily due to its inclusion in CODIS. The results of this study show that DNA extracted from drinking vessels that came into contact with lips covered in lip balm yielded the most successful PCR amplification results based on amplicon intensity. It was also discovered that although lip balm does aid in the quantity of DNA transferred, the quality is lower when compared to DNA transferred from bare lips due to the increased smearing of the bands present on the agarose gels. In general, DNA collected directly from lips covered in lip balm yielded a better quantity of DNA which suggest that its use should increase chances of collecting transfer DNA from inert surfaces.

DNA, Transfer, Lip Balm