

Comparison of Breath Collection Techniques Using TD-GCxGC-MS

Natasha J. Babuik¹, E. Y. Mesfin¹, S. A. Schmidt¹, A. P. de la Mata¹, J. J. Harynuk¹

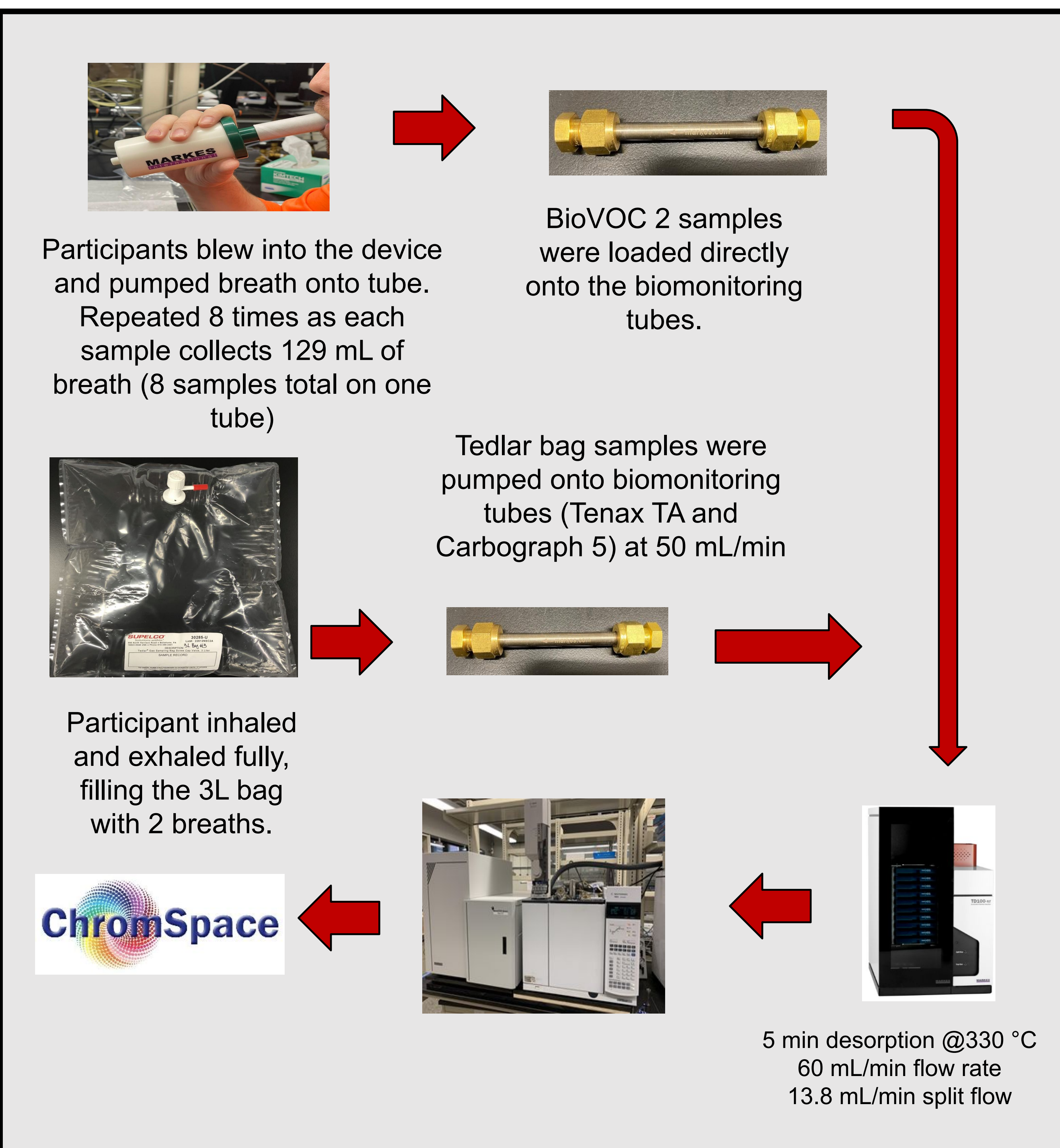
Department of Chemistry, University of Alberta, Edmonton, Alberta



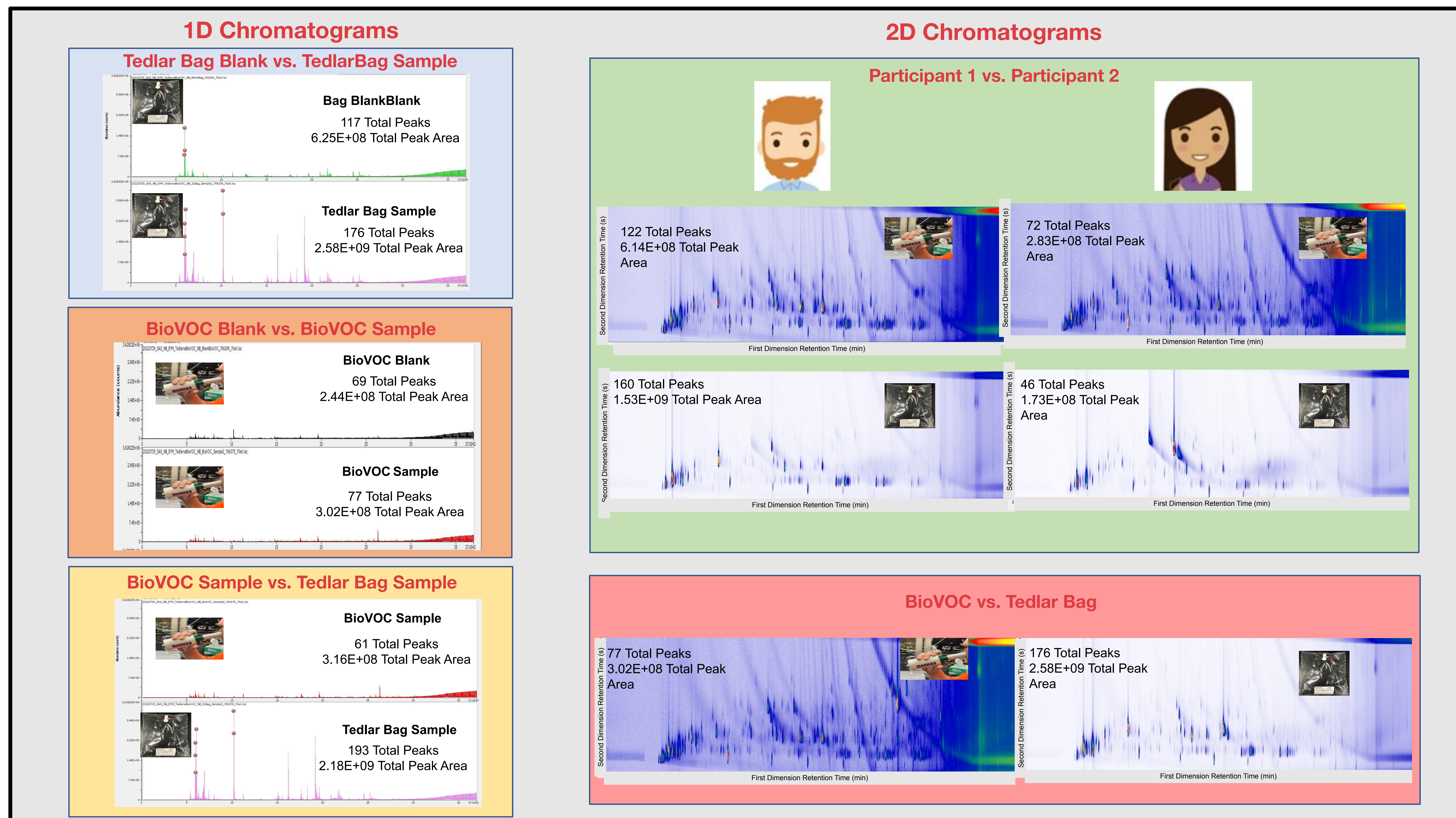
Introduction

- Exhaled breath contains volatile organic compounds (VOCs). VOCs are a broad class of compounds that includes many different organic compounds. Within the human body, these volatile metabolites act as biomarkers. They can indicate disease presence, progression, and environmental hazards/exposures, and can be used for other applications.¹
- Breath is gaining popularity as a biosample because its sampling process is non-invasive and low risk for patients.
- In this study, 3L Tedlar bags and the BioVOC2 device were compared as collection techniques for breath volatiles using TD-GCxGC-TOFMS. Techniques were compared according to analytical performance (diversity of compounds, analyte responses, etc.), as well as practical considerations (sampling time, ease of use, etc.).

Methods



Results



Conclusions

- Between the two sampling techniques used, Tedlar 3L bags resulted in more peaks, and more peak area than the BioVOC.
- Increased number of peaks and peak area allows for aids in detection of smaller compounds, paving the way for disease diagnostics.
- Further work needs to be done to have cleaner blanks for Tedlar bags
- Further work needs to be done on sampling techniques for BioVOC2 device.
- These results will help us in the future as we apply these methods to diagnose diseases and to continue analyzing breath.

Acknowledgements



References

- (1)A.Z.Berna, A.R.O.John, Clinical Chemistry 68:1 43-51 (2022) Breath Metabolites to Diagnose Infection