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Untargeted chemical characterization of the aerosol generated by a heated tobacco product

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All authors are employees of Philip Morris International

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Outline

- Brief summary of the methods used
- Performance characteristics
- Results
- Conclusions

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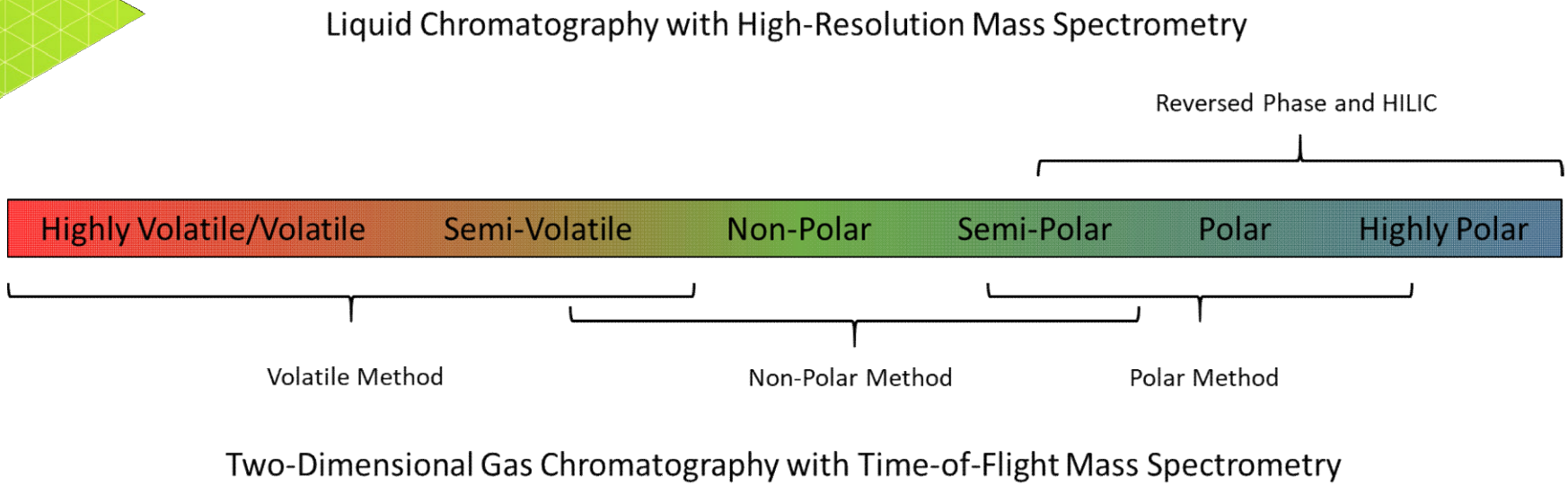
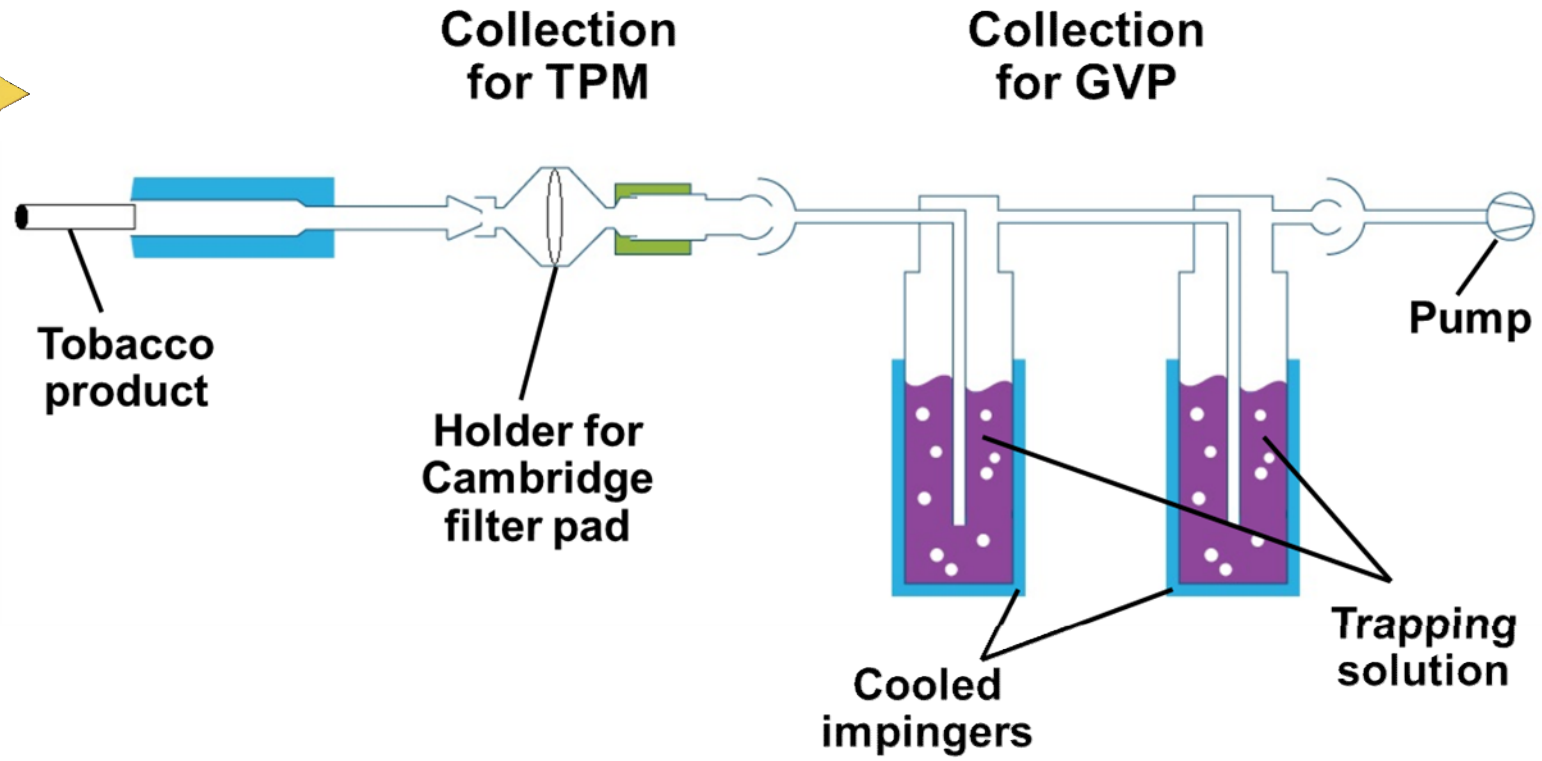
Suite of complementary methods



Sample collection procedure



TPM = Total Particulate Matter
GVP = Gas–Vapor Phase

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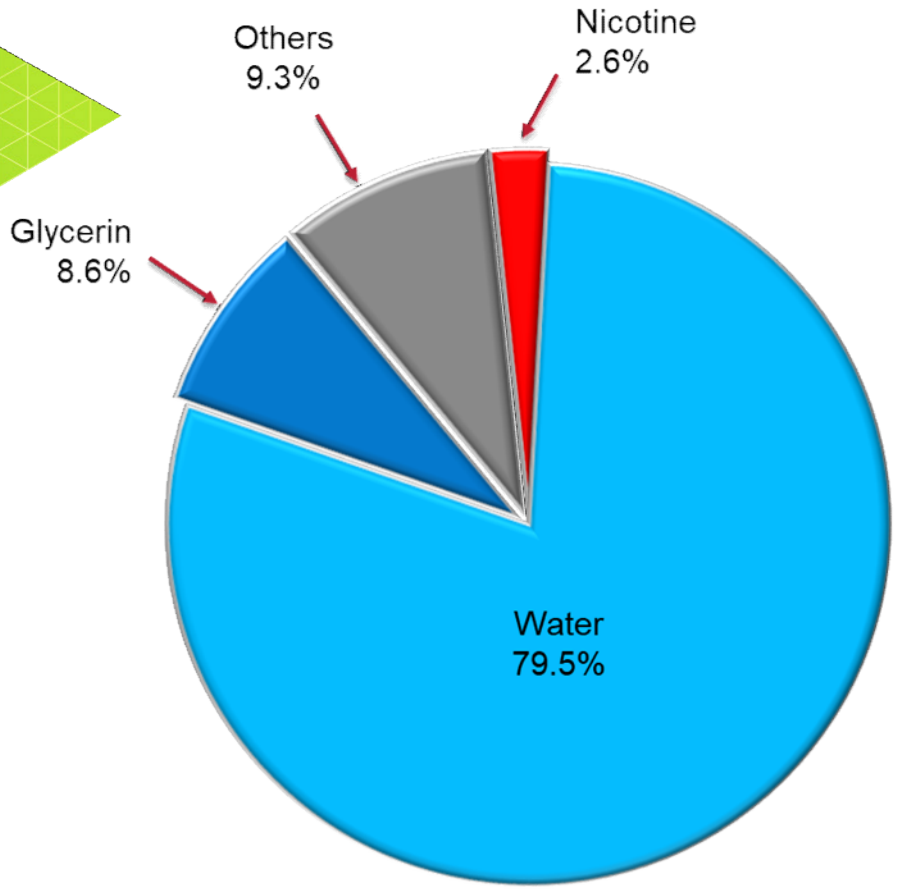
Total Particulate Matter (TPM)



Values quoted are for THS 2.2 using an in-situ extraction technique

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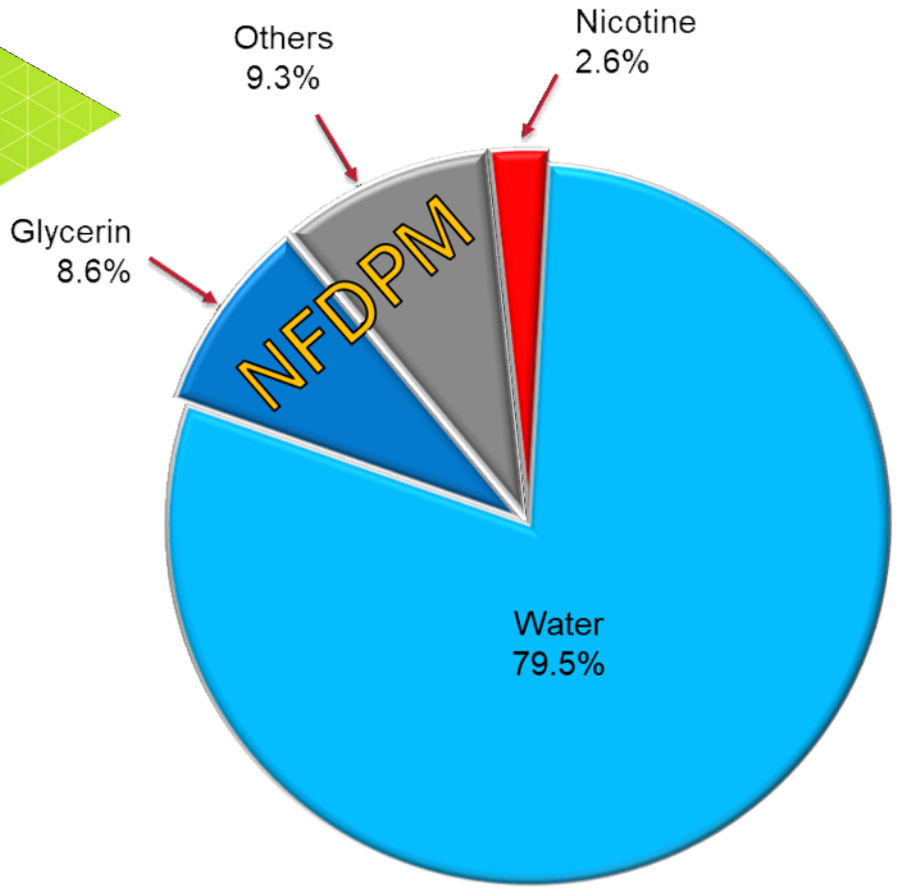

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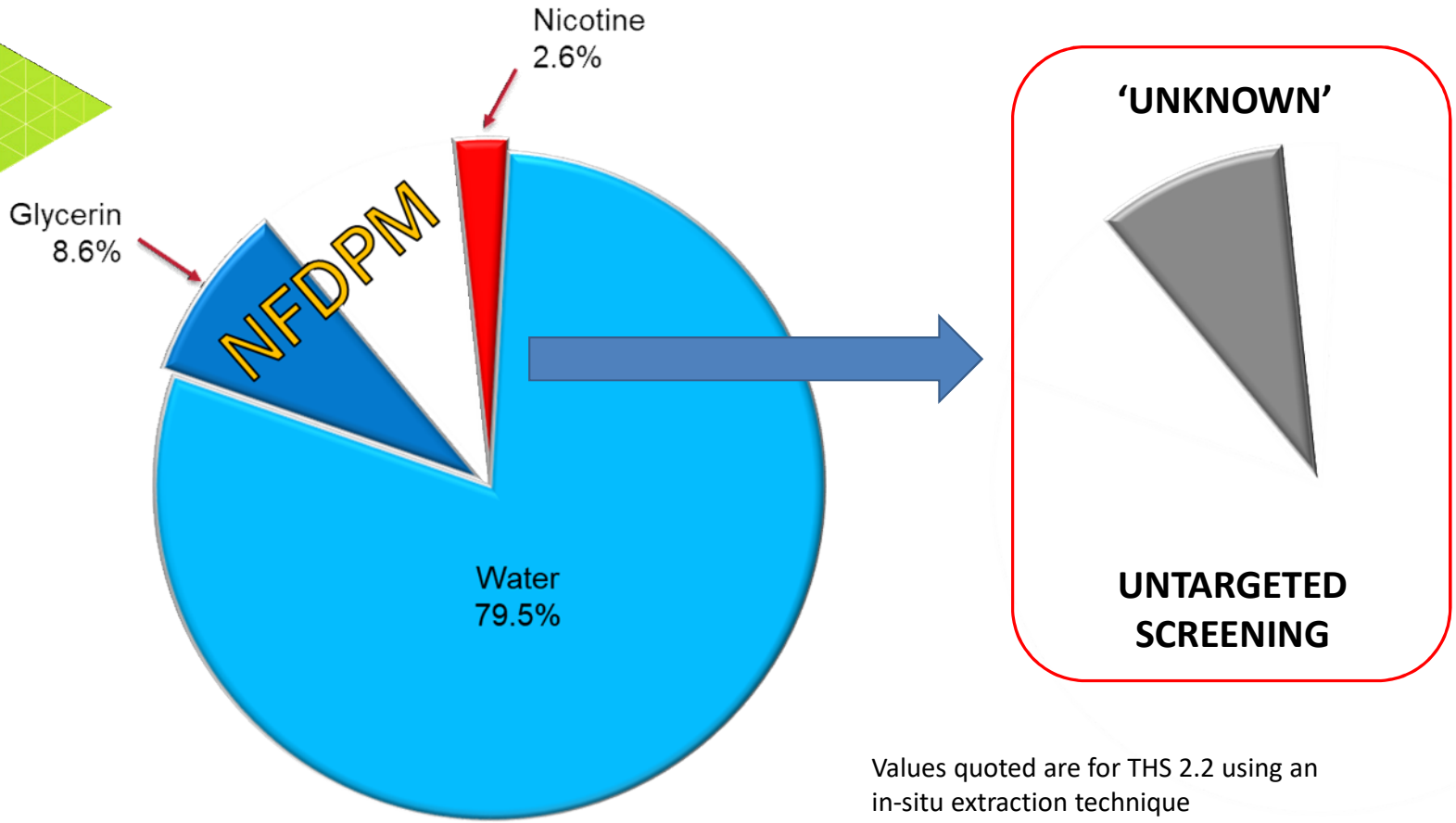

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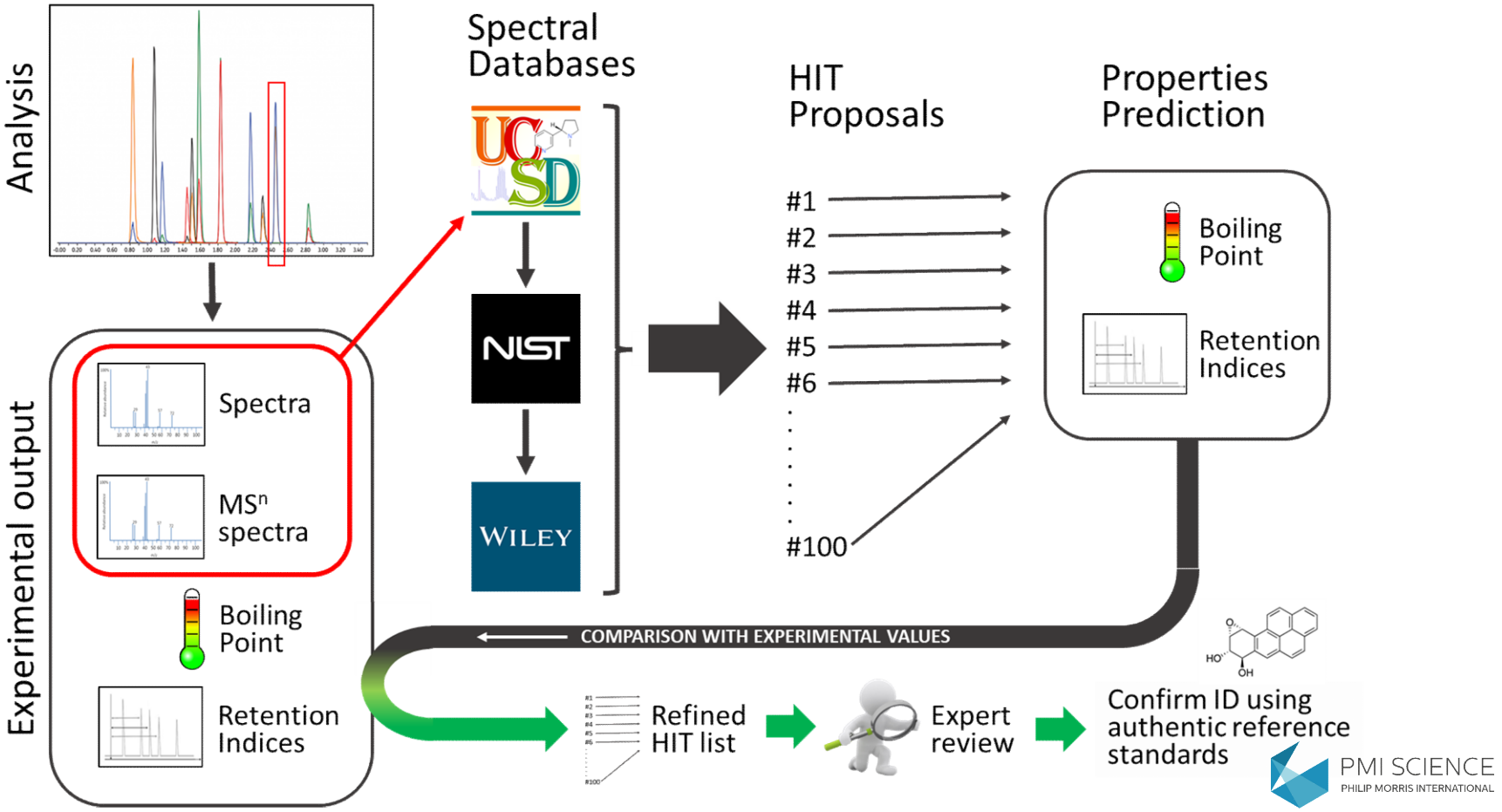
Compound identification workflow



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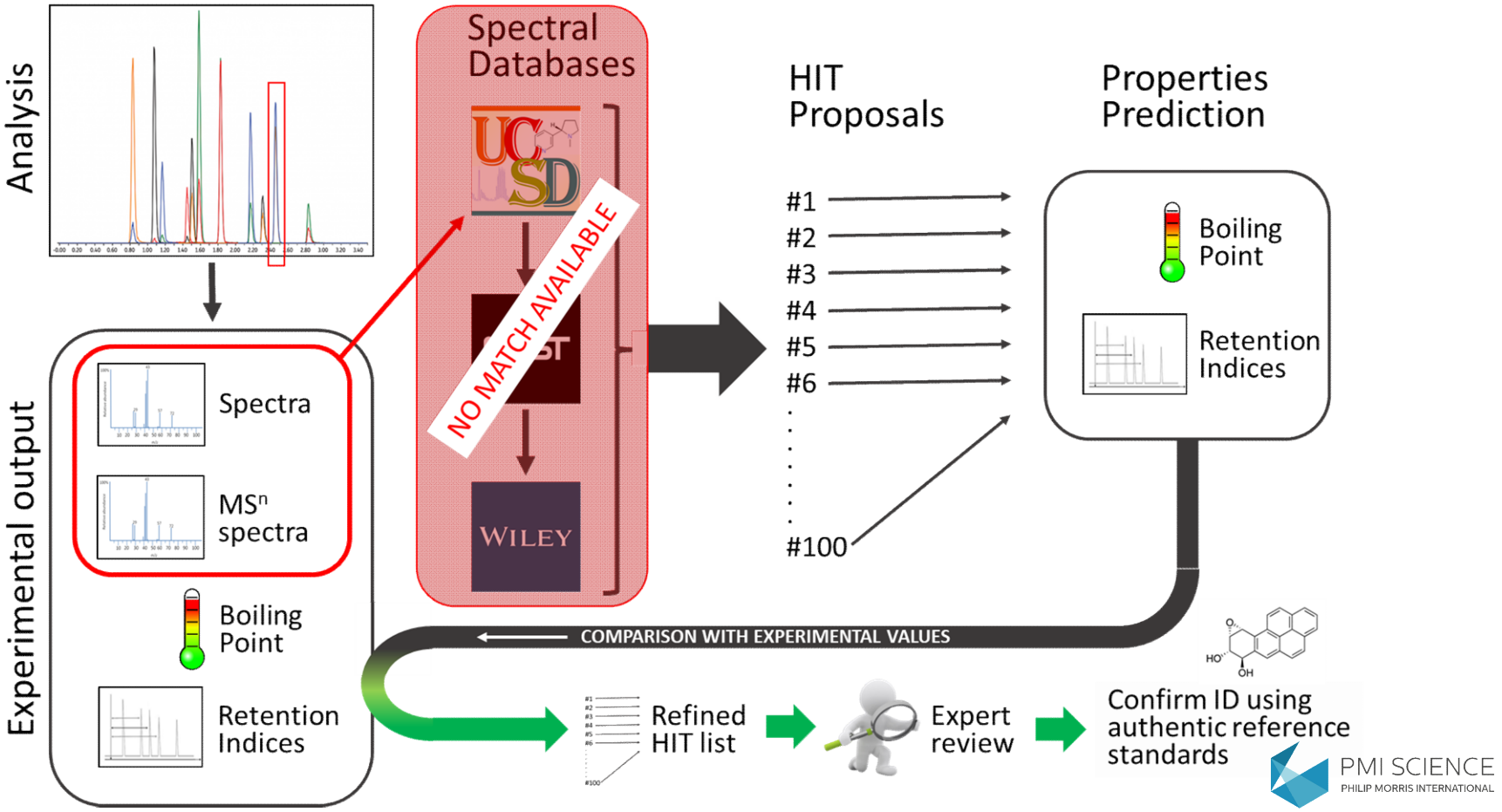

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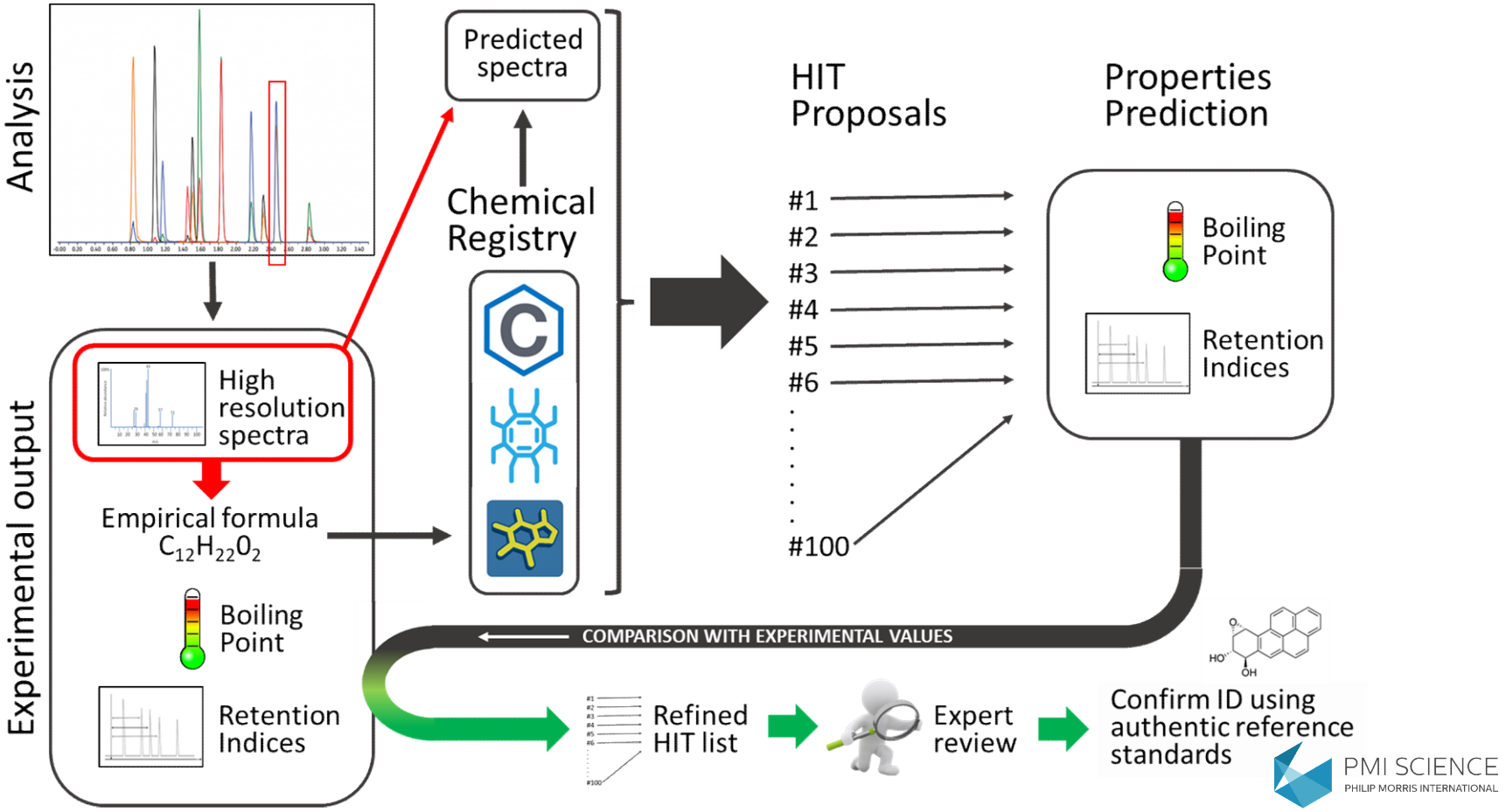
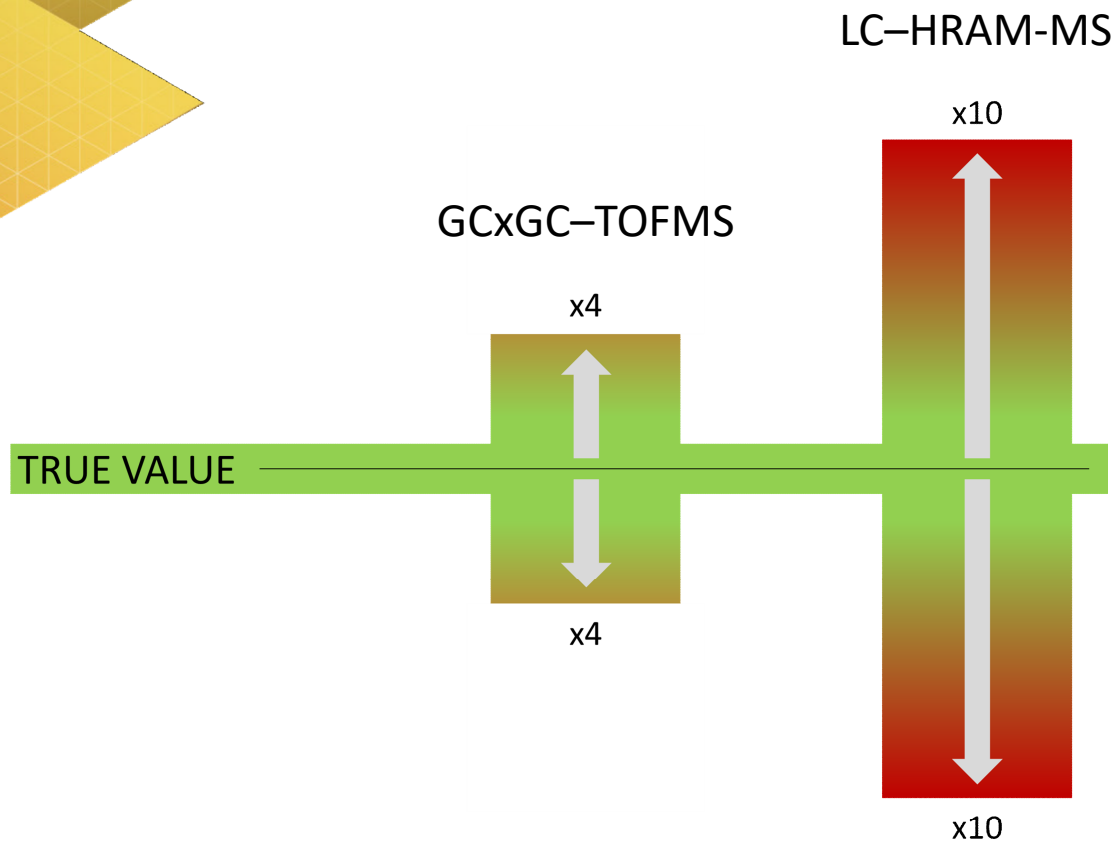


Method performance: Semi-quantification



Comparison versus known HPHC concentrations determined by quantitative targeted analysis

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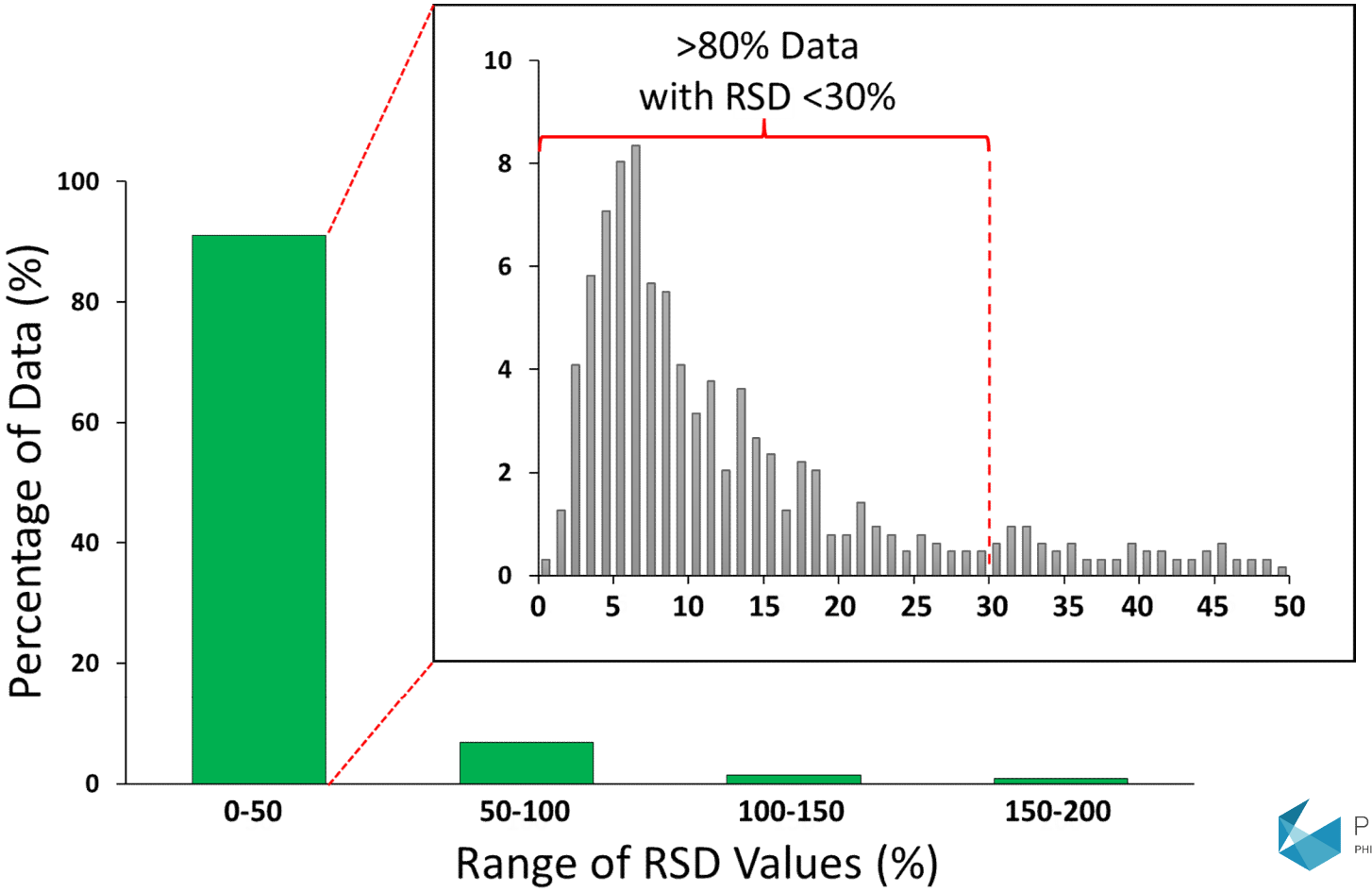
Method performance: Reproducibility



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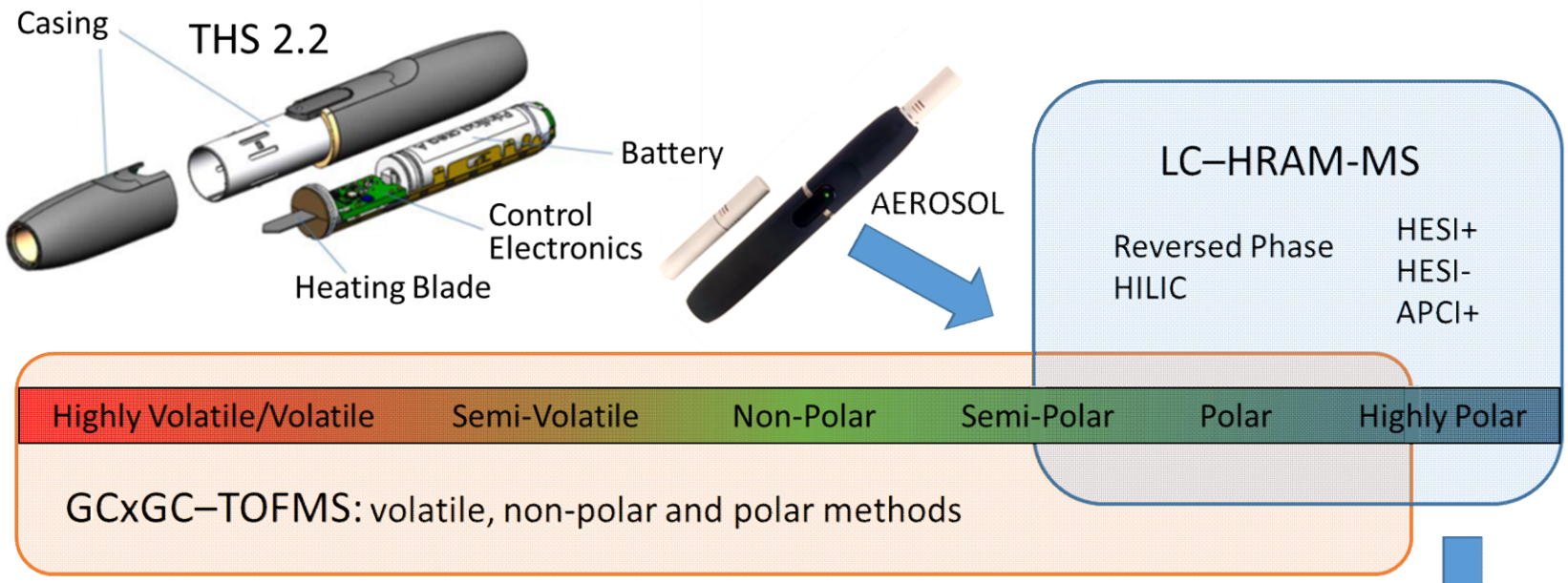
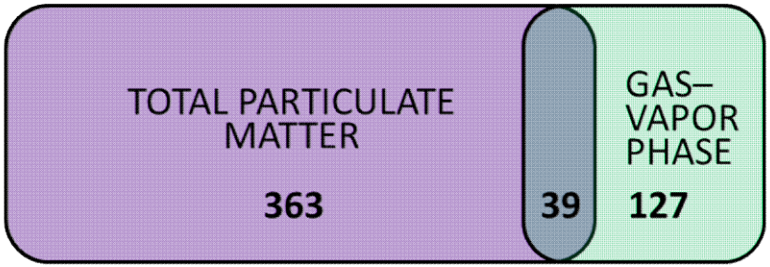
Results overview



532* COMPOUNDS
≥100ng/item IN
THS 2.2 AEROSOL

*including nicotine, water and glycerin



ANALYSIS

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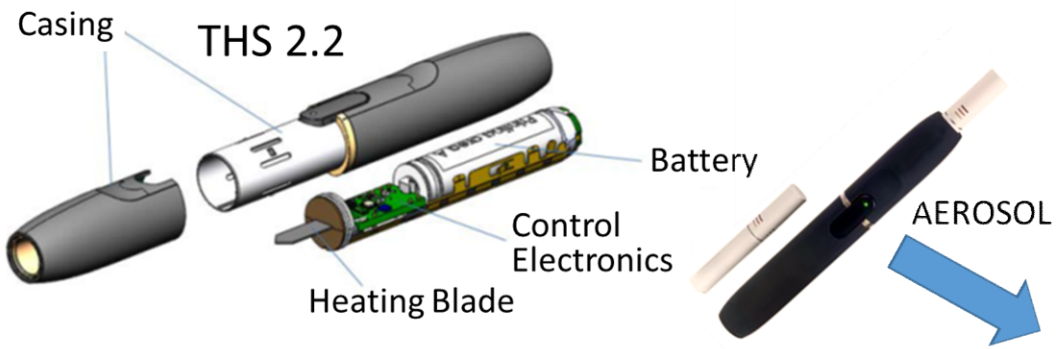

LC–HRAM-MS

Reversed Phase
HILIC

HESI+
HESI-
APCI+

Highly Volatile/Volatile | Semi-Volatile | Non-Polar | Semi-Polar | Polar | Highly Polar

GCxGC–TOFMS: volatile, non-polar and polar methods

ANALYSIS

Ca. 10-fold fewer compounds compared with cigarette smoke

TOTAL PARTICULATE MATTER		GAS–VAPOR PHASE
363	39	127

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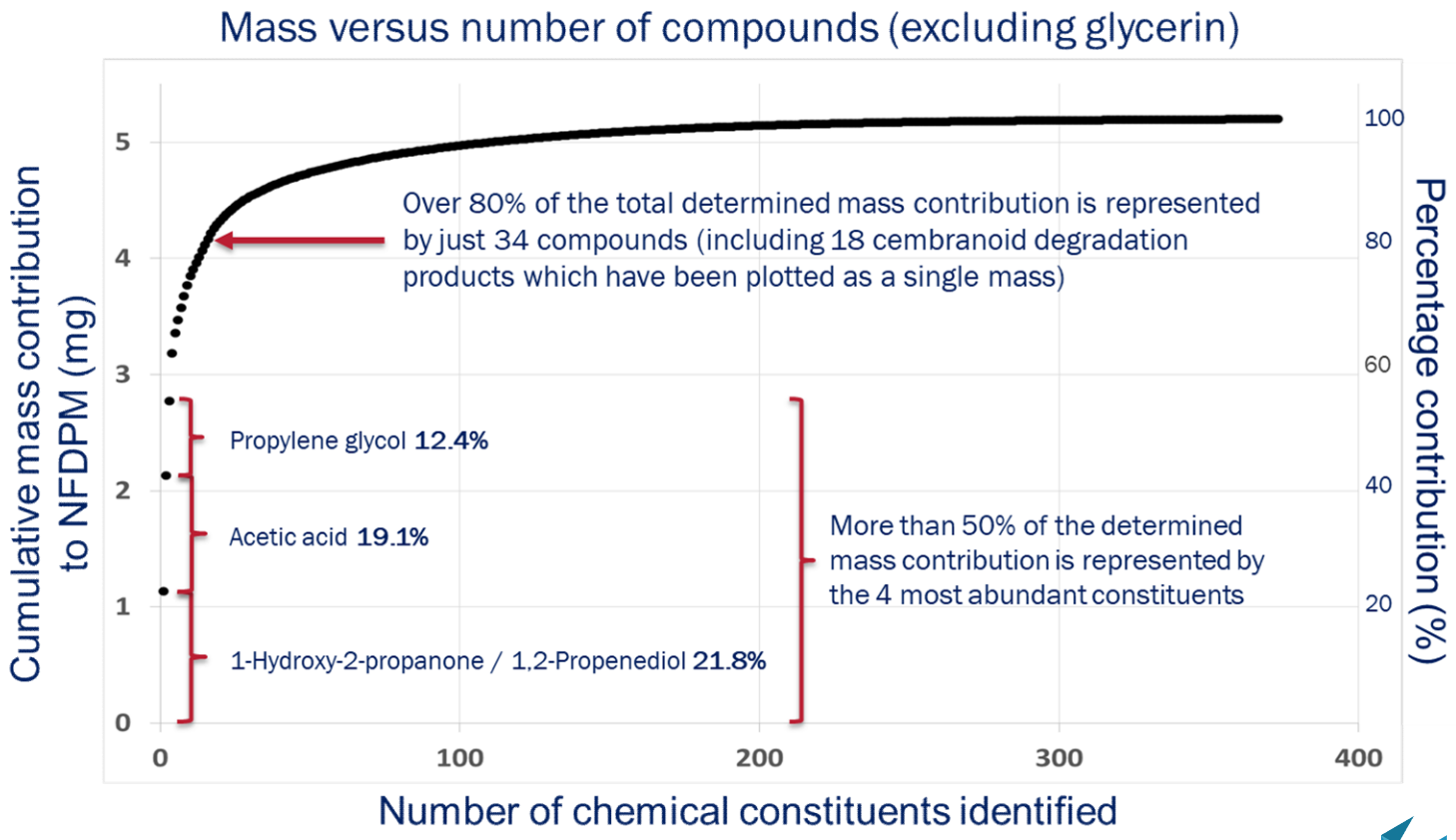
Particulate phase



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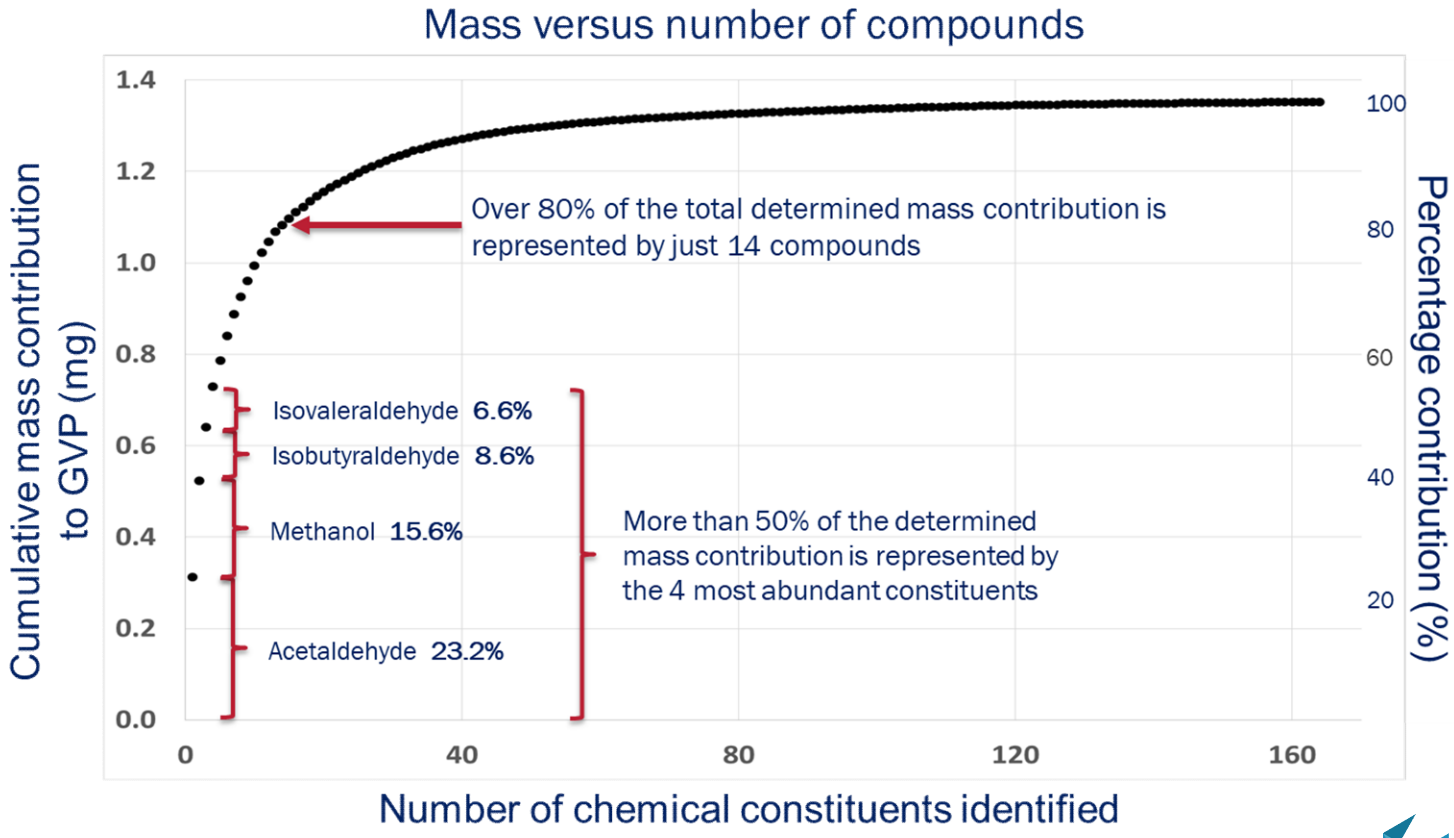
Gas–vapor phase



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Conclusions

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- The reported data are indicative that the previously uncharacterized fraction of TPM generated by THS 2.2 has been evaluated to the fullest practicable extent
- This work represents the most comprehensive chemical characterization of a heated tobacco aerosol to date

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THANK YOU FOR YOUR ATTENTION

Bentley, M.C., Almstetter, M., Arndt, D., Knorr, A., Martin, E., Pospisil, P., Maeder, S., 2020. Comprehensive chemical characterization of the aerosol generated by a heated tobacco product by untargeted screening. Anal Bioanal Chem 412, 2675–2685. https://doi.org/10.1007/s00216-020-02502-1

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