

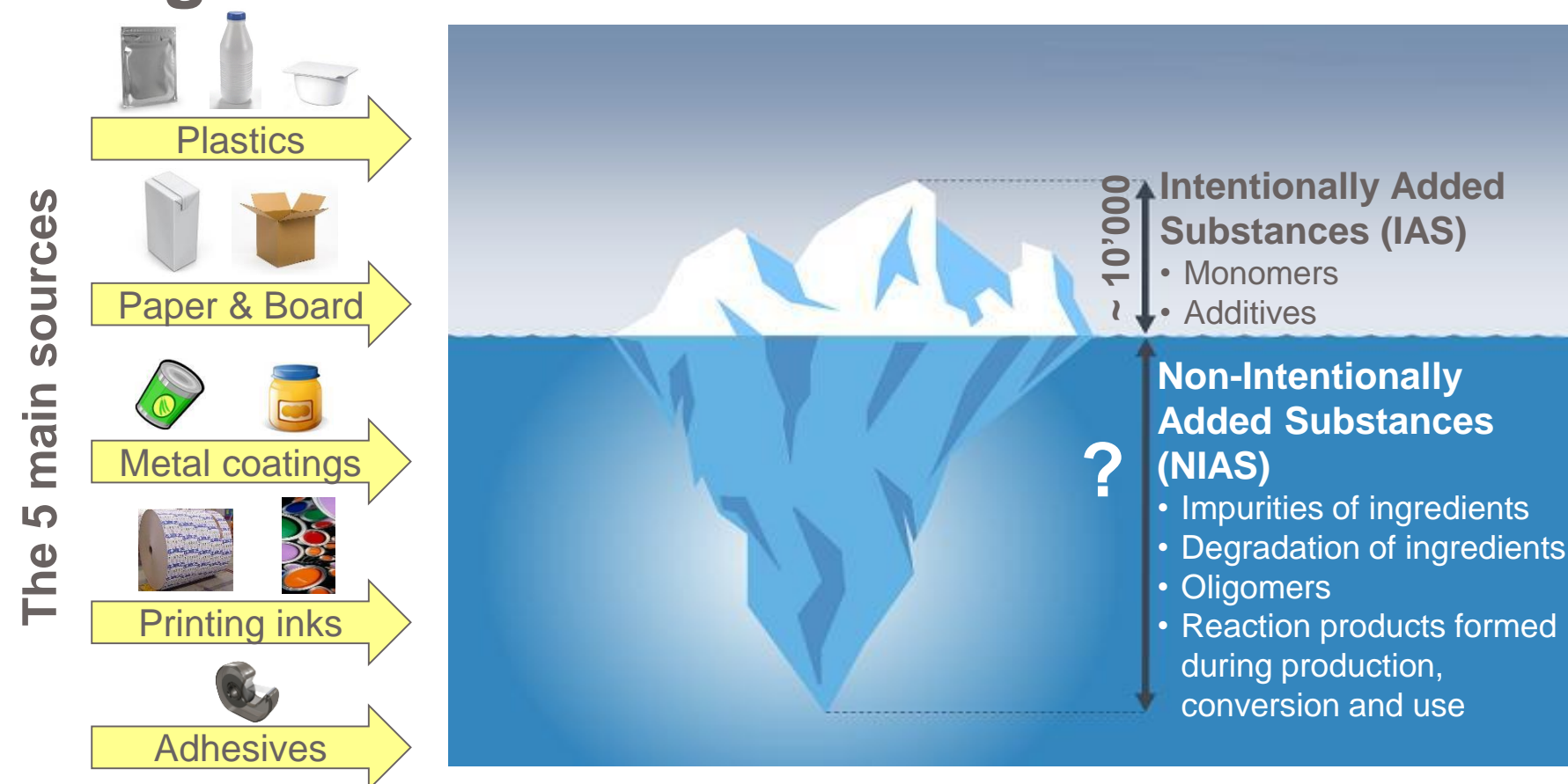
# Untargeted Chemical Screening of Food Packaging Composition & Migration: Our Current Approach

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## Context & Needs

Packaging materials can contain a wide range of known and unknown substances



Food packers are responsible for the Safety & Compliance of their Packaging materials

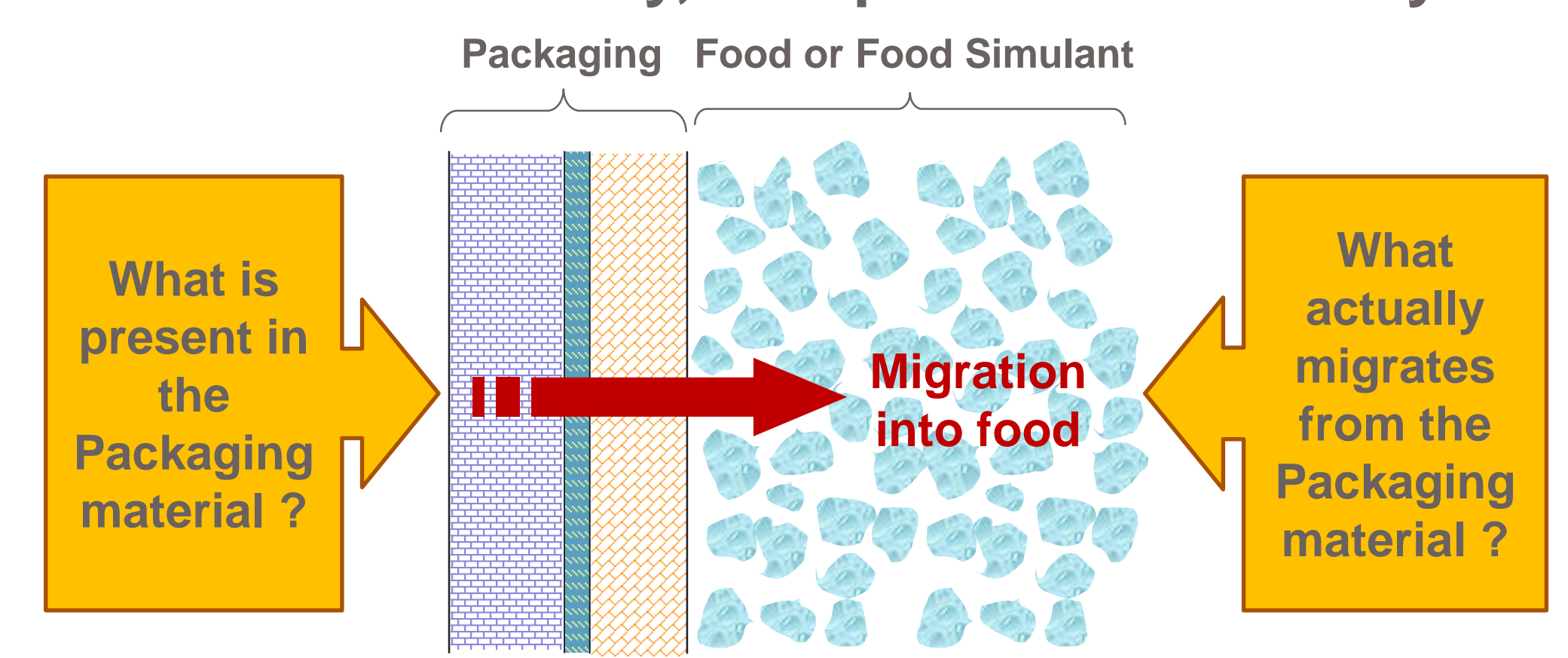
Complexity of the supply chain

- Many actors implicated from chemical industry to converters
- Lack of chemical knowledge, especially at converter level
- Information difficult to convey to end user (food packer)

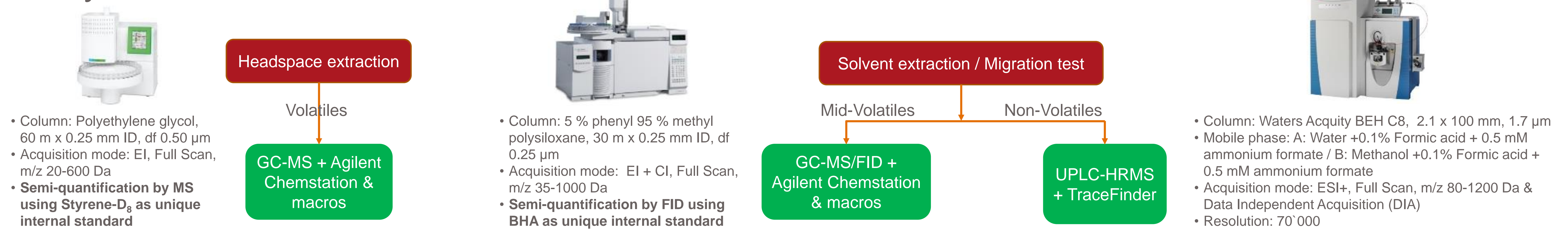
Diversity of regulations:

- Lack of supra-national regulations for authorized substances (IAS)
- No harmonization between national regulations
- NIAS are not regulated but... their safety must be assessed based on internationally recognized scientific principles

Packaging Composition & Migration must be checked for Safety, Compliance and Quality

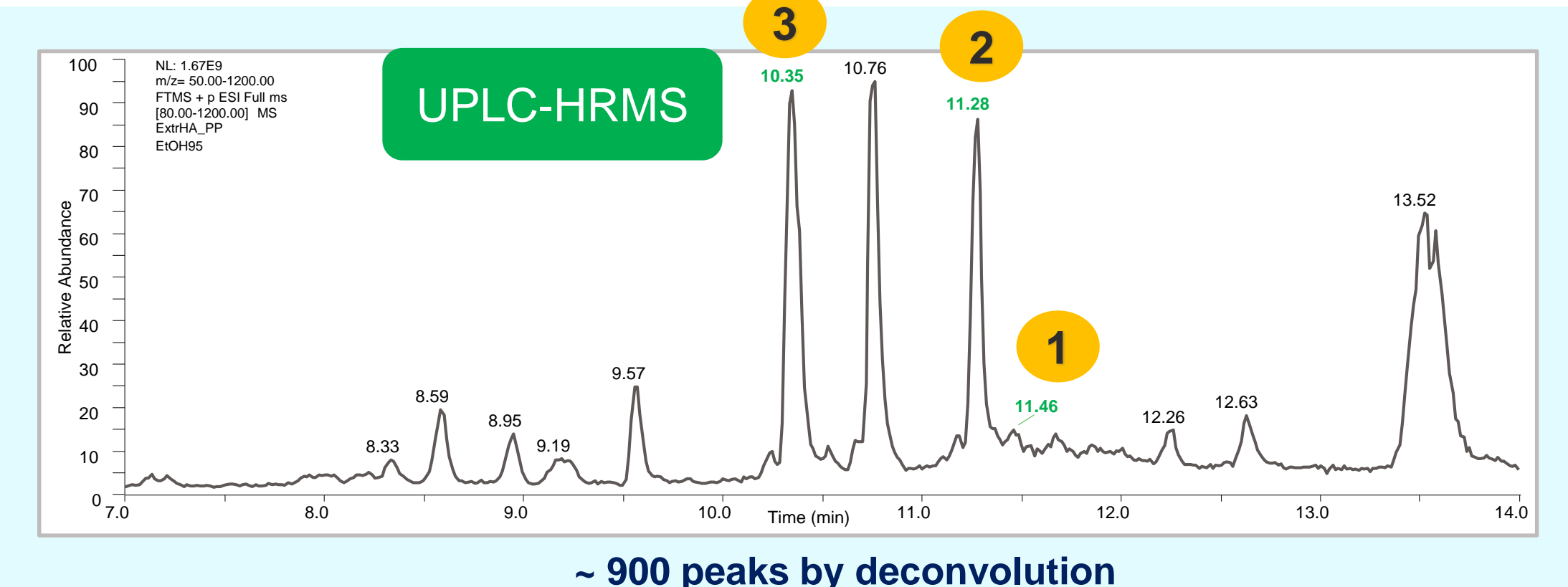
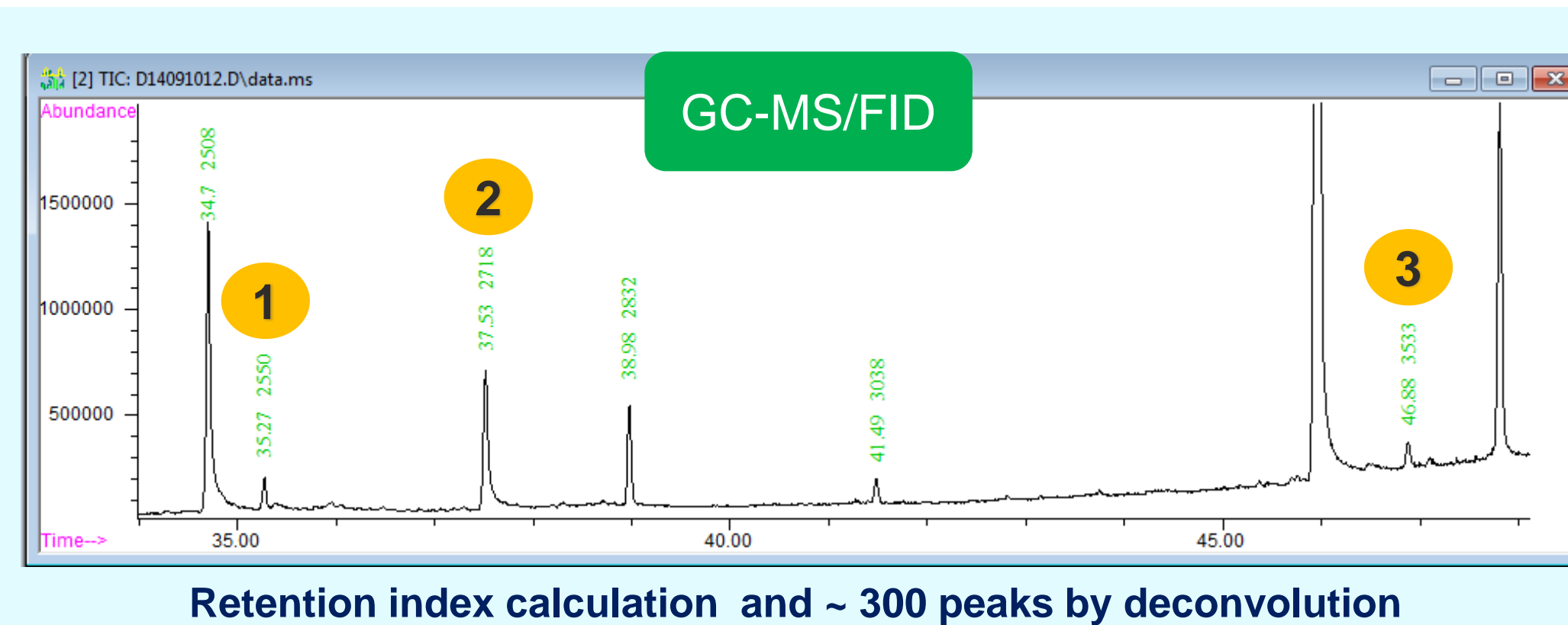


## Analytical Procedures



## Data Treatment & Interpretation process

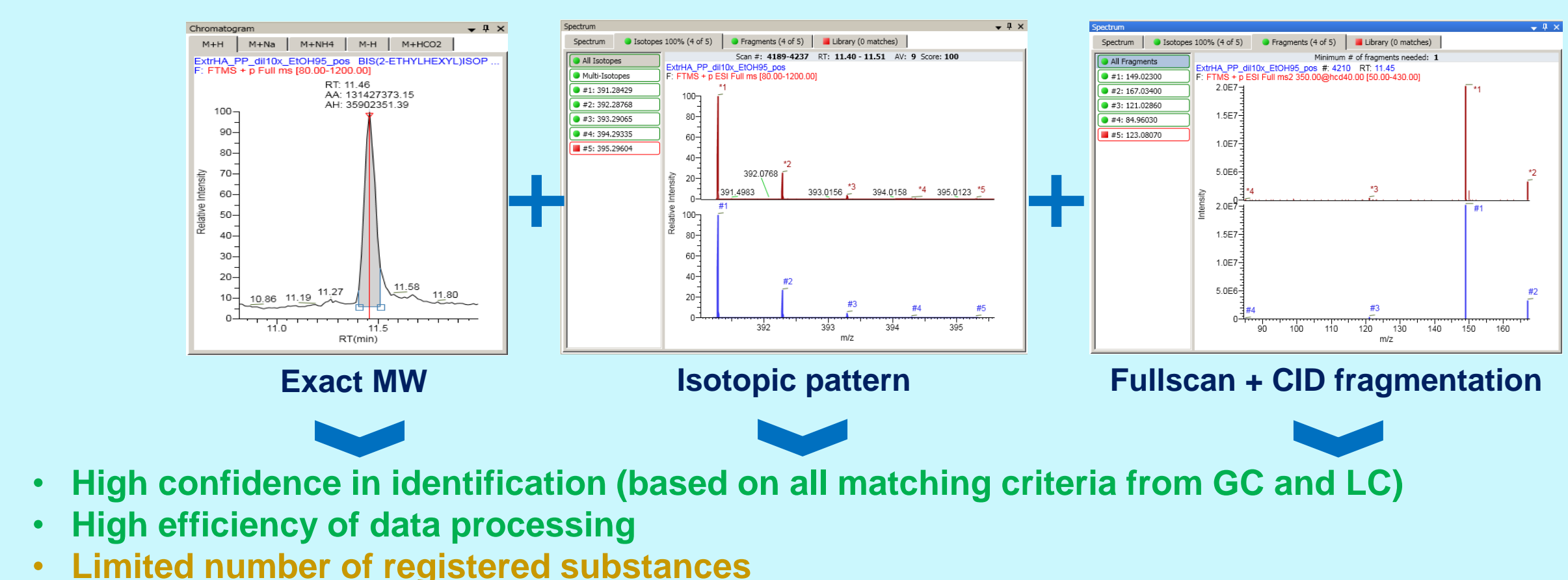
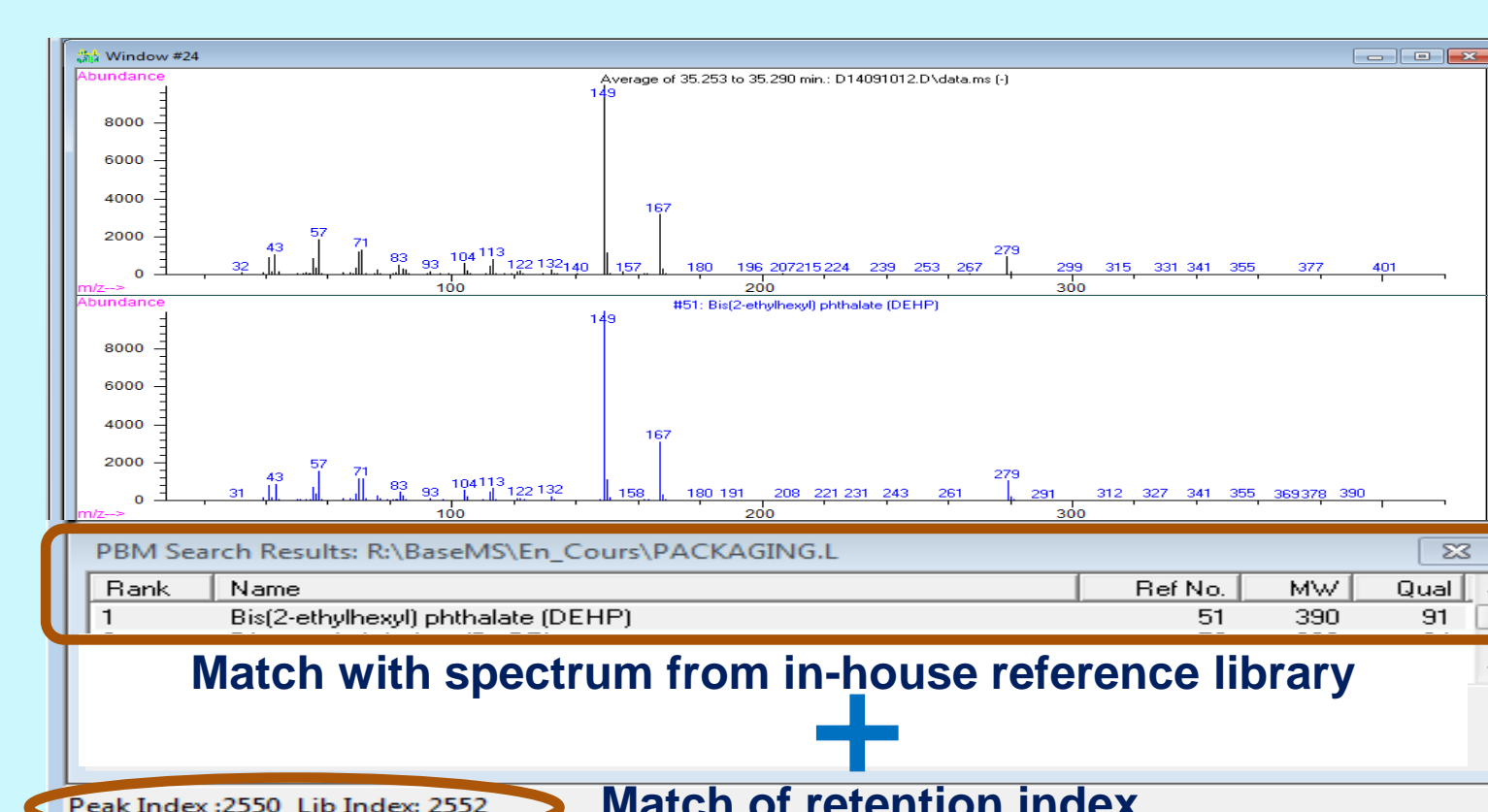
### TIC Deconvolution



### Tier 1

Search in targeted/injected substances database

Example 1: Di(2-ethylhexyl) phthalate

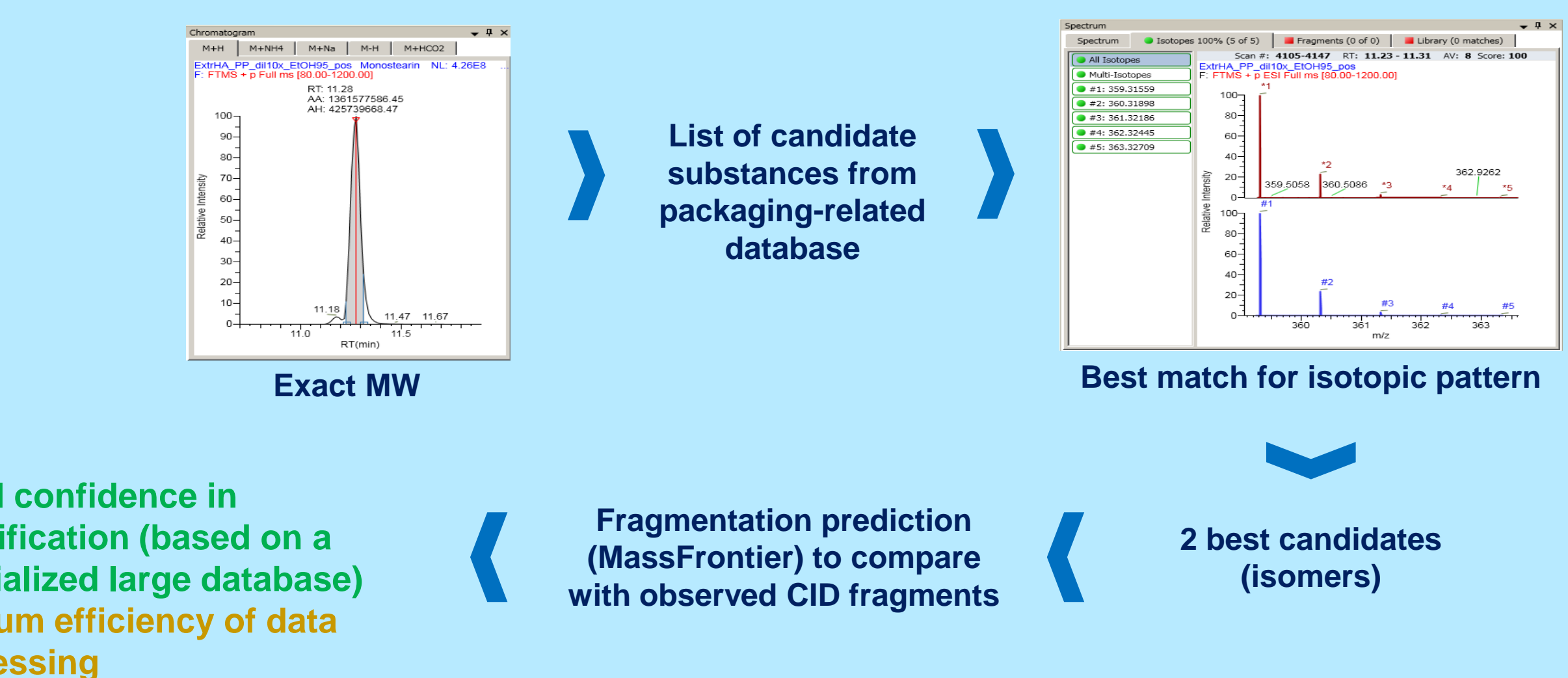
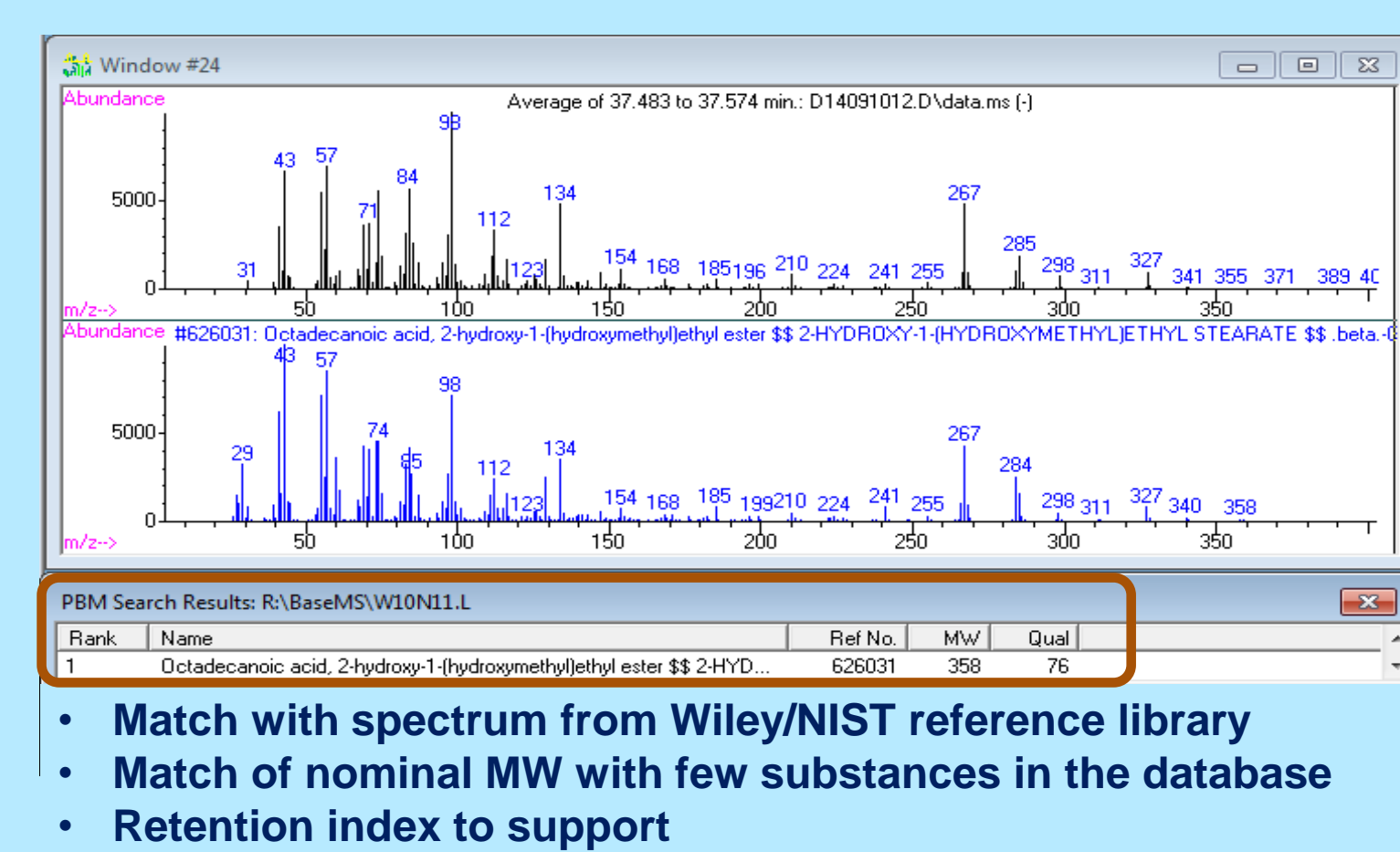


### Tier 2

Database-assisted identification using an in-house packaging-related database

(~4000 IAS + NIAS with exact MW and ~1000 retention indices)

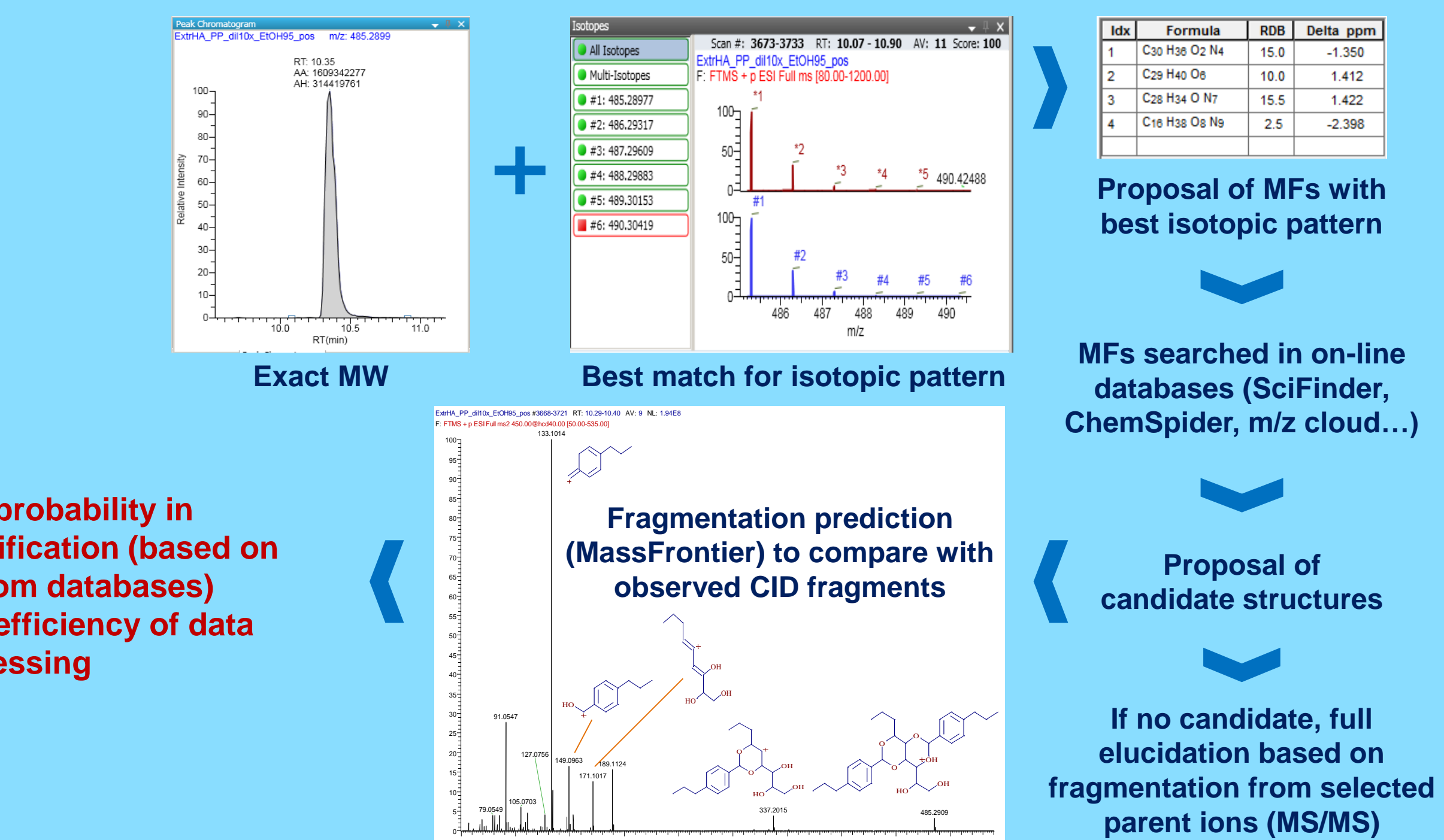
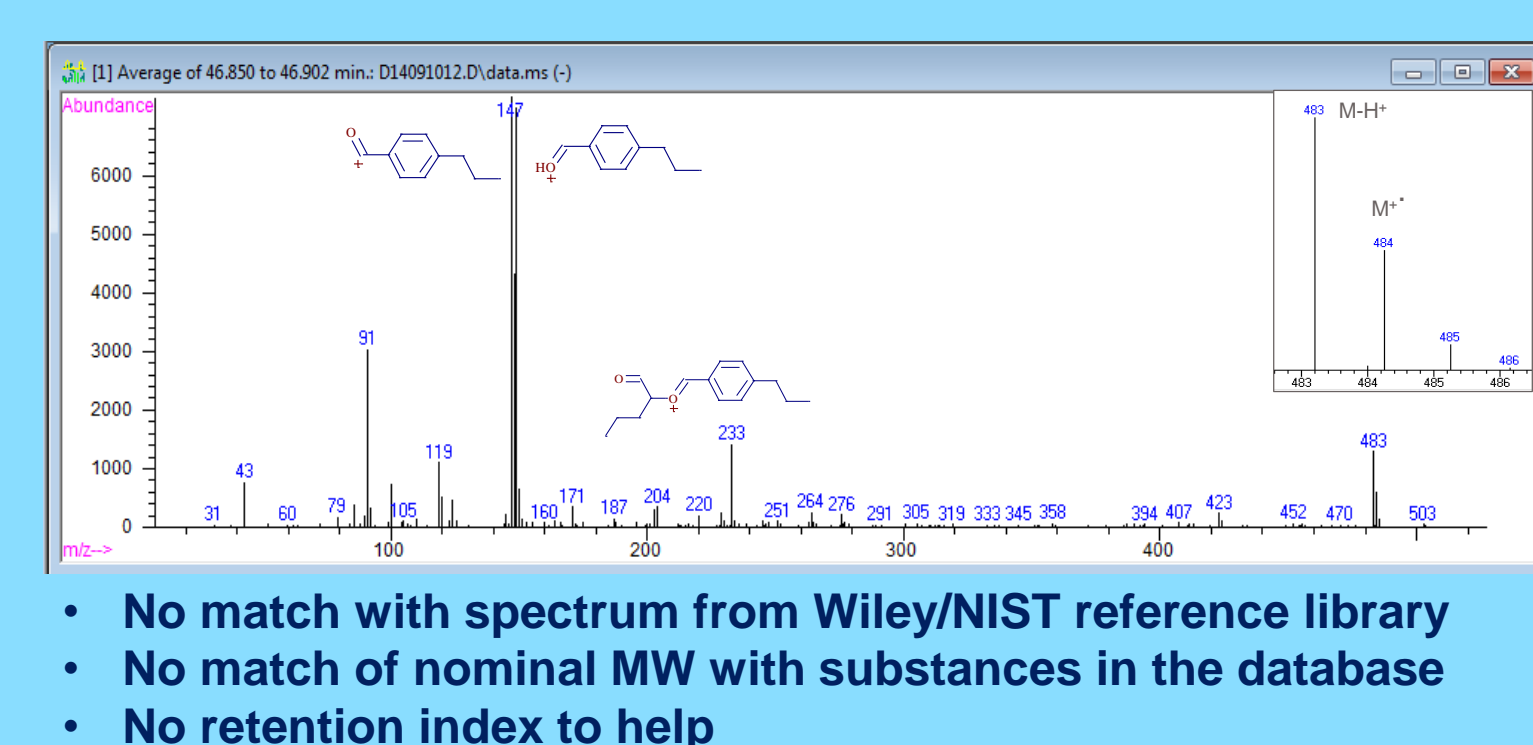
Example 2: Glycerol 2-monostearate



### Tier 3

Investigation of unknowns

Example 3: Bis(4-propylbenzylidene) propylsorbitol



## Next steps & Challenges

- GC-HRMS (EI/CI) to implement
- Automatic deconvolution and searches for routine/high sample throughput
- Lack of standards for confirmation of NIAS identity and quantification
- Test of LC semi-quantification by Charged Aerosol Detector (CAD) or other approaches

## Conclusions

- Complementarity of GC and LC
- Complete workflow from an unique LC-HRMS acquisition (Full scan + CID)
- Need of tools to improve treatment and reduce manual data handling
- Better knowledge /partnership with packaging suppliers needed