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New method for skin ceramides profiling by SFC-HRMS

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Duplan

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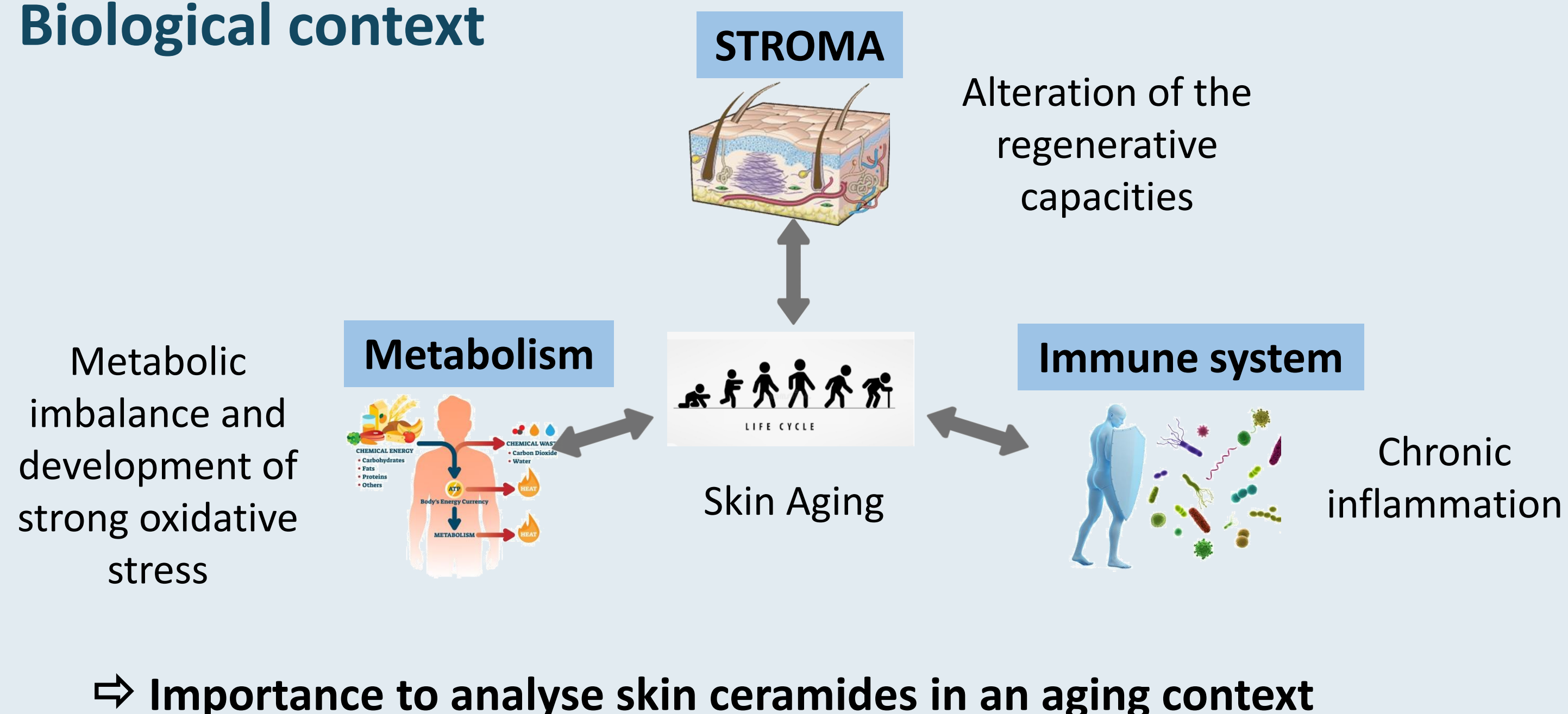
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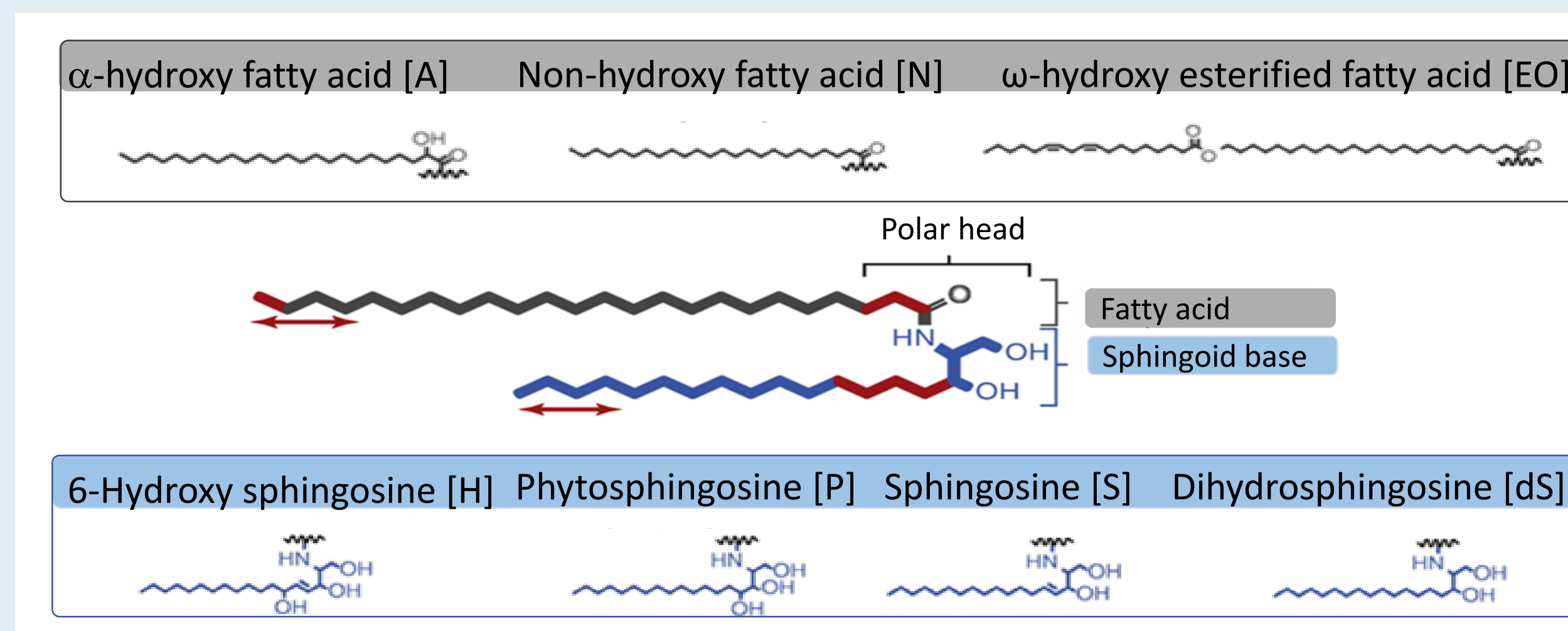
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Biological context

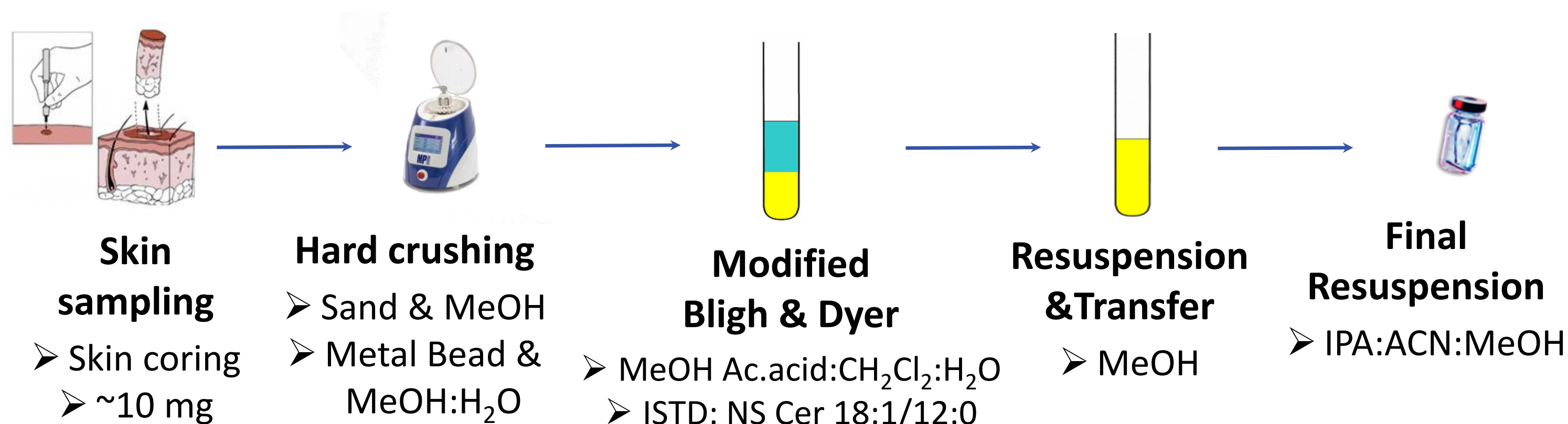


Ceramides structures^{1,2}



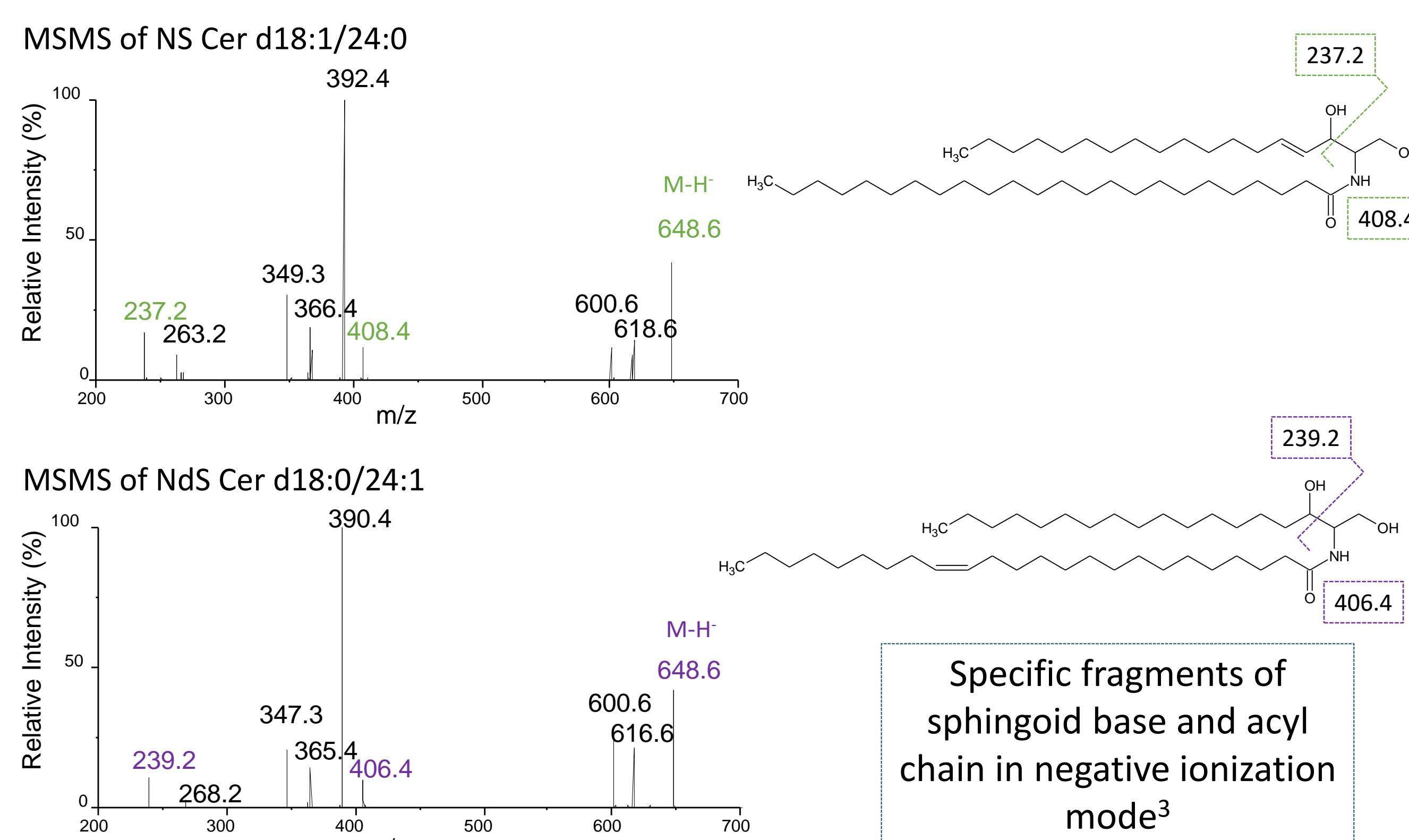
⇒ Huge and complex diversity of skin ceramides

Skin ceramides extraction



Ceramides characterization

⇒ NS vs NdS : same formulas but different structures



⇒ Structures validated for all sub families of skin ceramides

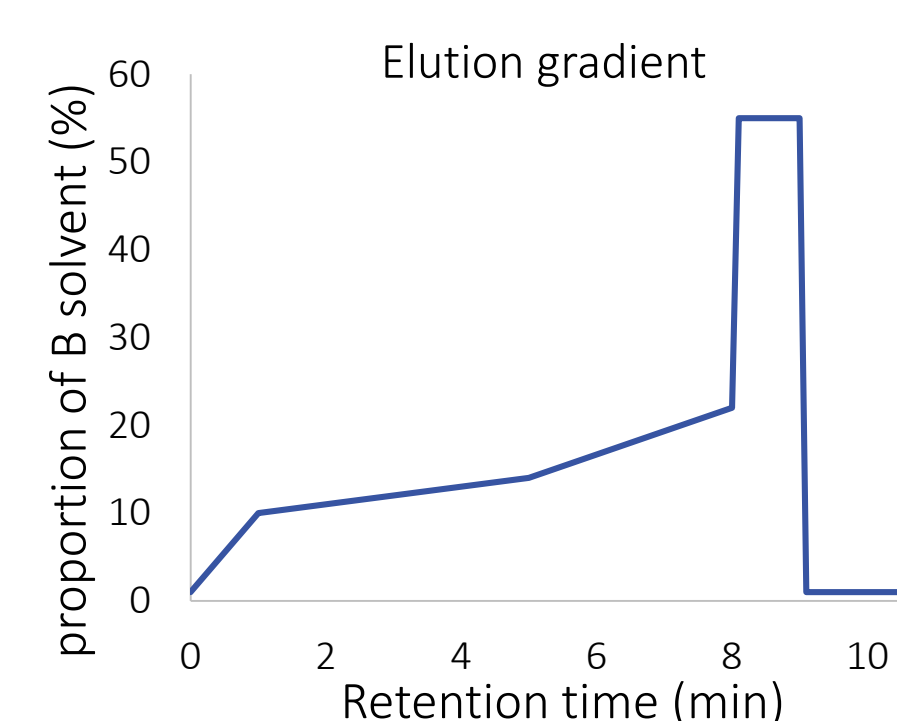
SFC-QTOF analysis

✓ Optimized SFC-MS conditions

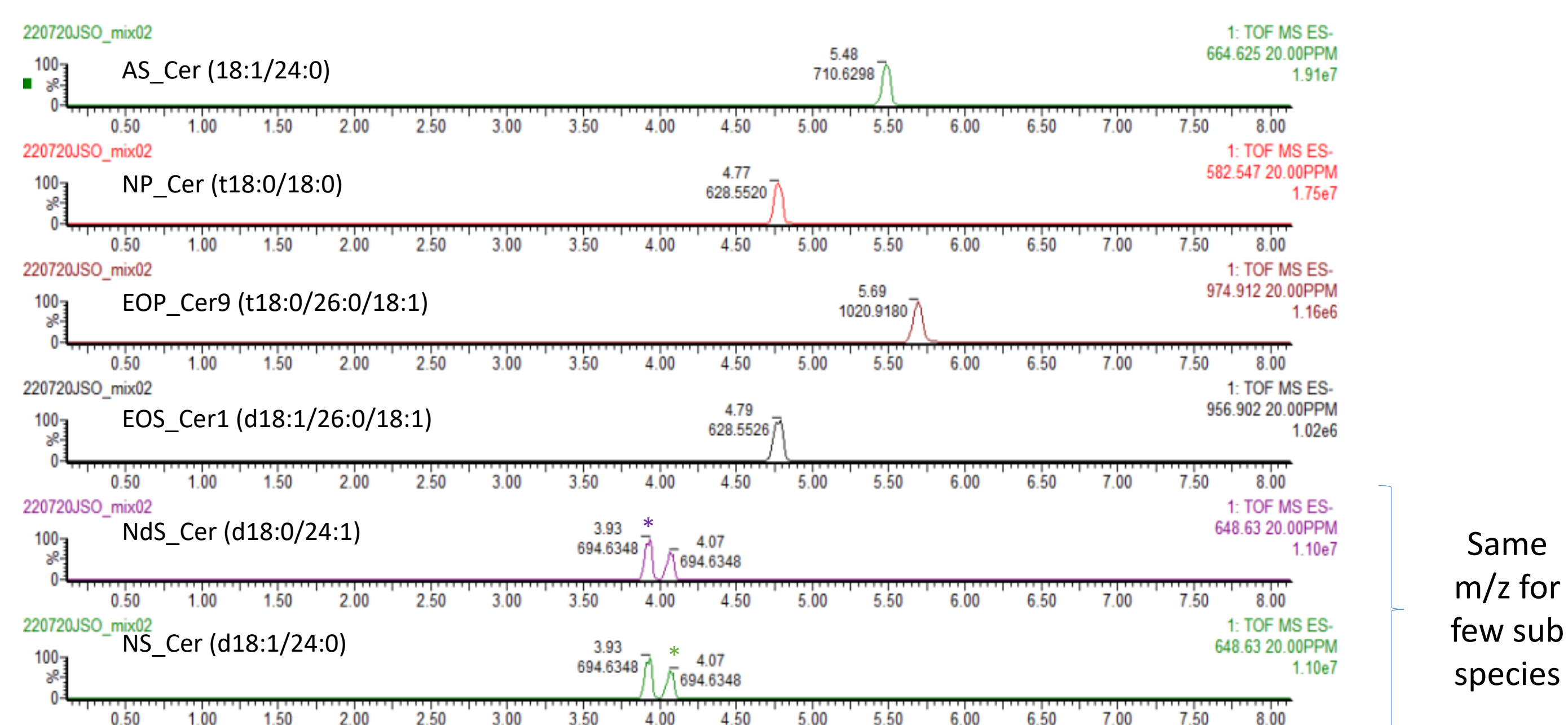
- Column:** Torus DIOL, 100 x 3 mm, 1.7 μm; Waters
- A solvent:** SCCO₂
- B solvent:** IPA:ACN (50:50); 40% MeOH; 1% FA
- Flow rate:** 1.1 mL/min
- ISM:** Methanol at 0.1 mL/min
- ESI:** Negative ionization mode



⇒ Ceramides separation by polar head in 8 min



✓ Example of separation of commercial standard solution

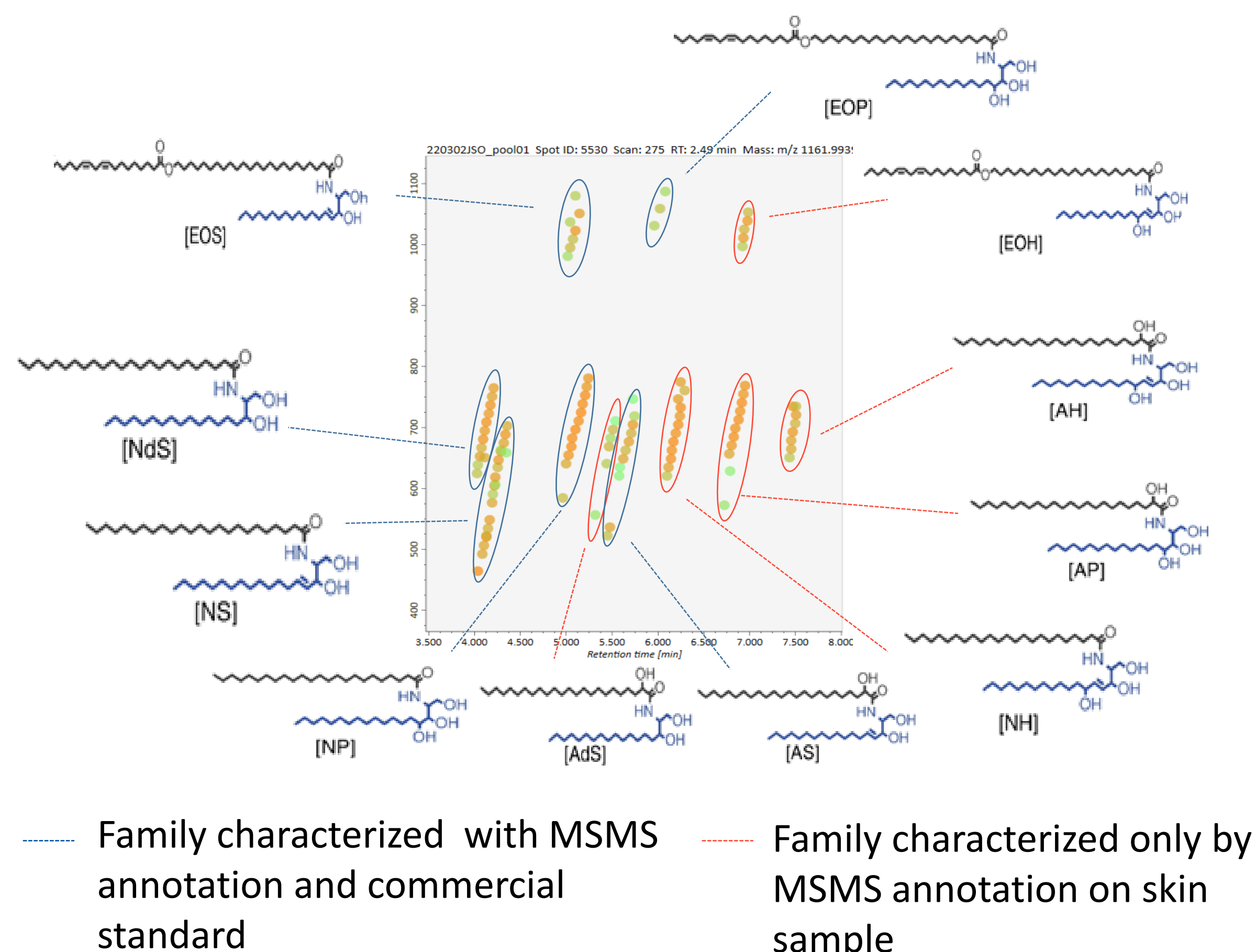


Same m/z for few sub species

⇒ Confirmation of the annotation using MS/MS spectra

Data Processing

- Creation of in-house database containing 280 species divided in 11 subclasses of ceramides
 - MS Dial data processing : optimization of integration parameters
- ⇒ 2D visualization of results obtained on skin samples



Conclusion & outlook

- ✓ Optimization and validation of skin ceramides extraction
- ✓ Development of a specific and robust method for skin ceramides quantitative profiling using supercritical fluid chromatography coupled to high resolution mass spectrometry

⇒ Application to biological sample in aging context: ongoing analysis

References

- [1] Smeden et al, Biochimica et Biophysica Acta, 2014 (<https://doi.org/10.1016/j.bbalip.2013.10.002>)
- [2] Smeden et al, Biochimica et Biophysica Acta, 2014 (<http://dx.doi.org/10.1016/j.bbalip.2013.11.006>)
- [3] Jamin et al, EJMS, 2018 (DOI: 10.1177/1469066718815380)

Acknowledgments

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