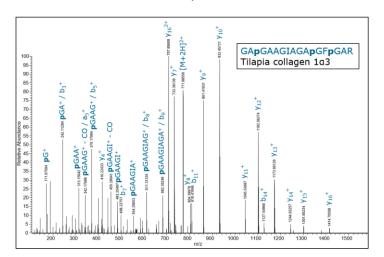# TRISKELION

Collagen analysis at Triskelion

Triskelion has one of the most complete portfolios worldwide regarding collagen LC-MS analysis. Based on previous experience in quantitative protein LC-MS of biopharmaceuticals, we started performing collagen projects in 2013. Since then we successfully completed more than 100 research studies and method developments.
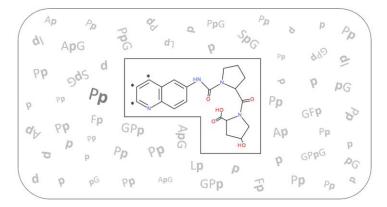

GApGAAGIAGApGFpGAR
Tilapia collagen 1α3

Collagen types

In each animal species many collagen types are present, also depending on the tissue type. Triskelion has experience, not only with the most abundant collagen types 1, 2 and 3 and their subtypes, but also lesser abundant types (e.g. 4, 5 and 6). Due to our bioanalytical background [6,7] we are able to determine collagen type composition of several tissues, such as serum/plasma, liver, kidney and skin.

Collagen hydrolysates

Collagen/gelatin is commercially further processed to collagen hydrolysates or "collagen peptides" to serve as nutraceuticals. Triskelion has a wide variety of in-house targeted and non-targeted methods to study these hydrolysates and their *in vivo* behavior: quantitative methods for amino acid analysis, free and total (after hydrolysis) [8] and a flexible method for quantification of collagen di- and tripeptides [9]. High resolution MS equipment is used to perform non-targeted analysis, e.g. to compare the similarity of produced batches or to monitor hydrolysates during digestion and absorption [10].

Animal species

Together with the world market leader in gelatin, Triskelion designed TrustGel®, the fully internally standardized method to quantify animal species in gelatin [1]. In contrast to other published methodologies the method was validated according to bioanalytical guidelines (EMA) and Good Laboratory Practice (GLP), ensuring scientific quality, data traceability and data integrity. A wide variety of animal species is covered, such as cow, pig, horse, several bird and fish species et cetera [2,3]. To identify animal species Triskelion built a curated sequence database. It contains hundreds of species and collagen types [4,5], based on selected high quality nucleotide sequences translated to protein.

References

[1] *Food Chemistry* 2018; **243**: 461-467.
[2] *Food Chemistry: X* 2022; **14**: 100333.
[3] *PLoS One* 2022; **17**: e0279369.
[4] *Journal of Molecular Evolution* 2018; **86**: 293-302.
[5] *Journal of Molecular Evolution* 2019; **87**: 106-130.
[6] *Bioanalysis* 2016; **8**, 891-904.
[7] *Bioanalysis* 2020; **12**: 1231-1241.
[8] *Clinical and Experimental Dermatology* 2021; **46**: 109-117.
[9] *Rapid Communications in Mass Spectrometry* 2020; **34**: e8934.
[10] *Analytical and Bioanalytical Chemistry* 2020; **412**: 973–982.

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