

Table S1. Instrument configuration details and settings for collagen crosslink analysis.

LC system	Dionex UltiMate™ 3000 Rapid Separation Quaternary System (ThermoFisher Scientific, USA).
Mass spectrometer	Q Exactive™ Focus (ThermoFisher Scientific, Bremen, Germany)
Ionisation source	HESI-II (ThermoFisher Scientific, USA)
Analytical column	Cogent Diamond Hydride™ HPLC column, 2.2 µm particle size, 2.1 mm inner diameter, 150 mm length, 100 Å pore size (PM Separations NZ Ltd., Hamilton, New Zealand)
Flow rate	Analytical column: 0.4 mL/min
Column oven temperature	40 °C
Gradient	80–10% B for 3 min, 2.5 min hold at 10% B, 10–80% B for 1 min, 3 min equilibration at 80% B
Buffers	A: 0.1% Formic acid/water B: 0.1% Formic acid/acetonitrile

Table S2. Mass spectrometer source settings for collagen crosslinks analysis and collagen crosslink detection.

Crosslink Analysis		Crosslink Detection	
Capillary temperature	350 °C	Resolution	35,000
S-Lens RF level	50%	Isolation window	1.0 <i>m/z</i>
Polarity	Positive	Default charge	1
Source voltage	4.0 kV	AGC target	2 × 10 ⁴
Sheath gas flow rate	35 L/min	Maximum injection time	Auto
Aux gas flow rate	6 L/min	Minimum AGC target	8 × 10 ³
Aux gas heater temperature	300 °C	Number of micro-scans	1
		Spectrum data type	Profile

Table S3. Inclusion list for parallel reaction monitoring analysis. The table shows accurate masses for all crosslinks DHLNL: dihydroxylysine norleucine; HLNL: hydroxylysine norleucine; HHL: histidinohydroxylysine norleucine; HHMD: histidinohydroxymerodesmosine; DPD: deoxy pyridinolone; PYD: pyridinolone.

Crosslink	Mass (<i>m/z</i>)	CS [<i>z</i>]	Polarity	Start (min)	End (min)	CE
DHLNL	308.1816	1	Positive	5.0	7.0	24
HLNL	292.1867	1	Positive	5.0	7.0	24
HHL	223.1237	1	Positive	3.0	7.5	20
HHMD	287.6635	2	Positive	5.0	8.5	12
DPD	413.2030	1	Positive	5.0	8.5	27
PYD	429.1979	1	Positive	5.0	8.0	30