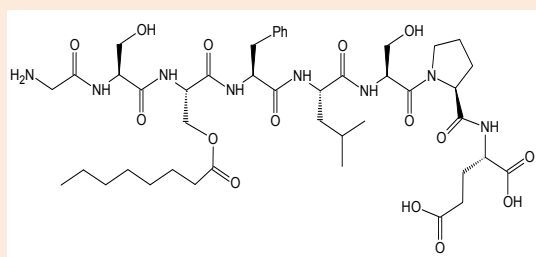


Structural analysis of peptide trace decompositions

Peptides, middle-size molecules, are big hope as one of next-generation drugs. The structural analysis of the decomposition and impurities is critical to ensuring stable quality. TRC possesses technologies for small molecule drugs, ranging from fractionation and structural analysis of trace components of APIs and drug products, and peptide synthesis technologies. Here is an example of our structural analysis of Ghrelin(1-8) trace decomposition using MS and NMR.

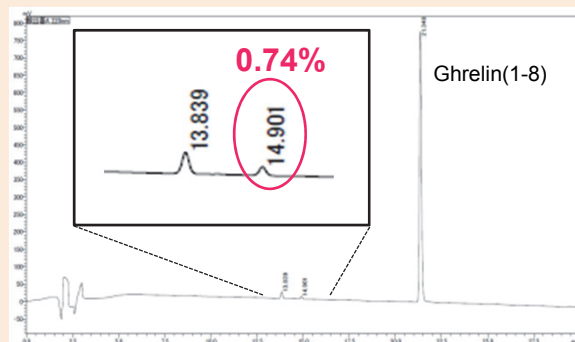
HPLC analysis of Ghrelin(1-8) decomposition



Ghrelin(1-8)

Amino acid sequence: GSS(octanoyl)FLSPE
(Monoisotopic Mass : 948.4804)

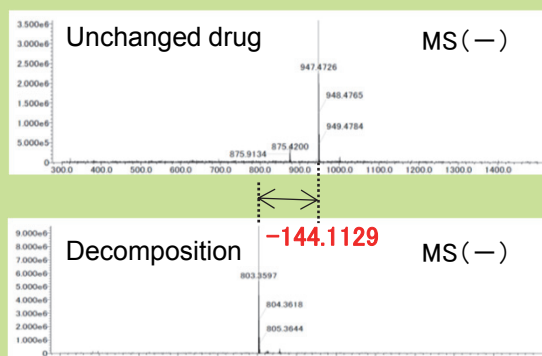
Hydrolysis



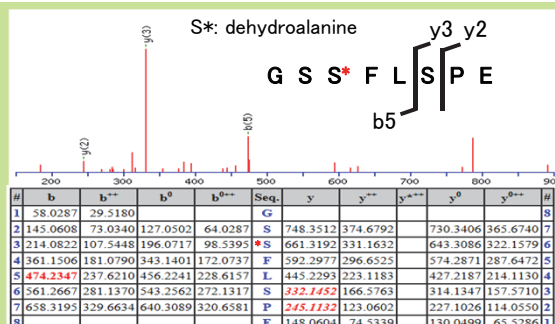
HPLC chromatogram of Ghrelin(1-8) (detection wavelength: 220 nm)

The decomposition (14.901) was isolated by automated solid phase extraction (SPE).

LC-MS structural analysis

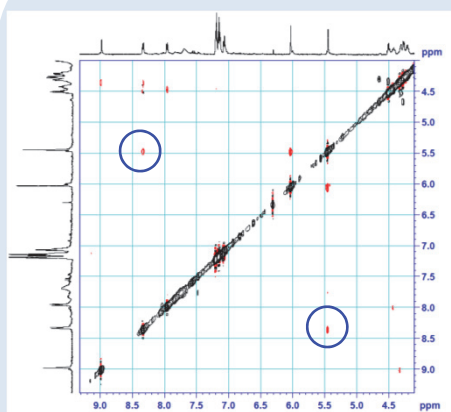


MS/MS analysis



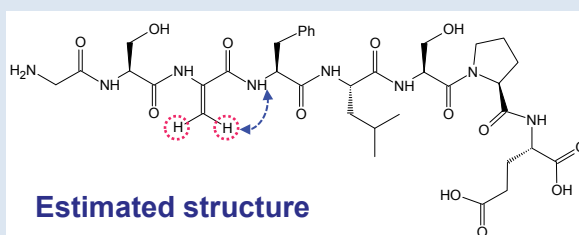
Ser(octanoyl) was possibly converted to dehydroalanine via β -elimination. ($-C_8H_{16}O_2$: theoretical mass, 144.1150)

NMR structural analysis



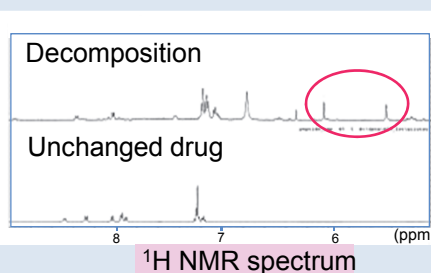
ROESY spectrum of decomposition

ROE correlations between dehydroalanine's proton and the adjacent phenylalanine's amide proton



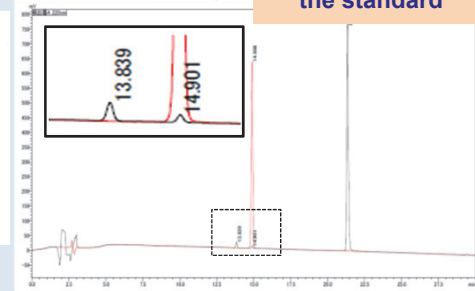
Estimated structure

The peptide with the estimated structure was chemically synthesized into a standard



¹H NMR spectrum

Proton signal of dehydroalanine



Red: synthetic standard of dehydroalanine

The same LC retention time as the standard