

The evaluation of for sun-damaged skin by D-amino acid

Noriko Fujii

Research Reactor Institute, Kyoto University

We previously reported that biologically uncommon D-aspartyl residues are present in sun-damaged skin from elderly people, possibly in elastin. Here, we report the kinetics of Asp racemization in model peptides corresponding to elastin sequences from exons 6 and 26A. We estimated the activation energy (E) of racemization of Asp residues, the racemization rates (RR) at 37°C and the time (t) required for the D/L ratio of Asp to approximate to 1.0 (D/L ratio of Asp=0.99) at 37°C. For an exon 6 peptide, E=29.0 kcal/mol, RR= 2.59×10^{-2} /yr and t=101.0 yr. For an exon 26A peptide E=26.2 kcal/mol, RR= 4.27×10^{-2} /yr and t=61.3 yr; and for a second exon 26A peptide E=25.7 kcal/mol, RR= 5.55×10^{-2} /yr and t=47.0 yr. These results suggest that racemization of Asp residues in elastin could occur within a human life span. We propose that D-Asp could be a useful molecular indicator of aging.