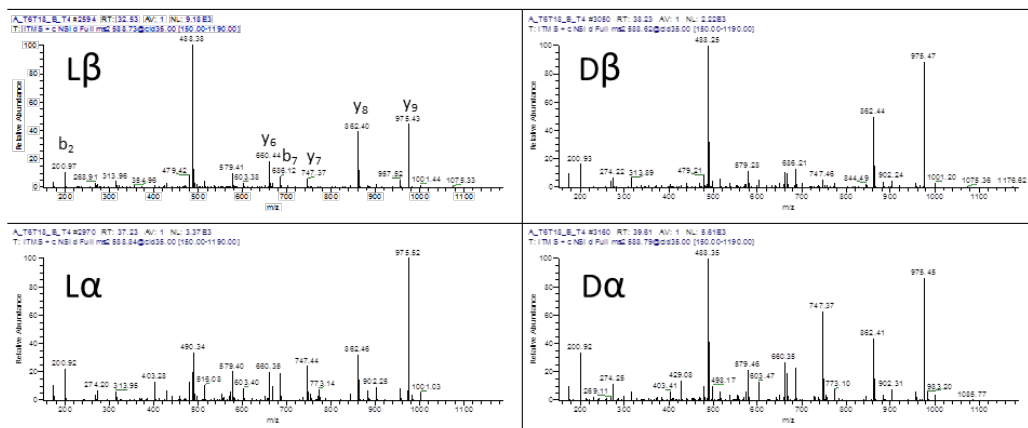
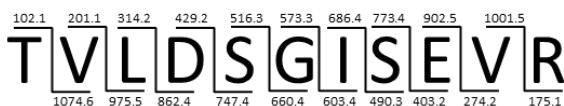
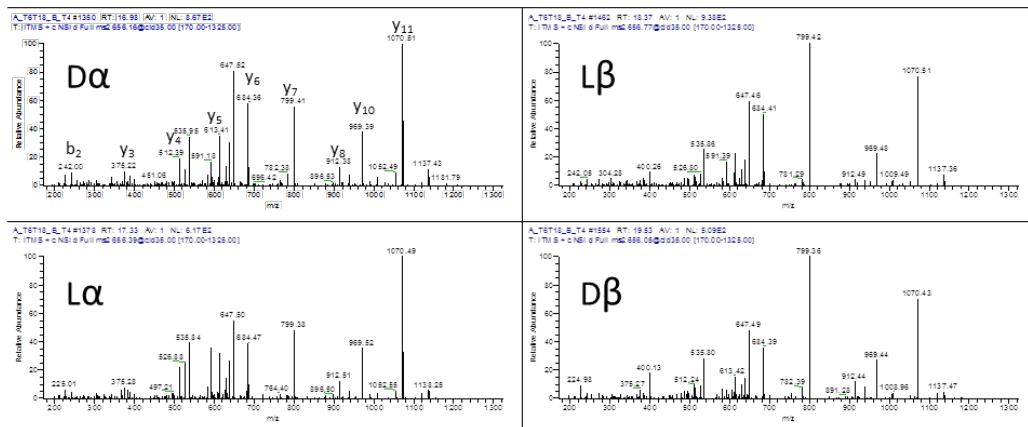
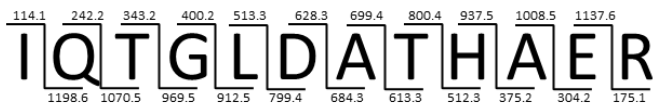


a)  $\alpha$ A 55-65 TVLDSGISEVR  
(synthetic peptide)

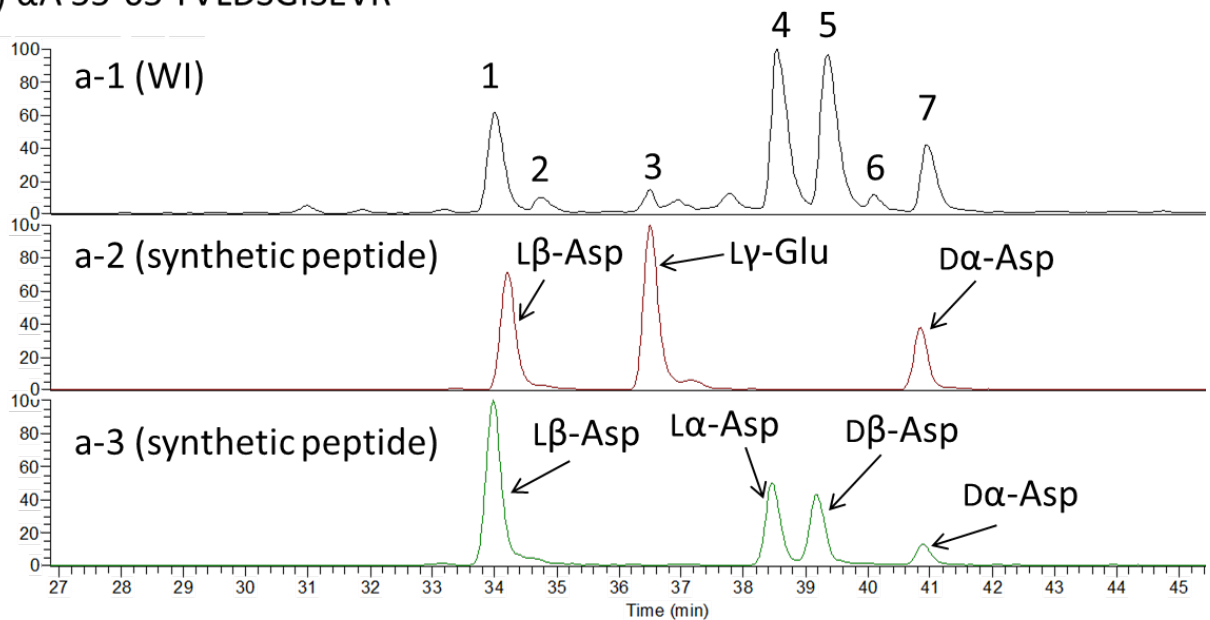


b)  $\alpha$ A 146-157 IQTGLDATHAER  
(synthetic peptide)

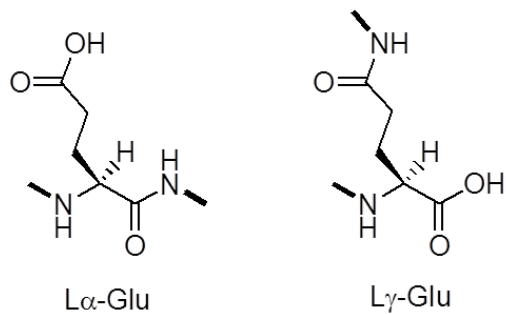


**Figure S1;** MS/MS spectrums of the synthetic peptides a)  $\alpha$ A 55-65: TVLDSGISEVR b)  $\alpha$ A 146-157: IQTGLDATHAER

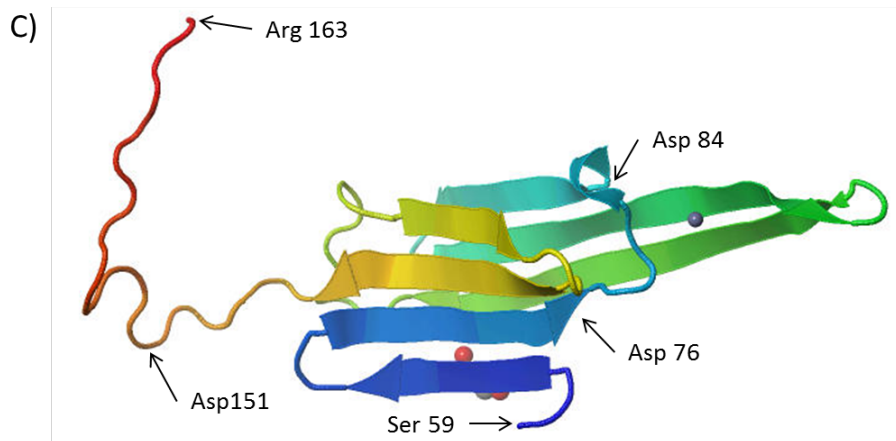
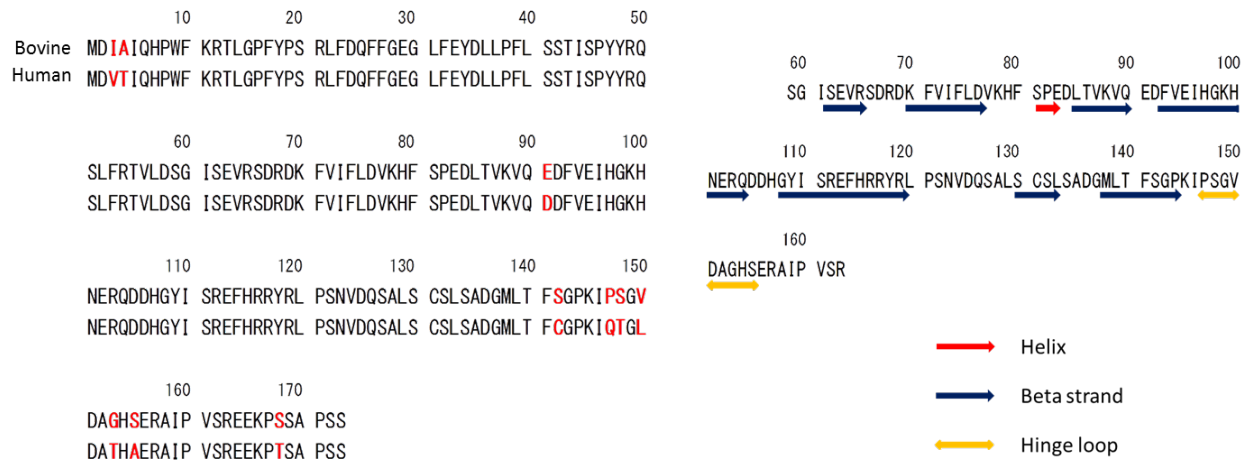
a)  $\alpha$ A 55-65 TVLD SGISEVR



b)



**Figure S2;** a) LC-MS chromatograms of the tryptic peptides of  $\alpha$ A 55-65: TVLD SGISEVR (a-1) and synthetic peptides of  $\alpha$ A 55-65 (a-2, a-3). L $\beta$ -Asp: TVLD(L $\beta$ -Asp)SGISE(L $\alpha$ -Glu)VR, L $\gamma$ -Glu: TVLD(L $\alpha$ -Asp)SGISE(L $\gamma$ -Glu)VR, D $\alpha$ -Asp: TVLD(D $\alpha$ -Asp)SGISE(L $\alpha$ -Glu)VR, L $\alpha$ -Asp: TVLD(L $\alpha$ -Asp)SGISE(L $\alpha$ -Glu)VR, D $\beta$ -Asp: TVLD(D $\beta$ -Asp)SGISE(L $\alpha$ -Glu)VR b) The structure of L $\alpha$ - and L $\gamma$ -glutamyl (Glu) residue in protein.



**Figure S3;** a) Primary sequence of bovine and human  $\alpha$ A-crystallin b) Primary and secondary structures of bovine  $\alpha$ A-crystallin 59-163 c) Tertiary structure of bovine  $\alpha$ A-crystallin 59-163 (PDB ID: 3L1E).