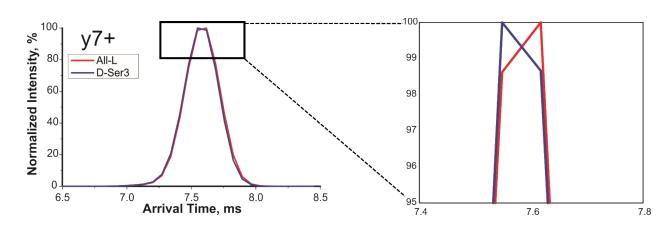
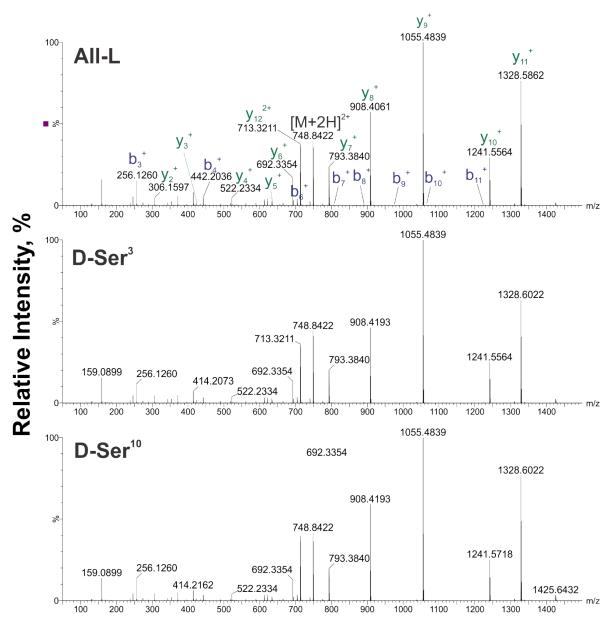
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Supporting Information For: Two-dimensional Identification and Localization of Isomers in Crystallin Peptides Using TWIM-MS					
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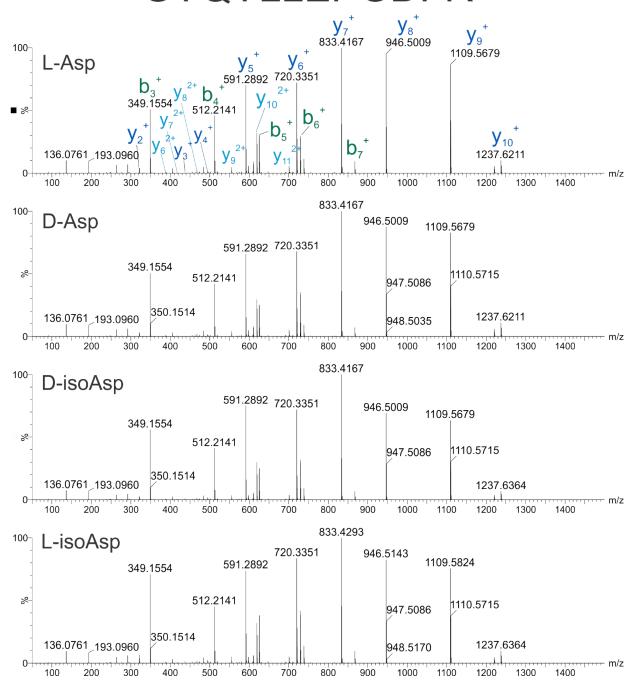
 $\textbf{Figure S1}. \ \text{ATDs of } y_7^+ \ \text{ions for AP}_{\text{D/L}} SWFDTGLSEMR \ \text{and the magnified peak maxima}.$ 

### **APSWFDTGLSEMR**



**Figure S2**: The CID spectra for the peptide isomers of APSWFDTGLSEMR: All-L (Top), D-Ser3 (Middle), and D-Ser10 (Bottom).

# **GYQYLLEPGDFR**



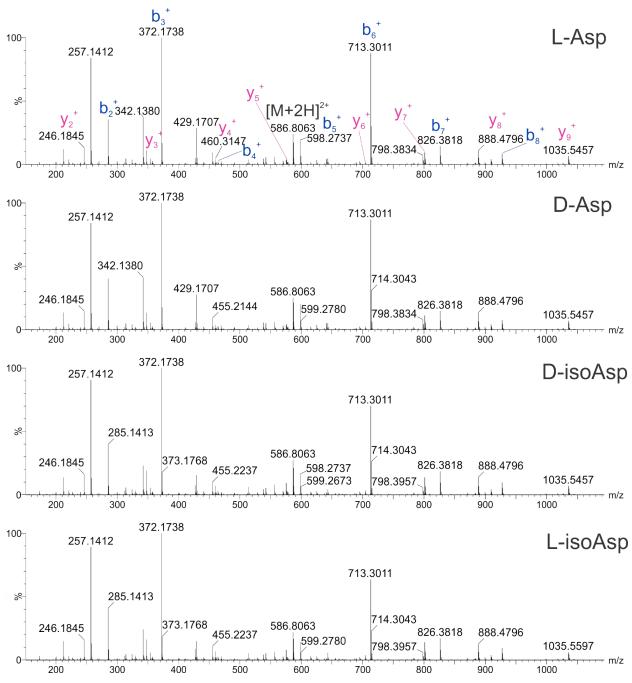
**Figure S3**: The CID spectra for the peptide isomers of GYQYLLEPGDFR: L-Asp (Top), D-Asp (Second), D-isoAsp (Third), and L-isoAsp (Bottom).

#### **GYQYLLEPGDFR** (a)<sub>100</sub> ATDs Area-overlaps (L vs Asp isomers) 80 Area-overlaps, % 60 40 - D-Asp 20 D-isoAsp L-isoAsp -99% Confidence Level b9<sup>+</sup> b10<sup>+</sup> b11<sup>+</sup> b2<sup>+</sup> b3<sup>+</sup> b4<sup>+</sup> b5<sup>+</sup> b6<sup>+</sup> b8<sup>+</sup> **(b)**<sub>4</sub> ATDs Area-overlaps (L vs Asp isomers) D-Glu D-isoGlu L-isoGlu 3 99% Confidence Level Intensity Ratio 0 b8<sup>+</sup> b2<sup>+</sup> b3<sup>+</sup> b5<sup>†</sup> b6<sup>+</sup> b7<sup>+</sup> b9<sup>+</sup> b10<sup>+</sup> b11<sup>+</sup> b4<sup>+</sup>

**Figure S4:** Result summary for peptide isomers GYQYLLEPG<u>D</u>FR. **(a)** ATD area-overlaps between L-Asp and D-Asp (blue), D-isoAsp (orange), or L-isoAsp (green) for b-ions. **(b)** CID intensity ratios of the isomeric b-ions.

### Full CID Spectra:

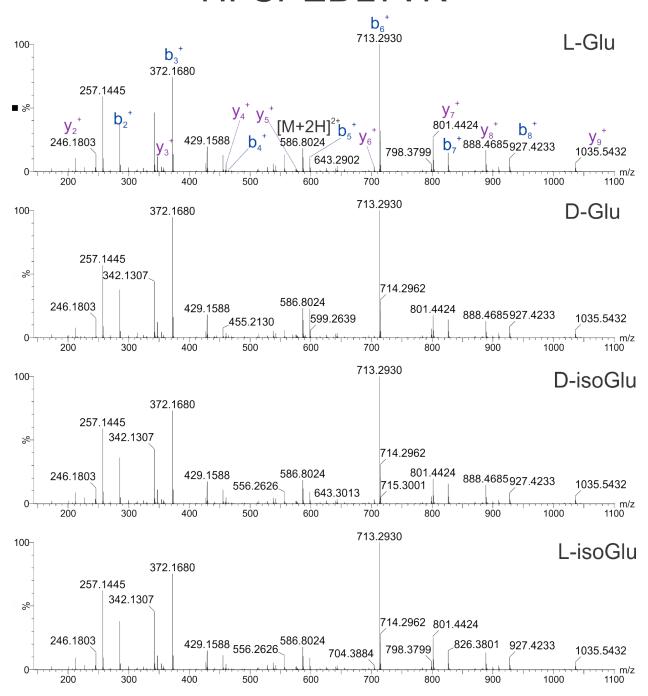
### **HFSPEDLTVK**



**Figure S5:** The CID spectra for the peptide isomers of HFSPDELTVK: L-Asp (Top), D-Asp (Second), D-isoAsp (Third), and L-isoAsp (Bottom).

### Full CID Spectra:

## **HFSPEDLTVK**



**Figure S6**: The CID spectra for the peptide isomers of HFSPDELTVK: L-Glu (Top), D-Glu (Second), D-isoGlu (Third), and L-isoGlu (Bottom).