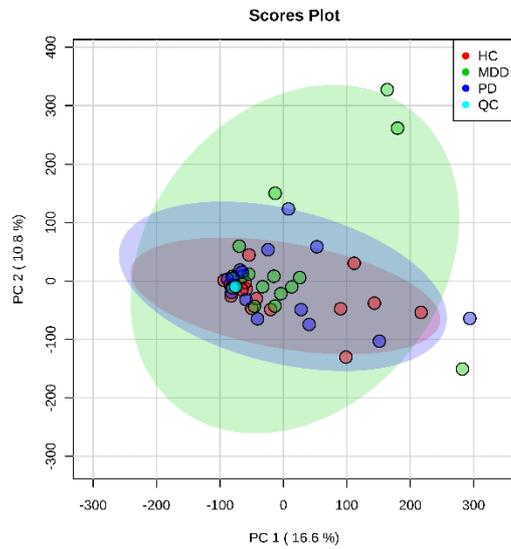


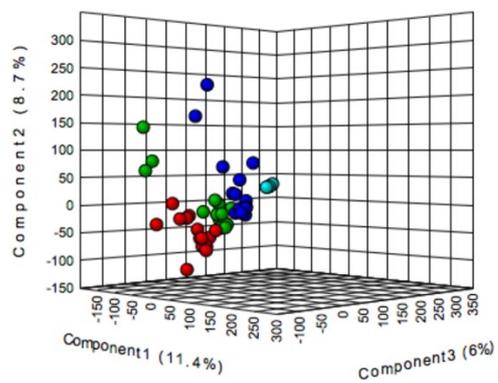
Supplementary figures.

S1: A: PCA analysis with all QC samples are focused in one dot, showing good instrumental analysis quality. B: 3-D PLS-DA analysis, showing separated trend among three groups with the first three components.

A

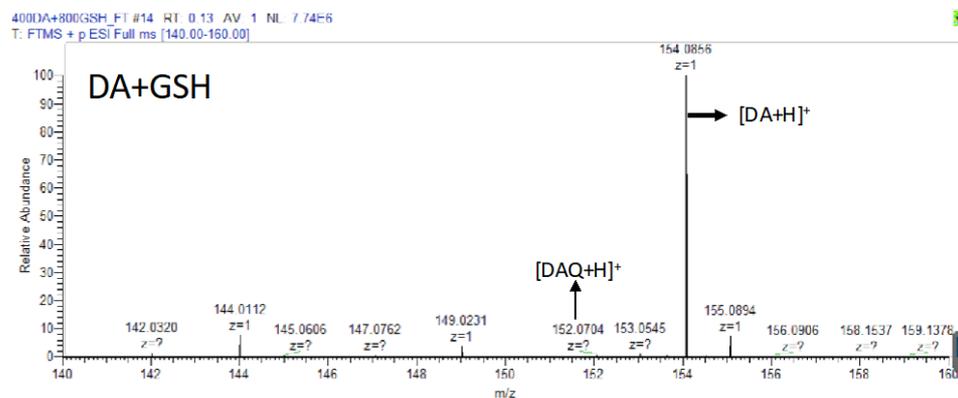
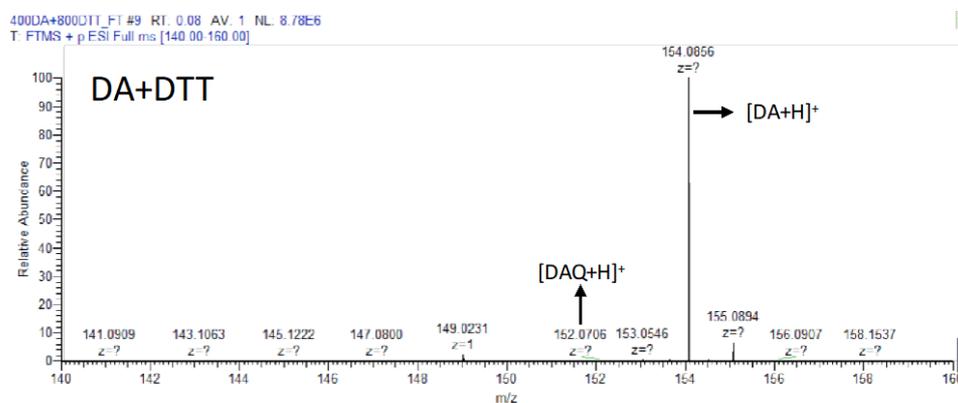
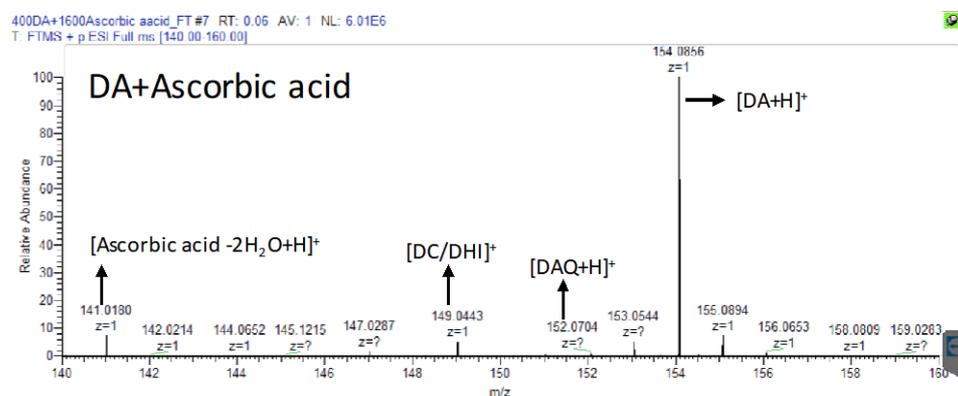
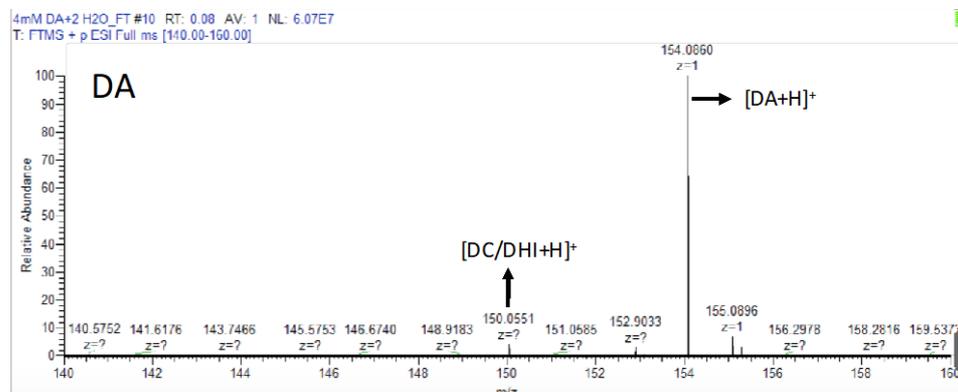


B



S2

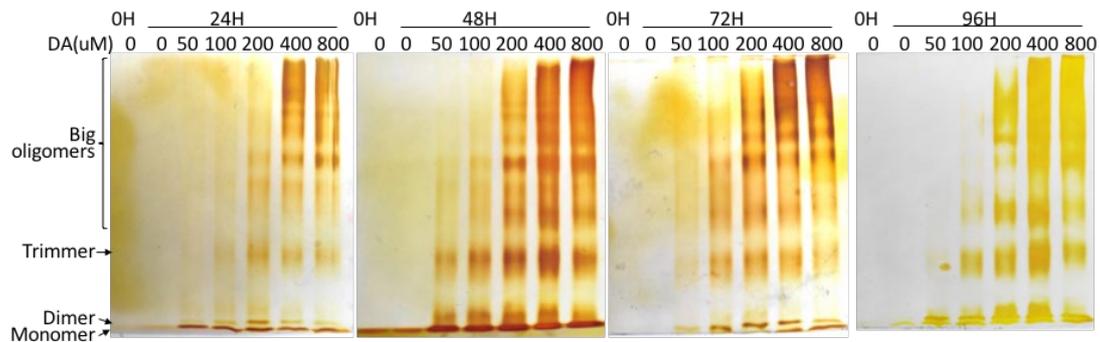
Detected DA and in vitro derivatives using nano LC-MS with and without antioxidants. The concentrations of compounds are shown in the title of the figures and the spectrum of specific DA derivatives are highlighted with an arrow and its name.



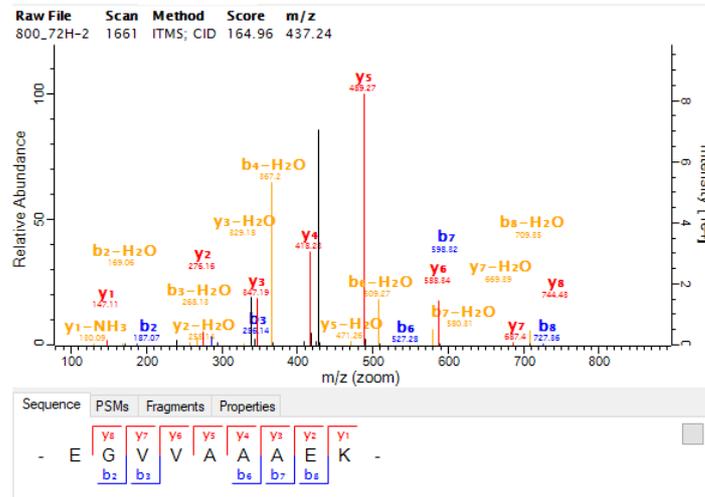
S3

(A) DA induced α -syn oligomerization is in a concentration dependent manner. Fixed concentration of α -syn (10uM) are treated with a gradient concentration of DA at 37 °C. The DA concentration and incubation time could be seen from the top of the figures. **(B)** The MaxQuant matched MS/MS spectrum of unmodified α -syn peptide fragment "13-EGVVAAA EK-21". **(C)** The MaxQuant matched MS/MS spectrum of DAQ modified α -syn peptide fragment "24-QGVAEAAGKTKEGVLYVGSK-43". 10 sites of y ion (in red) are matched and 8 sites of b ion (in blue) are matched, they are in a good distribution at the same time. DAQ modification on Lysine site (32K) is matched by 8 times.

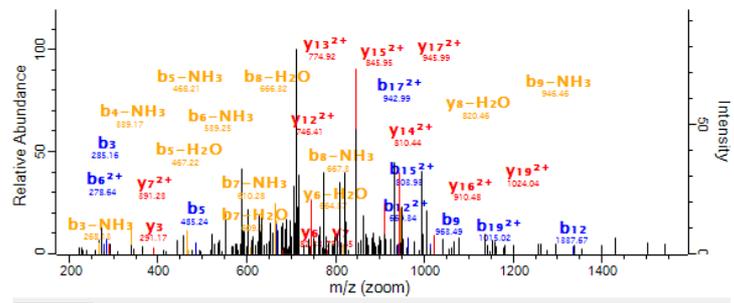
A



B



C



Sequence	PSMs	Fragments	Properties
- Q G V A E A A G Q T Q E G V L Q V G	y19²⁺	y17²⁺ y18²⁺ y12²⁺ y13²⁺ y14²⁺ y15²⁺ y16²⁺ y17²⁺ y18²⁺ y19²⁺ y7⁺ y6⁺ y2⁺	
S K -	b19²⁺	b3 b5 b6²⁺ b9 b12 b15²⁺ b17²⁺	