**SUPPORTING MATERIAL**

# Carnitine is a Pharmacological Allosteric Chaperone of the Human Lysosomal α-Glucosidase

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## Figure captions

**Figure S1.** ***Effect of L-CAR and D-CAR on rhGAA***

*a) Time course of the stabilizing effect of L- and D-CAR on the activity of rhGAA*. The stability of rhGAA activity was measured in the absence and in the presence of L-CAR (10 or 20 mM) and D-CAR for 48 h. *b) Effect of L-CAR on rhGAA activity.* The specific activity of rhGAA was measured in the absence and in the presence of L-CAR at various concentrations.

**Figure S2.** ***Comparison of the effect of D-CAR and A-D-CAR on the stability of rhGAA*** *(a) Effect on the rhGAA stability*. The specific activity of rhGAA was measured in the absence and in the presence of D- and A-D-CAR at various concentrations (0.1-10 mM). *(b) Effect on the rhGAA activity:* D- and A-D-CAR at various concentrations (0.1-10 mM) were incubated with rhGAA and the enzymatic activity was measured after 5 h of incubation at pH 7.4. *(c) Effect of D-CAR on the stability of the rhGAA activity.* rhGAA was incubated alone or with D-CAR (2-10 mM) in sodium phosphate buffer pH 7.4 at 37 °C. After 5h, the residual α-glucosidase activity was measured with the standard assay. *(d) Effect of D-CAR on the structural stability of rhGAA:* D-CAR was incubated with rhGAA at 5 concentrations (from 2 to 10 mM). Changes in the fluorescence of SYPRO Orange were monitored by DSF as a function of temperature at pH 7.4. *(e) Summary of the $T_m$s measured by DSF:* $T_m$ values were calculated according to Niesen et al., 2007 [1]. The standard deviations for each melting temperature were calculated from three replicates.

**Figure S3.** ***Effect of L-CAR on rhGAA stability in the medium***

PD fibroblasts were incubated in Dulbecco's modified Eagle's medium (DMEM) in the presence or in the absence of L-CAR 10 mM (black and grey lines, respectively). GAA activity decreased over time, with significant differences between rhGAA in combination with L-CAR and rhGAA alone already detectable after 2 hrs.

1. Niesen, F. H.; Berglund, H.; Vedadi, M. The use of differential scanning fluorimetry to detect ligand interactions that promote protein stability. *Nature Protocols* **2007,** 2, 2212-2221.