SUPPLEMENTARY FILES

Supplementary Table 1

Pharmacokinetics parameters derived from the plasma following 5mg and 2mg IV d6-α-tocopherol administration to 6 healthy (Subjects matched).

Parameter		IV d6 α-tocopherol	p-values
Elimination Rate (K_e)	5mg intervention	0.0214 ± 0.002	NS
	2mg intervention	0.0236 ± 0.001	
Half-life (h)	5mg intervention	33.7 ± 3.0	NS
	2mg intervention	30.0 ± 1.4	
C_{max} (μM)[1]	5mg intervention	1.06 ± 0.09 emp. 1.06 ± 0.05 mod.	<0.001
	2mg intervention	0.48 ± 0.02 emp. 0.48 ± 0.04 mod.	
T_{max} (h)[2]	5mg intervention	6.7 ± 0.3	NS
	2mg intervention	7.7 ± 1.1	
AUC_{0-72} (μM-h)[3]	5mg intervention	43.0 ± 4.8 emp. 43.0 ± 3.1 mod.	<0.001
	2mg intervention	17.5 ± 0.9 emp. 17.5 ± 2.4 mod.	

Pharmacokinetics parameters derived from the plasma d6-α-T concentrations following 5mg and 2mg IV d6 α-tocopherol administration to 6 healthy (Mean ± SEM).

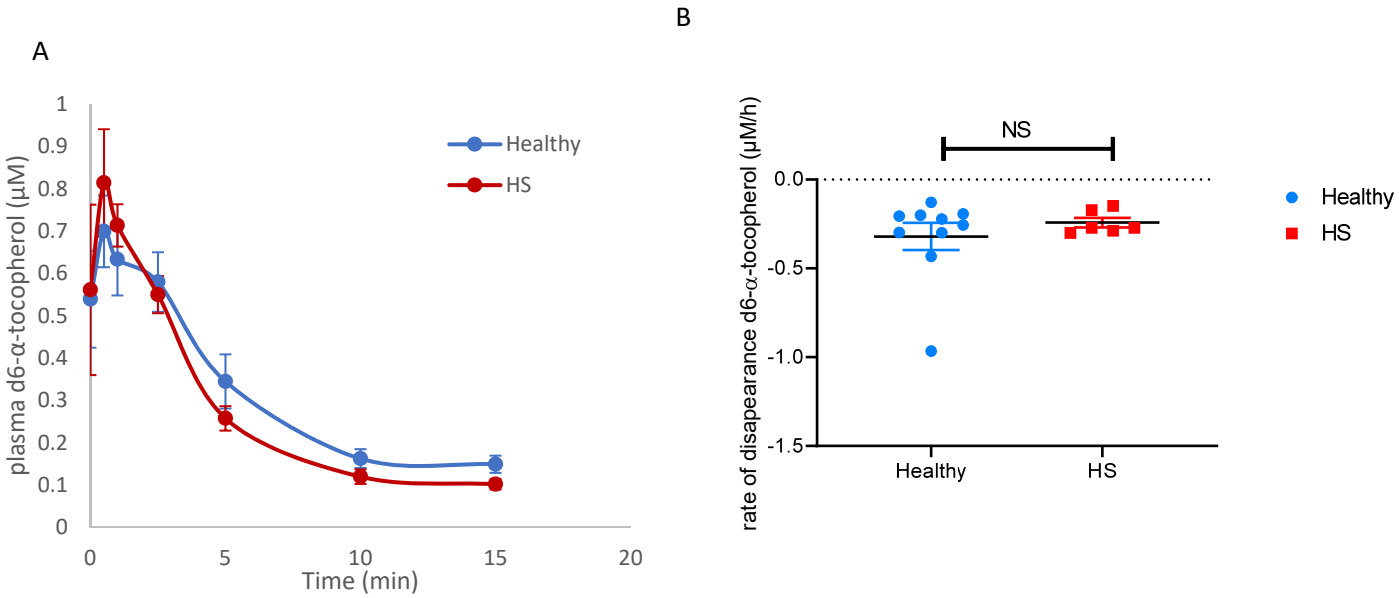
(1) C_{max}, maximum concentration post-nadir for the IV dose.

(2) $T_{max,}$ Time of maximum concentration post-nadir for the IV dose.

(3) AUC_{0-72} is calculated from the plasma concentrations from 0 to 72 h. AUC_{0-8h} is calculated from the plasma concentration from 0 to 8h corresponding to the time of C_{max} for d6-α-tocopherol. C_{max}, maximal concentration**;** T_{max}, time of maximum concentration, K_e; Constant of elimination; emp., empirical standard errors of the mean (SEM); mod., Mixed-effects model-based standard errors of the mean.

Supplementary figure 1

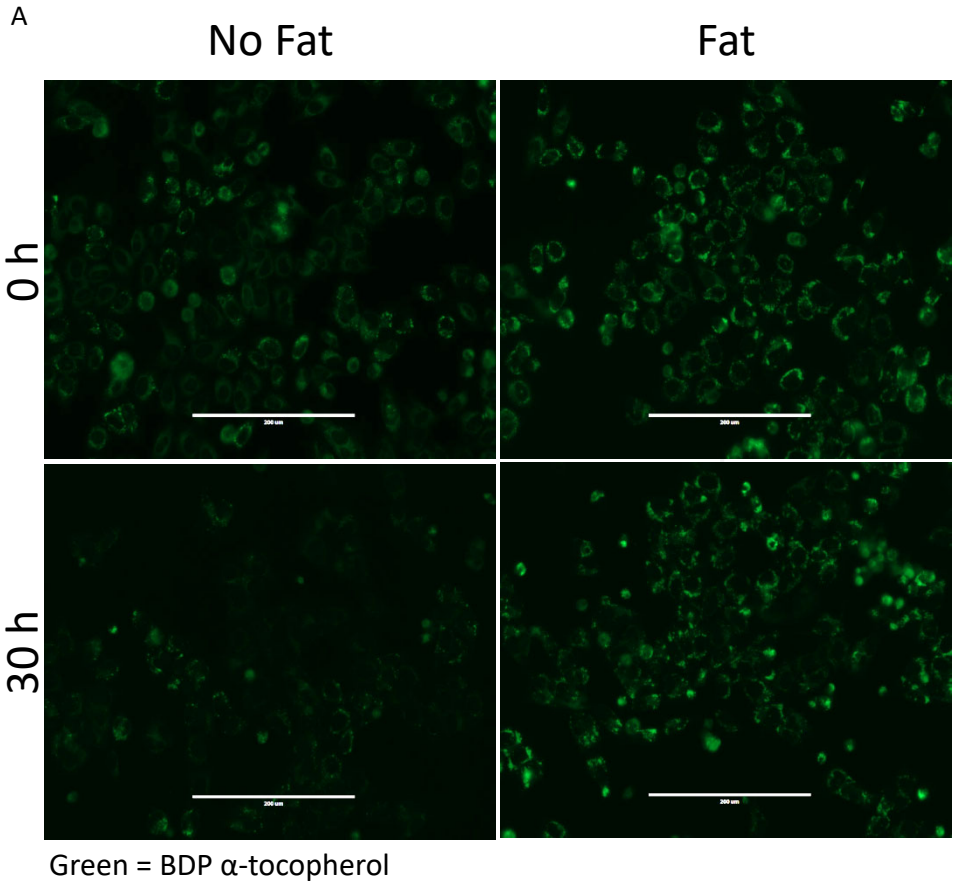
Initial disappearance of d6-α-tocopherol in Healthy and HS patient.



Initial disappearance of d6-α-tocopherol in 10 Healthy and 6 HS patient from 0 to 15min following IV injection of 2mg d6-α-tocopherol (a) or matched to patient status (b). Statistics . Statistics: (a) two-way ANOVA (multiple comparisons), (b) Student's t test (Unpaired, Two-tailed).

Supplementary Figure 2

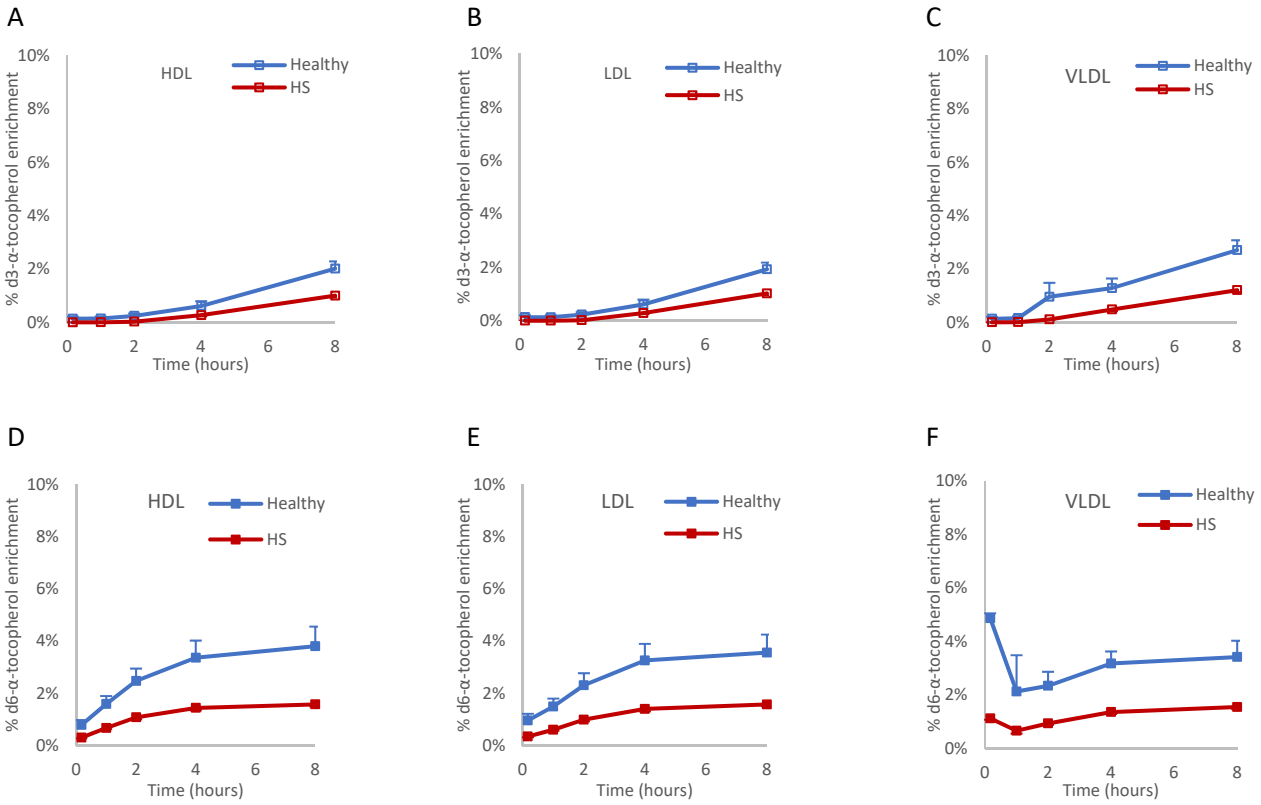
Fat traps vitamin E *in vitro*



(a) IHH cells loaded with or without 100μM of oleic acid for 24h, followed by incubation with 10μM BDP-α-tocopherol (green) for 2h. Images were taken at this time (0h), or 30h later after incubation in media without BDP-α-tocopherol.

Supplementary Figure 3

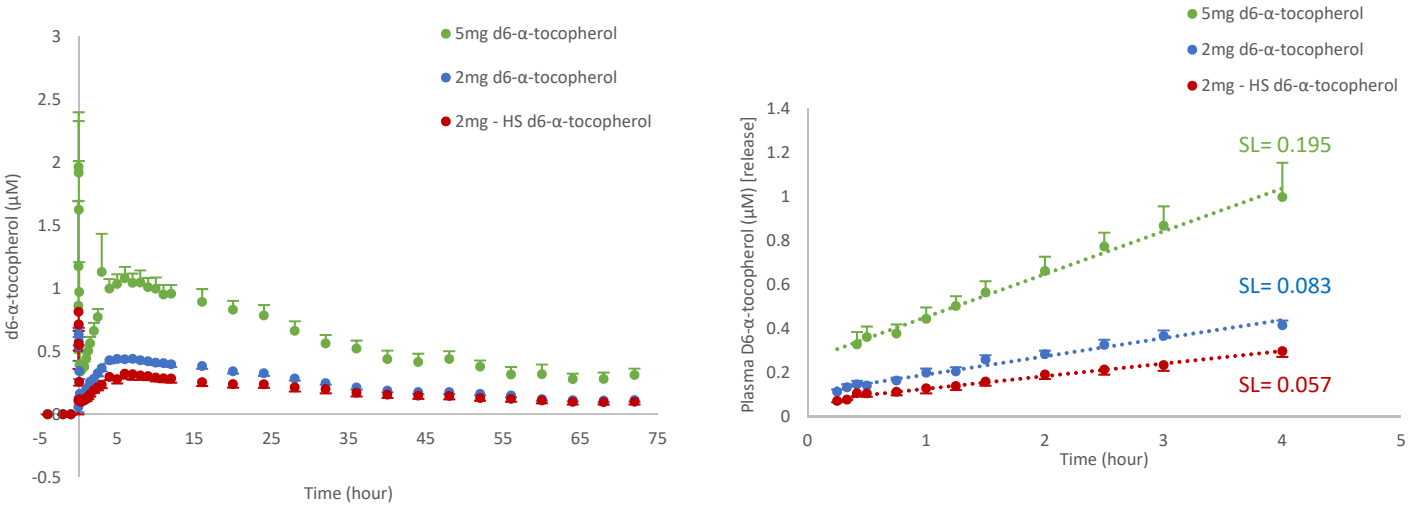
d6-, d3-α-Tocopherol %enrichment into lipoproteins in 10 healthy vs 6 HS women



(a-c) percent d3-α-tocopherol (d-f) and percent d6-α-tocopherol enrichment for VLDL, LDL and HDL from 0 to 8 hours in 10 healthy (□,■) and 6 HS (□,■) subjects following 2mg IV and oral administration of deuterated tocopherols. Statistics: two-way ANOVA (multiple comparisons).

Supplementary figure 4

Plasma concentrations of d6-α-tocopherol healthy and 6 HS women



A) d6-α-tocopherol 5mg (●), 2mg (●) and 2mg (●) in HS subjects was administered intravenously at time zero, plasma samples obtained over 72h. (b) Initial disappearance of d6 α-tocopherol in Healthy (5mg (●), 2mg (●) and 2mg in HS subjects (●) (0-72h). Data for d6-α-tocopherol 2 and 5mg for healthy subjects are also shown in figure 1G_Inset. SL, Slope