Electronic Supplementary Material (ESI) for Toxicology Research.

Alkyl chain modulated cytotoxicity and antioxidant activity of bioinspired amphiphilic selenolanes

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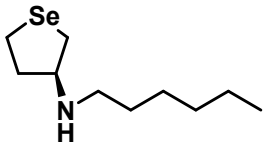
Experimental Methods S1

NMR Spectrum data

^{1}H (500 MHz), ^{13}C (125.8 MHz), and ^{77}Se(95.4 MHz) NMR spectra were recorded with a Bruker AV-500 spectrometer at 298 K. Coupling constants (*J*) are reported in Hz.

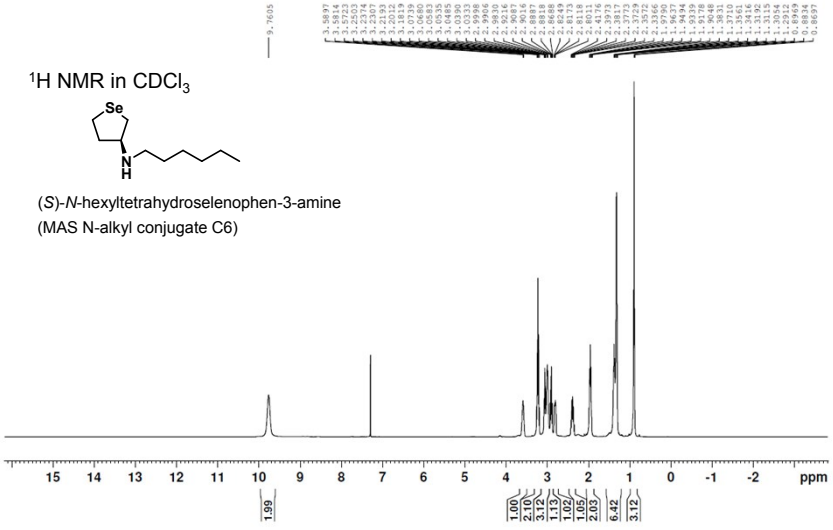
(*S*)-*N*-hexyltetrahydroselenophen-3-amine (MAS N-alkyl conjugate C6)



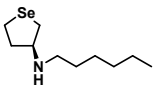
^{1}H NMR ($CDCl_3$) δ=0.88 (t, *J*= 6.8 Hz, 3H), 1.29–1.38 (m, 6H), 1.90–1.97 (m, 2H), 2.34–2.42(m, 1 H), 2.80–2.82 (m, 1H), 2.87–2.92 (m, 1H), 2.98–3.07 (m, 3H), 3.18–3.25 (m, 2H), 9.76 ppm (br s, 2H); ^{13}C NMR ($CDCl_3$) δ= 13.9, 18.4,22.5, 22.9, 26.1, 26.6, 31.2, 34.2, 47.3, 63.0 ppm; ^{77}Se NMR($CDCl_3$) δ=165.3 ppm

NMR Spectra

(*S*)-*N*-hexyltetrahydroselenophen-3-amine(MAS N-alkyl conjugate C6)

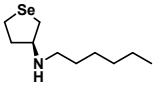


^{13}C NMR in $CDCl_3$



(*S*)-*N*-hexyltetrahydroselenophen-3-amine
(MAS N-alkyl conjugate C6)

^{77}Se NMR in $CDCl_3$



(*S*)-*N*-hexyltetrahydroselenophen-3-amine
(MAS N-alkyl conjugate C6)

Supplementary figure legends

Figure S1. The hydrolytic stability of the conjugates was checked by monitoring the ^{1}H (500 MHz) NMR spectra of the representatives DHS-C_{14} in deuterated water. For this, approximately 1 mg of above compound was dissolved in 1 ml of 1:9 mixture of DMSO-d6 and D_2O and NMR spectra were recorded with a Bruker AV-500 spectrometer at 298 K at 1 min and 24 h after making the solutions. The spectra clearly show that there is no degradation of the conjugates under these conditions at least for 24 h.

Figure S2. Chain length dependant cytotoxicity of the DHS and MAS conjugates (C_{6-14}) in cells. (A) & (B) Graphs show the effect of hydrophobic chain length on the cytotoxic effect of the conjugates of DHS and MAS as determined by MTT assay at 24 h after addition of 30 μM of above compounds to CHO and MCF7 cells respectively. Cytotoxicity is expressed as percentage of the control cells (DMSO, 0.25%). Results are presented as mean ± SEM, n = 3.

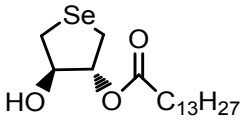
Figure S3. Cytotoxic effects of DHS, MAS and their conjugates (C_{6-14}) on MCF7 cells. Cytotoxicty was evaluated by the MTT assay at different time points (24, 48 and 72 h) after the addition of the varying concentrations (1-50 μM) of DHS, MAS and their conjugates (C_{6-14}). Cytotoxicity is expressed as percentage of the control cells (DMSO, 0.25%). Results are presented as mean ± SEM, n = 3.

Figure S4. Cytotoxic effect of free fatty acid ($C_{6:0}$ to $C_{12:0}$) in cells. The CHO (A) and MCF7 (B) cells were treated with increasing concentrations of fatty acids for 72 h and the cytotoxicity was determined by MTT assay. Cytotoxicity is expressed as percentage of the control cells (DMSO, 0.25%). Results are presented as mean ± SEM, n = 3.

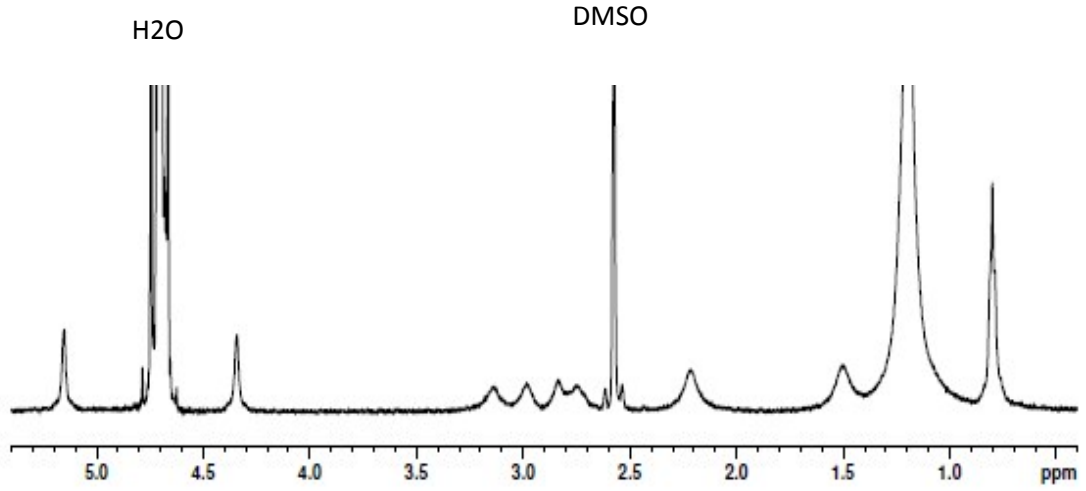
Figure S5. The effect of the treatments with DHS and MAS on the activity of lactate dehydrogenase (LDH) was evaluated using LDH detection kit, Roche, Switzerland. For this assay, CHO cells (1×10^6) were homogenised in 150 µl of cold LDH assay buffer provided with the kit. Approximately 50 µl of this lysate was incubated with DHS or MAS for 2 h and then subjected to LDH activity determination according to manufacturer′s instructions. The control sample represents untreated cell lysate subjected to LDH determination.

Figure S1

DHS-C_{14}



Time = 1 min



Time = 24 h

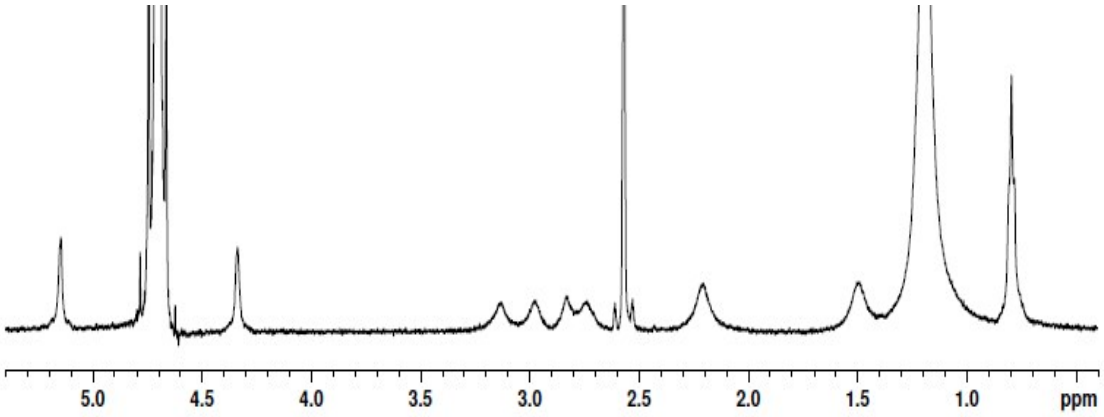


Figure S2

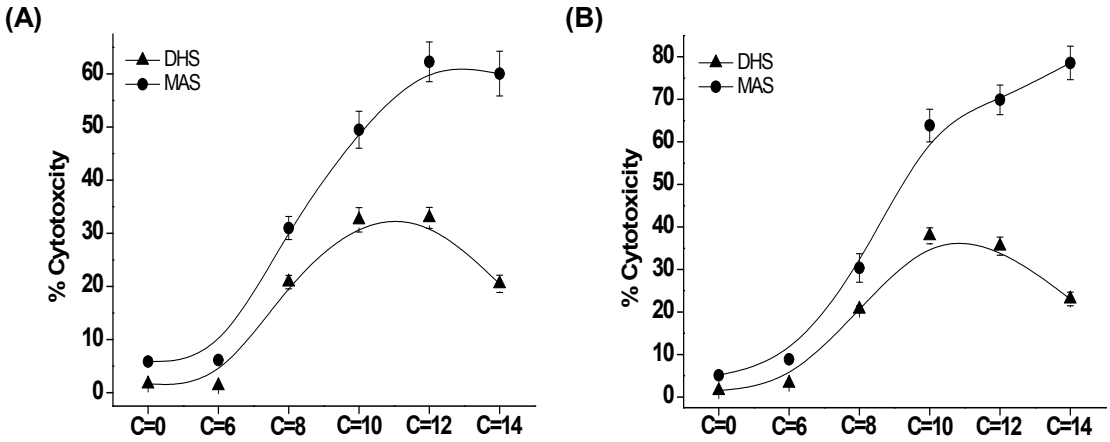

(A)
DHS
MAS
% Cytotoxcity
0
10
20
30
40
50
60
C=0
C=6
C=8
C=10
C=12
C=14
(B)
DHS
MAS
% Cytotoxicity
0
10
20
30
40
50
60
70
80
C=0
C=6
C=8
C=10
C=12
C=14

Figure S3

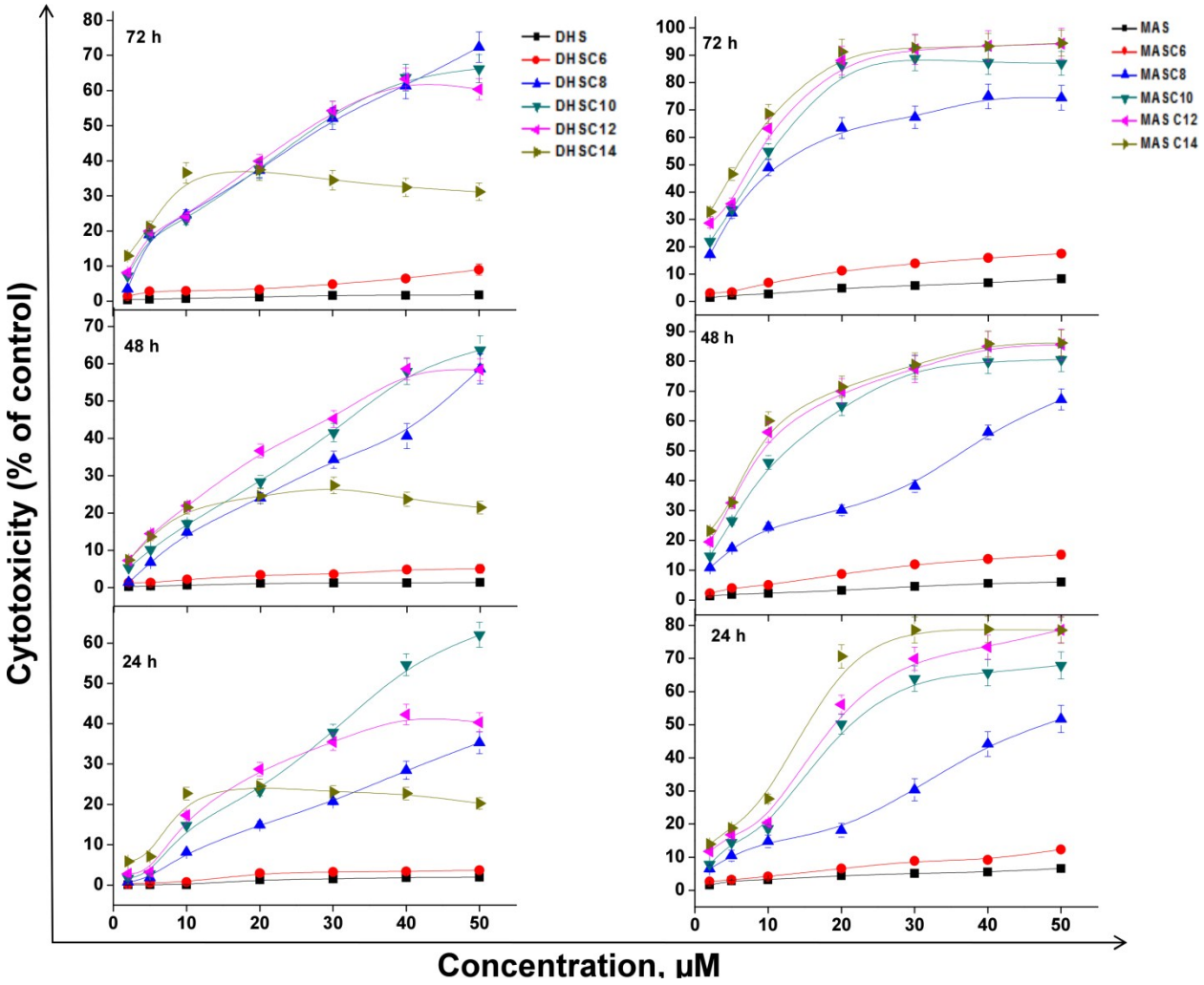

72 h
48 h
24 h
DHS
DHSC6
DHSC8
DHSC10
DHSC12
DHSC14
MAS
MASC6
MASC8
MASC10
MAS C12
MAS C14
Cytotoxicity (% of control)
Concentration, μM

Figure S4

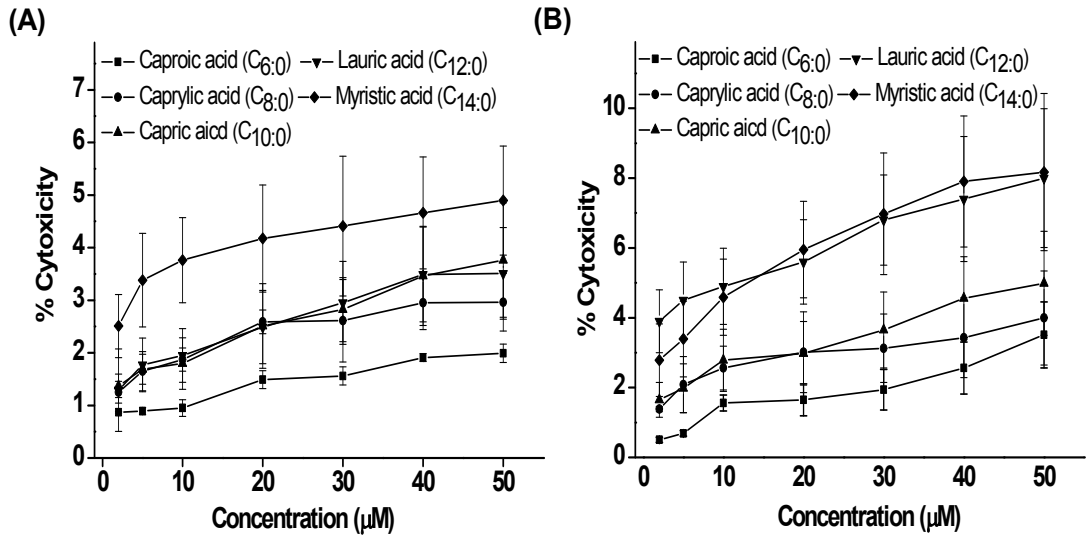
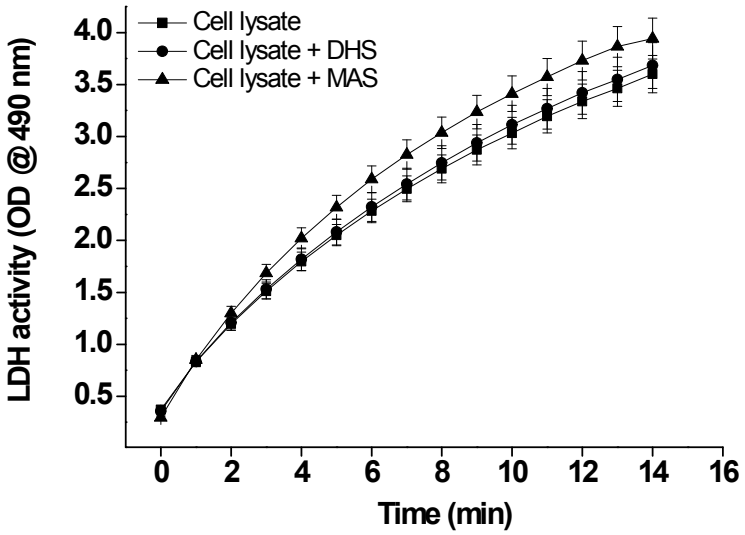

(A)
Caproic acid ($C_{6:0}$)
Lauric acid ($C_{12:0}$)
Caprylic acid ($C_{8:0}$)
Myristic acid ($C_{14:0}$)
Capric aicd ($C_{10:0}$)
% Cytoxicity
Concentration (μM)
(B)
Caproic acid ($C_{6:0}$)
Lauric acid ($C_{12:0}$)
Caprylic acid ($C_{8:0}$)
Myristic acid ($C_{14:0}$)
Capric aicd ($C_{10:0}$)
% Cytoxicity
Concentration (μM)

Figure S5


Cell lysate
Cell lysate + DHS
Cell lysate + MAS
LDH activity (OD @490 nm)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0
2
4
6
8
10
12
14
16
Time (min)