^{1}H-NMR SPECTRA DATA – COMPOUND STRUCTURE CONFIRMATION

For each δ (ppm) chemical shift stated, only the respective Hs are shown

m-7NH-m series

12-7NH-12 (1,9-bis(dodecyl)-1,1,9,9-tetramethyl-5-amino-1,9-nonanediammonium dibromide)

^{1}H-NMR data for 12-7NH-12 are consistent with data from our previous report. [a]

16-7NH-16 (1,9-bis(hexadecyl)-1,1,9,9-tetramethyl-5-amino-1,9-nonanediammonium dibromide)

δ_H/ppm (500 MHz, $CDCl_3$, Me_4Si):

0.88 (6H, t, Me), 1.25-1.35 (52H, m, -(C**H**$_2$)$_{13}$), 1.74 (4H, m, $^+$N-C-C**H**$_2$), 2.19 (4H, m, $^+$N-C-C**H**$_2$-C-N), 2.90 (1H, br s, N**H**), 2.98 (4H, m, $^+$N-C$_2$-C**H**$_2$-N), 3.32 (12H, s, $^+$NMe), 3.36-3.45 (4H, m, $^+$N-C**H**$_2$), 4.08-4.12 (4H, m, $^+$N-C**H**$_2$-C$_2$-N).

18-7NH-18 (1,9-bis(octadecyl)-1,1,9,9-tetramethyl-5-amino-1,9-nonanediammonium dibromide)

δ_H/ppm (500 MHz, $CDCl_3$, Me_4Si):

0.87 (6H, t, Me), 1.26-1.38 (60H, m, -(C**H**$_2$)$_{15}$), 1.76 (4H, m, $^+$N-C-C**H**$_2$), 2.04 (1H, br s, N**H**), 2.53 (4H, m, $^+$N-C-C**H**$_2$-C-N), 2.88 (4H, m, $^+$N-C$_2$-C**H**$_2$-N), 3.30 (4H, m, $^+$N-C**H**$_2$), 3.40 (12H, s, $^+$NMe), 4.10-4.18 (4H, m, $^+$N-C**H**$_2$-C$_2$-N).

18:1-7NH-18:1 (1,9-bis(*cis*-oleyl)-1,1,9,9-tetramethyl-5-imino-1,9-nonanediammonium dibromide)

δ_H/ppm (500 MHz, $CDCl_3$, Me_4Si):

0.85 (6H, t, Me), 1.20-1.40 (44H, m, (C**H**$_2$)$_5$-C-C=C-C-(C**H**$_2$)$_6$), 1.77 (4H, m, $^+$N-C-C**H**$_2$), 1.90 (1H, br s, N**H**), 2.03 (8H, m, allylic Hs), 2.10 (2H, m, $^+$N-C-C**H**$_2$-C-N), 2. 68 (4H, m, $^+$N-C$_2$-C**H**$_2$-N), 3.23 (4H, m, $^+$N-CH$_2$), 3.49 (12H, s, $^+$NMe), 4.10-4.15 (4H, m, $^+$N-C**H**$_2$-C$_2$-N), 5.30-5.40 (4H, t, vinyl Hs).

m-3-m series

12-3-12 (1,3-propanediyl-bis(dimethyl-dodecylammonium) dibromide)

^{1}H-NMR data for 12-3-12 are consistent with data from our previous report. [b]

16-3-16 (1,3-propanediyl-bis(dimethyl-hexadecylammonium) dibromide)

^{1}H-NMR data for 16-3-16 are consistent with data from our previous report. [c]

18-3-18 (1,3-propanediyl-bis(dimethyl-octadecylammonium) dibromide)

δ_H/ppm (500 MHz, $CDCl_3$, Me_4Si):

0.88 (6H, t, Me), 1.26-1.40 (60H, m, -(C**H**$_2$)$_{15}$), 1.82 (4H, m, $^+$N-C-C**H**$_2$), 2.83 (2H, m, N$^+$-C-C**H**$_2$-C-N$^+$), 3.40 (12H, s, $^+$NMe), 3.46 (4H, m, $^+$N-C**H**$_2$), 3.98 (4H, m, $^+$N-C**H**$_2$-C-C**H**$_2$-N$^+$).

18:1-3-18:1 (1,3-propanediyl-bis(dimethyl-*cis*-oleylammonium) dibromide)

^{1}H-NMR data for 18:1-3-18:1 are consistent with data from our previous report.[d]

m-7-m series

12-7-12 (1,7-heptanediyl-bis(dimethyldodecylammonium) dibromide)

δ_H/ppm (500 MHz, $CDCl_3$, Me_4Si):

0.89 (6H, t, Me), 1.20-1.38 (36H, m, -(C**H**$_2$)$_9$), 1.55 (6H, m, $^+$N-C$_2$-(C**H**$_2$)$_3$-C$_2$-N$^+$), 1.78 (2H, m, $^+$N-C-C**H**$_2$-), 1.85 (4H, m, $^+$N-C-C**H**$_2$-C$_3$-C**H**$_2$-C-N$^+$), 3.33 (12H, s, $^+$NMe), 3.48 (4H, m, $^+$N-C**H**$_2$), 3.98 (4H, m, $^+$N-C**H**$_2$-C$_5$-C**H**$_2$-N$^+$).

16-7-16 (1,7-heptanediyl-bis(dimethylhexadecylammonium) dibromide)

δ_H/ppm (500 MHz, $CDCl_3$, Me_4Si):

0.87 (6H, t, Me), 1.26-1.38 (52H, m, -(C**H**$_2$)$_{13}$), 1.58 (6H, m, $^+$N-C$_2$-(C**H**$_2$)$_3$-C$_2$-N$^+$), 1.72 (2H, m, $^+$N-C-C**H**$_2$-), 1.88 (4H, m, $^+$N-C-C**H**$_2$-C$_3$-C**H**$_2$-C-N$^+$), 3.23 (12H, s, $^+$NMe), 3.43 (4H, m, $^+$N-C**H**$_2$), 3.91 (4H, m, $^+$N-C**H**$_2$-C$_5$-C**H**$_2$-N$^+$).

18-7-18 (1,7-heptanediyl-bis(dimethyl-octadecylammonium) dibromide)

δ_H/ppm (500 MHz, $CDCl_3$, Me_4Si):

0.88 (6H, t, Me), 1.20-1.36 (60H, m, -(C**H**$_2$)$_{15}$), 1.57 (6H, m, $^+$N-C$_2$-(C**H**$_2$)$_3$-C$_2$-N$^+$), 1.72 (2H, m, $^+$N-C-C**H**$_2$-), 1.86 (4H, m, $^+$N-C-C**H**$_2$-C$_3$-C**H**$_2$-C-N$^+$), 3.35 (12H, s, $^+$NMe), 3.49 (4H, m, $^+$N-C**H**$_2$), 3.88 (4H, m, $^+$N-C**H**$_2$-C$_5$-C**H**$_2$-N$^+$).

REFERENCES:

[a] Ref [21], [b] Ref [47] and #236 therein, [c] Ref [47] and #222 therein, [d] Ref [44] – see main article's bibliography.