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# The antibacterial effect of PEGylated carbosilane dendrimers on *P. aeruginosa* alone and in the combination with phage-derived endolysin

Sara Quintana-Sanchez<sup>1,2,3</sup>, Natalia Gómez-Casanova<sup>4</sup>, Javier Sánchez-Nieves<sup>1,2,3,\*</sup>, Rafael Gómez<sup>1,2,3</sup>, Jarosław Rachuna<sup>5</sup>, Sławomir Wąsik<sup>6</sup>, Jacek Semaniak<sup>6</sup>, Barbara Maciejewska<sup>7</sup>, Zuzanna Drulis-Kawa<sup>7</sup>, Karol Ciepluch<sup>5</sup>, Francisco Javier de la Mata<sup>1,2,3</sup>, Michał Arabski<sup>5,\*</sup>

<sup>1</sup> Department of Organic and Inorganic Chemistry, Research Institute in Chemistry “Andrés M. del Río” (IQAR), University of Alcalá, 28871 Alcalá de Henares, Spain; sara.quintana@edu.uah.es (S.Q.-S.); rafael.gomez@uah.es (R.G.); javier.delamata@uah.es (F.J.d.I.M.)

<sup>2</sup> Networking Research Center for Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN), 28029 Madrid, Spain; Ramón y Cajal Institute of Health Research, IRYCIS, 28034 Madrid, Spain;

<sup>4</sup> Department of Biomedicine and Biotechnology, Faculty of Pharmacy, University of Alcalá, 28871 Alcalá de Henares, Spain; natalia.gomezc@uah.es

<sup>5</sup> Division of Medical Biology, Jan Kochanowski University, 25-406 Kielce, Poland; jaroslaw.rachuna@gmail.com (J.R.); kciepluch@ujk.edu.pl (K.C.)

<sup>6</sup> Institute of Physics, Jan Kochanowski University, 25-406 Kielce, Poland; slawomir.wasik@ujk.edu.pl (S.W.); jacek.semaniak@ujk.edu.pl (J.S.)

<sup>7</sup> Department of Pathogen Biology and Immunology, University of Wrocław, 51-148 Wrocław, Poland; barbara.maciejewska@uwr.edu.pl (B.M.); zuzanna.drulis-kawa@uwr.edu.pl (Z.D.-K.)

\* Correspondence: javier.sancheznieves@uah.es (J.S.-N.); arabski@ujk.edu.pl (M.A.)

## 4.1. Synthesis of cationic CBS dendrimers.

$\text{GoSi}(\text{SiMe}_2\text{V})_4$  (1):

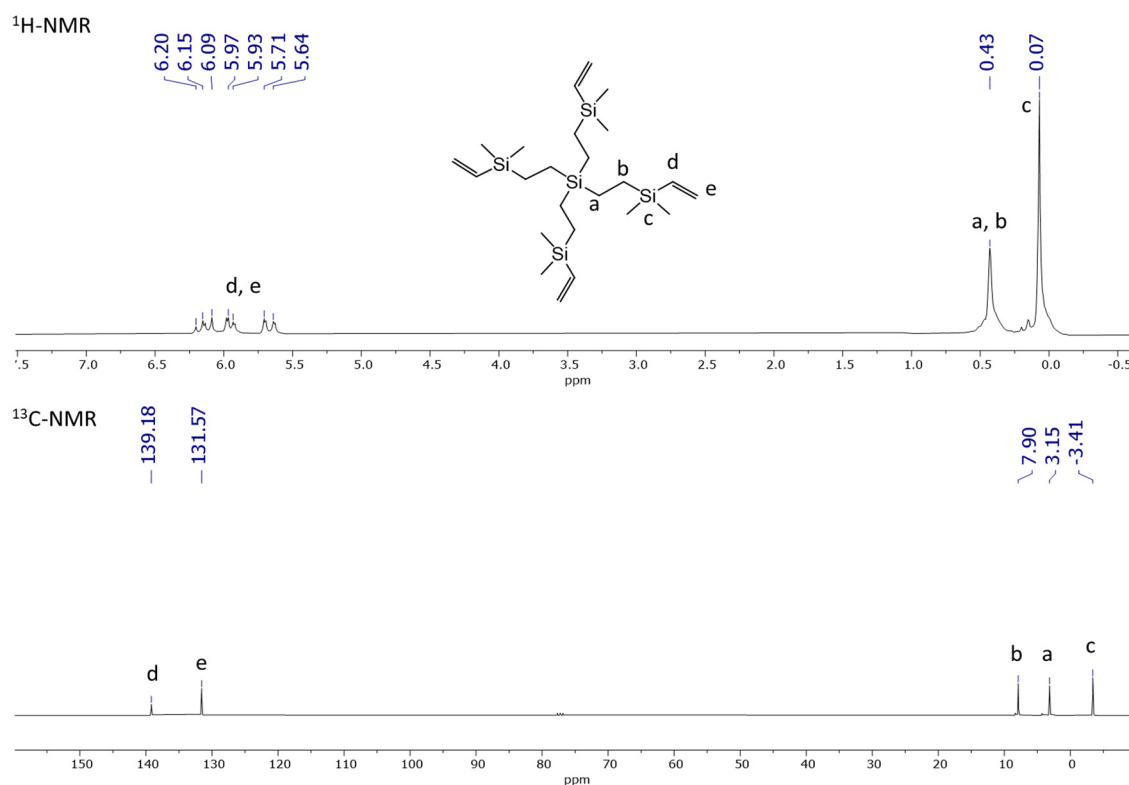
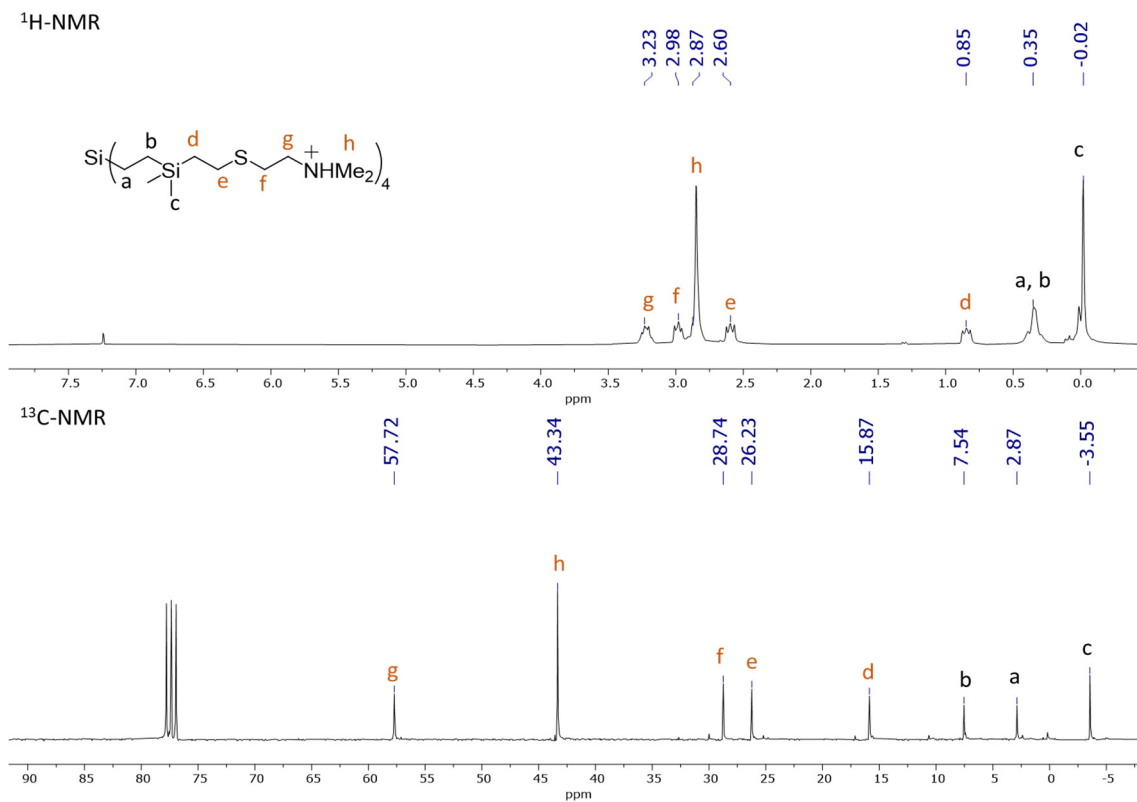


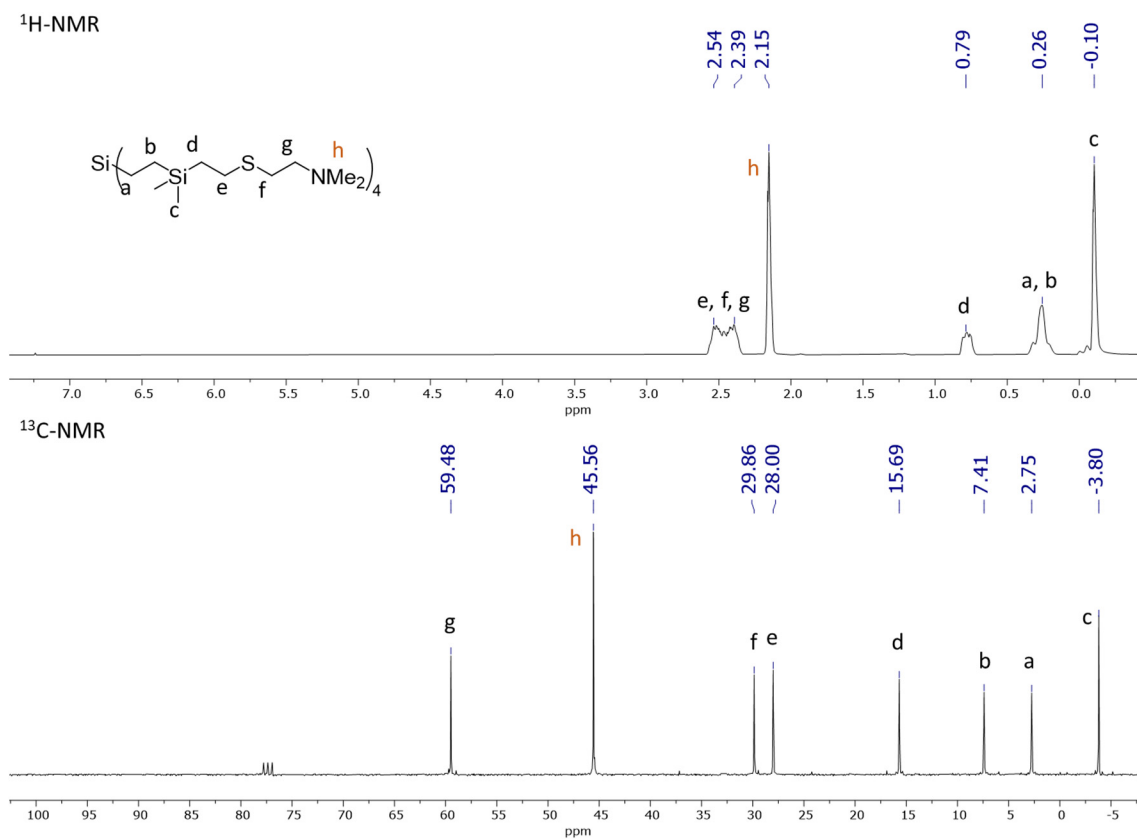
Figure S1. <sup>1</sup>H and <sup>13</sup>C-NMR of compound 1 ( $\text{CDCl}_3$ ).

**G<sub>0</sub>Si(SiMe<sub>2</sub>-NMe<sub>2</sub>HCl)<sub>4</sub> (2):**



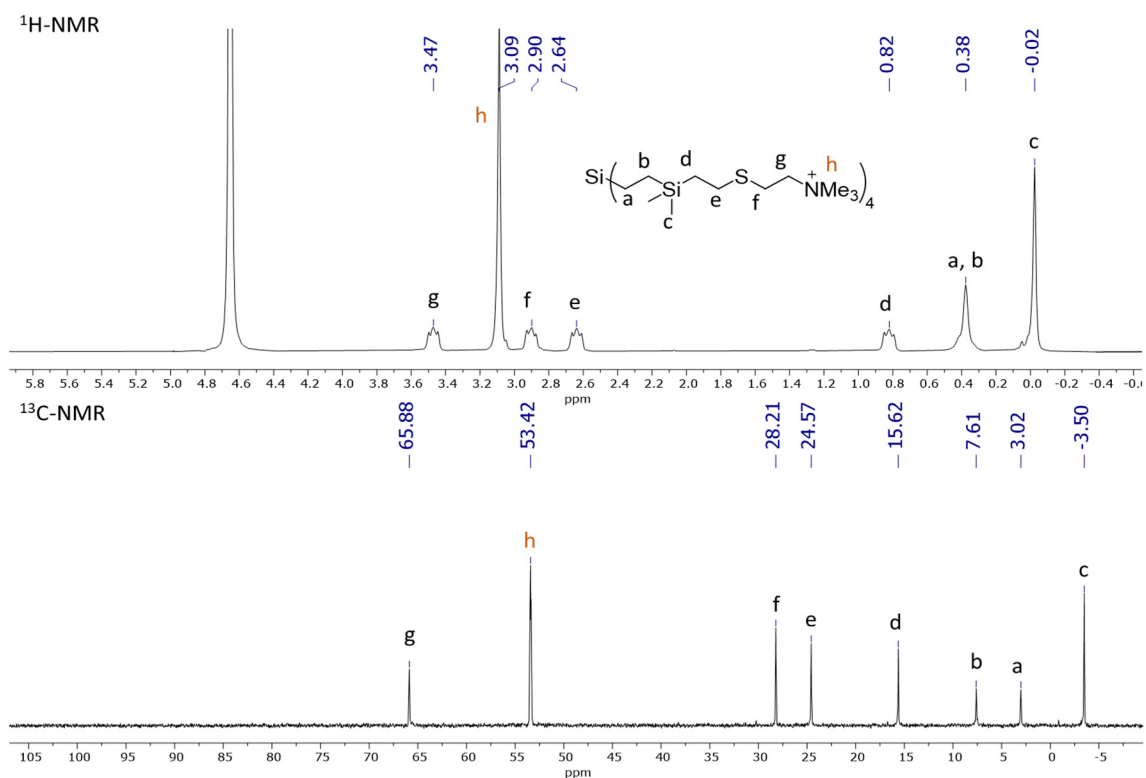
**Figure S2.** <sup>1</sup>H and <sup>13</sup>C-NMR of compound 2 (CD<sub>3</sub>OD).

**G<sub>0</sub>Si(SiMe<sub>2</sub>-NMe<sub>2</sub>)<sub>4</sub> (3):**



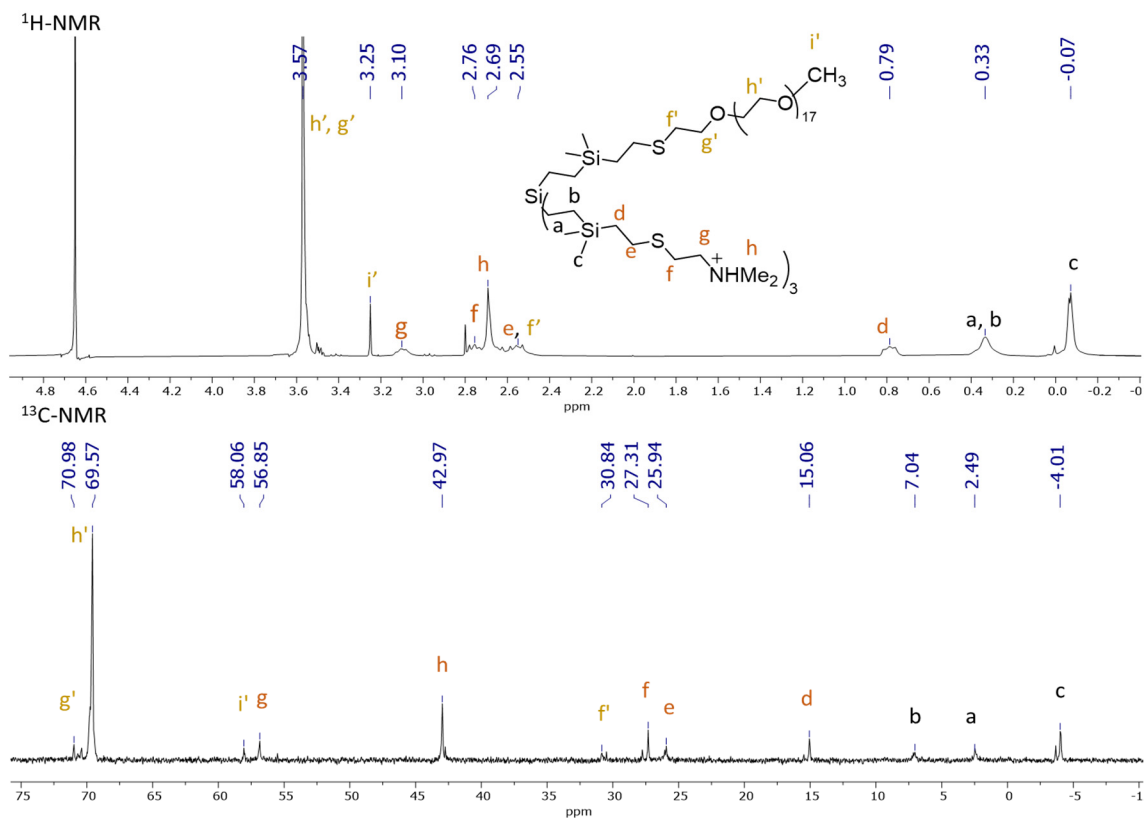
**Figure S3.** <sup>1</sup>H and <sup>13</sup>C-NMR of compound 3 (CDCl<sub>3</sub>).

**G<sub>0</sub>Si(SiMe<sub>2</sub>-NMe<sub>3</sub>Cl)<sub>4</sub> (4):**



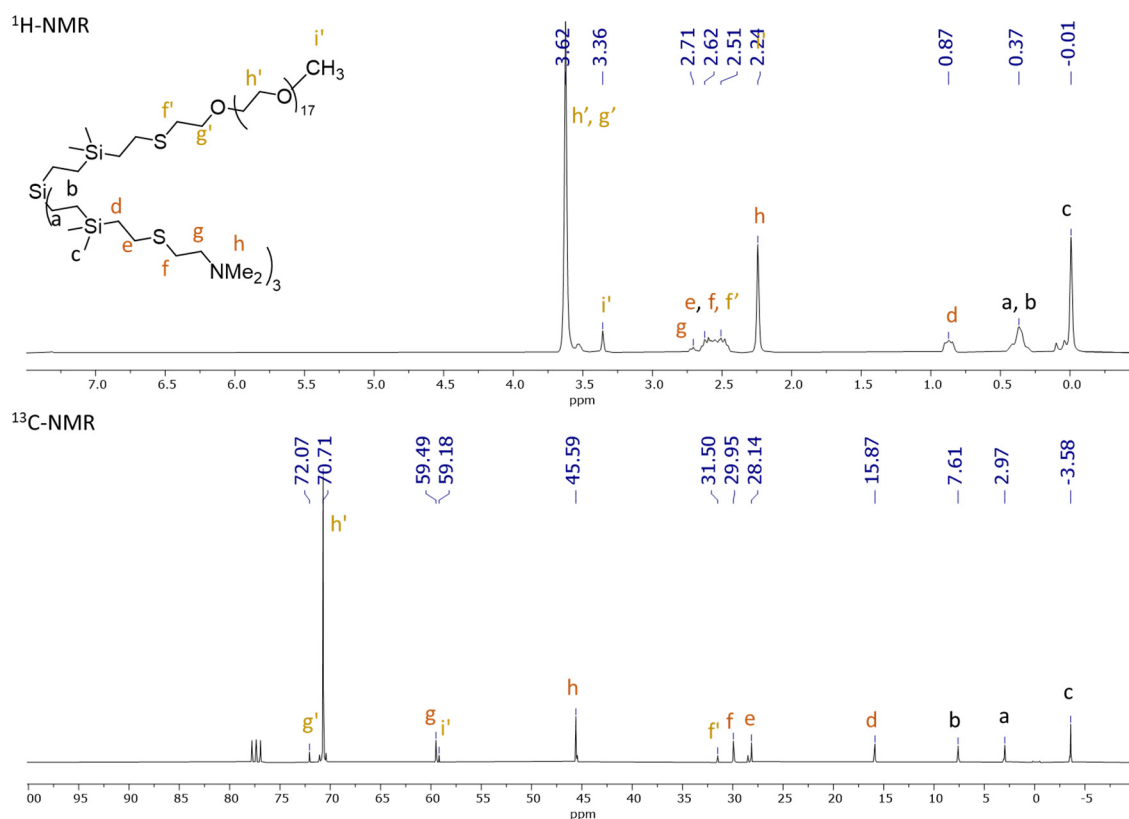
**Figure S4.** <sup>1</sup>H and <sup>13</sup>C-NMR of compound 4 (D<sub>2</sub>O).

**G<sub>0</sub>Si(SiMe<sub>2</sub>-PEG800)(SiMe<sub>2</sub>-NMe<sub>2</sub>HCl)<sub>3</sub> (5):**



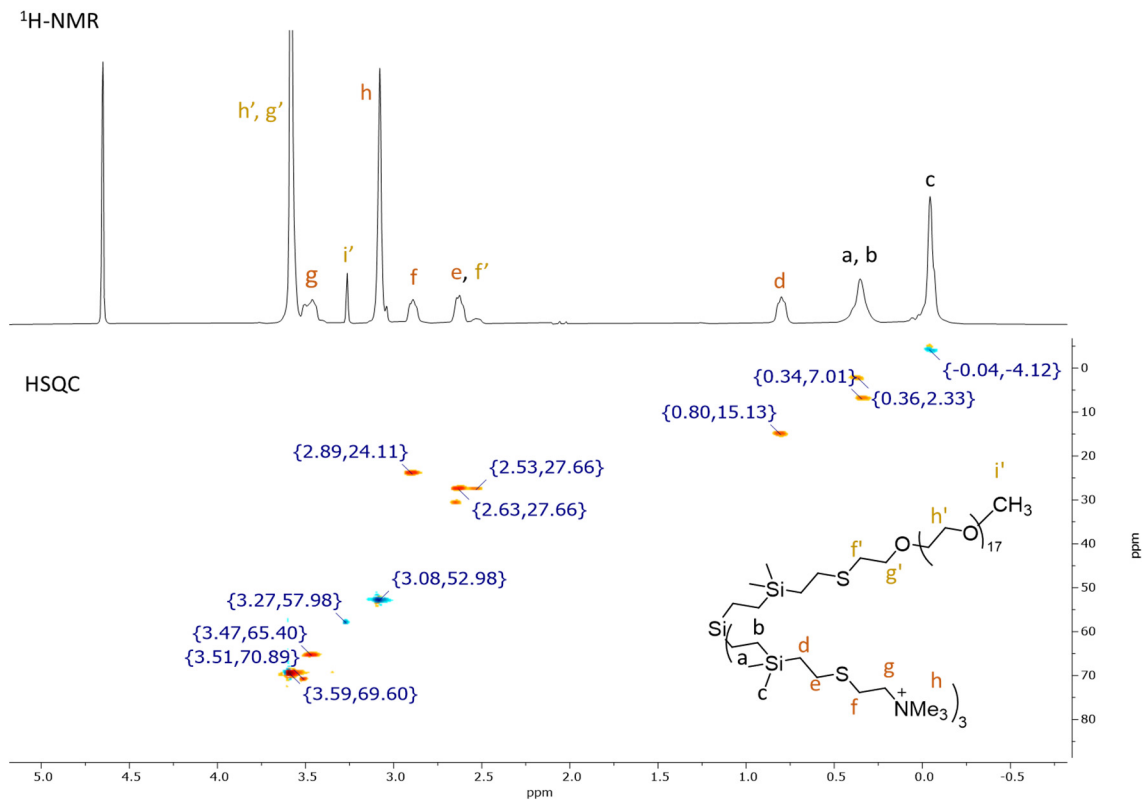
**Figure S5:** <sup>1</sup>H and <sup>13</sup>C-NMR of compound 5 (CD<sub>3</sub>OD).

**G<sub>0</sub>Si(SiMe<sub>2</sub>-PEG800)(SiMe<sub>2</sub>-NMe<sub>2</sub>)<sub>3</sub> (6):**



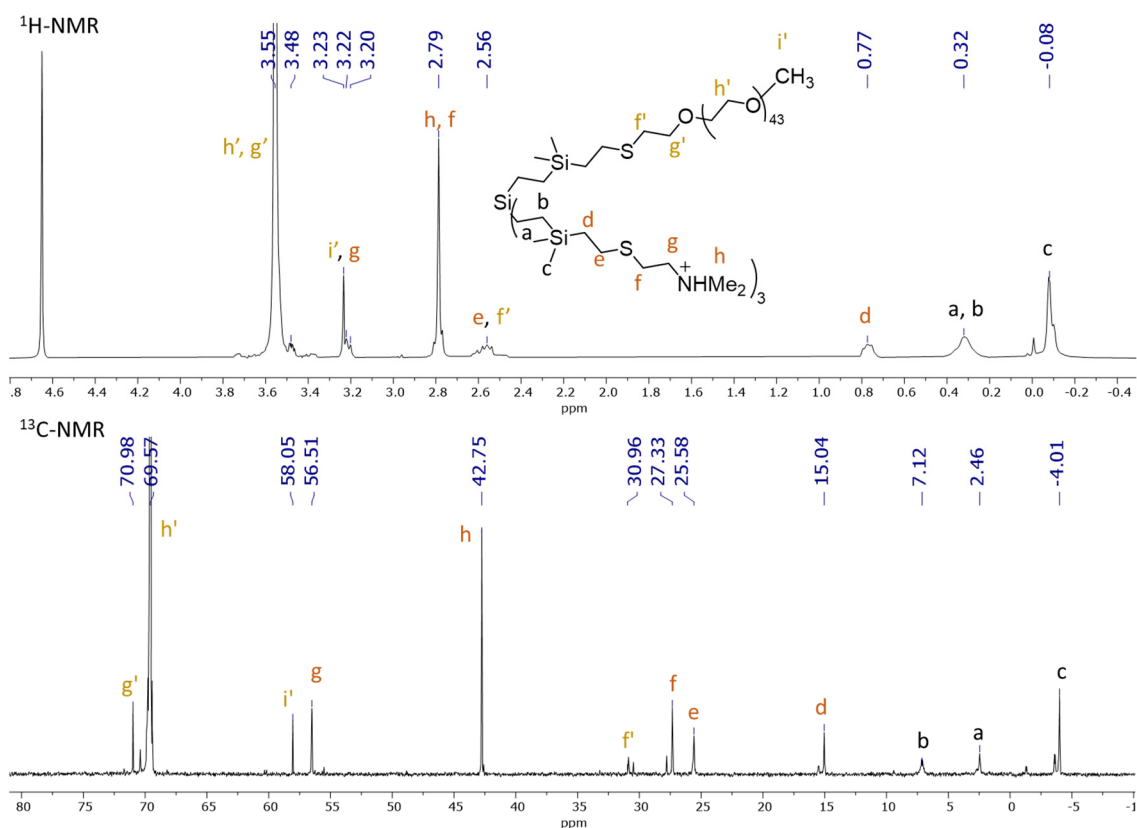
**Figure S6.** <sup>1</sup>H and <sup>13</sup>C-NMR of compound **6** (CDCl<sub>3</sub>).

**G<sub>0</sub>Si(SiMe<sub>2</sub>-PEG800)(SiMe<sub>2</sub>-NMe<sub>3</sub>Cl)<sub>3</sub> (7):**



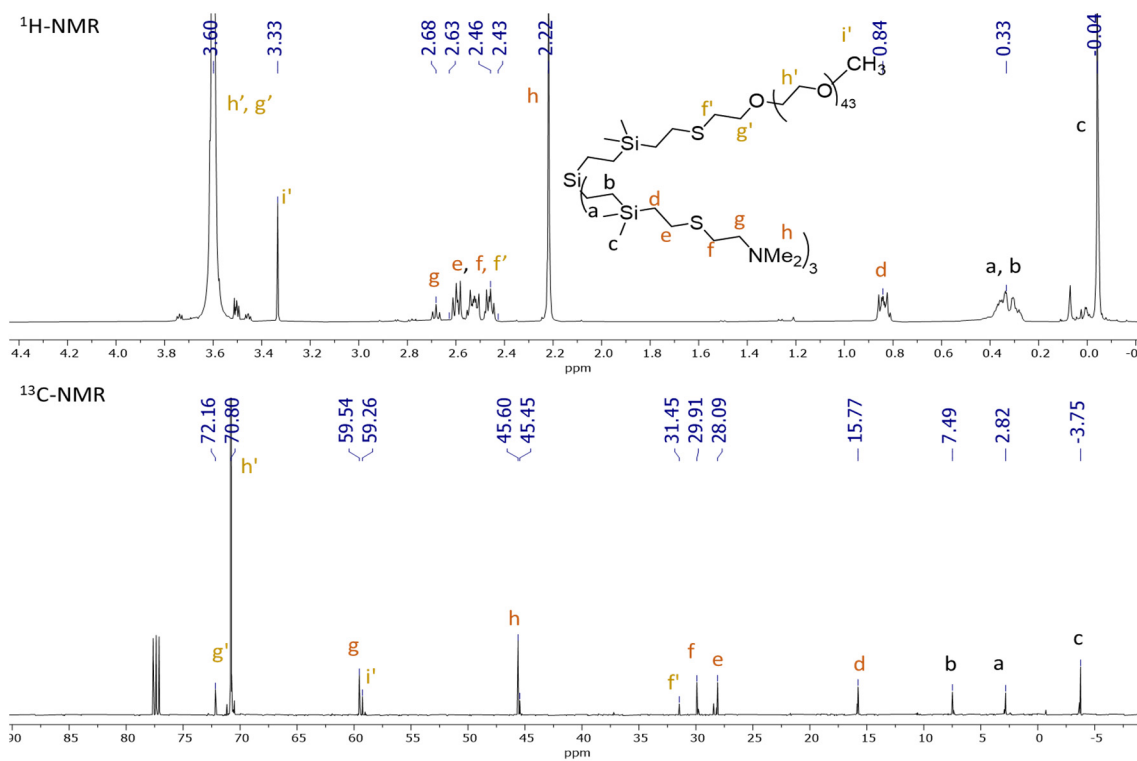
**Figure S7.** <sup>1</sup>H and HSQC of compound **7** (D<sub>2</sub>O).

**G<sub>0</sub>Si(SiMe<sub>2</sub>-PEG2K)(SiMe<sub>2</sub>-NMe<sub>2</sub>HCl)<sub>3</sub> (8):**



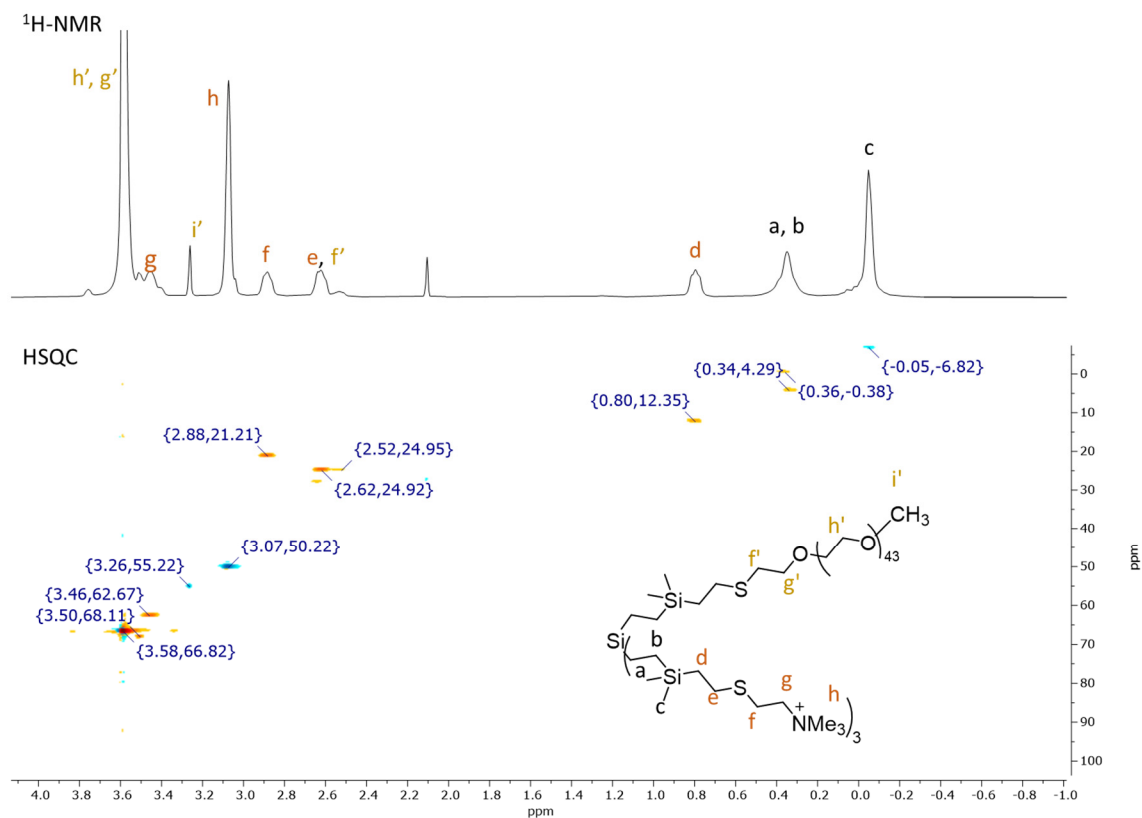
**Figure S8:** <sup>1</sup>H and <sup>13</sup>C-NMR of compound 8 (CD<sub>3</sub>OD).

**G<sub>0</sub>Si(SiMe<sub>2</sub>-PEG2K)(SiMe<sub>2</sub>-NMe<sub>2</sub>)<sub>3</sub> (9):**



**Figure S9:** <sup>1</sup>H and <sup>13</sup>C-NMR of compound 9 (CDCl<sub>3</sub>).

**G<sub>0</sub>Si(SiMe<sub>2</sub>-PEG2K)(SiMe<sub>2</sub>-NMe<sub>3</sub>Cl)<sub>3</sub> (10):**



**Figure S10.** <sup>1</sup>H and HSQC of compound 10 (D<sub>2</sub>O)

**Table S1.** Relationship between antibacterial concentration in mg/l and  $\mu$ M used in this work.

| ppm $\rightarrow$ (mg/L) | 4 ( $\mu$ M) | 7 ( $\mu$ M) | 10 ( $\mu$ M) |
|--------------------------|--------------|--------------|---------------|
| 1024                     | 928          | 586          | 347           |
| 512                      | 464          | 293          | 174           |
| 256                      | 232          | 146          | 87            |
| 128                      | 116          | 73           | 43            |
| 64                       | 58           | 37           | 22            |
| 32                       | 29           | 18           | 11            |
| 16                       | 14.5         | 9.1          | 5.4           |
| 8                        | 7.25         | 4.6          | 2.7           |
| 4                        | 3.6          | 2.3          | 1.4           |
| 2                        | 1.8          | 1.1          | 0.7           |
| 1                        | 0.9          | 0.6          | 0.3           |
| 0.5                      | 0.4          | 0.3          | 0.2           |
| 0.25                     | 0.2          | 0.1          | 0.08          |
| 0.125                    | 0.1          | 0.07         | 0.04          |

**Table S2.** Antibacterial activity of cationic CBS dendrimer (**4**) and with pegylated cationic CBS dendrimer PEG-800 (**7**) or PEG-2000 (**10**) against *P. aeruginosa* planktonic cells and biofilm. Data are in  $\mu\text{M}$ .

| Dendrimer<br>(compound<br>no.) | Planktonic<br>cells |      | Biofilm                         |       |                  |       |
|--------------------------------|---------------------|------|---------------------------------|-------|------------------|-------|
|                                |                     |      | Preventing biofilm<br>formation |       | Removing biofilm |       |
|                                | MIC                 | MBC* | MBIC                            | MBBC* | MBDC             | MBEC* |
| <b>4</b>                       | 29                  | 29   | 58                              | 116   | 116              | 464   |
| <b>7</b>                       | 146                 | 146  | 293                             | 586   | 586              | >586  |
| <b>10</b>                      | 87                  | 87   | >347                            | >347  | >347             | >347  |

\*Drop Plate Method. Planktonic cells: Minimum Inhibitory Concentration (MIC) and Minimum Bactericide Concentration (MBC). Biofilm: Minimum Biofilm Inhibitory Concentration (MBIC), Minimum Bactericidal Concentration in Biofilm (MBBC), Minimum Biofilm Damaging Concentration (MBDC) and Minimum Biofilm Eradication Concentration (MBEC).