Electronic Supplementary Material (ESI) for Analyst.

Supplementary Information

Disposable bacterial lysis cartridge (BLC) suitable for *in-situ* water-borne pathogen detection system

[1] *Eun-Hee Lee,* [1]*Hyun Jeong Lim,* [1,*]*Ahjeong Son,* [2,*]*Beelee Chua*

[1] Department of Environmental Science and Engineering, Ewha Womans University, Seoul, Republic of Korea
[2] School of Electrical Engineering, Korea University, Seoul, Republic of Korea

*Corresponding Author Ahjeong Son: Current address. 52 Ewhayeodae-gil, Seodaemun-gu, Ewha Womans University, Seoul, Republic of Korea; E-mail. ahjeong.son@gmail.com; Phone. +82 (2) 3277-3339; Fax. +82 (2) 3277-3275

*Corresponding Author Beelee Chua: Current address. Anam-dong, Seongbuk-gu, Korea University, Seoul, Republic of Korea; Email. chuabeelee@gmail.com; Phone. +82 (2) 3290-4639

Summary

- Dimensions of bacterial lysis cartridge (BLC)
- Schematic of sample handling platform.
- Photo of sample handling platform.
- Photo of BLC's built-in ozone generator.
- Photo of BLC in operation.
- Calibration curve between optical density ($OD_{600\ nm}$) and gram-dry cell weight (g-DCW) of *Bacillus subtilis* (*B. subtilis*).
- DNA concentration ($ng.\mu l^{-1}$) versus sonication time (s).
- Standard curve that enumerates DNA concentration from *B. subtilis* cell concentration.

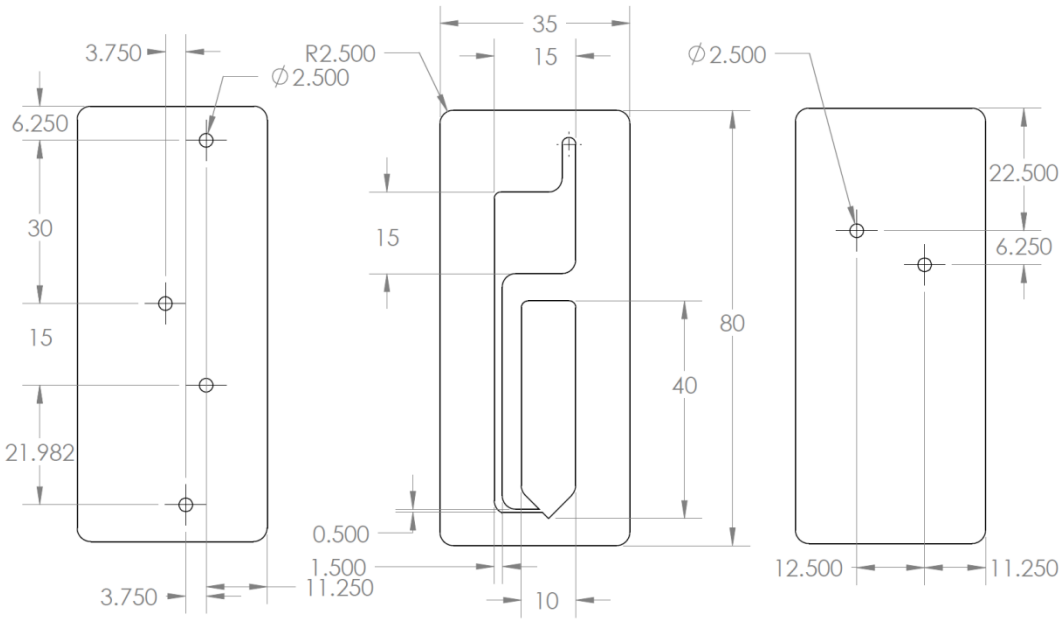

Fig. S1. Dimensions of bacterial lysis cartridge (BLC)

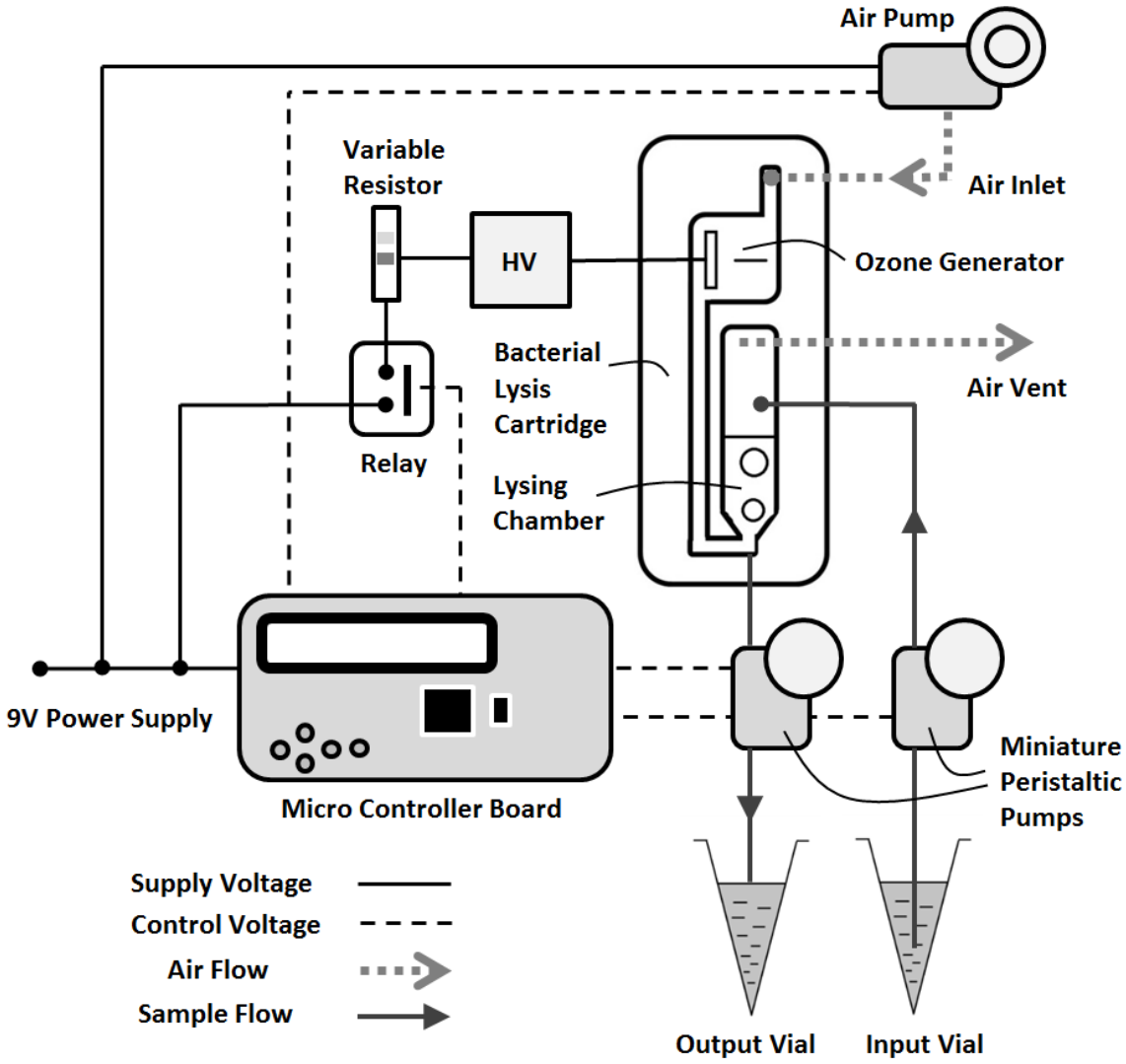

Fig. S2. Schematic of sample handling platform.

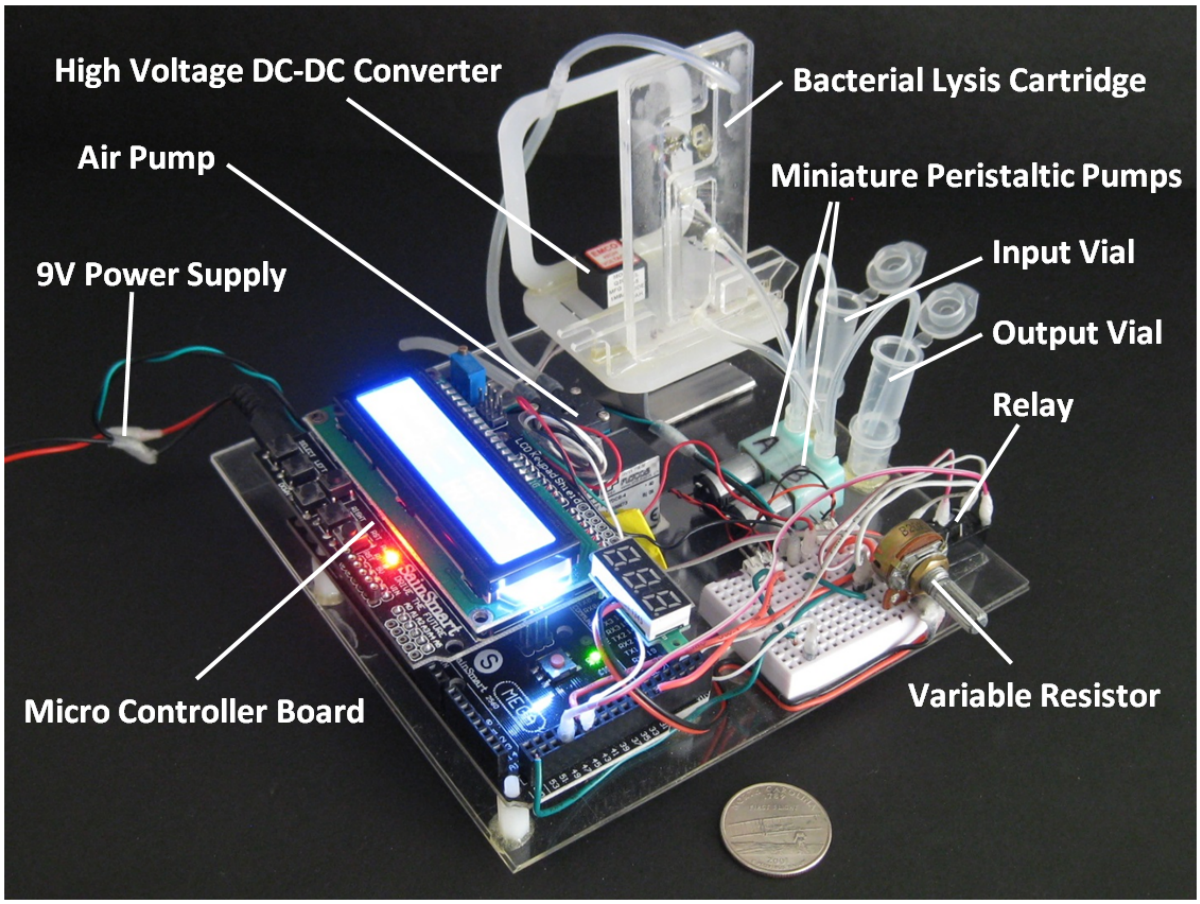

Fig. S3. Photo of sample handling platform.

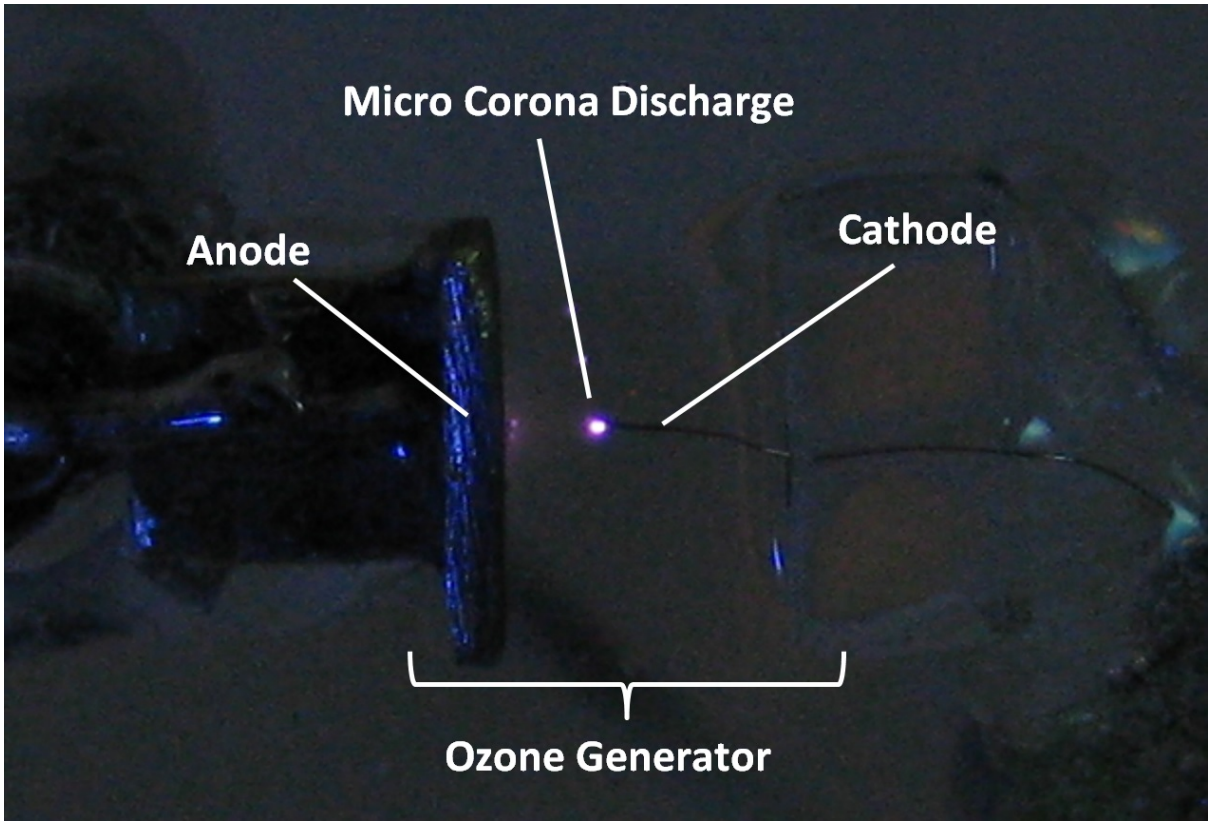

Fig. S4. Photo of BLC's built-in ozone generator.

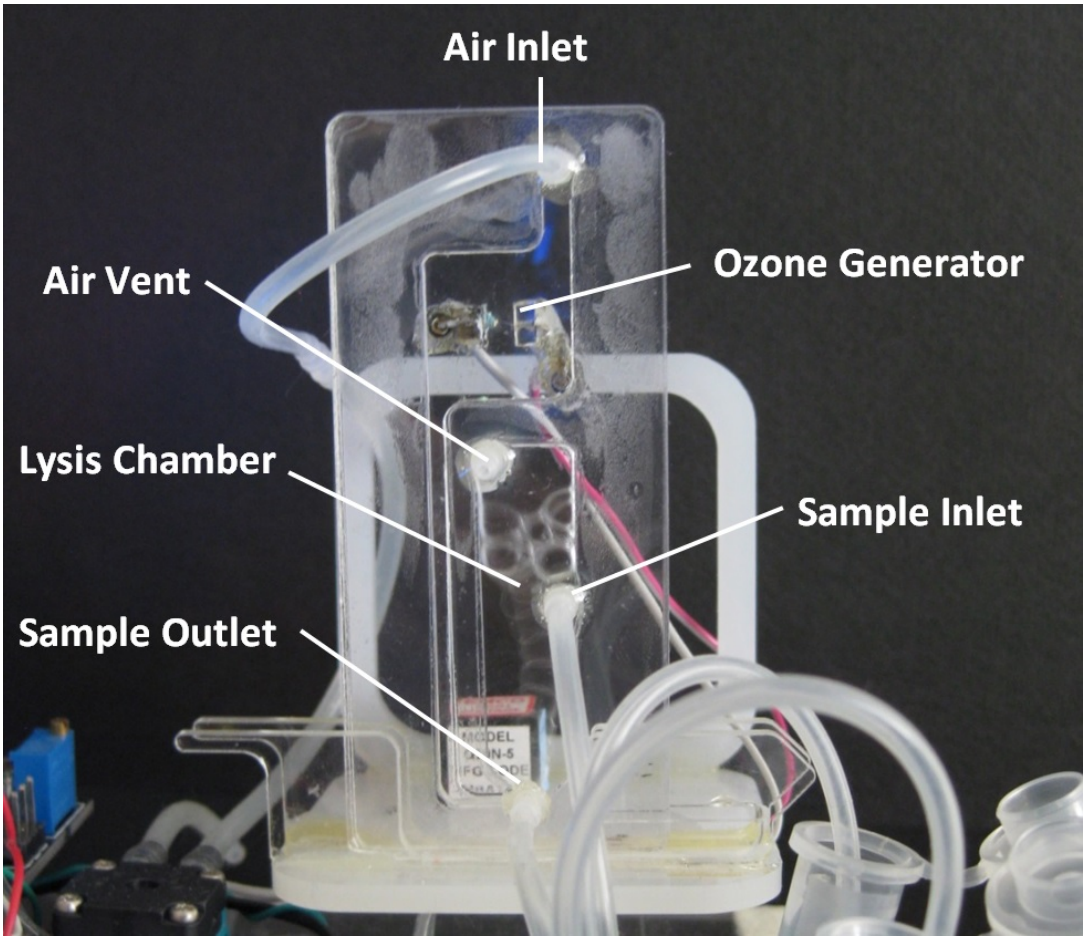

Fig. S5. Photo of BLC in operation.

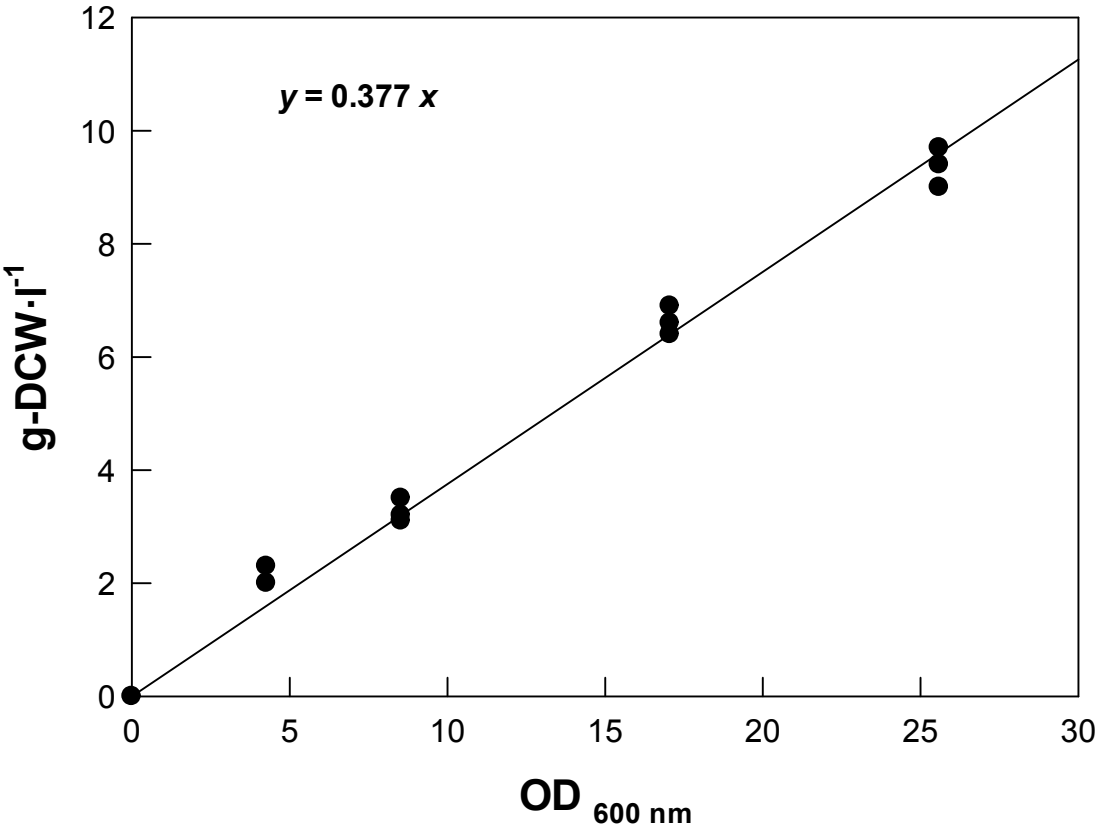

Fig. S6. Calibration curve between optical density ($OD_{600\ nm}$) and gram-dry cell weight (g-DCW) of *B*. *subtilis*.

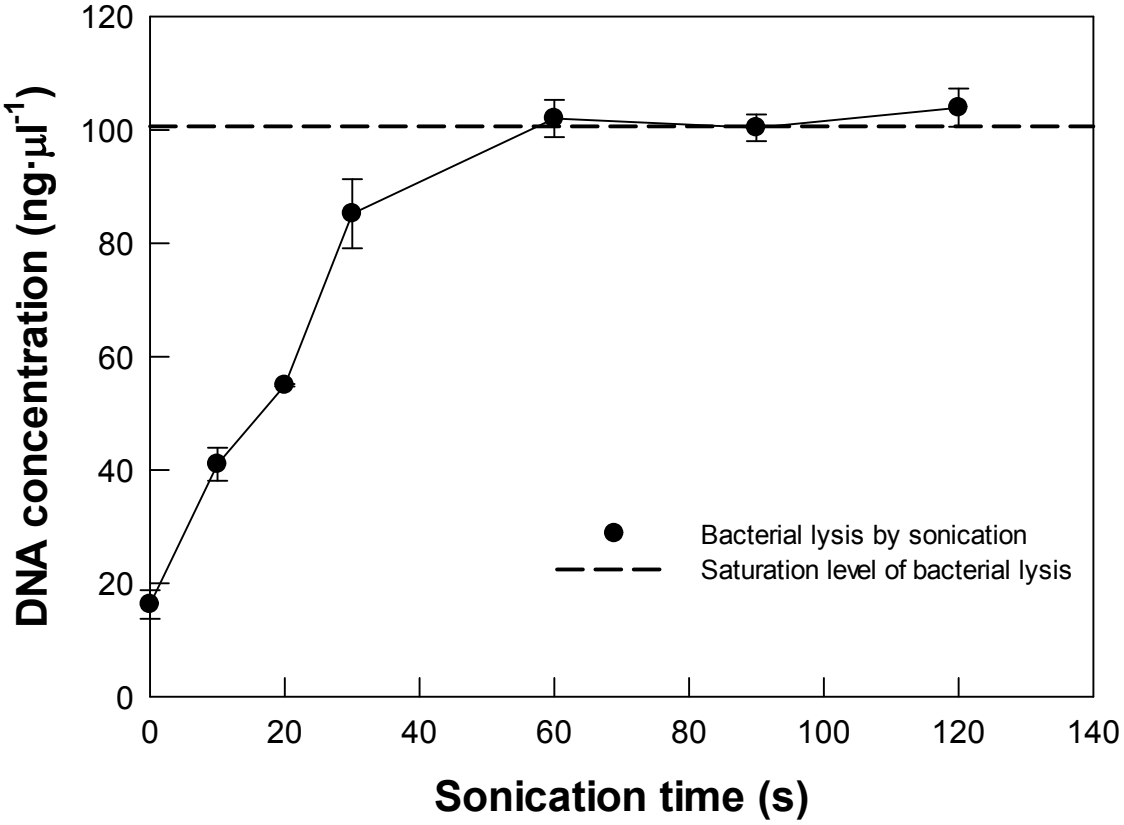

Fig. S7. DNA concentration (ng·µl^{-1}) versus sonication time (s).

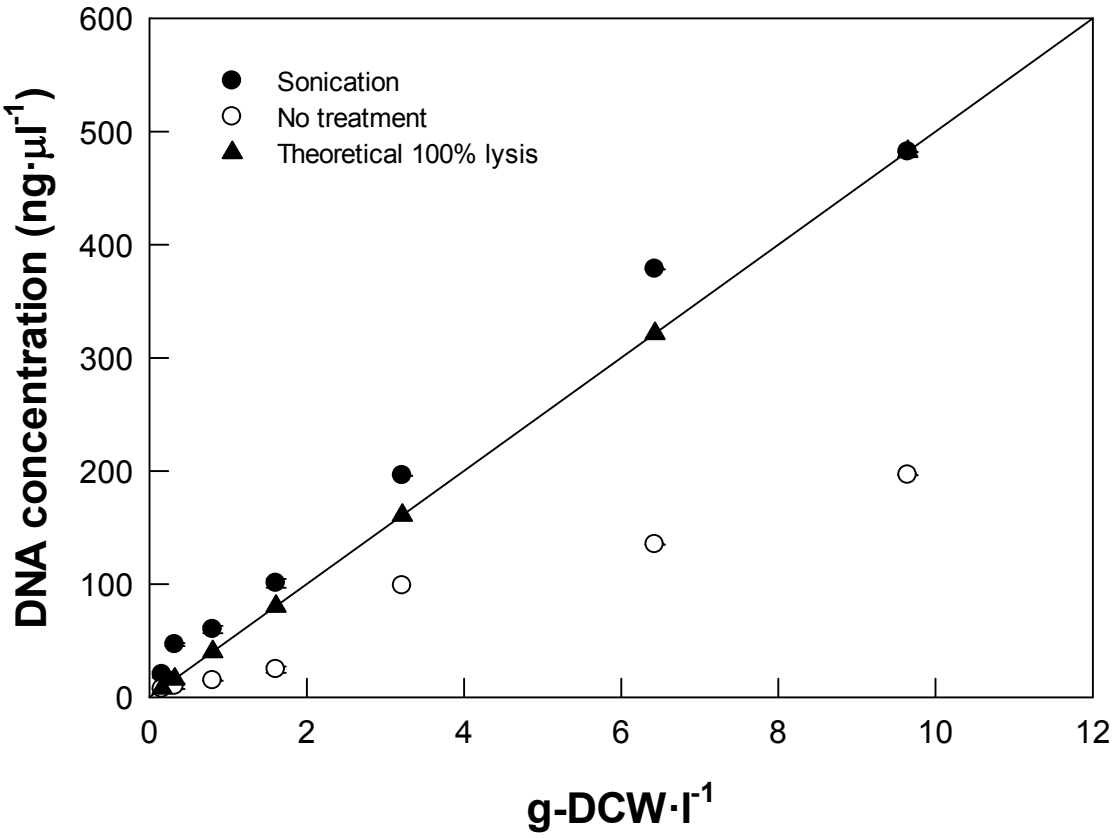

Fig. S8. Standard curve that enumerates DNA concentration from *B. subtilis* cell concentration.

Maranger and Bird[1] reported that the bacterial abundance in aquatic systems in Canada ranged from 10^6 to 10^7 cells/ml. Middelboe et al.[2] observed that 1×10^7 to 4×10^8 cells/ml in the estuarine. The cell concentration of *Bacillus subtilis* used in this study was 2.18 of optical density at 600 nm. Based on the calibration curve obtained by Paidhungat et al.,[3] the optical density of 2.18 can be converted to 2×10^8 cells/ml. Therefore the range of cell concentration of our study is comparable to that in environmental samples.

Supplementary References

1 R. Maranger and D. F. Bird, *Mar. Ecol. Prog. Ser.*, 1995, **121**, 217-226.
2 M. Middleboe, R. N. Glud and K. Finster, *Limnol. Oceanogr.*, 2003, **48**, 1447-1456.
3 M. Paidhungat, B. Setlow, W. B. Daniels, D. Hoover, E. Papafragkou and P. Setlow, *Appl. Environ. Microbiol.*, 2002, **68**, 3172-3175.