Supplementary Information

Enhancement of radionuclide bio-decontamination by screening highly efficient microalgae for Sr biomineralization

Cong Wang,*[a] Keon Ah Lee,*[bd] Eunpyo Choi,[a] Keun-Young Lee,[c] Ssung-Yop Lee,[ad] Kwang-Hwan Jung,†[bd] and Jungyul Park,†[ad]

[a.] *Department of Mechanical Engineering, Sogang University, 35 Baekbeom-ro (Shinsu-dong), Mapo-gu, Seoul 04107, Korea.*

[b.] *Department of Life Science, Sogang University, 35 Baekbeom-ro (Shinsu-dong), Mapo-gu, Seoul 04107, Korea.*

[c.] *Korea Atomic Energy Research Institute, Yuseong-gu, Daejeon 34057, Korea.*

[d.] *Interdisciplinary Program of Integrated Biotechnology, Sogang University, 35 Baekbeom-ro (Shinsu-dong), Mapo-gu, Seoul 04107, Korea.*

*These authors contributed equally to this work.

†To whom correspondence: sortpark@sogang.ac.kr (J. Park), kjung@sogang.ac.kr (K.-H. Jung)

Electronic Supplementary Information (ESI) available: [details of any supplementary information available should be included here]. See DOI: 10.1039/x0xx00000x

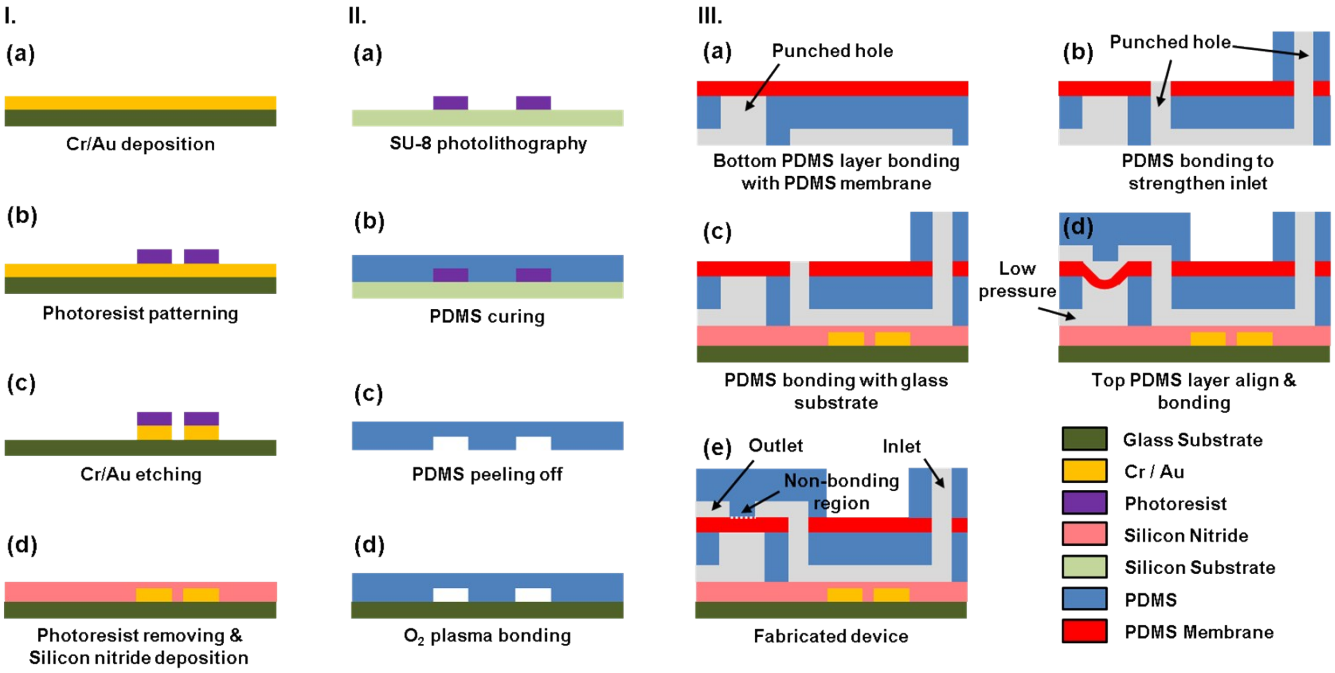

Figure S1. Fabrication process of the proposed microalgae screening microplatform: (I) Electrode array, (II) PDMS microfluidic chip and (III) assembly of microalgae screening microplatform.

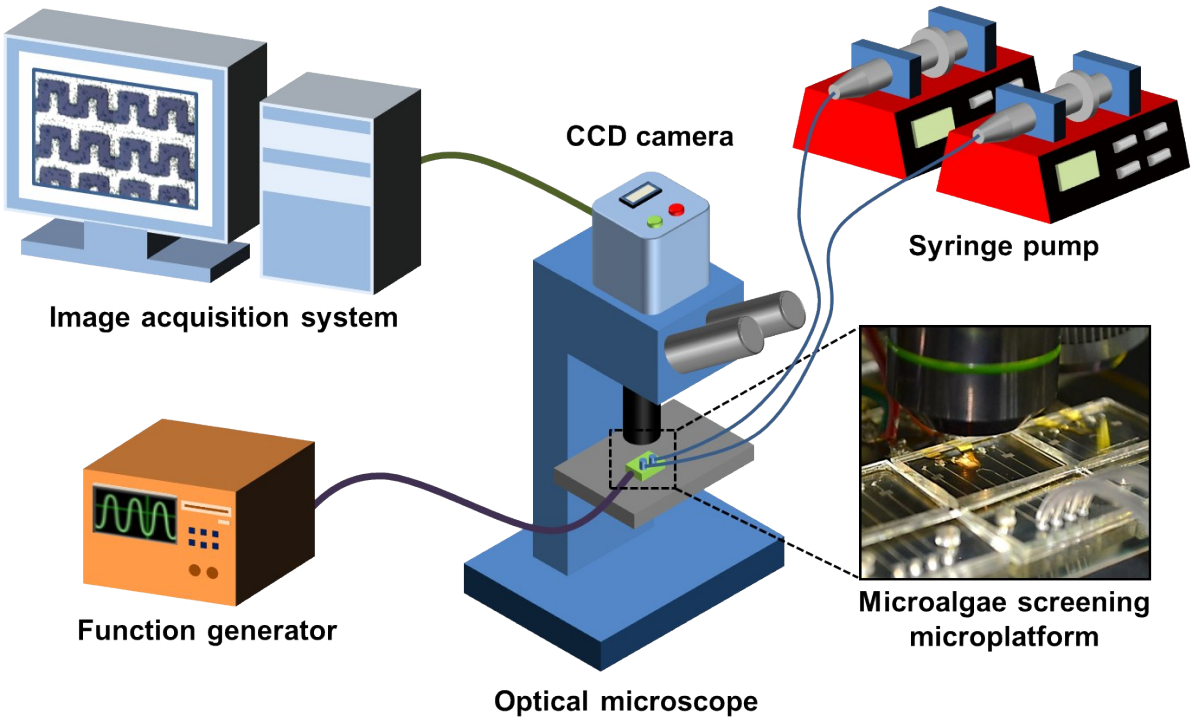

Figure S2. Experimental setup for microalgae screening, including function generator, syringe pump, microalgae screening microplatform, optical microscope, CCD camera and image acquisition system.

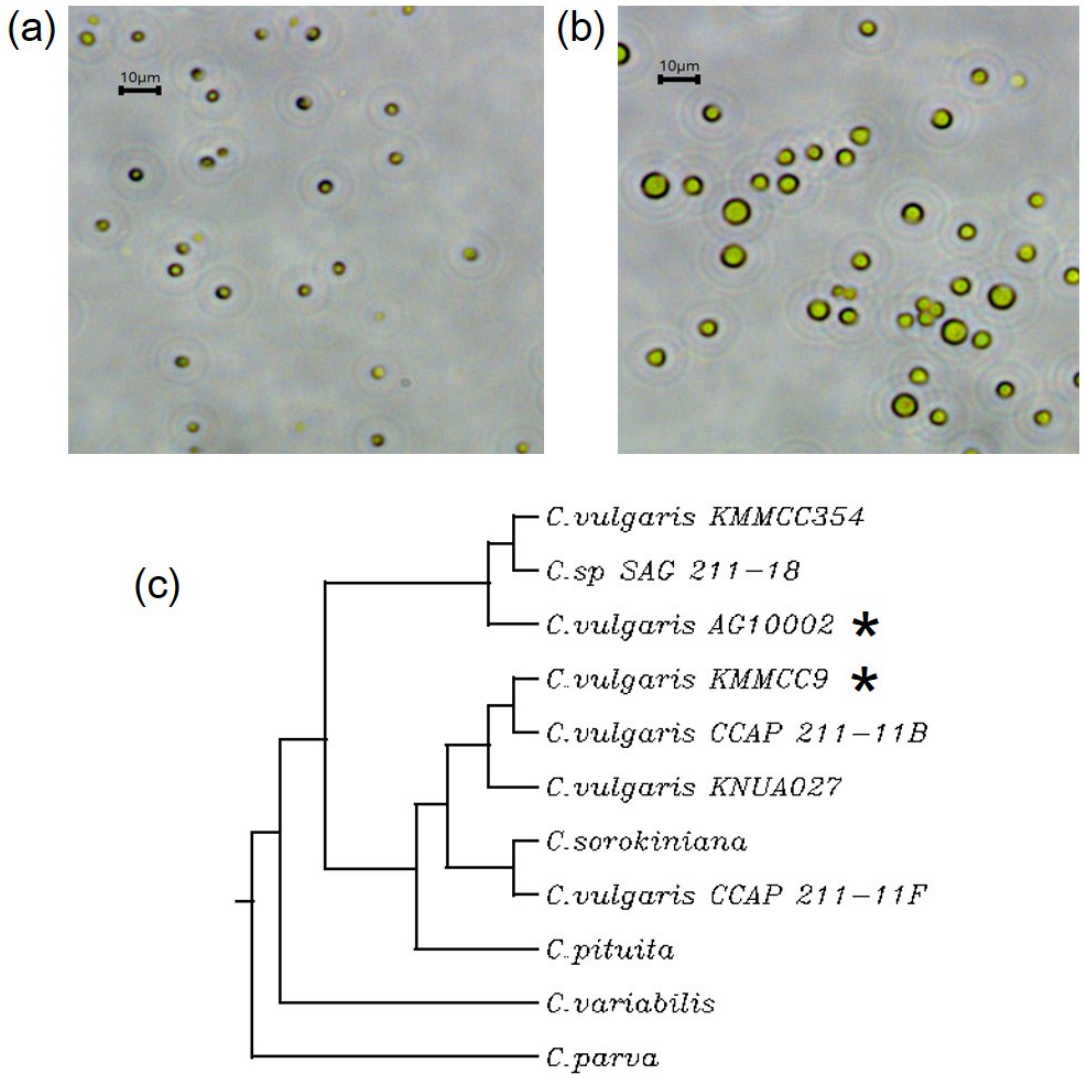

Figure S3. Microscopic images of microalgae: (a) *C. vulgaris KMMCC9* and (b) *C. vulgaris KCTC AG10002* in 3 mM $NaHCO_3$. The scale bar in the images is 10 μm. (c) A phylogenetic tree based on 18s rRNA sequences of several *C. vulgaris* strain, *C. sp*. strain*, C. sorokiniana, C. pituita*, *C. variabilis*, and *C. parva* using multiple sequence alignment ClustalW program. Note that the two strains (marked by *) are the outgroups of each other, however, close enough to perform further tests.

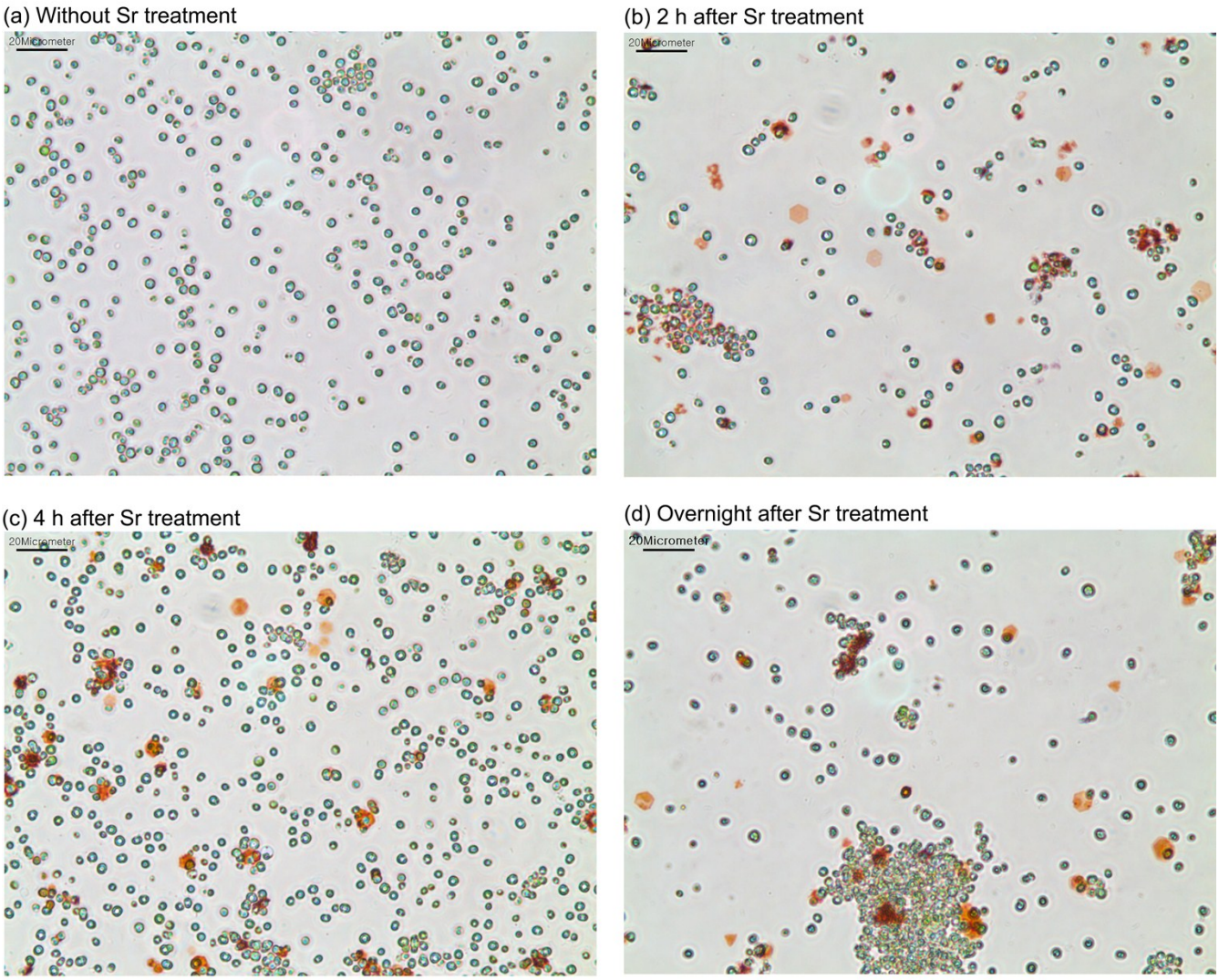

Figure S4. Histochemical method for detection of non-radioactive Sr absorbed in *C. vulgaris KMMCC9* after several hours' treatment of media containing non-radioactive Sr.

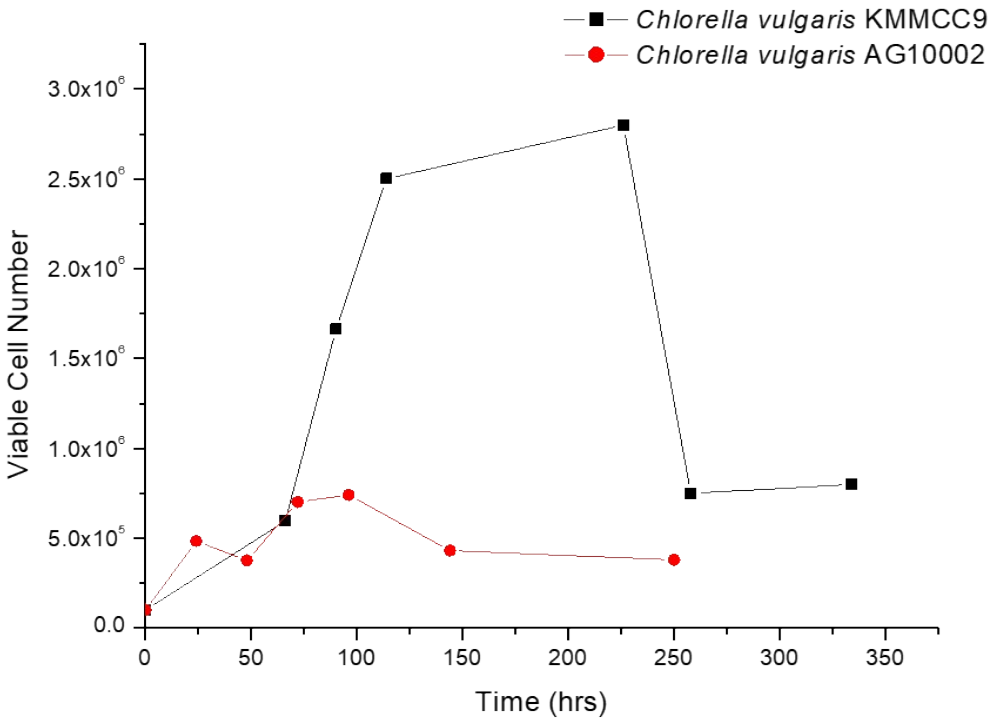

Figure S5. The viability of the microalgae in the assay buffer (i.e., $NaHCO_3$ solution) during DEP-based screening.

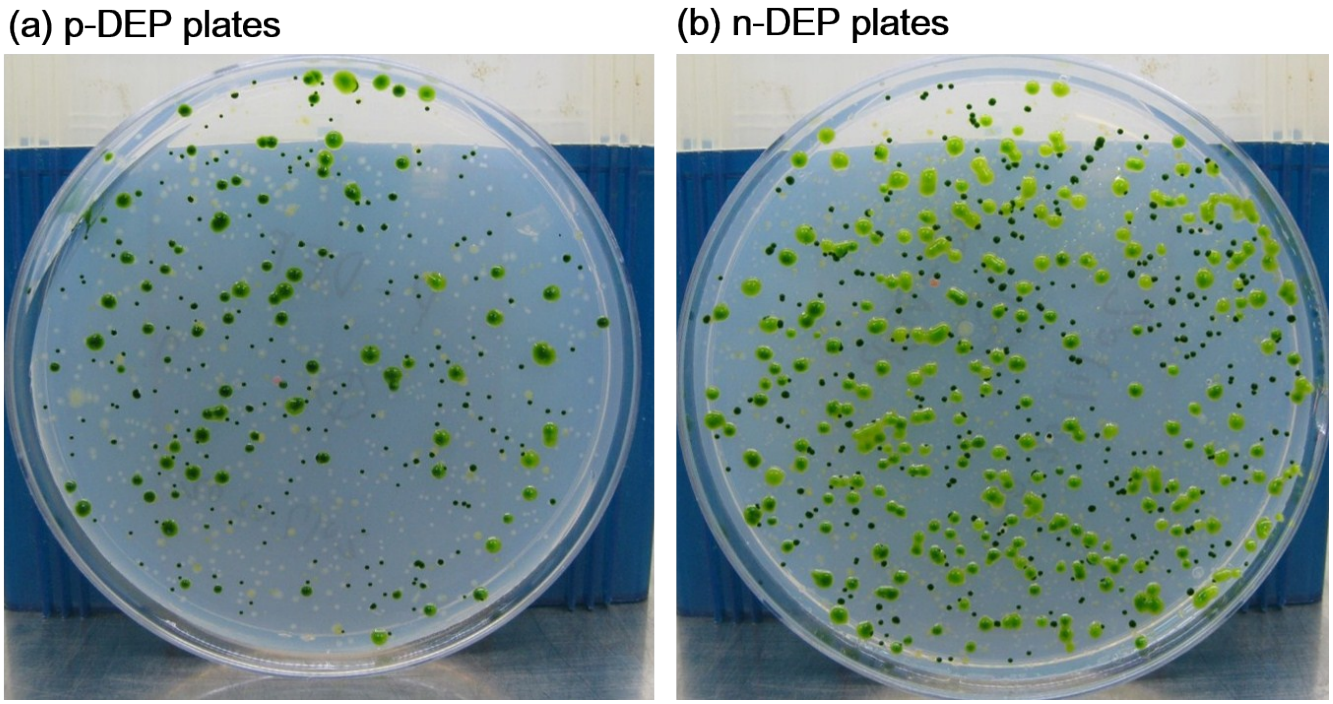

Figure S6. Colonies on the plates with (a) p-DEP group and (b) n-DEP group. The colonies numbers of *C. vulgaris KMMCC9* and *C. vulgaris KCTC AG10002* in p-DEP or n-DEP group were confirmed by colony counting. Note that the smaller and greener are *C. vulgaris KMMCC9* and the larger and light greens are *C. vulgaris KCTC AG10002*, which were confirmed by 18s rRNA sequencing.