

Table S1. The recipe of BG-11 (Blue Green Medium).

Component	Amount (mL/L)	Stock Solution (g/500 mL dH ₂ O)
NaNO ₃	100	7.5
K ₂ HPO ₄	10	2
MgSO ₄ ·7H ₂ O	10	3.75
CaCl ₂ ·2H ₂ O	10	1.8
Citric acid	10	0.3
Ferric ammonium citrate	10	0.3
EDTANa ₂	10	0.05
Na ₂ CO ₃	10	1.0
A ₅ (Trace metal solution)	1	Mixture of trace metals

Adjust PH to 7.1 with 1M NaOH or HCl

Table S2. The recipe of Mixture of trace metals.

Component	Stock Solution (g/L dH ₂ O)
H ₃ BO ₃	2.86
MnCl ₂ ·4H ₂ O	1.86
ZnSO ₄ ·7H ₂ O	0.22
Na ₂ MoO ₄ ·2H ₂ O	0.22
CuSO ₄ ·5 H ₂ O	0.22
Co(NO ₃) ₂ ·6 H ₂ O	0.22

Table S3. The instruments and chemicals employed in the experiment.

Number	Name	Type	Supplier
1	Scanning Electron Microscopy	S4800	HITACHI
2	Fourier Transform Infrared Spectroscopy	NicoletIS50	Thermo Fisher Scientific
3	UV-Spectrometer	UV-8000S	Shanghai Yidian Analytical Instrument Co., Ltd
4	Intelligent Light Incubator	GRH-350	Changzhou Putian Instrument Manufacturing Co., LTD
5	High Speed Refrigerant Centrifuge	HC-3018R	Changsha Xiangzhi centrifuge Instrument Co., LTD
6	Vertical Flow Clean Bench	SW-CJ-1FD	Suzhou Boler purification equipment Co., LTD
7	Freeze Dryer	SCIENTN-10N	Ningbo Xinzhi Biotechnology Co., LTD
8	Fluorescence Spectrometer	F-7000	HITACHI
9	Autoclave	SN 310C	YAMATO
10	Ultrasonic Cell Disrupter System	SCIENTN-II D	Ningbo Xinzhi Biotechnology Co., LTD
11	Fluorescence Microscope	BX41	Olympus
12	Pipettor	100 μ L-10 ml	Eppendorf
13	PS-MPs	5 μ m	Tianjin Base Line Chrom Tech Research Centre
14	The assay kits for SOD, MDA and Soluble proteins	/	Shinuoda Biological Technology Co., Ltd

15	NaNO_3	/	Shanghai Macklin Biochemical Co., Ltd
16	K_2HPO_4	/	Shanghai Macklin Biochemical Co., Ltd
17	$\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$	/	Shanghai Macklin Biochemical Co., Ltd
18	$\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$	/	Shanghai Macklin Biochemical Co., Ltd
19	$\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$	/	Shanghai Macklin Biochemical Co., Ltd
20	Citric acid	/	Shanghai Macklin Biochemical Co., Ltd
21	Ferric ammonium citrate	/	Shanghai Macklin Biochemical Co., Ltd
22	EDTANa_2	/	Shanghai Macklin Biochemical Co., Ltd
23	Na_2CO_3	/	Shanghai Macklin Biochemical Co., Ltd
24	H_3BO_3	/	Shanghai Macklin Biochemical Co., Ltd
25	$\text{MnCl}_2 \cdot 4\text{H}_2\text{O}$	/	Shanghai Macklin Biochemical Co., Ltd
26	$\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$	/	Shanghai Macklin Biochemical Co., Ltd
27	$\text{Na}_2\text{MoO}_4 \cdot 2\text{H}_2\text{O}$	/	Shanghai Macklin Biochemical Co., Ltd
28	$\text{CuSO}_4 \cdot 5 \text{H}_2\text{O}$	/	Shanghai Macklin Biochemical Co., Ltd

29	$\text{Co}(\text{NO}_3)_2 \cdot 6 \text{H}_2\text{O}$	/	Shanghai Macklin Biochemical Co., Ltd
30	Acetone	/	Shanghai Macklin Biochemical Co., Ltd
31	Glutaraldehyde	/	Shanghai Macklin Biochemical Co., Ltd
32	PBS	/	Shanghai Macklin Biochemical Co., Ltd
33	Fluorescein diacetate	/	Shanghai Macklin Biochemical Co., Ltd

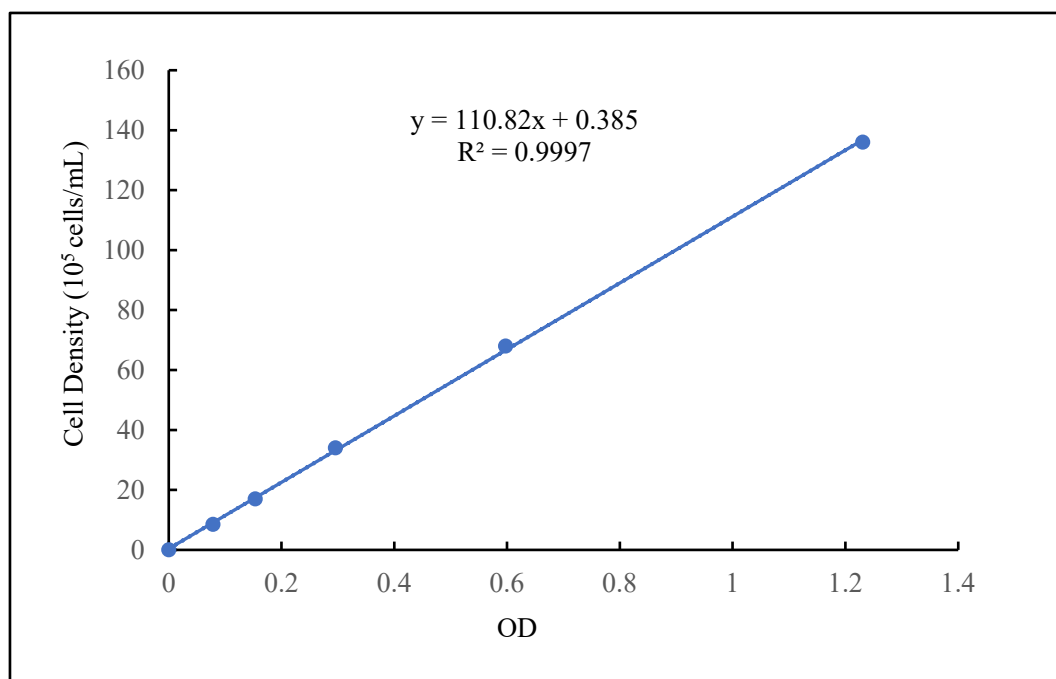


Figure S1. The relationships between optical density and Cell Density of microalgae.