Electronic Supplementary Information (ESI) for

Metabolic profiling of silver nanoparticle toxicity in *Microcystis aeruginosa*

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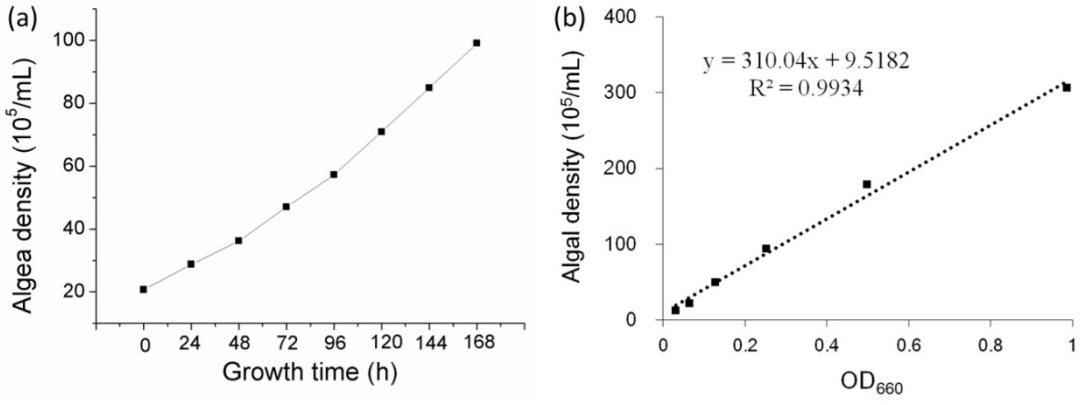
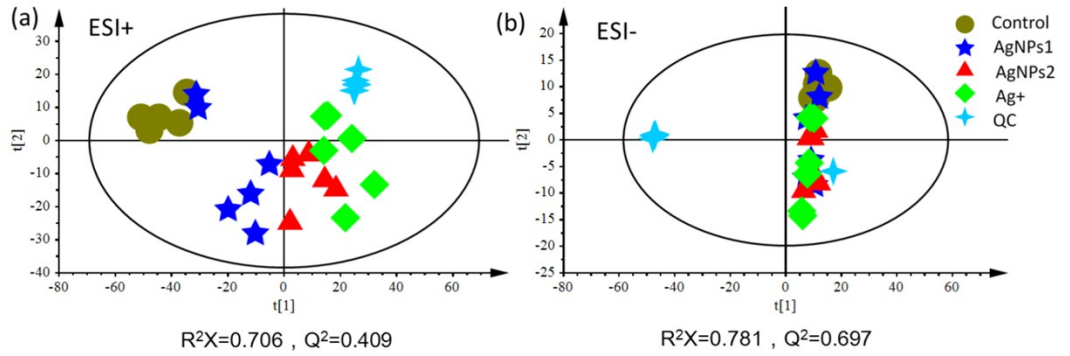
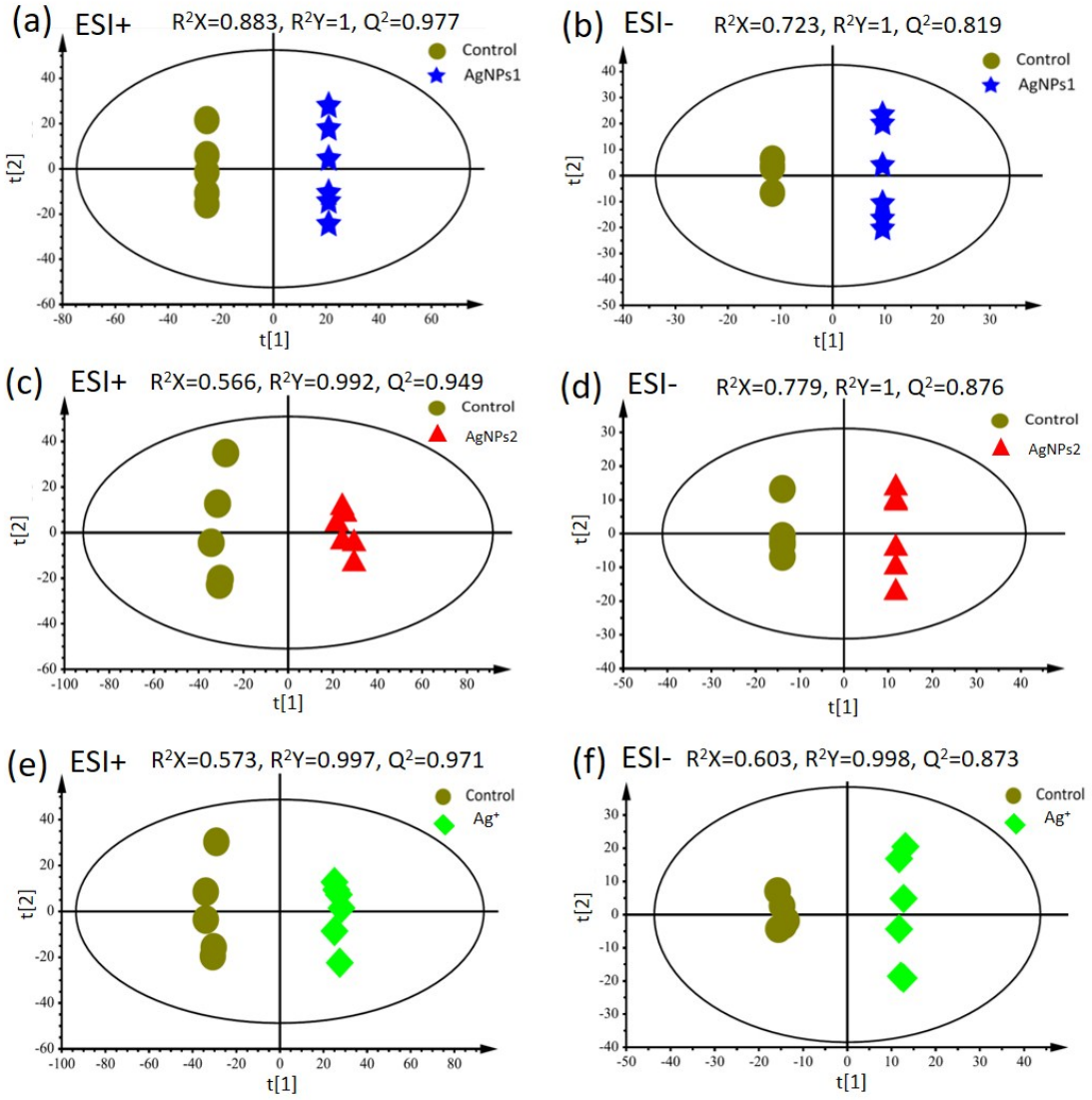
Figures and captions



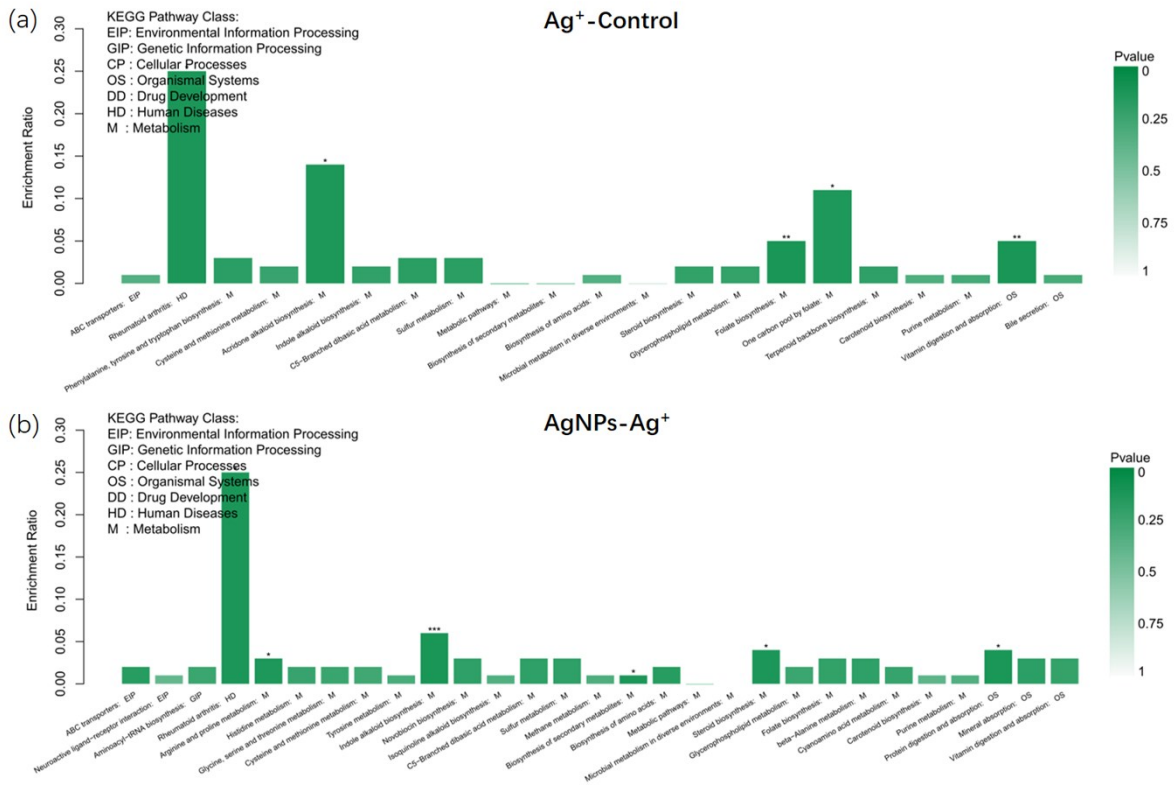
ESI Figure 1 (a) *M. aeruginosa* growth curve within 168 h and (b) their standard growth curve. Algae cells were cultured under controlled conditions (25 ± 1 ℃, 12h light-dark cycle) in standard growth medium (HGZ-145) at pH 7.5.



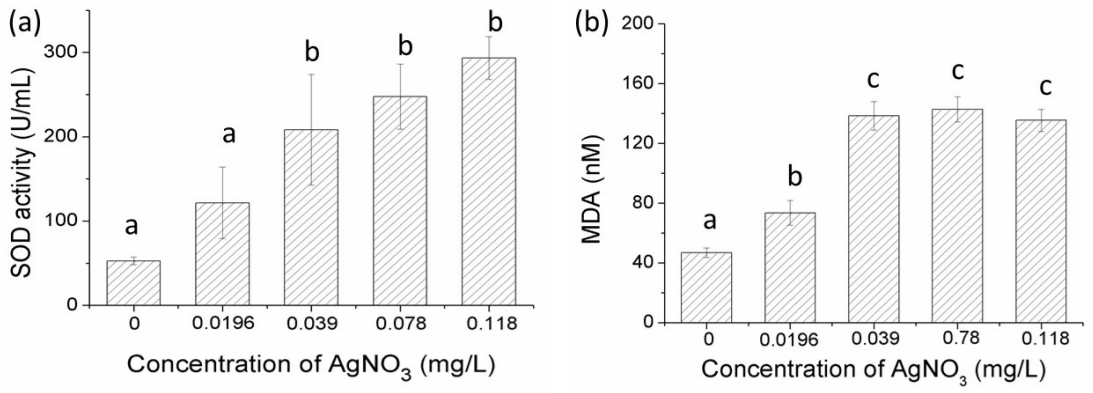
ESI Figure 2 Scatter plots of score of the principal component analysis of all samples. (a) ESI positive model. (b) ESI negative model. QC is the quality-control group.



ESI Figure 3 The OPLS-DA scores plots of all samples. (a, c, e) Electrospray ionization positive model (ESI+). (b, d, f) Electrospray ionization negative model (ESI-)



ESI Figure 4 Metabolic pathway enrichment analyses in *M. aeruginosa* exposed to Ag^{+} and AgNPs. Each pillar in the graph represents a specific metabolic pathway, and their names and classification are shown below. The color indicates the significance of metabolic pathway enrichment, which represent by P value. The right color gradient represents the P value. The darker of the green pillar shows, the more significant the enrichment of the metabolic pathway is. P value < 0.001 marked as ***, P value < 0.01 marked as **, and P value < 0.05 marked as *, respectively.



ESI Figure 5 Effect of $AgNO_3$ on (a) SOD activity and (b) MDA generation in algae cells. The cells (10^5 cells / mL) were incubated with AgNPs for 96h and the concentrations of AgNPs in the cell culture medium were 0 mg/L, 0.0196 mg/L, 0.039 mg/L, 0.078 mg/L, and 0.118 mg/L, respectively. Different letters over the column indicates the significant elevation in comparison with control ($p < 0.05$).

Tables

ESI Table 1 The components of the HGZ-145 algal culture medium

Constant element	Content（g/L）	Trace element	Content（g/L）
$NaNO_3$	0.2	HBO_3	0.00286
KNO_3	0.051	$MnCl_2 \cdot 4H_2O$	0.00181
K_2HPO_4	0.049	$ZnSO_4 \cdot 7H_2O$	0.000222
$MgSO_4 \cdot 7H_2O$	0.075	$Na_2Mo_4 \cdot 2H_2O$	0.000391
Na_2CO_3	0.02	$CuSO_4 \cdot 5H_2O$	0.000079
$Ca(NO_3)_2 \cdot 4H_2O$	0.059	Fe-EDTA	0.000932
NH_4Cl(NH_4Cl- EDTA)	0.0391		

ESI Table 2 The elution gradient of mobile phase

Time (min)	**Flow (mL/min)**	**A (%)**	**B (%)**
0	0.3	95	5
1	0.3	95	5
6	0.3	5	95
9	0.3	5	95
13	0.3	95	5
15	0.3	95	5

ESI Table 3 Full list of the significantly different metabolites in *M. aeruginosa* upon AgNPs exposure (ESI+)

No	VIP	Name	Molecular Weight	RT(min)	T-Test	Fold change
1	1.77	Camptothecin	348.111	17.05	0	-0.71
2	1.77	PE(20:1(11Z)/24:1(15Z))	855.6717	17.84	0	-1.56
3	1.77	PC(15:0/20:4(5Z,8Z,11Z,14Z))	767.5465	10.75	0	1.51
4	1.77	PG(16:1(9Z)/20:4(5Z,8Z,11Z,14Z))	768.4941	10.75	0	1.52
5	1.76	Setariol	414.3134	15.71	0	-1.15
6	1.73	Veranisatin C	372.1056	16.04	0	-0.49
7	1.72	PC(18:0/24:0)	873.7187	17.77	0	1.26
8	1.72	TG(18:0/16:0/18:1(11Z))[iso6]	860.7833	17.86	0	-1.5
9	1.71	PC(22:0/P-18:1(11Z))	827.6768	17.77	0	1.15
10	1.69	Vitamin D3	384.3392	16.22	0	-1.06
11	1.69	TG(18:2(9Z,12Z)/16:0/20:5(5Z,8Z,11Z,14Z,17Z))	876.7207	17.77	0	1.14
12	1.69	Folic acid	441.1397	14.89	0	-0.54
13	1.68	1-Octacosanol	410.4488	15.59	0	-2.09
14	1.68	Epidermin	261.1212	17.48	0	-1.11
15	1.67	TG(18:2(9Z,12Z)/14:0/20:4(5Z,8Z,11Z,14Z))	850.705	17.77	0	1.09
16	1.67	Strictosidine	530.2264	7.9	0	1
17	1.67	Stigmastanol	416.4018	15	0	-0.64
18	1.66	PC(24:1(15Z)/P-18:1(11Z))	853.6924	17.77	0	1.08
19	1.66	Erucic acid	338.3185	16.22	0	-1
20	1.63	Tyramine	137.0841	18.05	0	-0.43

21	1.62	Oleic acid	287.2873	15.22	0.001	-0.96
22	1.62	MG(0:0/22:2(13Z,16Z)/0:0)	410.3396	15.72	0.001	-0.92
23	1.62	PE(22:5(4Z,7Z,10Z,13Z,16Z)/P-18:1(9Z))	775.5516	13.96	0.001	2.42
24	1.61	Camellenodiol	442.3447	14.99	0.001	-0.69
25	1.61	Acetylursolic acid	498.3709	15.22	0.001	-1.41
26	1.61	Mosinone A	620.4652	15.44	0.001	-1.77
27	1.61	Bryononic acid	454.3447	15.3	0.001	-1.02
28	1.61	Prostaglandin E3	350.2093	14.48	0.001	-0.42
29	1.6	PE(14:1(9Z)/P-18:1(11Z))	671.489	15.55	0.001	-0.89
30	1.6	DG(14:0/22:5(4Z,7Z,10Z,13Z,16Z)/0:0)	614.491	14.84	0.001	-0.52
31	1.6	Geranylgeraniol	290.261	16.98	0.001	-0.54
32	1.6	PIP(16:0/22:2(13Z,16Z))	970.5548	16.22	0.001	-1.96
33	1.59	1,3-Diaminopropane	74.0844	18.05	0.001	-0.51
34	1.59	Xanthoplanine	356.1862	14.04	0.001	-0.54
35	1.59	DG(14:0/15:0/0:0)	526.4597	14.93	0.001	-0.51
36	1.59	Heteratisine	391.2359	17.48	0.001	-1
37	1.58	Muricatacin	284.2351	12.14	0.001	0.75
38	1.58	Histidinal	139.0746	18.05	0.001	-0.86
39	1.58	Ceanothenic acid	454.3083	16.07	0.001	-1.07
40	1.58	Phytolaccoside B	664.3823	17.85	0.001	-1.64
41	1.57	5-Hydroxylysine	162.1004	18.08	0.001	-0.55
42	1.57	Usambarine	450.2783	17.76	0.001	-0.55
43	1.57	Phloionolic acid	332.2563	15.12	0.001	-0.78
44	1.57	DG(15:0/22:1(13Z)/0:0)	636.5693	14.79	0.001	-0.44
45	1.57	Canavaninosuccinate	292.1019	14.41	0.001	-0.75
46	1.56	Abscisic alcohol 11-glucoside	412.2097	17.49	0.001	-0.98

47	1.56	MG(0:0/22:5(7Z,10Z,13Z,16Z,19Z)/0:0)	404.2927	14.73	0.001	-1.5
48	1.56	Palmitic amide	255.2562	15.04	0.001	-1.03
49	1.56	Vitamin D3	384.3392	16.22	0.001	-1.67
50	1.55	Cytochalasin Ppho	511.2934	14.4	0.001	-2
51	1.55	Isolimonic acid	506.2152	14.41	0.001	-0.9
52	1.55	Koenine	279.1259	17.49	0.001	-0.43
53	1.55	Helveticoside	534.2829	14.4	0.002	-2.01
54	1.55	Lacinilene C 7-methyl ether	260.1412	17.48	0.002	-0.45
55	1.55	PIP2(16:0/18:2(9Z,12Z))	994.4585	14.4	0.002	-2.29
56	1.55	MG(0:0/14:0/0:0)	302.2457	12.13	0.002	0.52
57	1.55	PG(18:0/18:1(11Z))	776.5567	13.98	0.002	2.85
58	1.55	DG(14:0/24:1(15Z)/0:0)	650.5849	15.55	0.002	-1.2
59	1.54	PIP3(16:0/18:1(11Z))	1076.441	14.41	0.002	-0.96
60	1.54	Thalsimine	636.2836	7.4	0.002	0.87
61	1.54	L-Proline	115.0633	18.05	0.002	-0.81
62	1.54	Glycinoeclepin C	514.2567	8.52	0.002	0.92
63	1.54	Cassaine	405.2879	16.22	0.002	-1.66
64	1.53	6-Hydroxymelatonin	248.1161	14.41	0.002	-0.67
65	1.53	Withaperuvin D	520.2672	14.41	0.002	-0.95
66	1.53	Gambogic acid	628.3036	14.4	0.002	-1.93
67	1.53	Vignatic acid B	519.2945	14.41	0.002	-0.94
68	1.53	PC(18:1(11Z)/24:1(15Z))	869.6874	15.33	0.002	-0.84
69	1.52	Quillaic acid	486.3345	14.96	0.002	-0.33
70	1.52	Camelledionol	440.329	10.78	0.002	0.44
71	1.51	Rosmarinine	353.1838	7.07	0.002	0.29
72	1.51	Ginkgol	302.261	15.74	0.002	-0.77

73	1.51	Raucaffricine	512.2159	10.89	0.002	0.78
74	1.51	MG(0:0/20:4(5Z,8Z,11Z,14Z)/0:0)	378.277	10.75	0.003	0.39
75	1.51	Lochnericine	352.1787	7.08	0.003	0.27
76	1.51	Cassine	297.2668	17.55	0.003	-0.38
77	1.51	Palmitic acid	256.2402	15.04	0.003	-0.9

RT, retention time; VIP, variable importance in the projection (> 1); T-test ($P < 0.05$), positive fold change value indicates increase when compared control group with AgNPs group, otherwise negative indicates decrease.

ESI Table 4 Full list of the significantly different metabolites in *M. aeruginosa* upon AgNPs exposure (ESI-)

No	Name	VIP	Molecular Weight	RT(min)	T-Test	Fold change
1	Sulfuric acid	1.6	97.9674	18.46	0.034	-0.19
2	Isatin	1.51	147.032	16.42	0.049	-0.13
3	Dehydromatricaria ester	1.69	172.0524	6.33	0.023	-0.14
4	1-Bromo-3-iodoacetone	1.75	261.849	1	0.017	-0.39
5	Colnelenic acid	1.71	292.2038	11.58	0.021	0.85
6	Dimethyl fukiic acid	1.83	300.0845	16.63	0.011	-0.35
7	Corchorifatty acid F	1.64	328.225	8.27	0.029	-0.97
8	Melicopicine	1.66	329.1263	14.92	0.026	0.39
9	Sucrose	1.53	342.1162	15.53	0.046	0.46
10	Cristacarpin	1.75	354.1467	15.24	0.017	0.34
11	Myricanone	1.87	356.1624	16.15	0.008	0.46
12	MG(0:0/24:6(6Z,9Z,12Z,15Z,18Z,21Z)/0:0)	1.96	430.3083	12.56	0.005	-0.73
13	Folic acid	1.68	441.1397	16.13	0.024	0.7
14	α-Tocotrienol	1.74	424.3341	17.47	0.018	0.69
15	2,5-Diaminopyrimidine nucleoside triphosphate	1.96	513.0063	10.13	0.005	-0.51
16	Cucurbitacin E	1.52	556.3036	13.61	0.049	0.49
17	DG(14:0/20:5(5Z,8Z,11Z,14Z,17Z)/0:0)	1.59	586.4597	14.68	0.036	0.53
18	Physagulin G	1.59	722.315	11.09	0.036	1.06
19	Glucosylceramide (d18:1/25:0)	1.57	825.7058	0.78	0.039	0.15

20	PC(20:3(5Z,8Z,11Z)/24:1(15Z))	1.69	893.6874	0.78	0.023	0.18

RT, retention time; VIP, variable importance in the projection (> 1); T-test ($P < 0.05$), positive fold change value indicates increase when compared control group with AgNPs group, otherwise negative indicates decrease.

ESI Table 5 Full list of the significantly different metabolites in *M. aeruginosa* between AgNPs1 and Ag^{+} exposure (ESI+)

No	VIP	Name	Molecular Weight	RT	T-Test	Fold change
1	1.77	Phytolaccoside B	664.3823	17.85	0	6.38
2	1.76	PC(20:0/24:1(15Z))	899.7343	17.79	0	-1.72
3	1.76	PC(24:1(15Z)/P-18:1(11Z))	853.6924	17.77	0	-1.66
4	1.76	PC(22:0/P-18:1(11Z))	827.6768	17.77	0	-1.65
5	1.76	Haemanthamine	301.1314	13.48	0	-1.12
6	1.75	PE(14:1(9Z)/18:4(6Z,9Z,12Z,15Z))	681.4370	17.73	0	6.58
7	1.75	PIP3(16:0/18:1(11Z))	1076.4405	14.41	0	1.86
8	1.75	Phaseic acid	280.1311	13.48	0	-1.06
9	1.75	Dibutyl phthalate	278.1518	13.48	0	-1.12
10	1.75	beta-Friedelinol	428.4018	16.22	0	-1.98
11	1.75	Cassaine	405.2879	16.22	0	-1.78
12	1.75	Heteratisine	391.2359	17.48	0	-1.49
13	1.75	Abscisic alcohol 11-glucoside	412.2097	17.49	0	-1.50
14	1.74	Vitamin D3	384.3392	16.22	0	-1.69
15	1.74	PIP2(16:0/20:1(11Z))	1024.5054	11.02	0	1.84

16	1.74	TG(18:1(11Z)/18:0/18:2(9Z,12Z))[iso6]	884.7833	17.85	0	-1.87
17	1.74	PIP2(16:0/20:2(11Z,14Z))	1022.4898	11.02	0	1.81
18	1.74	Carapanaubine	428.1947	17.51	0	-1.74
19	1.73	PC(15:0/18:1(11Z))	745.5622	14.71	0	3.83
20	1.73	Cassaidine	407.3036	15.86	0	-1.86
21	1.72	DG(20:5(5Z,8Z,11Z,14Z,17Z)/24:1(15Z)/0:0)	724.6006	14.7	0	3.87
22	1.72	PC(18:0/24:0)	873.7187	17.77	0	-1.39
23	1.72	DG(16:1(9Z)/22:5(4Z,7Z,10Z,13Z,16Z)/0:0)	640.5067	16.24	0	-6.74
24	1.72	MG(0:0/20:0/0:0)	386.3396	15.87	0	-1.80
25	1.72	Thalsimine	636.2836	15.39	0	-1.70
26	1.72	Vanilloloside	316.1158	13.48	0	-1.02
27	1.72	Camellenodiol	442.3447	14.99	0	-0.94
28	1.71	PIP(16:0/22:2(13Z,16Z))	970.5548	11.03	0	1.54
29	1.71	Glutinosone	220.1463	15.94	0	-2.47
30	1.71	Camptothecin	348.1110	17.05	0	-0.79
31	1.71	Solanocapsine	430.3559	15.9	0	-2.51
32	1.71	Caffeoylcycloartenol	588.4179	15.62	0	1.84
33	1.70	Acetylursolic acid	498.3709	17.55	0	-1.46
34	1.70	dodecanamide	199.1936	15.93	0	-2.24
35	1.69	PG(16:0/18:3(6Z,9Z,12Z))	744.4941	15.4	0	-2.55
36	1.69	PC(14:0/P-16:0)	689.5359	16.85	0	3.65
37	1.68	TG(18:2(9Z,12Z)/14:0/20:4(5Z,8Z,11Z,14Z))	850.7050	17.77	0	-1.49
38	1.68	PIP2(16:0/18:2(9Z,12Z))	994.4585	10.11	0	1.09
39	1.68	Cannabidiolic acid	358.2144	17.59	0	-0.65
40	1.68	Glycinoeclepin C	514.2567	8.52	0	2.07
41	1.68	Ceanothenic acid	454.3083	16.07	0	-0.95

42	1.67	Phloionolic acid	332.2563	15.12	0	-0.97
43	1.66	PIP2(16:0/18:1(11Z))	996.4741	10.11	0	1.12
44	1.66	Monoglucuronylglycyrrhetinic acid	646.3717	15.44	0	-2.07
45	1.66	PC(18:0/20:3(5Z,8Z,11Z))	811.6091	14.6	0	-2.43
46	1.66	Sitosterol	414.3862	12.39	0	1.28
47	1.65	PE(15:0/14:0)	649.4683	14.37	0	2.96
48	1.65	PE(16:1(9Z)/P-18:1(11Z))	699.5203	17.05	0	-0.89
49	1.65	TG(18:3(9Z,12Z,15Z)/20:4(5Z,8Z,11Z,14Z)/20:5(5Z,8Z,11Z,14Z,17Z))	922.7050	17.78	0	-1.37
50	1.65	Pangamic acid	436.2785	15.71	0	-3.12
51	1.64	Gravacridonediol	341.1263	13.47	0	-0.50
52	1.64	TG(19:0/12:0/19:0)	829.7285	17.77	0	-1.55
53	1.64	PIP(16:0/22:5(4Z,7Z,10Z,13Z,16Z))	964.5078	10.11	0	1.25
54	1.64	1,3-Diaminopropane	74.0844	18.05	0	-0.62
55	1.64	Mecambrine	295.1208	13.5	0	-0.89
56	1.64	Myricatomentoside I	504.1995	14.41	0	-1.43
57	1.64	Gambogic acid	628.3036	14.4	0	-1.35
58	1.64	Stigmastanol	416.4018	15.00	0	-0.52
59	1.63	Hydroxygaleon	342.1467	13.06	0	-1.61
60	1.63	PE(14:0/18:3(6Z,9Z,12Z))	685.4683	17.57	0	3.70
61	1.63	Isolimonic acid glucoside	668.2680	8.07	0	1.43
62	1.63	Pterosterone	480.3087	11.02	0	0.51
63	1.63	Veranisatin C	372.1056	16.04	0	-0.57
64	1.62	Plastoquinone 3	340.2402	14.43	0	-1.33
65	1.62	15-Hexadecanolide	254.2246	11.94	0	-0.81
66	1.62	Raucaffricine	512.2159	10.89	0	1.90
67	1.62	L-Proline	115.0633	18.05	0	-0.55

68	1.62	Cytochalasin Ppho	511.2934	14.40	0	-1.45
69	1.61	5-Hydroxylysine	162.1004	18.08	0	-0.53
70	1.61	Capric acid	172.1463	15.01	0	-0.71
71	1.61	Vignatic acid B	519.2945	14.41	0	-0.91
72	1.61	Helveticoside	534.2829	14.40	0	-1.47
73	1.61	PE(18:4(6Z,9Z,12Z,15Z)/18:4(6Z,9Z,12Z,15Z))	731.4526	15.61	0	1.58
74	1.60	Nomilinic acid	532.2308	11.30	0	1.47
75	1.60	abietol	288.2453	15.10	0	-2.04
76	1.60	Gibberellin A1 glucosyl ester	510.2101	12.28	0	1.18
77	1.60	Cyclopassifloic acid E	552.3662	17.96	0	1.36
78	1.60	Glucosylceramide (d18:1/26:1(17Z))	837.7058	14.85	0	-2.51
79	1.60	Pyropheophorbide a	534.2631	10.91	0	1.22
80	1.60	PC(18:1(11Z)/22:6(4Z,7Z,10Z,13Z,16Z,19Z))	831.5778	16.95	0	-3.22
81	1.59	MG(0:0/14:0/0:0)	302.2457	12.13	0	0.45
82	1.59	Strictosidine	530.2264	7.90	0	1.87
83	1.59	PIP2(16:0/18:0)	998.4898	17.60	0	-1.14
84	1.59	PE(14:0/P-16:0)	647.4890	15.53	0	-2.56
85	1.58	Colubrinoside	982.5137	10.76	0	0.67
86	1.58	Withaperuvin D	520.2672	14.41	0	-0.74
87	1.58	N-Hydroxy-L-tyrosine	197.0688	4.90	0	1.73
88	1.58	Lycofawcine	323.2097	13.59	0	-1.49
89	1.58	TG(18:2(9Z,12Z)/16:0/20:5(5Z,8Z,11Z,14Z,17Z))	876.7207	17.77	0	-1.57
90	1.58	Caproic acid	116.0837	18.05	0	-0.50
91	1.57	Cassine	297.2668	17.55	0	-0.61
92	1.57	PA(16:0/16:0)	648.4730	15.60	0	-3.03
93	1.57	Geranylgeraniol	290.2610	16.98	0	-0.55

94	1.57	Khellol glucoside	408.1056	13.47	0	-0.50
95	1.57	TG(18:2(9Z,12Z)/18:0/22:6(4Z,7Z,10Z,13Z,16Z,19Z))[iso6]	930.7676	17.86	0	-0.83
96	1.56	Isoleptospermone	266.1518	12.37	0	-0.91
97	1.56	Tyramine	137.0841	18.05	0	-0.39
98	1.56	Epidermin	261.1212	17.48	0	-0.32
99	1.54	MG(18:0/0:0/0:0)	358.3083	16.61	0	-0.58
100	1.54	Prostaglandin E3	350.2093	14.48	0	-0.66
101	1.54	Lochnerinine	382.1893	13.44	0	-1.01
102	1.53	O-Acetylserine	380.0807	13.48	0	-0.39
103	1.53	2-Heptadecylfuran	306.2923	16.34	0	-0.85
104	1.53	DG(18:2(9Z,12Z)/14:0/0:0)	564.4754	15.05	0	-1.27
105	1.53	Vitamin D3	384.3392	16.22	0	-0.43
106	1.53	Koenine	279.1259	17.49	0	-0.32
107	1.53	MG(0:0/18:4(6Z,9Z,12Z,15Z)/0:0)	350.2457	16.23	0	-1.33
108	1.52	Usambarensine	432.2314	10.11	0	0.28
109	1.52	DG(14:0/15:0/0:0)	526.4597	14.93	0.001	-0.36
110	1.52	Ginkgol	302.2610	15.74	0.001	-1.6
111	1.51	TG(18:3(9Z,12Z,15Z)/16:0/22:6(4Z,7Z,10Z,13Z,16Z,19Z))[iso6]	900.7207	17.78	0.001	-1.43
112	1.51	beta-Citraurol	434.3185	17.22	0.001	-0.49
113	1.51	L-Histidinol	141.0902	18.07	0.001	-0.34
114	1.51	DG(20:0/14:0/0:0)	596.5380	15.52	0.001	-0.74
115	1.51	PG(16:0/22:6(4Z,7Z,10Z,13Z,16Z,19Z))	794.5098	16.91	0.001	-0.81
116	1.51	Cappariloside A	334.1165	13.26	0.001	-1.28
117	1.51	N-Vinyl-2-pyrrolidone	141.0903	18.07	0.001	-0.44
118	1.51	19-Hydroxycinnzeylanol 19-glucoside	562.2625	14.41	0.001	-0.64
119	1.50	rhodexin A	536.2985	12.13	0.001	4.17

120	1.50	TG(16:1(9Z)/18:0/18:1(11Z))[iso6]	858.7676	17.85	0.001	-1.83
121	1.50	PE(22:5(4Z,7Z,10Z,13Z,16Z)/22:6(4Z,7Z,10Z,13Z,16Z,19Z))	837.5309	16.39	0.001	3.17
122	1.50	PC(20:0/24:0)	901.7500	17.77	0.001	-1.16

RT, retention time; VIP, variable importance in the projection (> 1); T-test ($P < 0.05$), positive fold change value indicates increase when compared control group with AgNPs group, otherwise negative indicates decrease.

ESI Table 6 Full list of the significantly different metabolites in *M. aeruginosa* between AgNPs1 and Ag^+ exposure (ESI-)

No	VIP	Name	Molecular Weight	RT	T-Test	Fold change
1	1.79	Sulfuric acid	97.9674	18.46	0.012	-0.16
2	1.77	Asparagusate	149.9809	18.1	0.014	-0.19
3	1.56	Itaconic acid	130.0266	5.43	0.038	-0.20
4	1.70	Damascenine	195.0895	11.14	0.020	0.21
5	1.78	D-Glycerol 1-phosphate	172.0137	18.1	0.013	-0.15
6	1.82	Eremopetasinorol	208.1463	10.41	0.010	-0.26
7	1.86	Harmine	212.0950	8.12	0.008	0.76
8	2.30	Phosphocholine	183.0660	4.96	0.000	1.73
9	1.75	Di-2-propenyl pentasulfide	241.9386	18.09	0.016	-0.14
10	2.18	Colnelenic acid	292.2038	11.58	0.001	-1.19

11	1.69	Gingerol	294.1831	11.1	0.020	0.93
12	1.58	Methyl dihydrophaseate	296.1624	11.1	0.035	1.00
13	1.77	Picein	298.1053	6.57	0.014	2.12
14	2.15	Valdiate	310.178	10.62	0.001	-0.53
15	2.25	Corchorifatty acid F	328.2250	8.27	0.000	-1.25
16	2.01	Sterculic acid	294.2559	8.67	0.003	-0.72
17	1.51	Gelsemicine	358.1893	16.15	0.046	0.31
18	1.96	α-Tocotrienol	424.3341	16.98	0.004	0.91
19	2.42	MG(0:0/24:6(6Z,9Z,12Z,15Z,18Z,21Z)/0:0)	430.3083	12.56	0.000	1.77
20	2.04	MG(0:0/22:6(4Z,7Z,10Z,13Z,16Z,19Z)/0:0)	402.2770	10.8	0.002	-0.67
21	2.50	Cinncassiol D2 glucoside	530.2727	10.43	0.000	-2.61
22	2.02	2,5-Diaminopyrimidine nucleoside triphosphate	513.0063	10.13	0.003	-0.34
23	2.16	Cucurbitacin E	556.3036	13.61	0.001	-1.33
24	2.15	PC(18:1(9Z)/0:0)[U]	521.3481	13.61	0.001	-1.25
25	2.06	Cucurbitacin C	560.3349	12.17	0.002	2.05
26	1.49	Gniditrin	646.2778	8.71	0.049	0.08
27	1.55	Lactodifucotetraose	634.2320	8.93	0.038	-0.13
28	2.10	Physagulin G	722.3150	11.09	0.001	1.74

29	2.18	PIP(16:0/22:5(4Z,7Z,10Z,13Z,16Z))	964.5078	10.22	0.001	1.03

RT, retention time; VIP, variable importance in the projection (> 1); T-test (P < 0.05), positive fold change value indicates increase when compared control group with AgNPs group, otherwise negative indicates decrease.