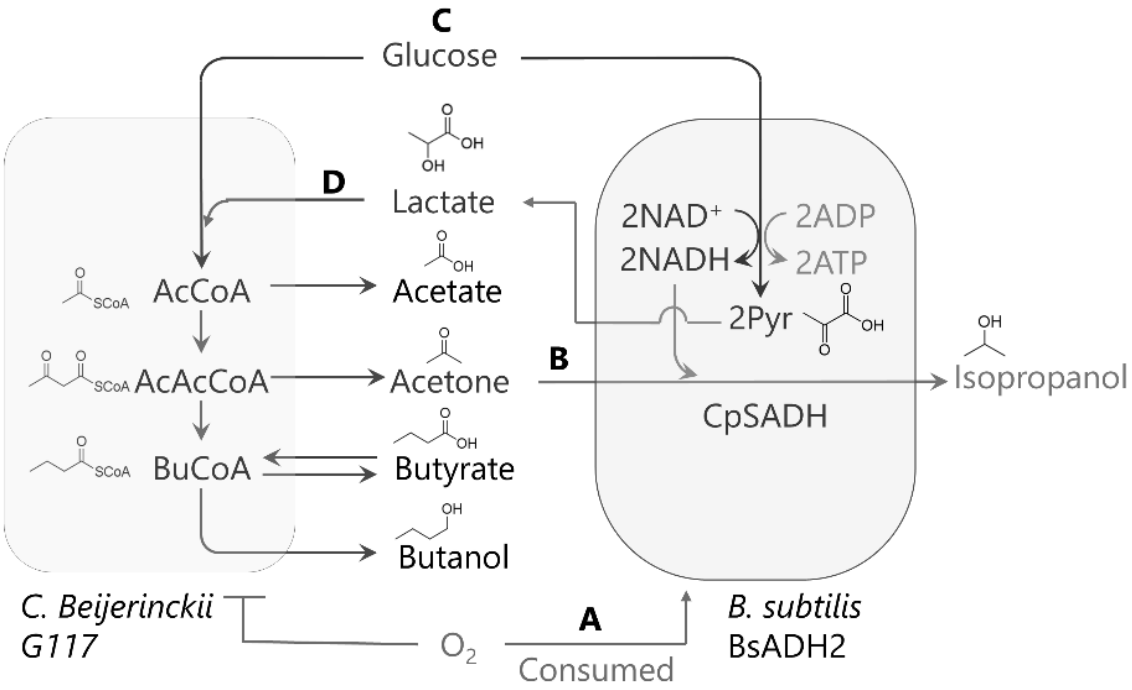
**Figure 1**




A: protection; B: redox balancing; C: competition; D: feeding

**Figure 2**

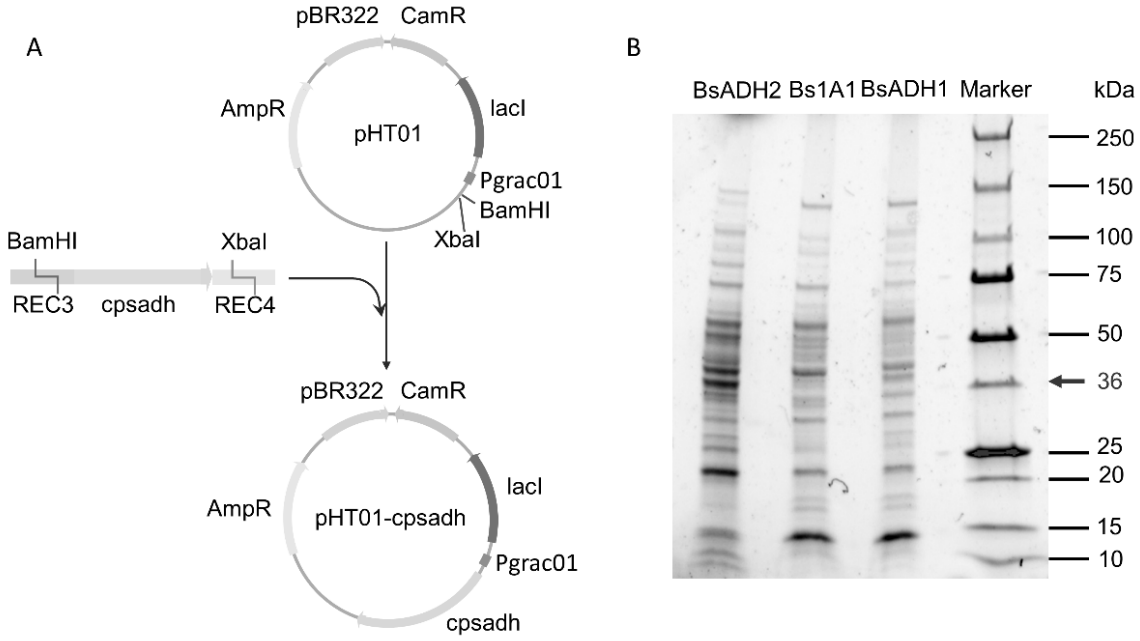
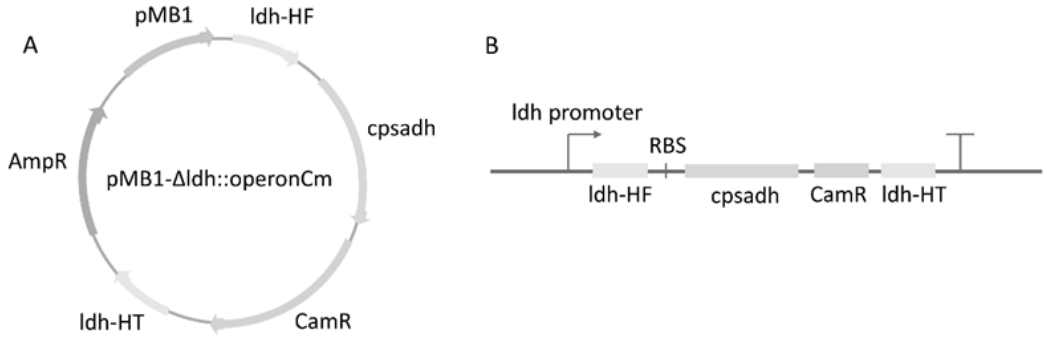



**Figure 3**



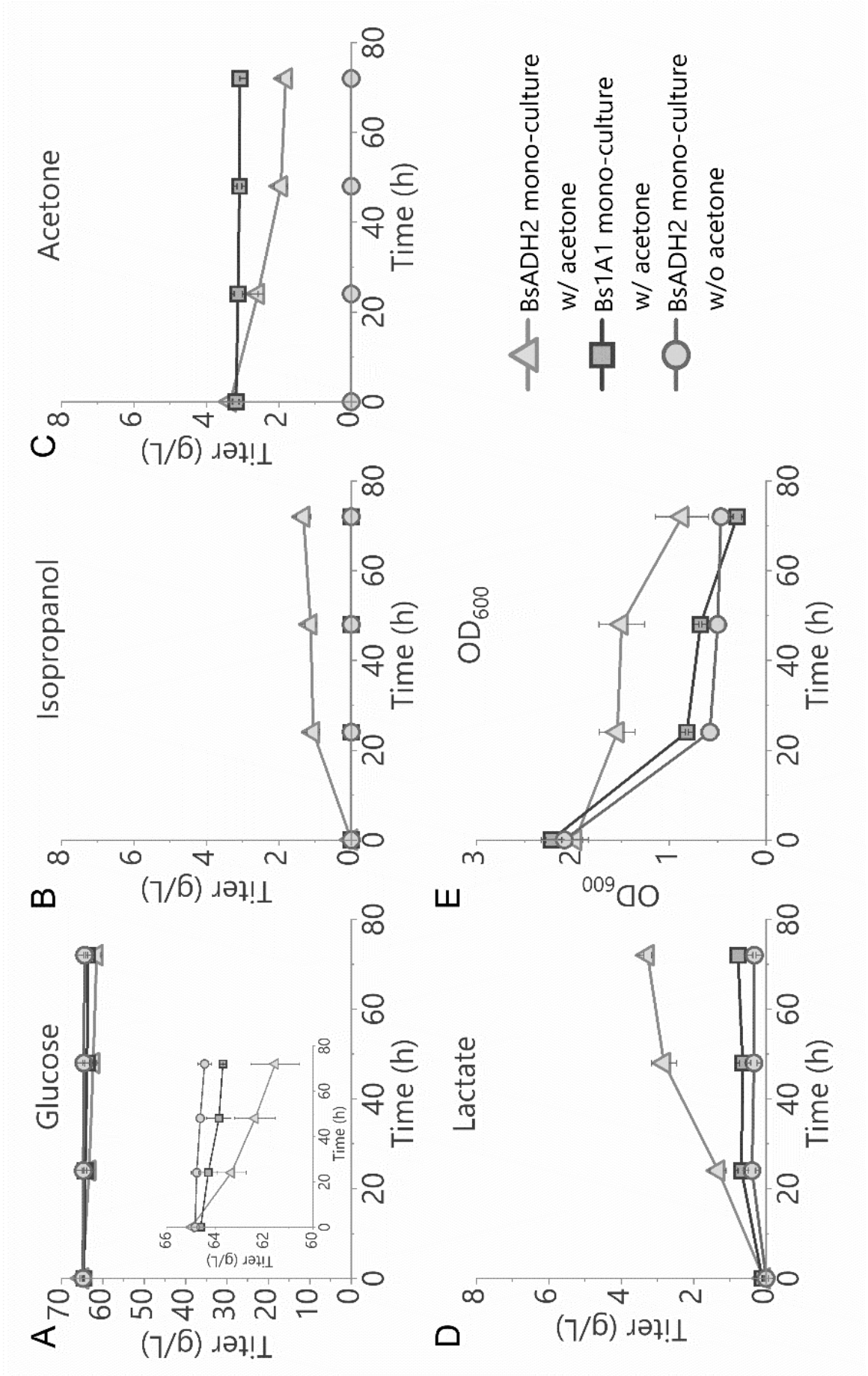

A
Glucose
Titer (g/L)
Time (h)
B
Isopropanol
Titer (g/L)
Time (h)
C
Acetone
Titer (g/L)
Time (h)
D
Lactate
Titer (g/L)
Time (h)
E
OD600
Time (h)
BsADH2 mono-culture
w/ acetone
Bs1A1 mono-culture
w/ acetone
BsADH2 mono-culture
w/o acetone

**Figure 4**

**Figure 5**

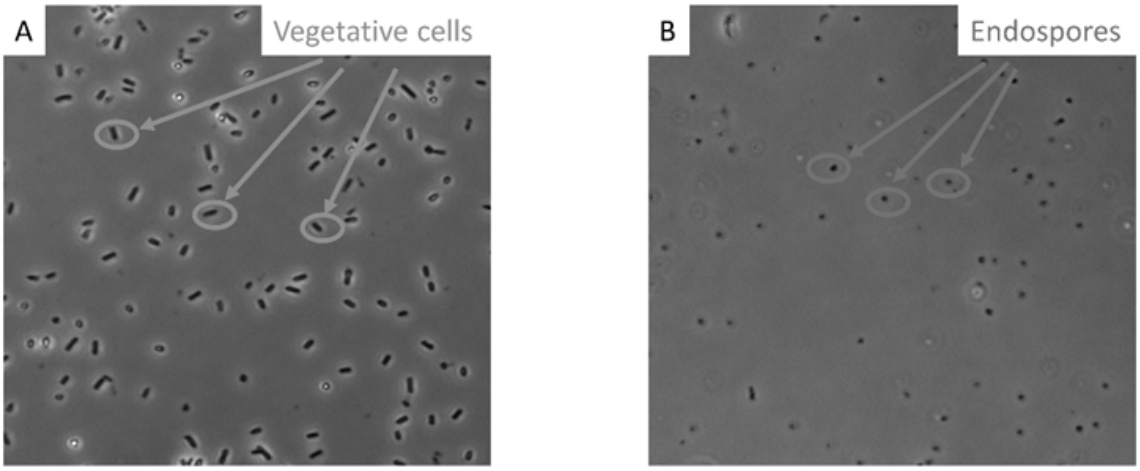



**Figure 6**

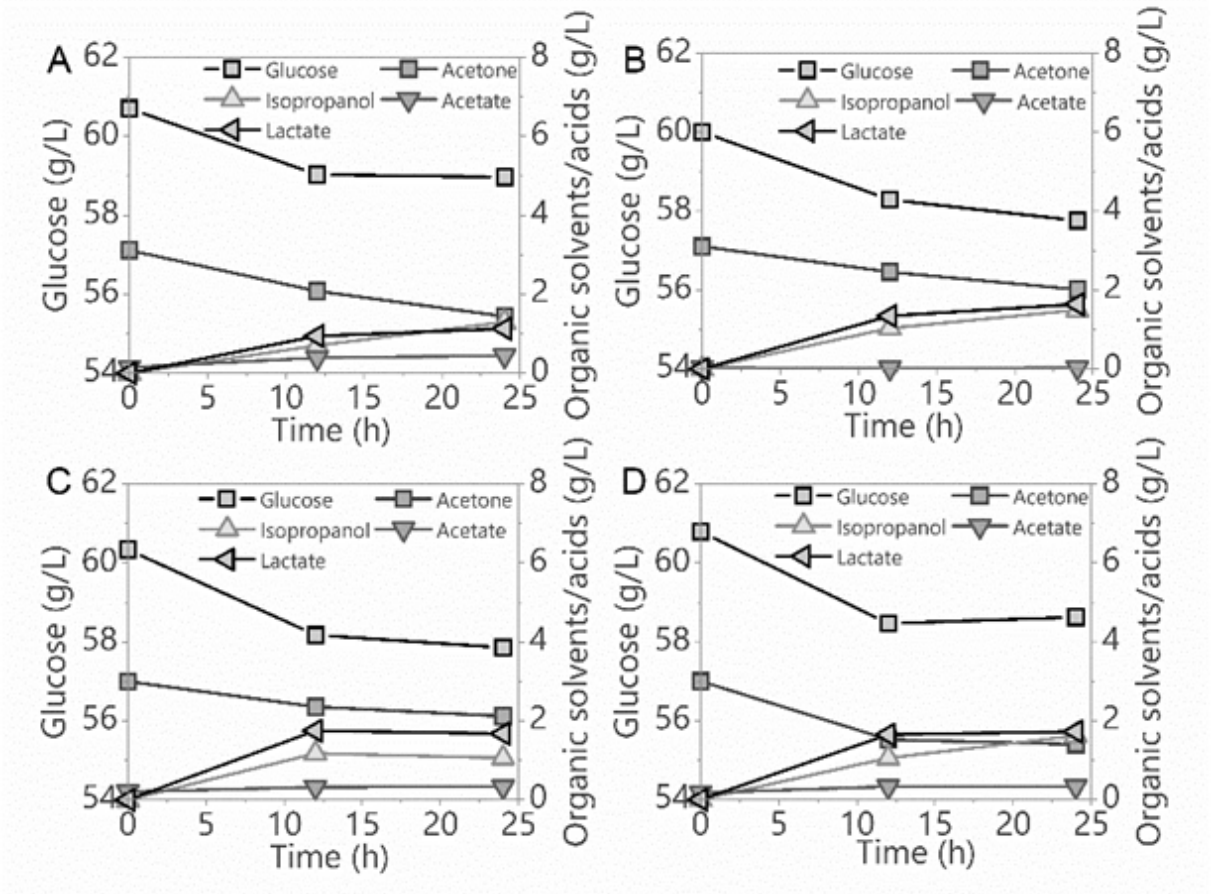
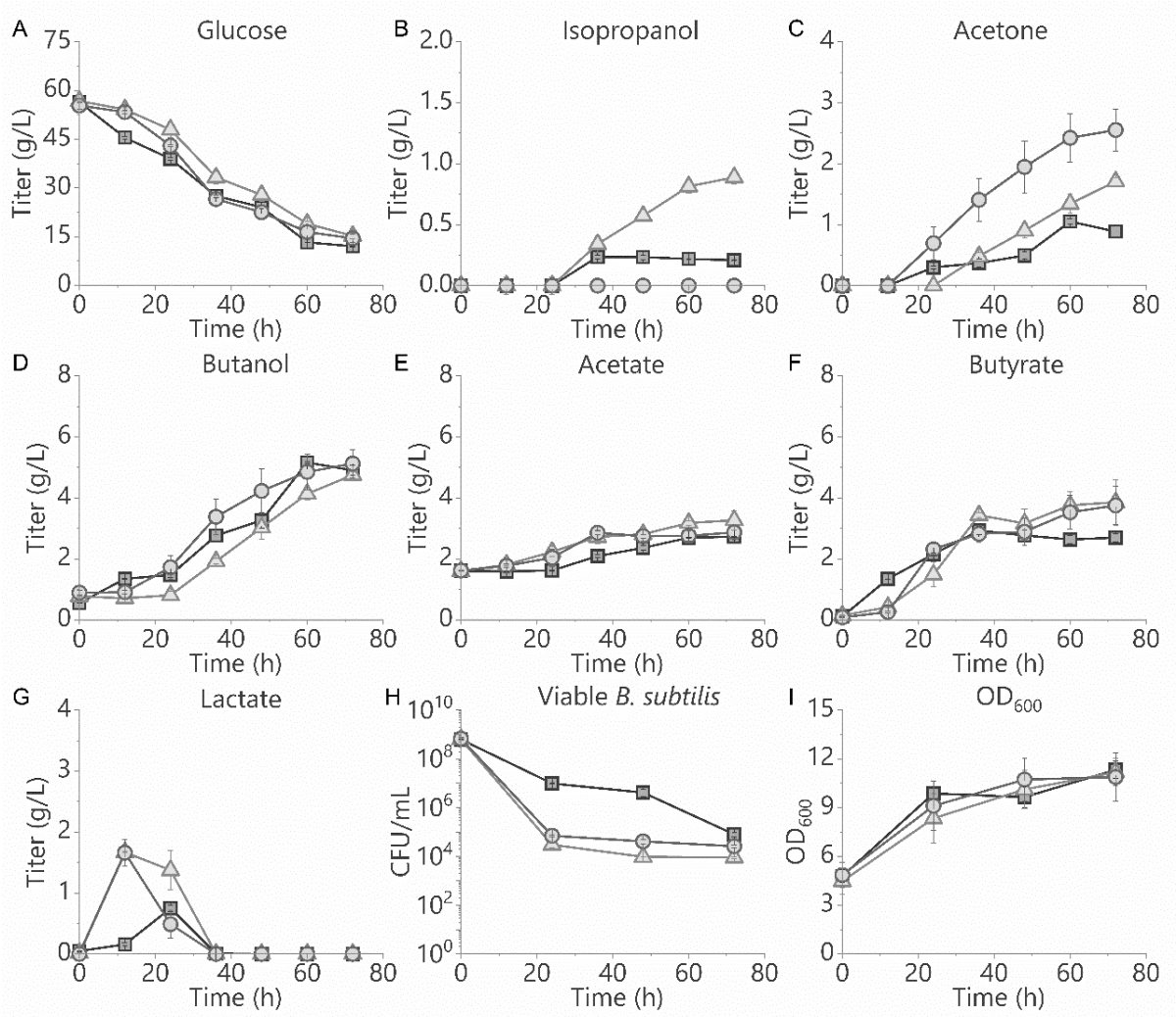


**Figure 7**




J

| | Yields relative to glucose consumption (mol/mol) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Acetate | Butyrate | Acetone | Isopropanol | Butanol | Alcohols | Acids | Total |
| BsADH2-CbG117 co-culture aerobic medium - Open | 0.074 | 0.125 | 0.063 | 0.014 | 0.269 | 0.283 | 0.199 | 0.545 |
| BsADH2-CbG117 co-culture aerobic medium - Closed | 0.123 | 0.192 | 0.127 | 0.065 | 0.281 | 0.346 | 0.315 | 0.789 |
| Bs1A1-CbG117 co-culture a -erobic medium - Closed | 0.096 | 0.19 | 0.197 | 0 | 0.303 | 0.303 | 0.285 | 0.786 |

**Figure 8**

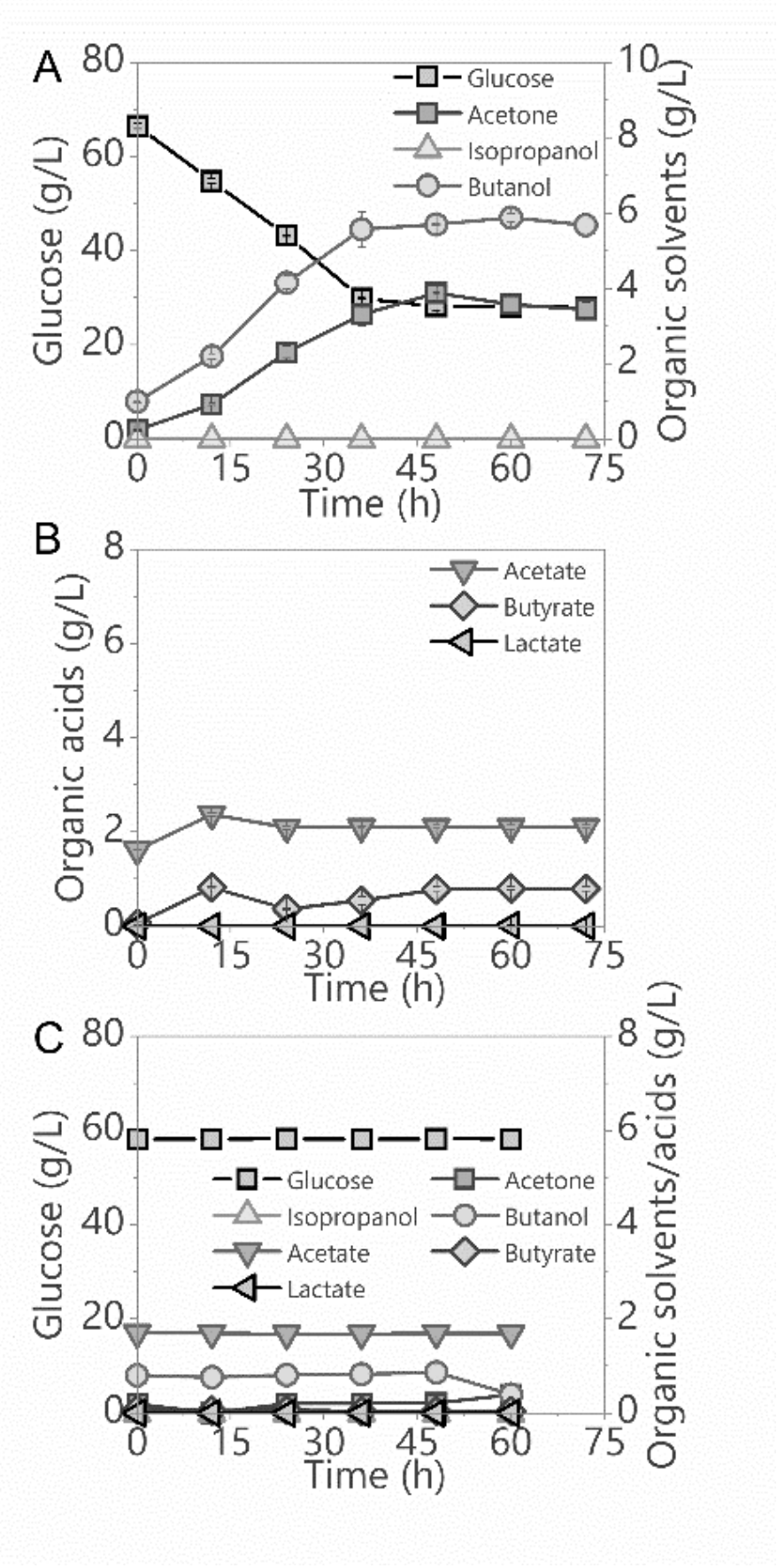

A
Glucose (g/L)
Organic solvents (g/L)
Time (h)
Glucose
Acetone
Isopropanol
Butanol
B
Organic acids (g/L)
Time (h)
Acetate
Butyrate
Lactate
C
Glucose (g/L)
Organic solvents/acids (g/L)
Time (h)
Glucose
Acetone
Isopropanol
Butanol
Acetate
Butyrate
Lactate

Figure 9

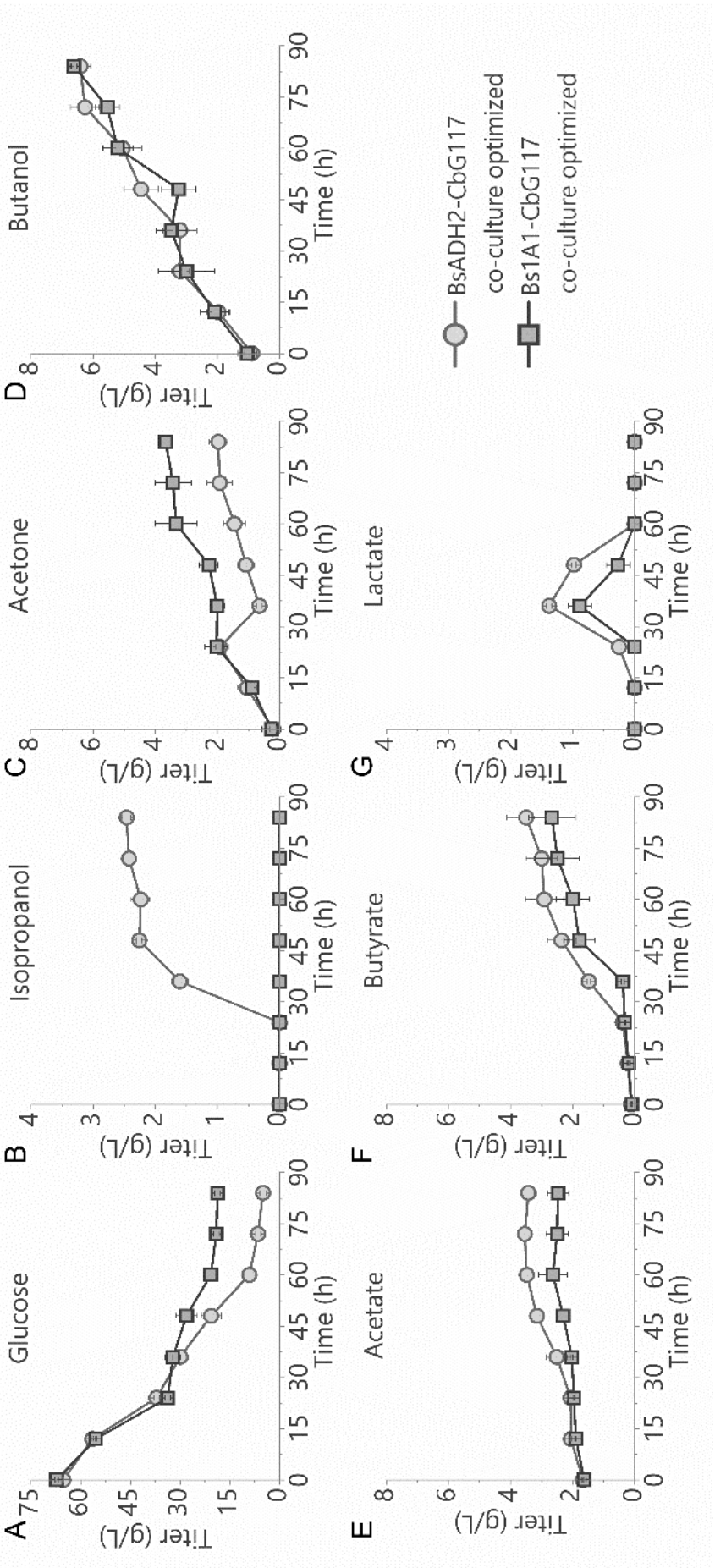

A
Glucose
B
Isopropanol
C
Acetone
D
Butanol
E
Acetate
F
Butyrate
G
Lactate
Titer (g/L)
Time (h)
BsADH2-CbG117
co-culture optimized
Bs1A1-CbG117
co-culture optimized

**Figure 10**

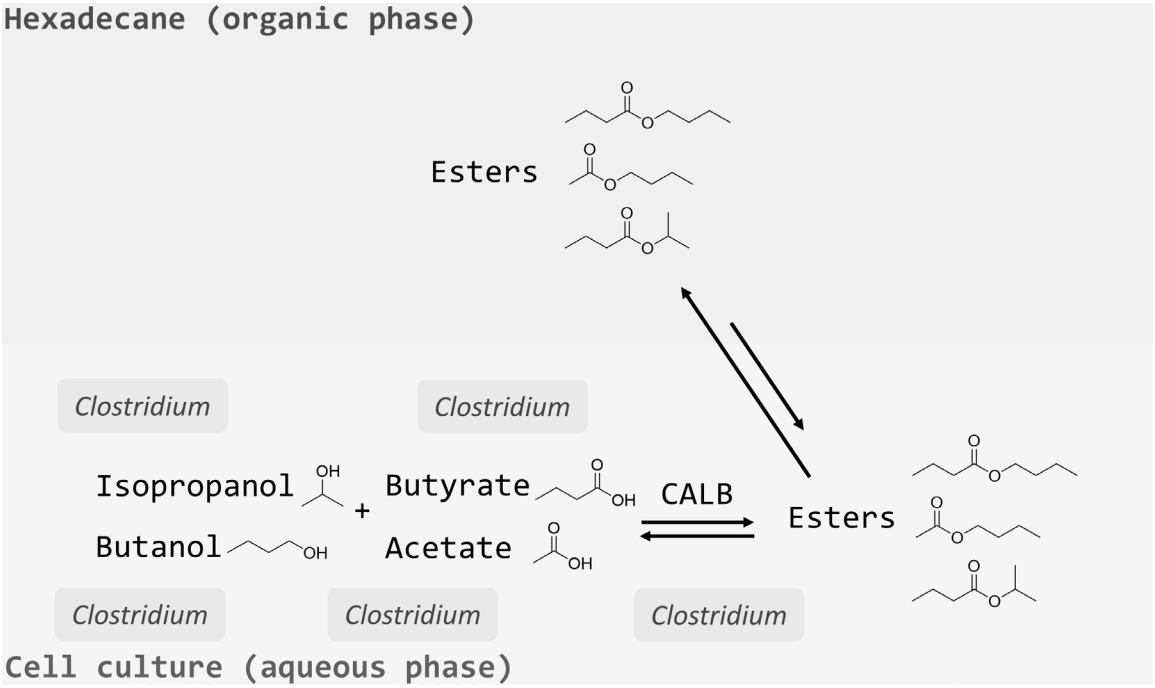



**Figure 11**

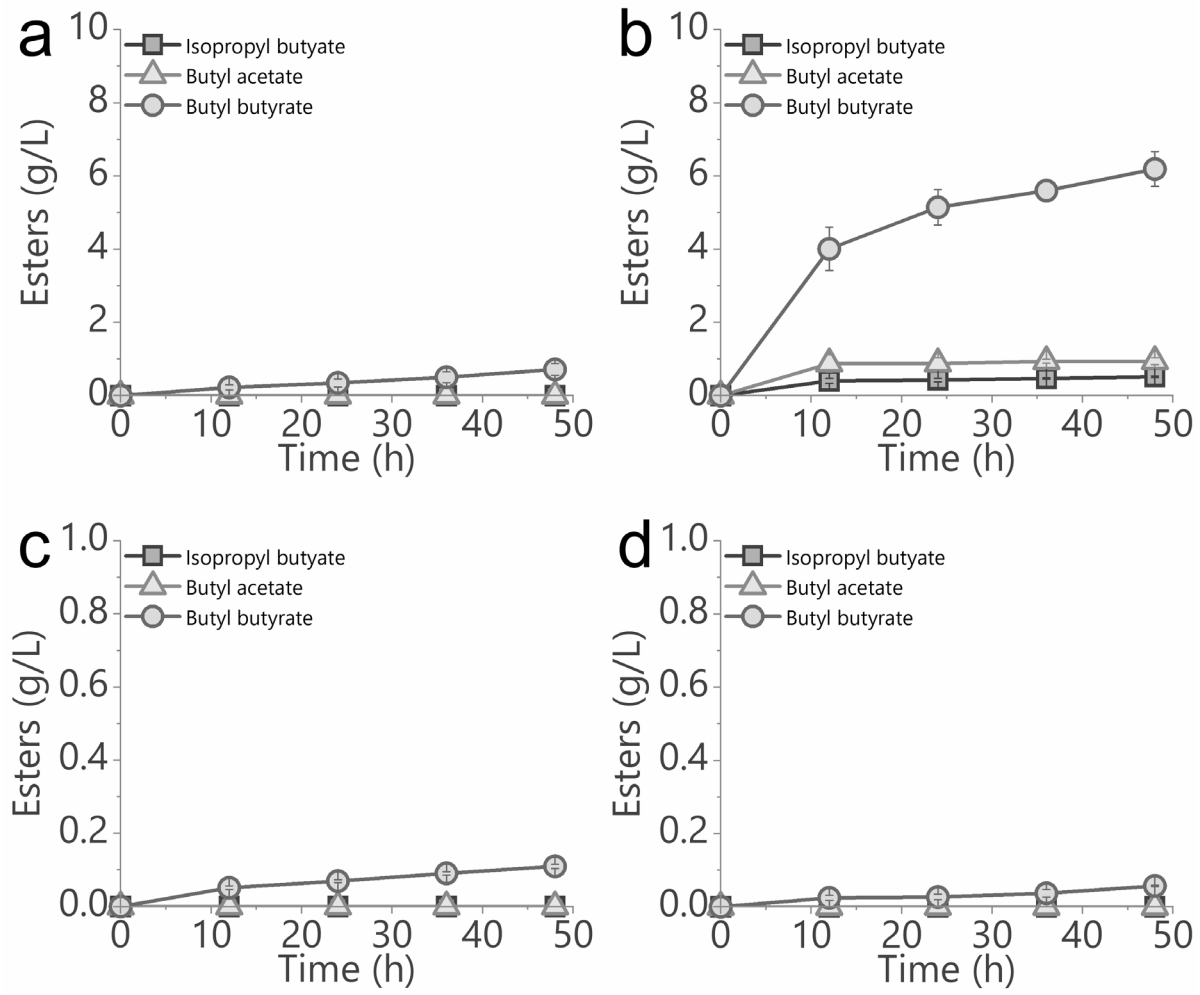


**Figure 12**

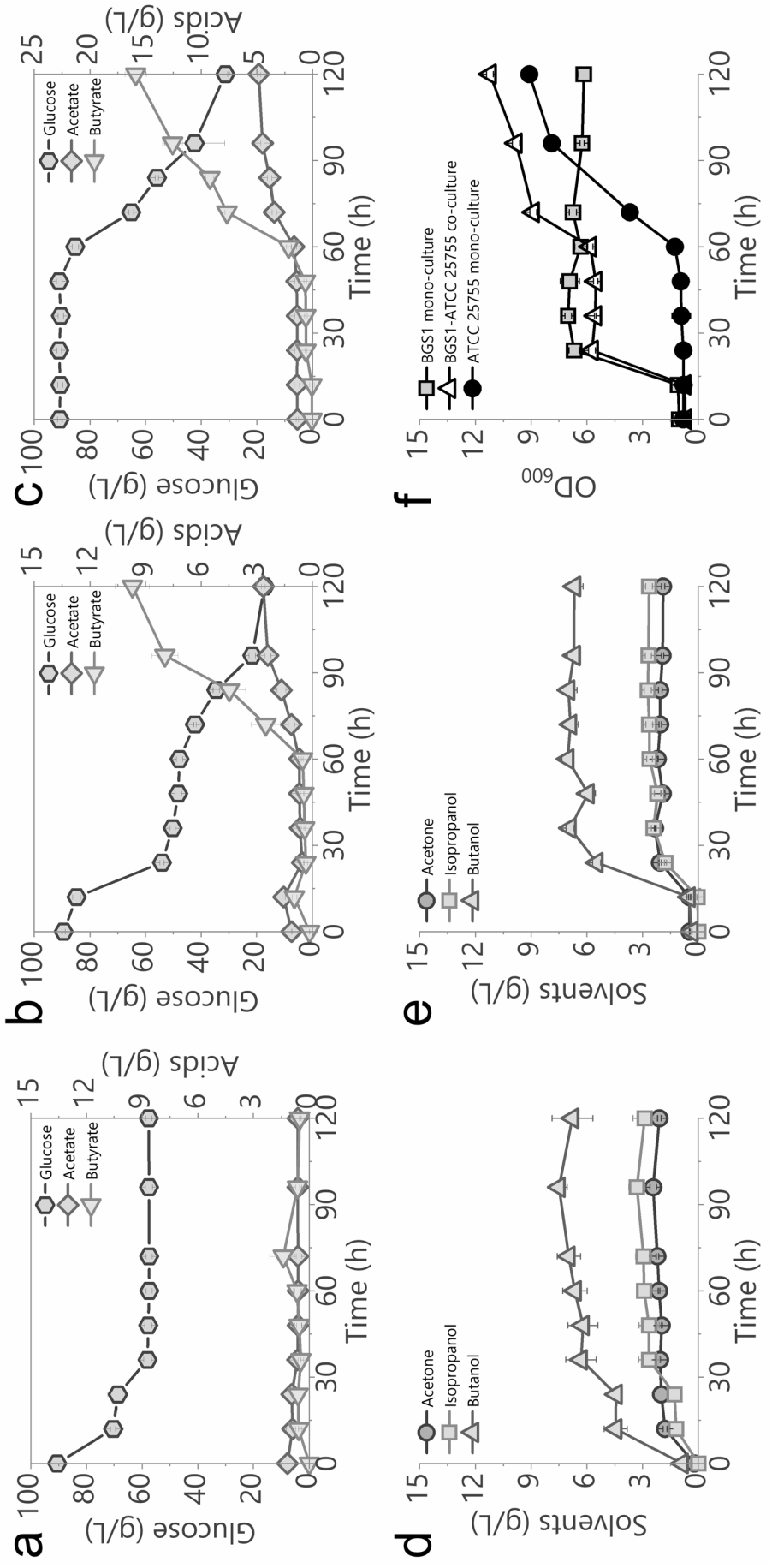

a
b
c
d
e
f
Glucose (g/L)
Acids (g/L)
Solvents (g/L)
OD600
Time (h)
Glucose
Acetate
Butyrate
Acetone
Isopropanol
Butanol
BGS1 mono-culture
BGS1-ATCC 25755 co-culture
ATCC 25755 mono-culture

**Figure 13**

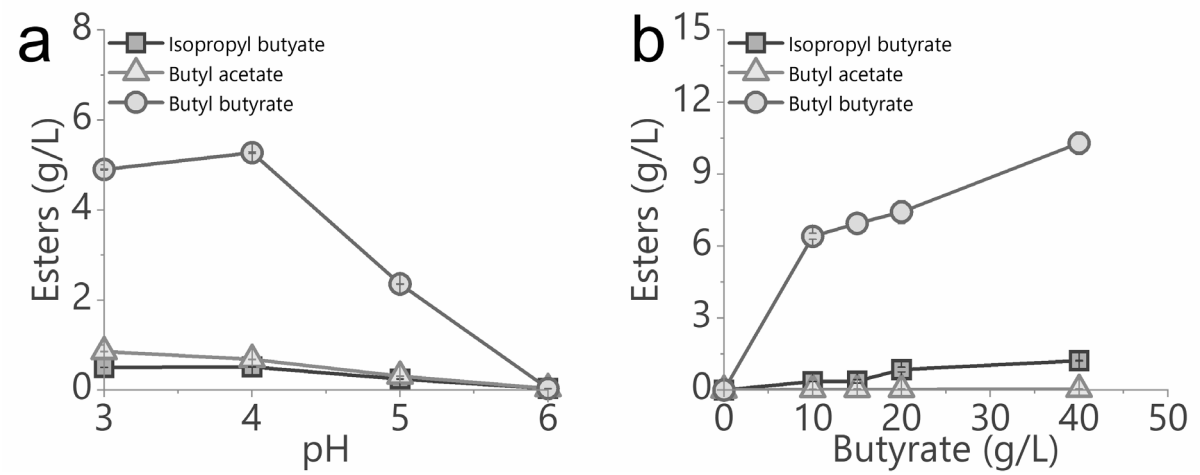



**Figure 14**

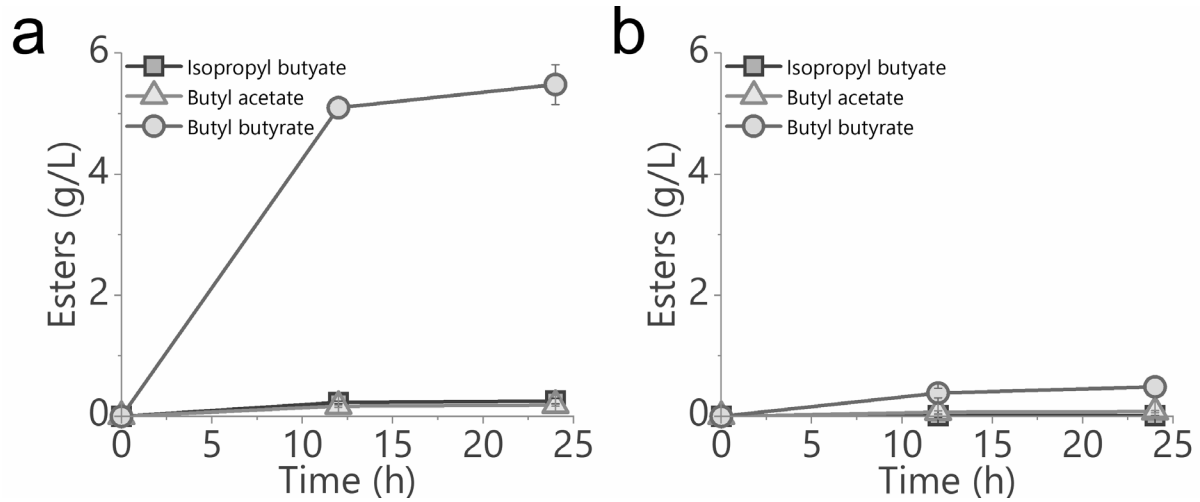
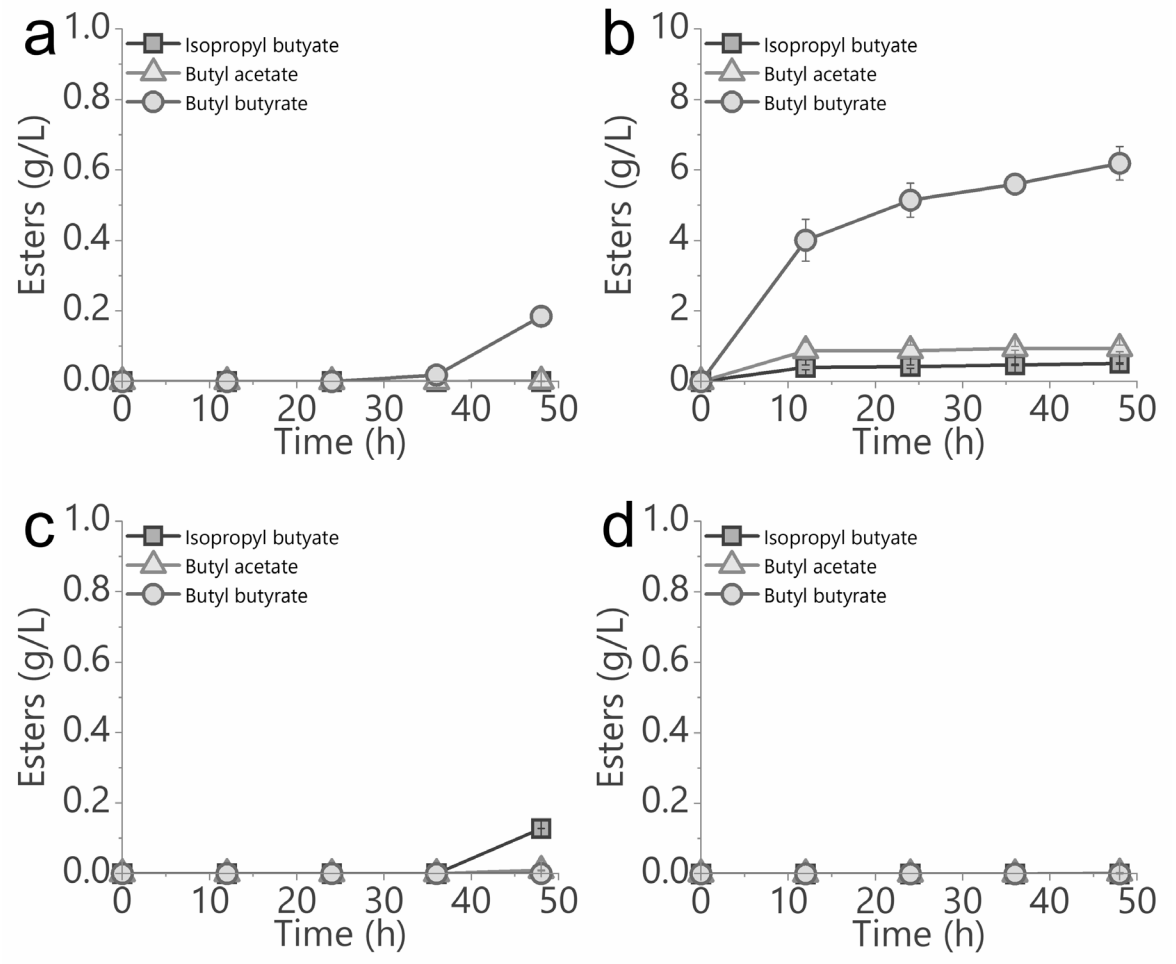


**Figure 15**


a
b
c
d
Isopropyl butyate
Butyl acetate
Butyl butyrate
Esters (g/L)
Time (h)
0
10
20
30
40
50
0.0
0.2
0.4
0.6
0.8
1.0
2
4
6
8
10

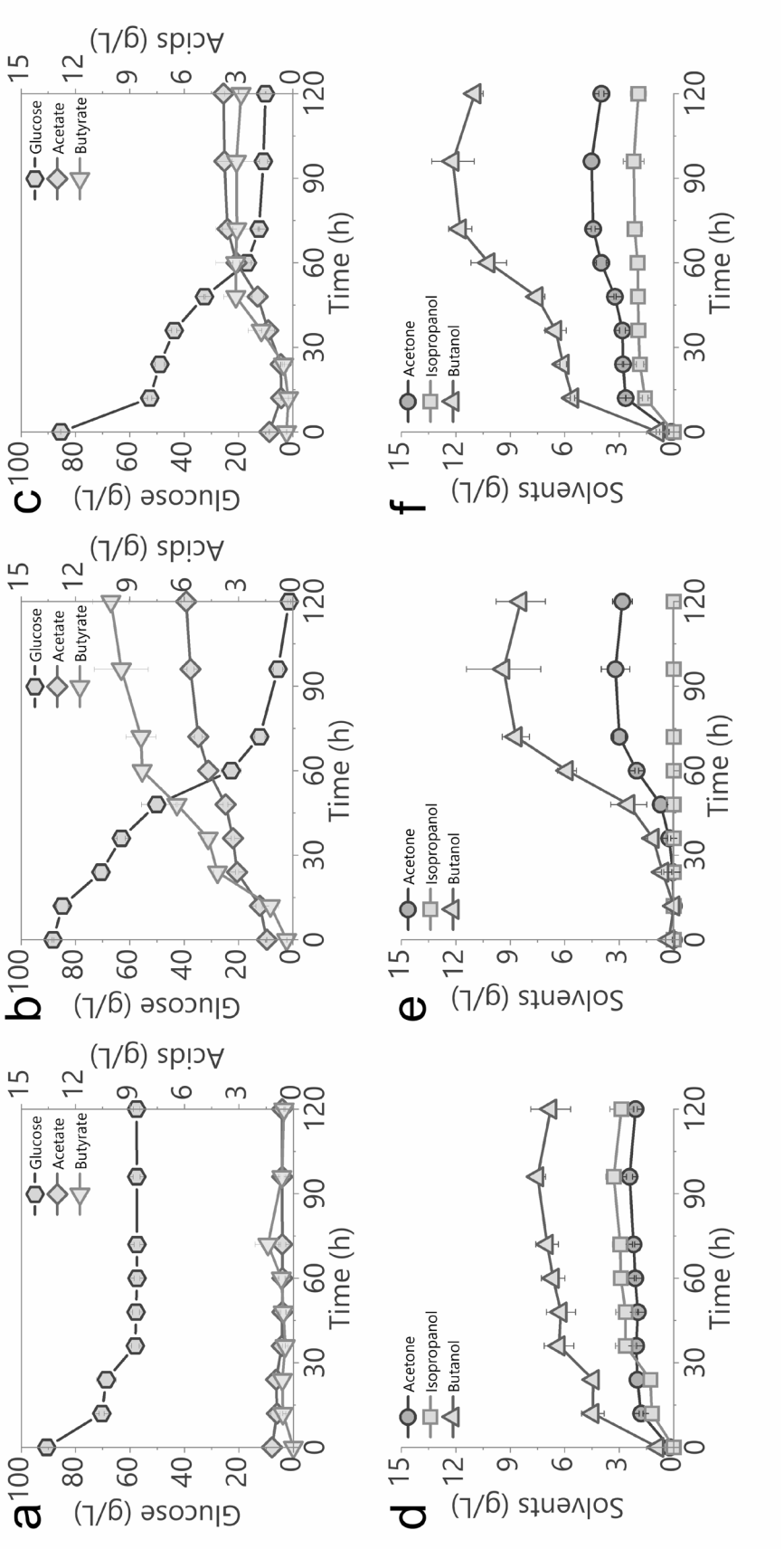
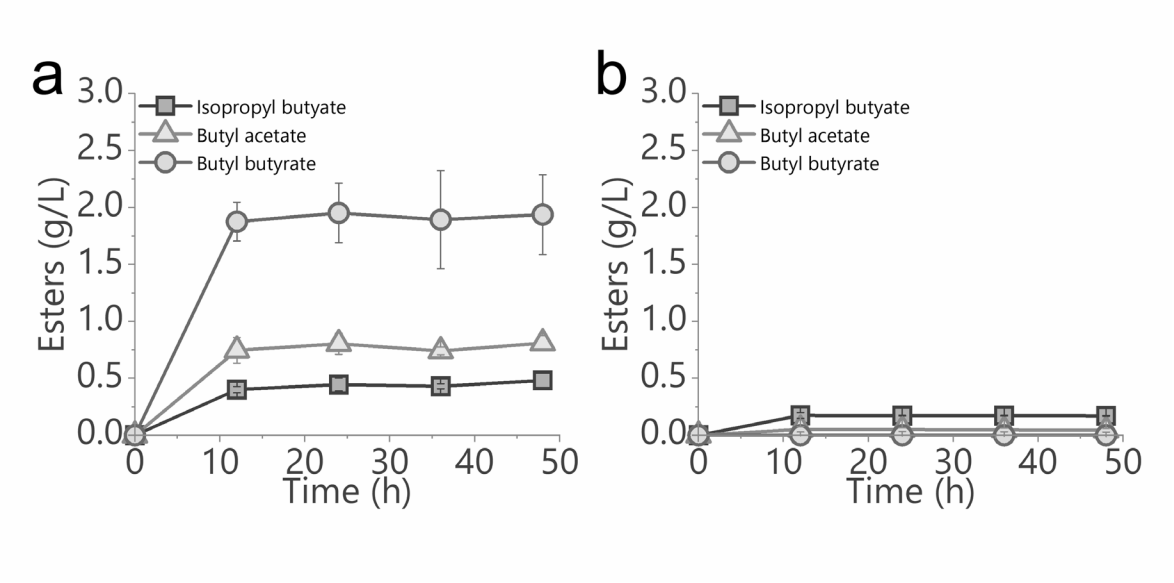

a
b
c
d
e
f
Glucose (g/L)
Acids (g/L)
Solvents (g/L)
Time (h)
Glucose
Acetate
Butyrate
Acetone
Isopropanol
Butanol

Figure 16

**Figure 17**


a
Isopropyl butyate
Butyl acetate
Butyl butyrate
Esters (g/L)
Time (h)
b
Isopropyl butyate
Butyl acetate
Butyl butyrate
Esters (g/L)
Time (h)