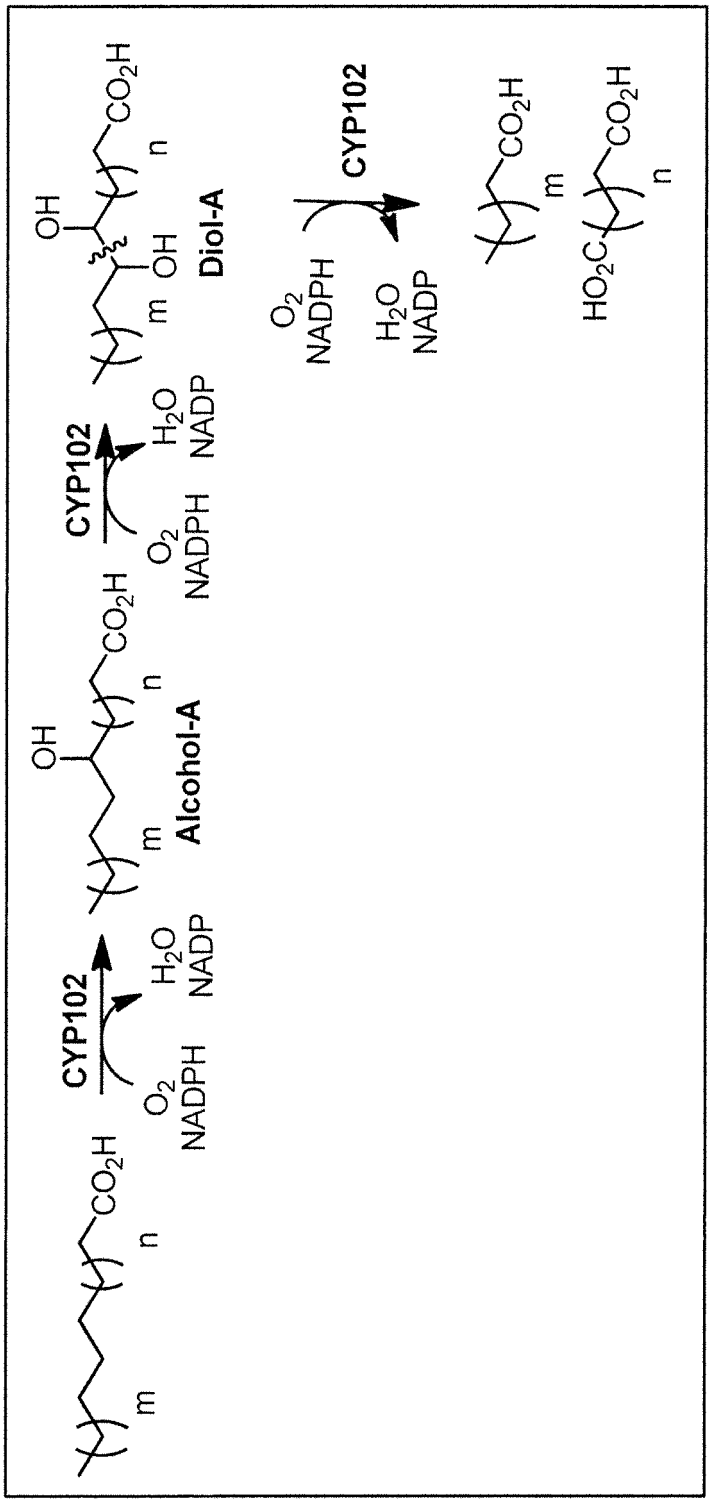
Figure 1


CYP102
O2
NADPH
H2O
NADP
Alcohol-A
CYP102
O2
NADPH
H2O
NADP
Diol-A
CYP102
O2
NADPH
H2O
NADP

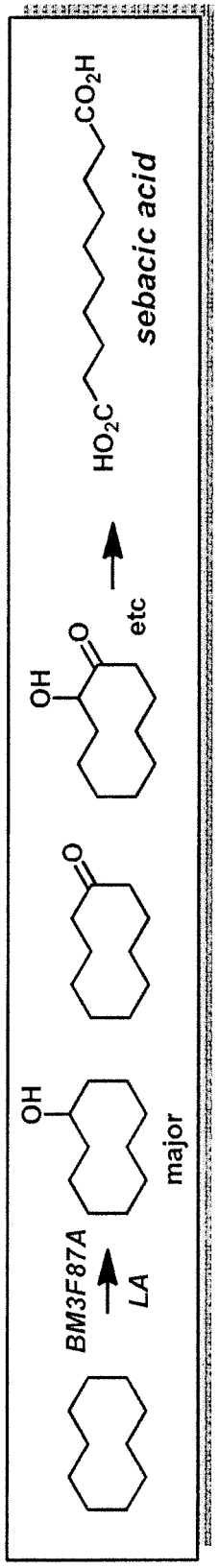
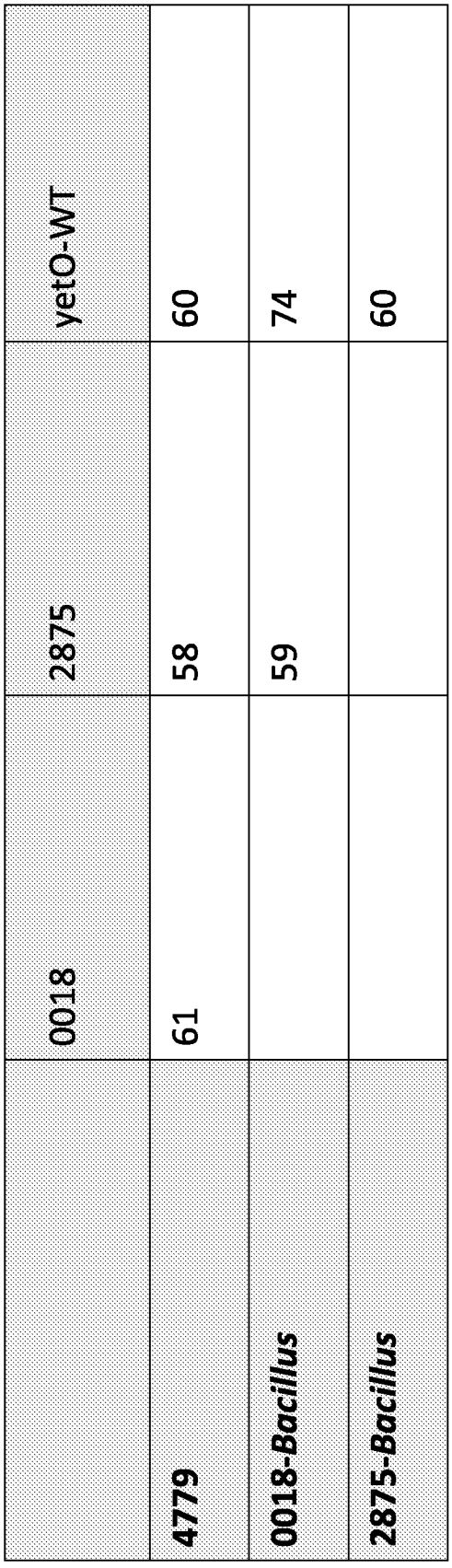


Figure 2



	0018	2875	yetO-WT
4779	61	58	60
0018-*Bacillus*		59	74
2875-*Bacillus*			60

FIG. 3

Plasmid	Mutant	[p450,μM] nmole/mL[1]	U[2]/nmole Lauric[1]	U[2]/nmole Myristic	U[2]/nmole Palmitic	% P450 (g/g) in Lysate
pSGI-040	yetO-wt	8.0	2920	2970	606	10
pSGI-055	yetO-F89A	3.9	445	144	-	11.9
pSGI-058	yetO-F89V	3.5	994	540	166	9.1
pSGI-056	yetO-F89I	4.0	882	228	109	9.6
pSGI-057	yetO-F89S	3.3	569	178	80	9.5
pSGI-118	BM3-wt	3.1	749	NM[3]	653	~20[4]
pSGI-004	BM3-F87A[1]	14.5	110	303	344	19

FIG. 4A

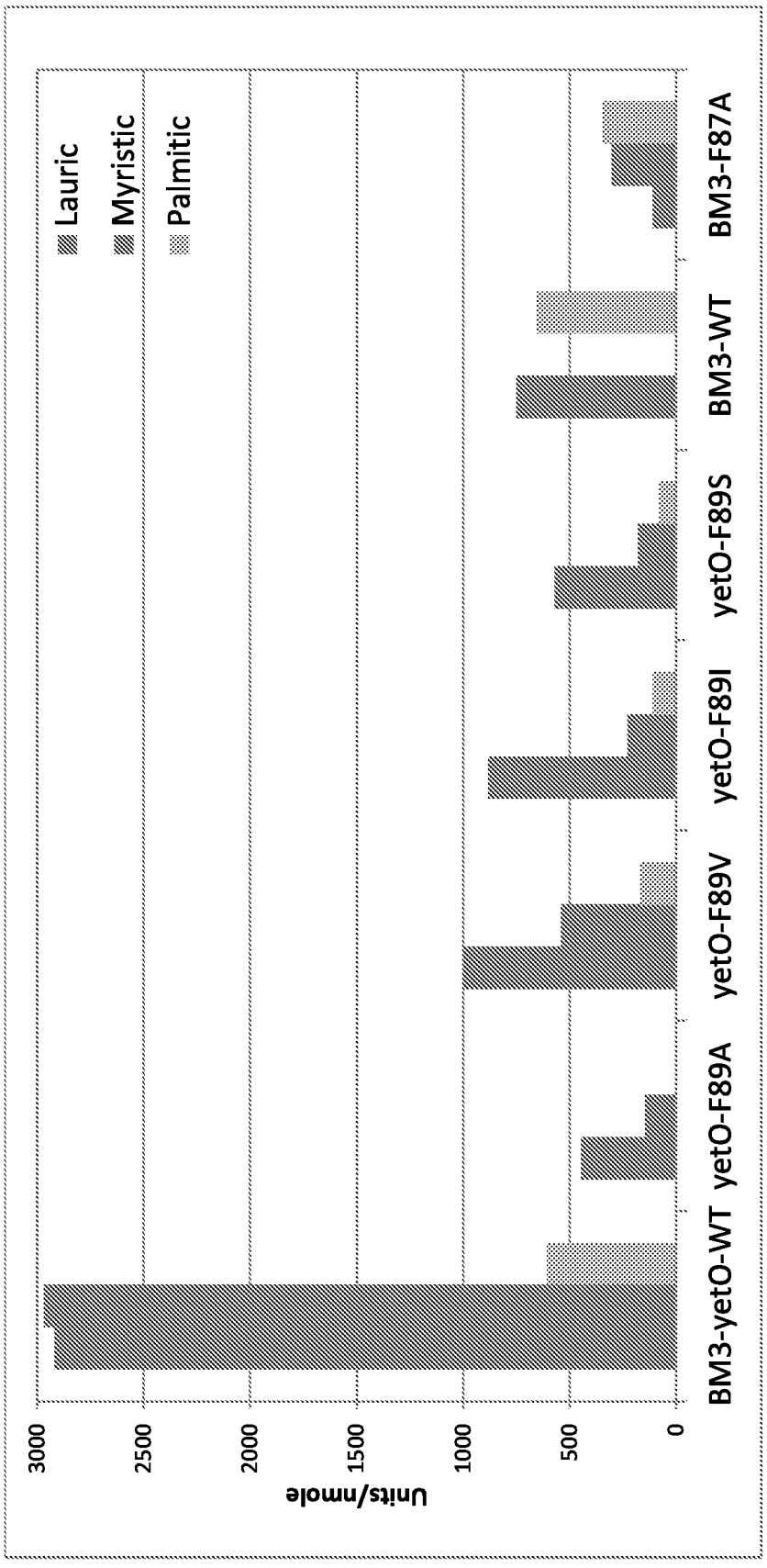

Lauric
Myristic
Palmitic
Units/nmole
3000
2500
2000
1500
1000
500
0
BM3-yetO-WT
yetO-F89A
yetO-F89V
yetO-F89I
yetO-F89S
BM3-WT
BM3-F87A

FIG. 4B

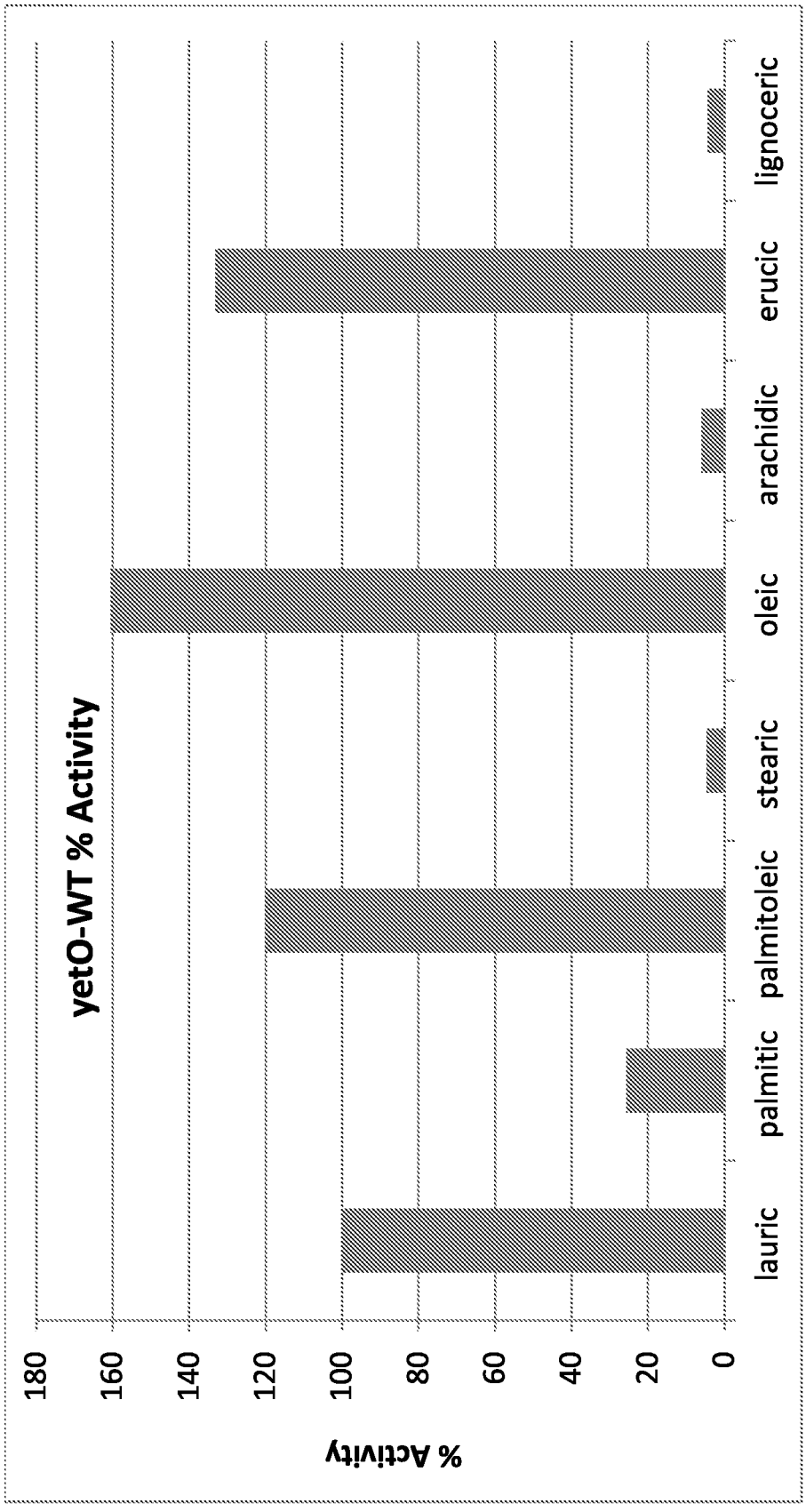

yetO-WT % Activity
% Activity
180
160
140
120
100
80
60
40
20
0
lauric
palmitic
palmitoleic
stearic
oleic
arachidic
erucic
lignoceric

FIG. 5

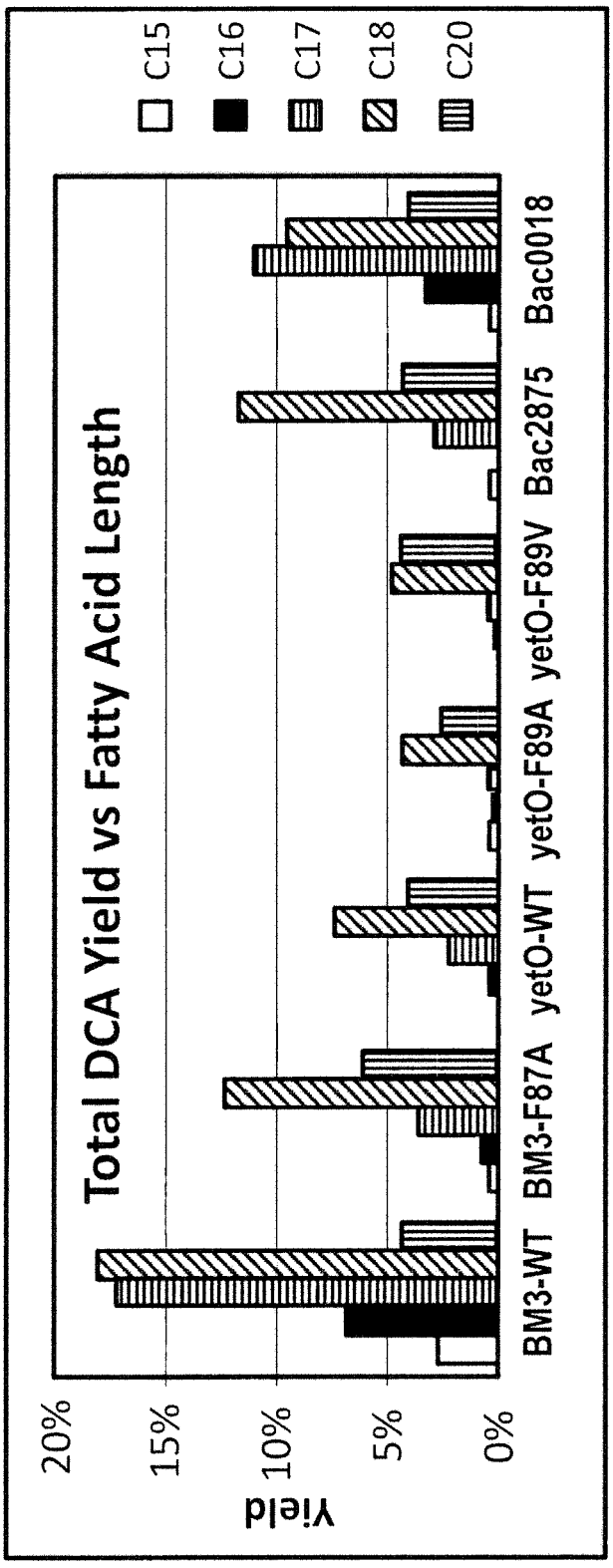

Total DCA Yield vs Fatty Acid Length
C15
C16
C17
C18
C20
Yield
20%
15%
10%
5%
0%
BM3-WT
BM3-F87A
yetO-WT
yetO-F89A
yetO-F89V
Bac2875
Bac0018

Figure 6a

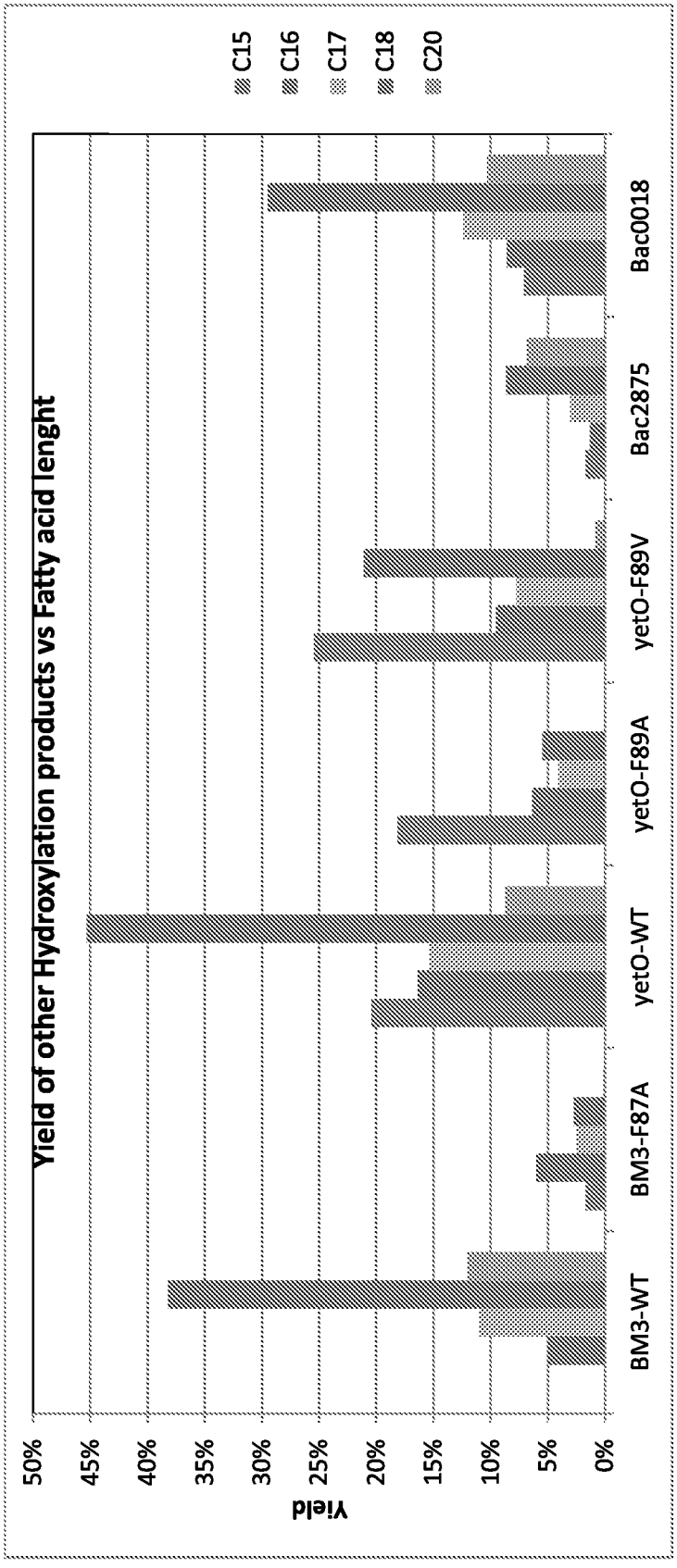

Yield of other Hydroxylation products vs Fatty acid lenght
C15
C16
C17
C18
C20
Yield
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
BM3-WT
BM3-F87A
yetO-WT
yetO-F89A
yetO-F89V
Bac2875
Bac0018

FIG. 6B

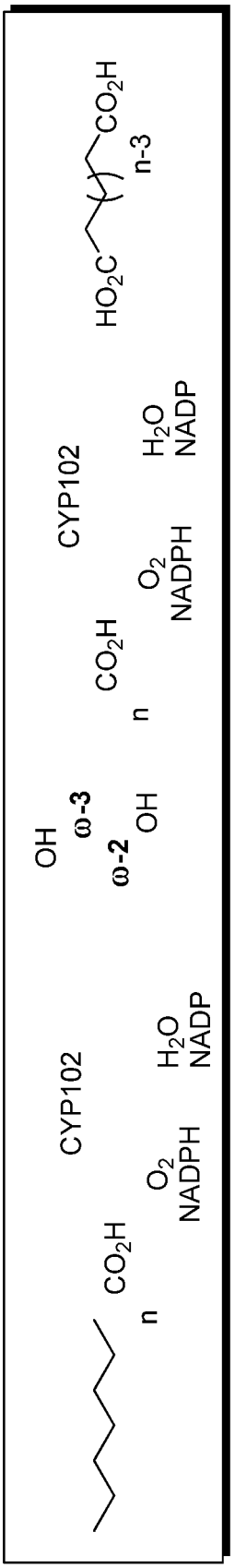

CO2H
n
O2
NADPH
CYP102
H2O
NADP
OH
ω-3
ω-2
OH
CO2H
n
O2
NADPH
CYP102
H2O
NADP
HO2C
CO2H
n-3

FIG. 7

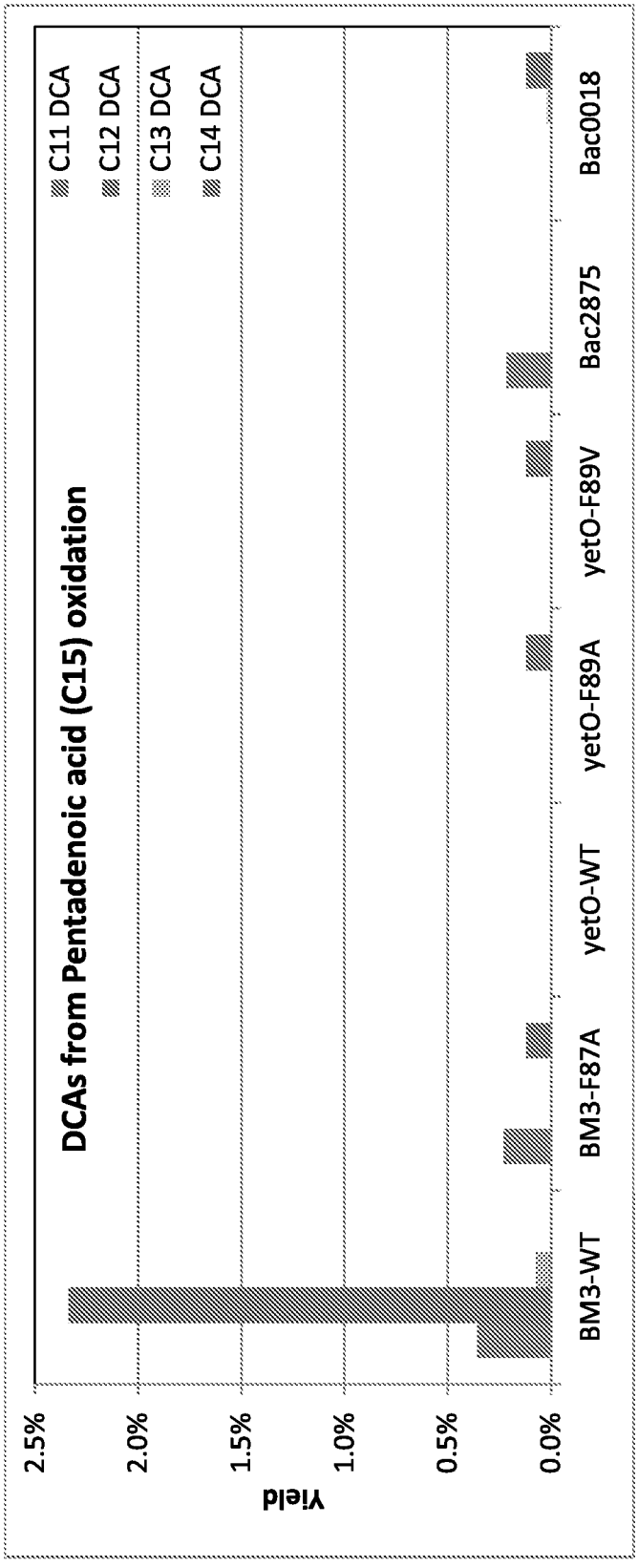

DCAs from Pentadenoic acid (C15) oxidation
C11 DCA
C12 DCA
C13 DCA
C14 DCA
Yield
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
BM3-WT
BM3-F87A
yetO-WT
yetO-F89A
yetO-F89V
Bac2875
Bac0018

FIG. 8A

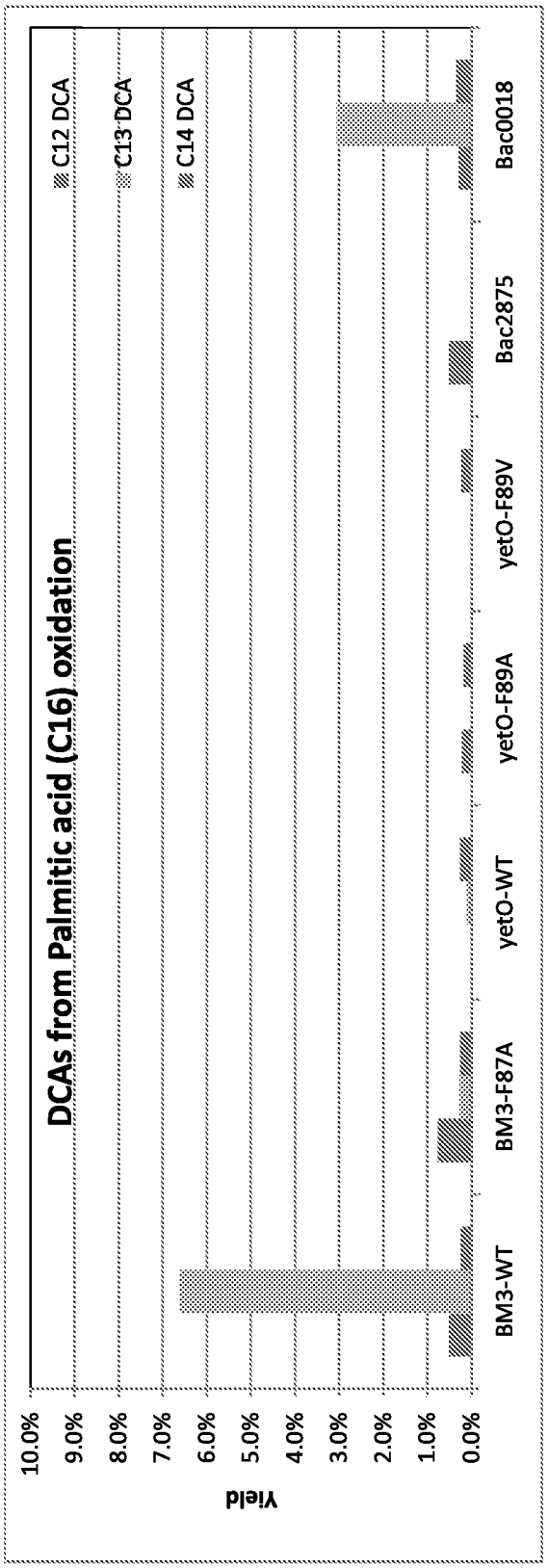

DCAs from Palmitic acid (C16) oxidation
C12 DCA
C13 DCA
C14 DCA
Yield
10.0%
9.0%
8.0%
7.0%
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
BM3-WT
BM3-F87A
yetO-WT
yetO-F89A
yetO-F89V
Bac2875
Bac0018

FIG. 8B

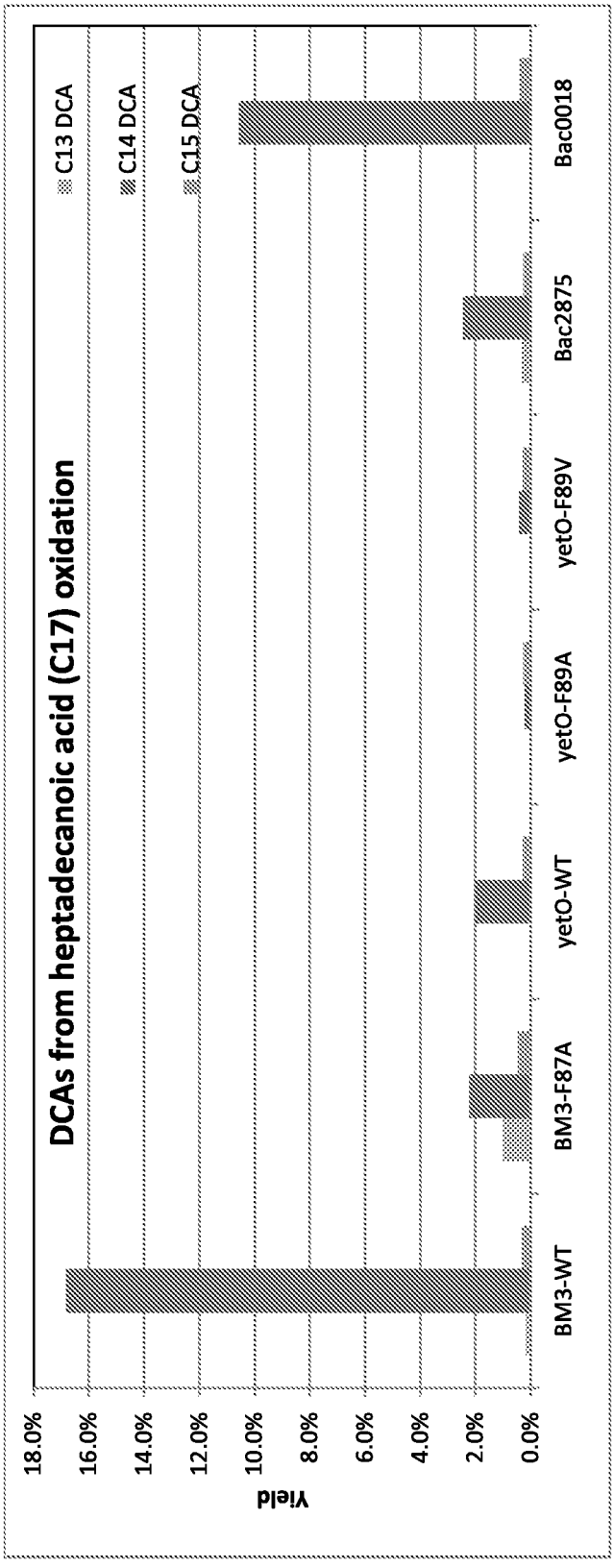

DCAs from heptadecanoic acid (C17) oxidation
C13 DCA
C14 DCA
C15 DCA
Yield
18.0%
16.0%
14.0%
12.0%
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
BM3-WT
BM3-F87A
yetO-WT
yetO-F89A
yetO-F89V
Bac2875
Bac0018

FIG. 8C

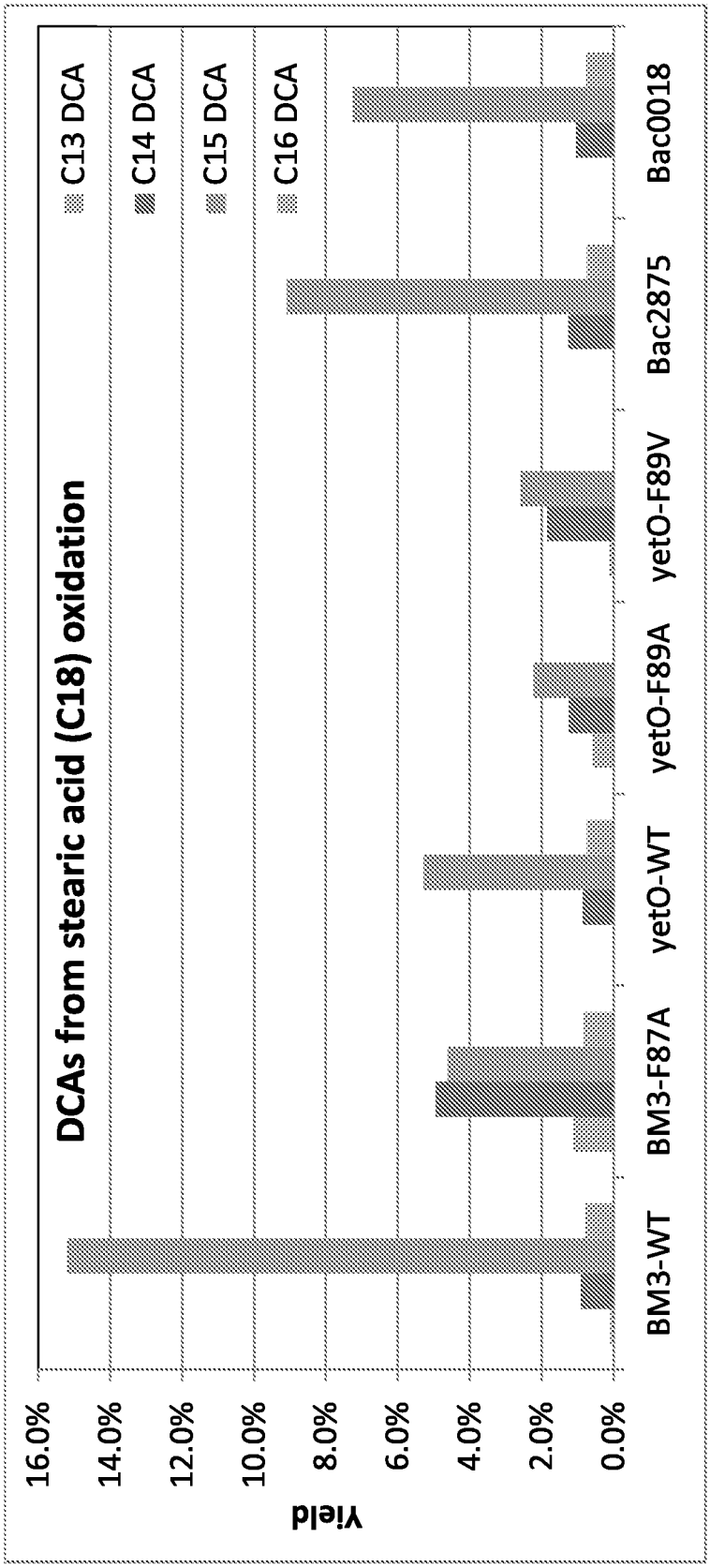

DCAs from stearic acid (C18) oxidation
C13 DCA
C14 DCA
C15 DCA
C16 DCA
Yield
16.0%
14.0%
12.0%
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
BM3-WT
BM3-F87A
yetO-WT
yetO-F89A
yetO-F89V
Bac2875
Bac0018

FIG. 9A

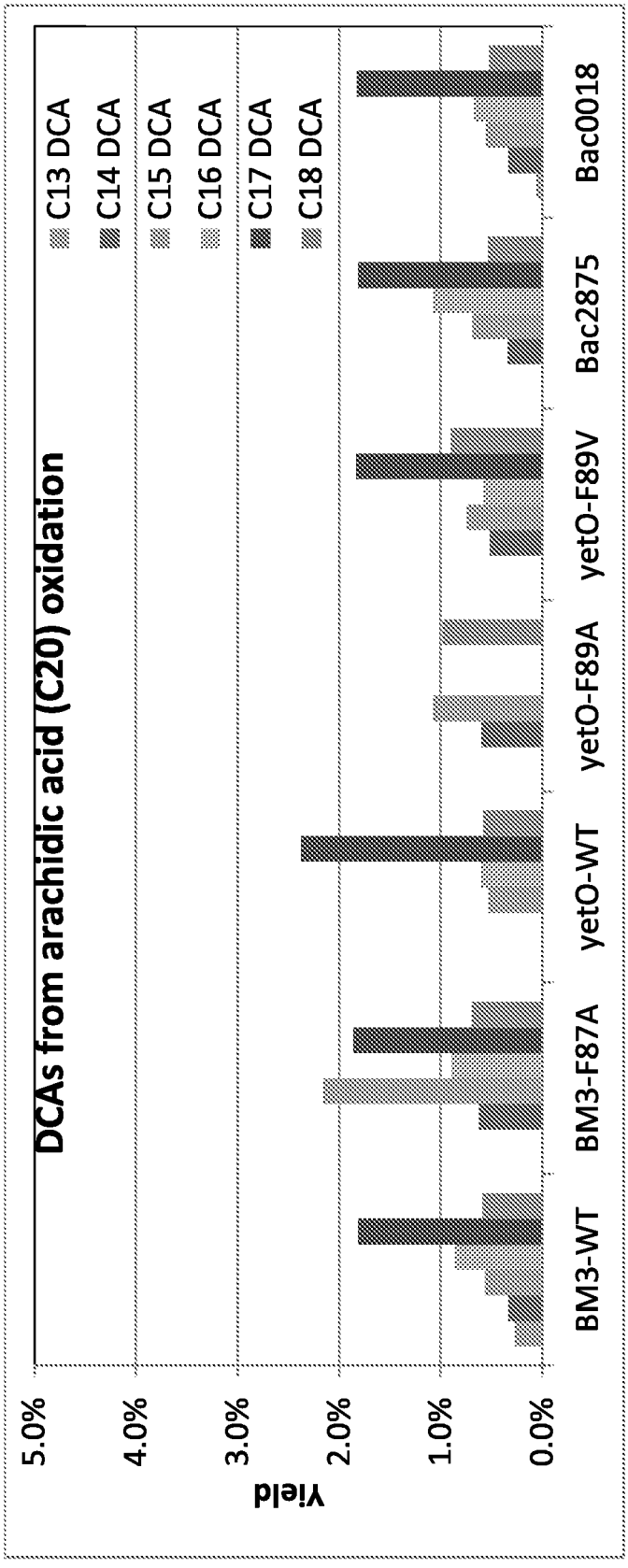

DCAs from arachidic acid (C20) oxidation
C13 DCA
C14 DCA
C15 DCA
C16 DCA
C17 DCA
C18 DCA
Yield
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
BM3-WT
BM3-F87A
yetO-WT
yetO-F89A
yetO-F89V
Bac2875
Bac0018

FIG. 9B

Figure 10

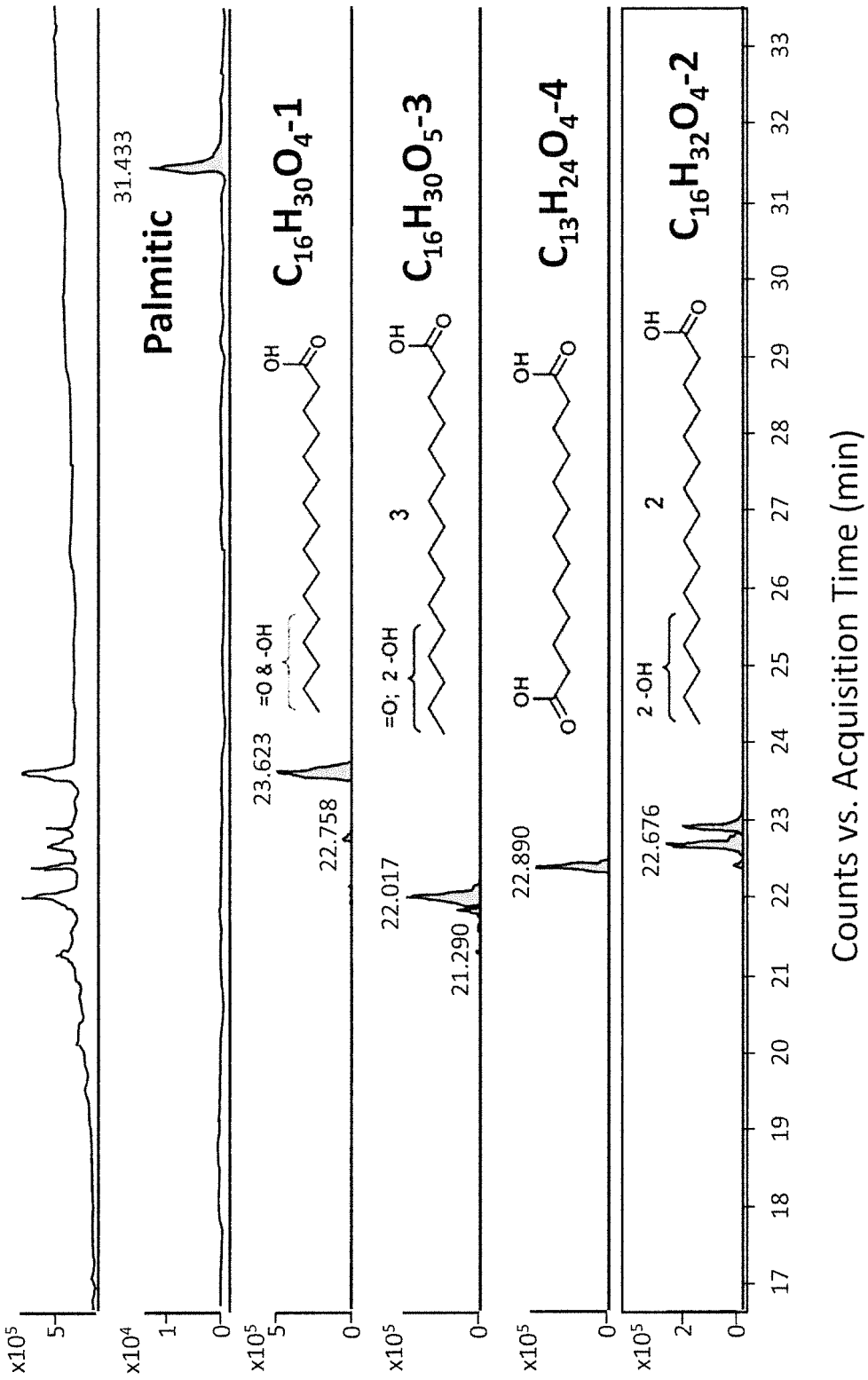

Palmitic
31.433
$C_{16}H_{30}O_4$-1
23.623
22.758
=O & -OH
$C_{16}H_{30}O_5$-3
22.017
21.290
=O; 2 -OH
3
$C_{13}H_{24}O_4$-4
22.890
$C_{16}H_{32}O_4$-2
22.676
2 -OH
2
OH
O
x10^5
x10^4
Counts vs. Acquisition Time (min)

Figure 11

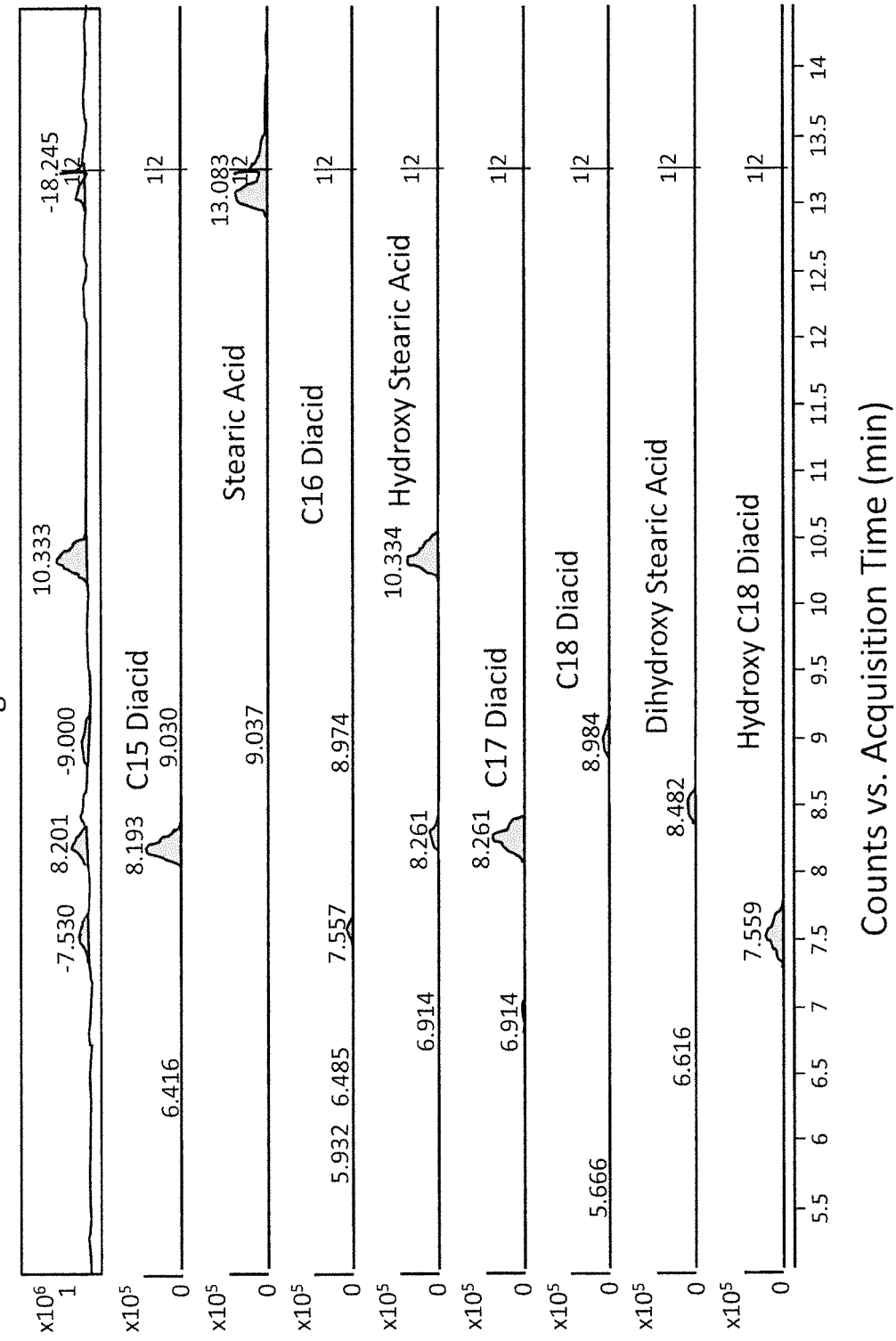
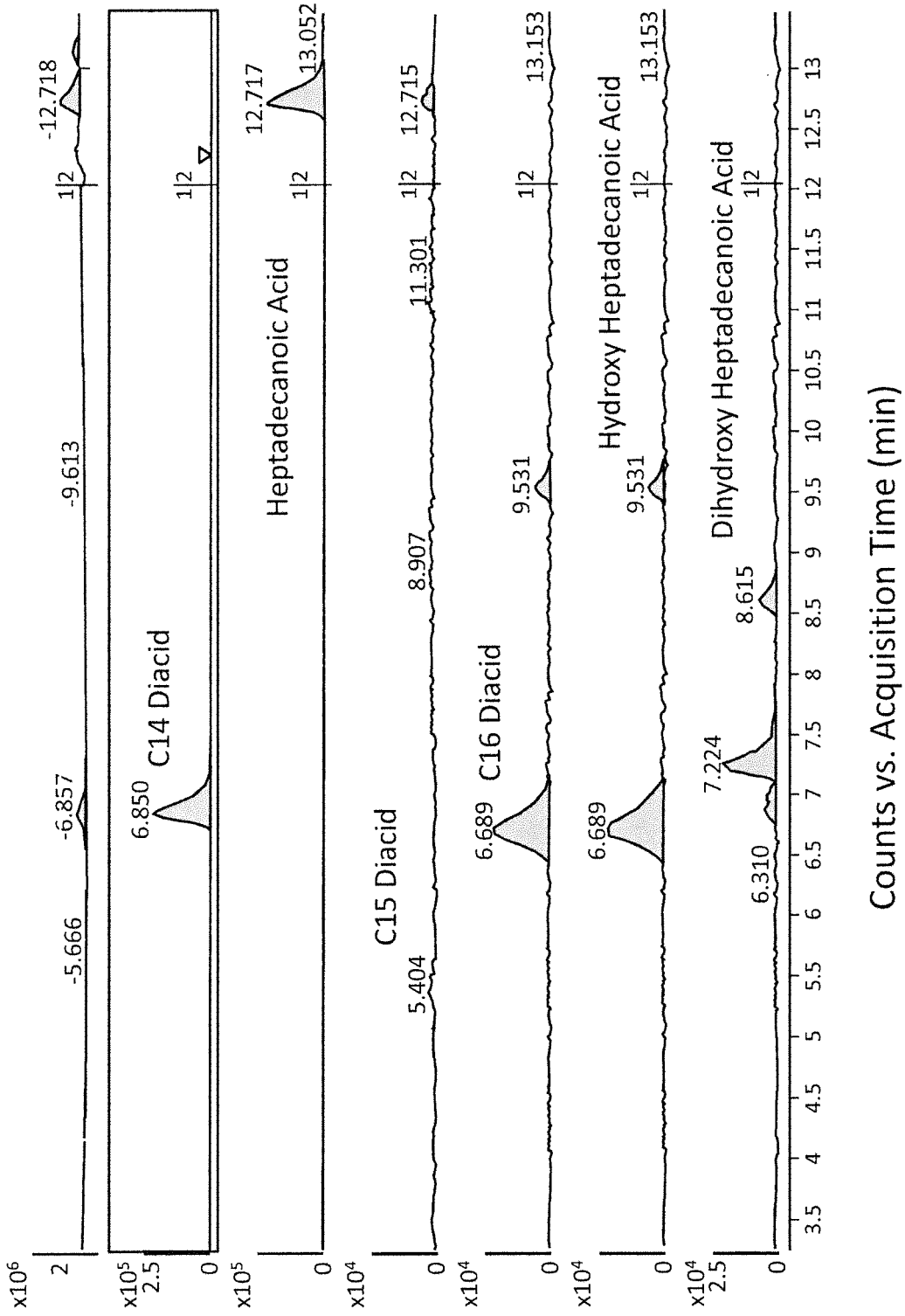

x10^6
1
-7.530
8.201
-9.000
10.333
-18.245
x10^5
0
6.416
8.193
C15 Diacid
9.030
Stearic Acid
13.083
9.037
C16 Diacid
5.932
6.485
7.557
8.974
Hydroxy Stearic Acid
10.334
6.914
8.261
C17 Diacid
C18 Diacid
8.984
5.666
Dihydroxy Stearic Acid
8.482
6.616
Hydroxy C18 Diacid
7.559
1/2
5.5
6
6.5
7
7.5
8
8.5
9
9.5
10
10.5
11
11.5
12
12.5
13
13.5
14
Counts vs. Acquisition Time (min)

Figure 12


-5.666
-6.857
-9.613
-12.718
C14 Diacid
6.850
Heptadecanoic Acid
12.717
13.052
C15 Diacid
5.404
8.907
11.301
12.715
C16 Diacid
6.689
9.531
13.153
Hydroxy Heptadecanoic Acid
6.689
9.531
13.153
Dihydroxy Heptadecanoic Acid
6.310
7.224
8.615
x10^6
x10^5
x10^4
Counts vs. Acquisition Time (min)

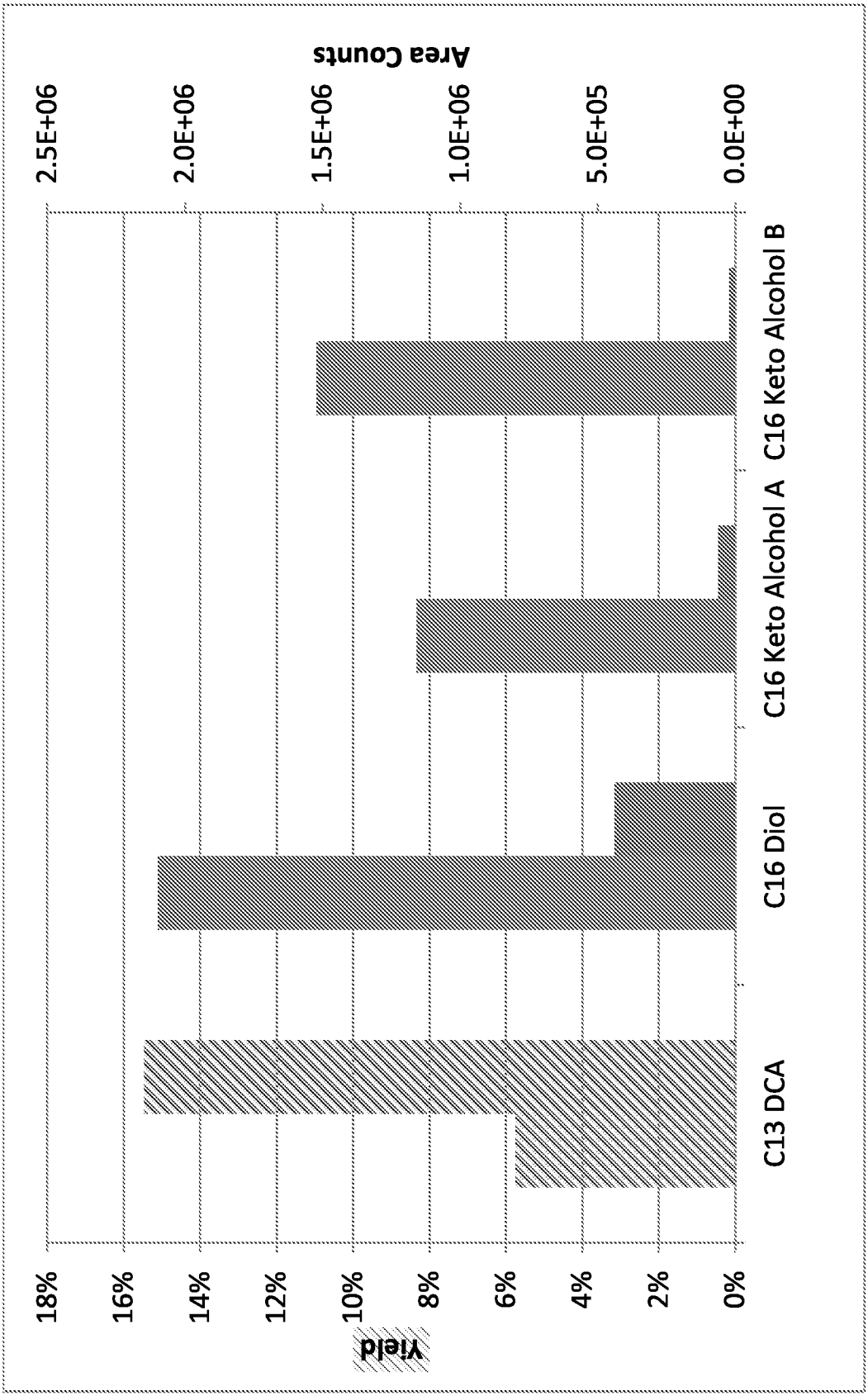

Area Counts
2.5E+06
2.0E+06
1.5E+06
1.0E+06
5.0E+05
0.0E+00
Yield
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
C13 DCA
C16 Diol
C16 Keto Alcohol A
C16 Keto Alcohol B

FIG. 13