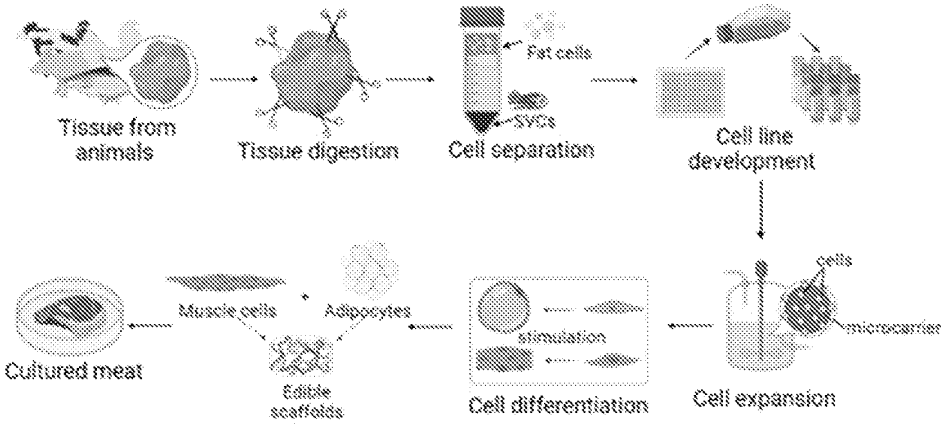


FIGURE 1A

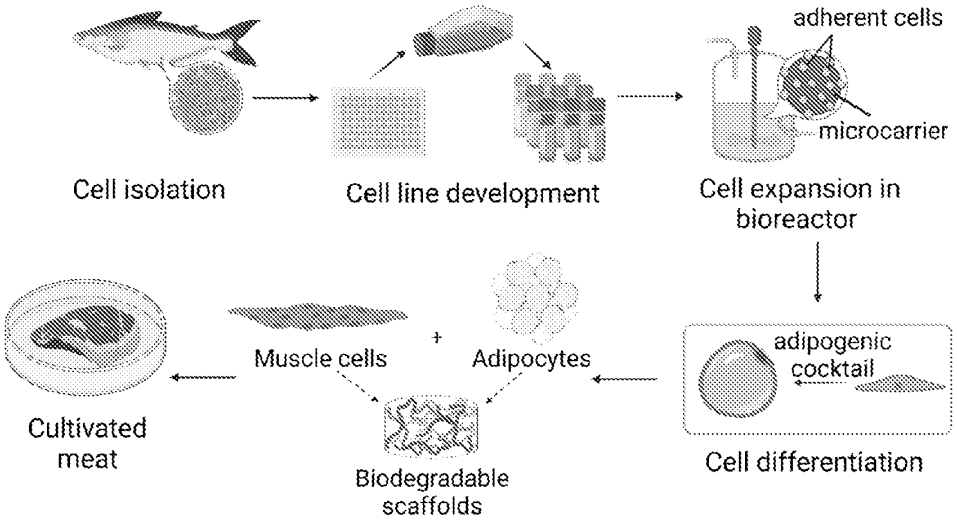
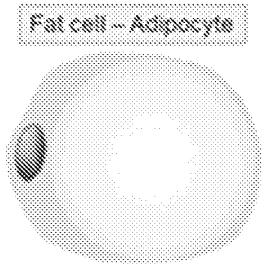
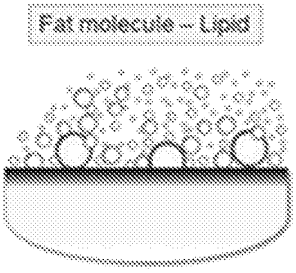


FIGURE 1B





Original source	Animal tissue	Typically plant oil
Structure	Complex cell organelle, matrix, membrane	Liquid or solid chemical mixture
Composition	Diverse	Simple
Lipid content	Stably stored in lipid droplet	Substance itself
Other nutrients	May contain bioactive proteins and others	Usually no protein or others
Texture and taste	May have profound effects; typically solid but juicy	Specific to lipid species; usually fluid
Temperature change	Relatively stable	May alter states of matter
Production	More studies needed	Typically defined

FIGURE 1C

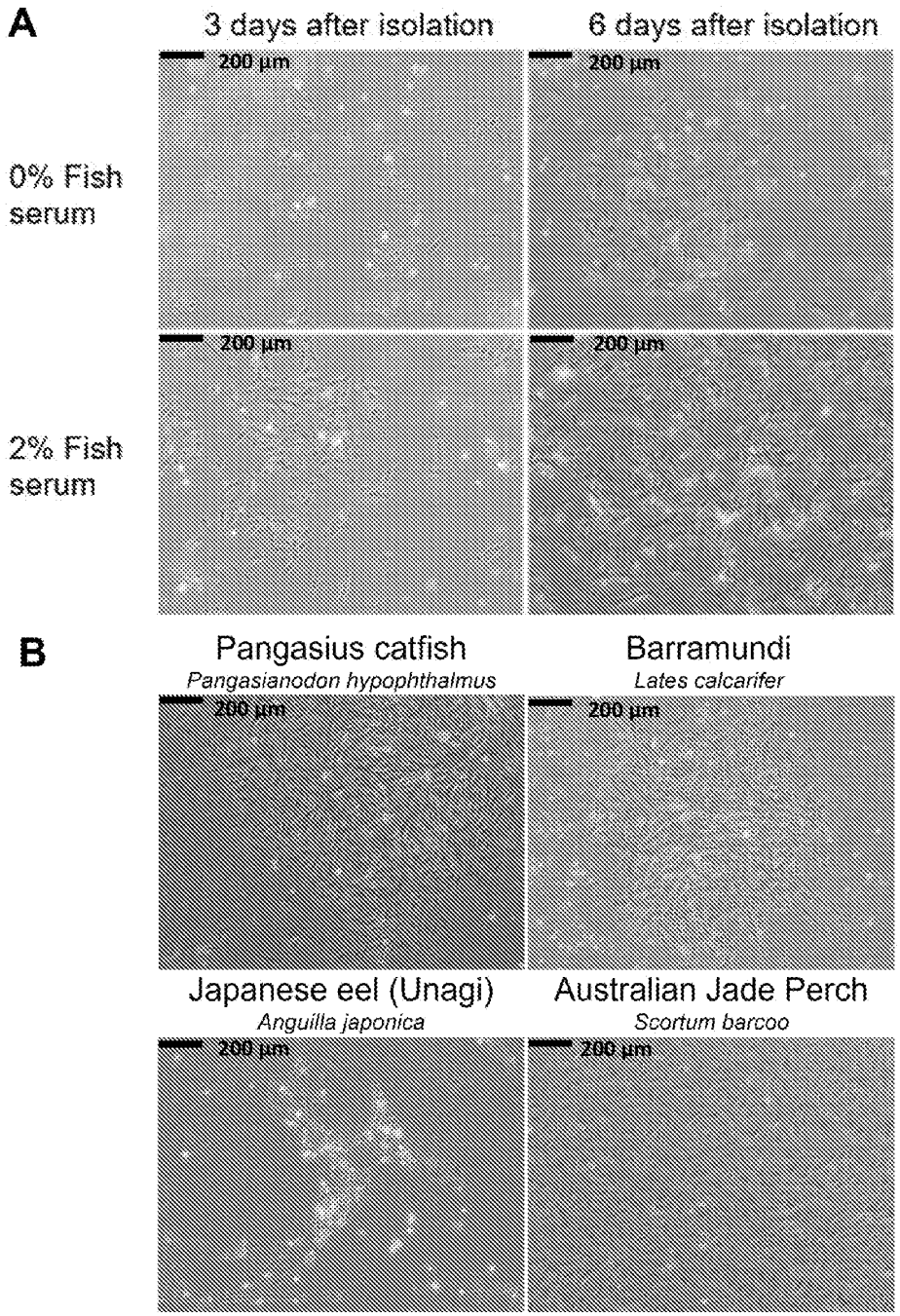

A
3 days after isolation
6 days after isolation
200 µm
0% Fish serum
2% Fish serum
B
Pangasius catfish
Pangasianodon hypophthalmus
Barramundi
Lates calcarifer
Japanese eel (Unagi)
Anguilla japonica
Australian Jade Perch
Scortum barcoo

Figure 2

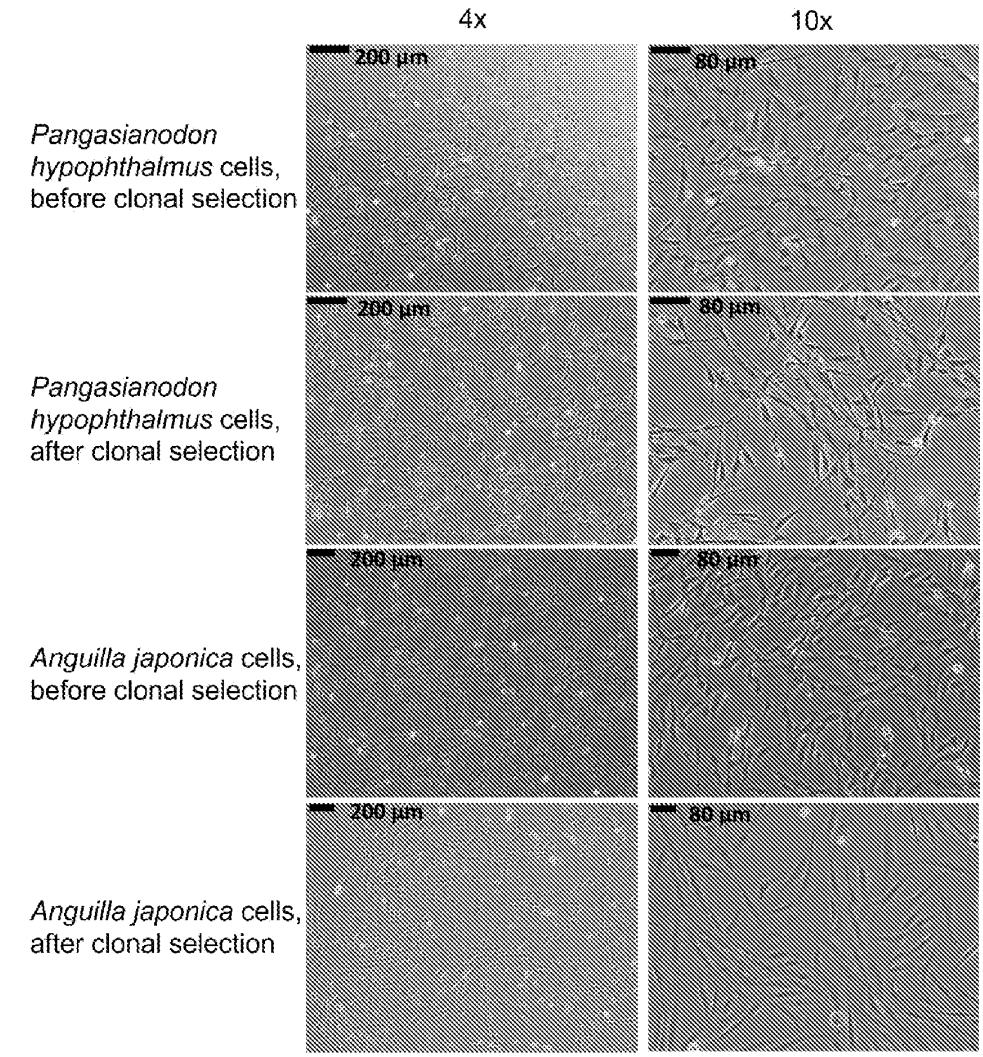

4x
10x
200 µm
80 µm
Pangasianodon hypophthalmus cells, before clonal selection
Pangasianodon hypophthalmus cells, after clonal selection
Anguilla japonica cells, before clonal selection
Anguilla japonica cells, after clonal selection

FIGURE 3

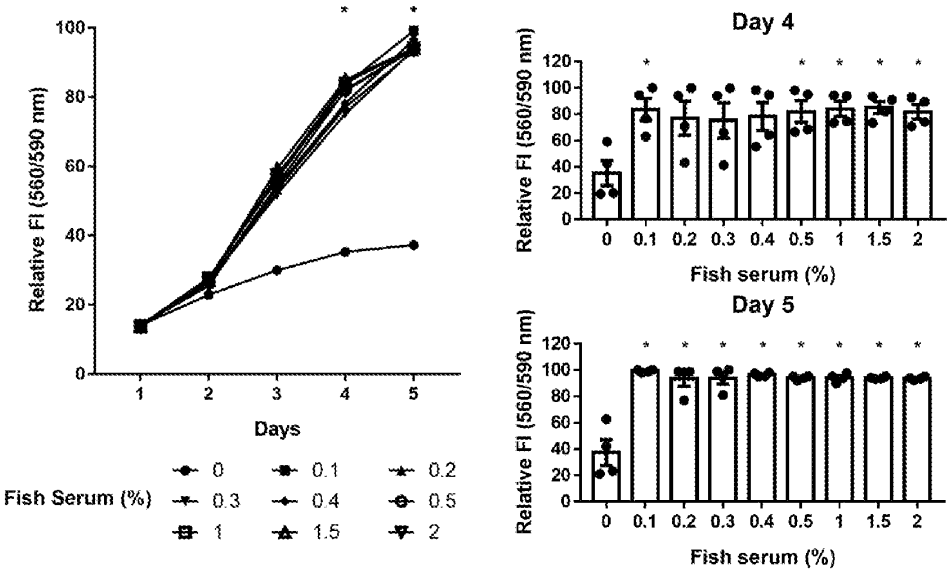


FIGURE 4

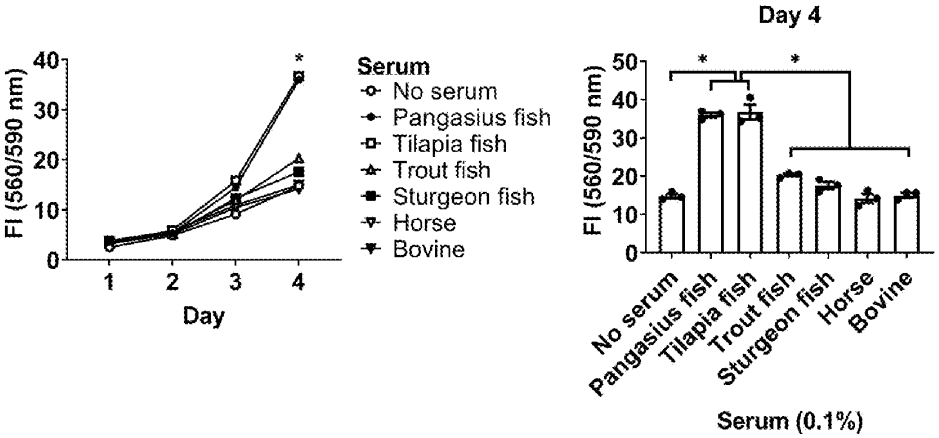


FIGURE 5

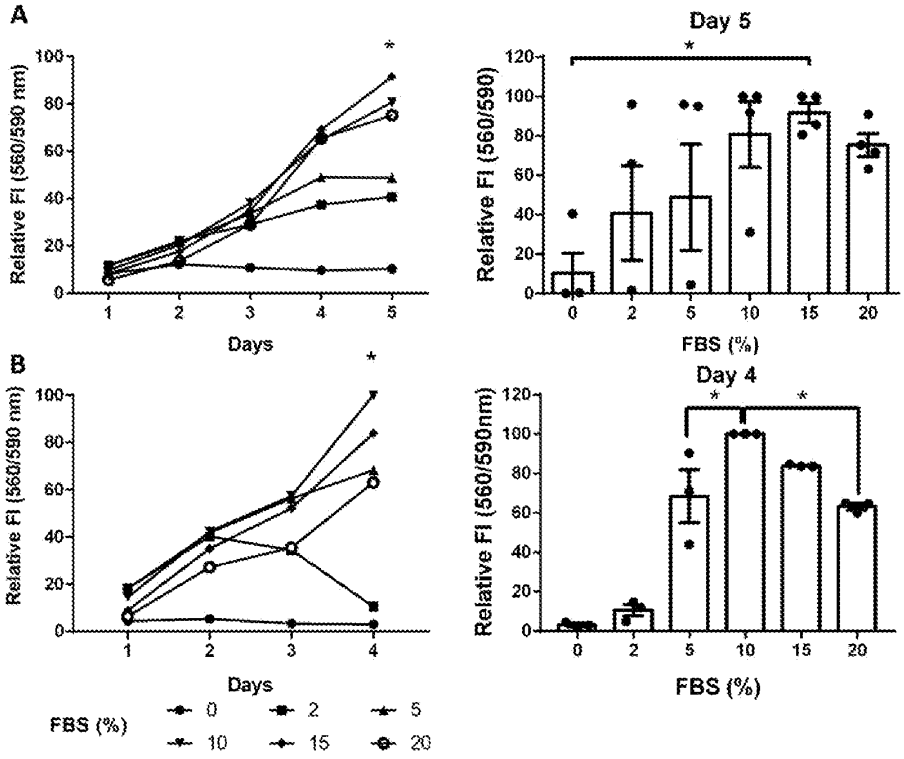

A
Relative FI (560/590 nm)
Days
B
Relative FI (560/590 nm)
Days
FBS (%)
0
2
5
10
15
20
Day 5
Relative FI (560/590)
FBS (%)
Day 4
Relative FI (560/590nm)
FBS (%)

FIGURE 6

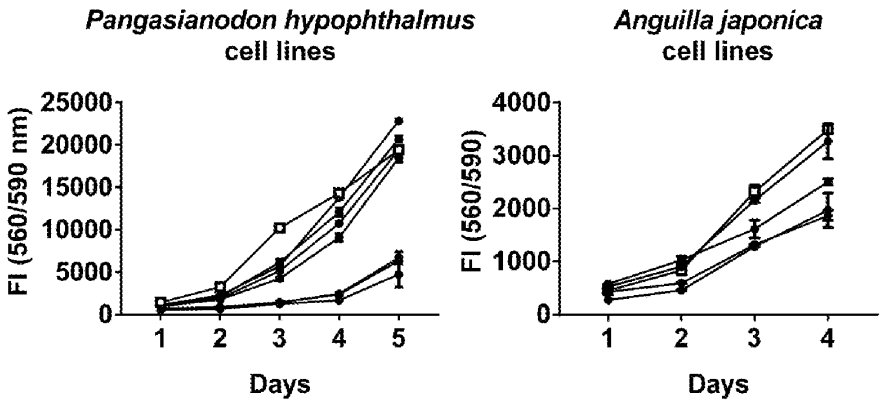


FIGURE 7

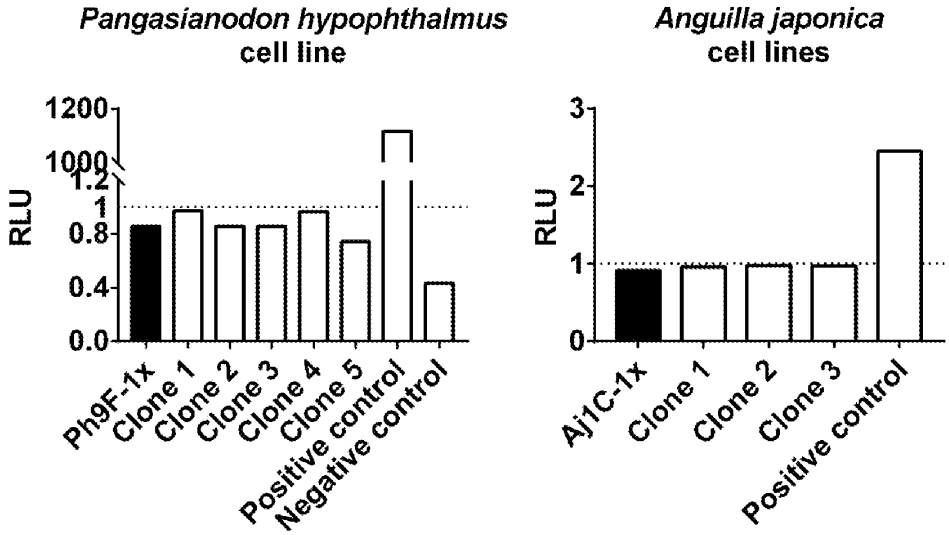


FIGURE 8

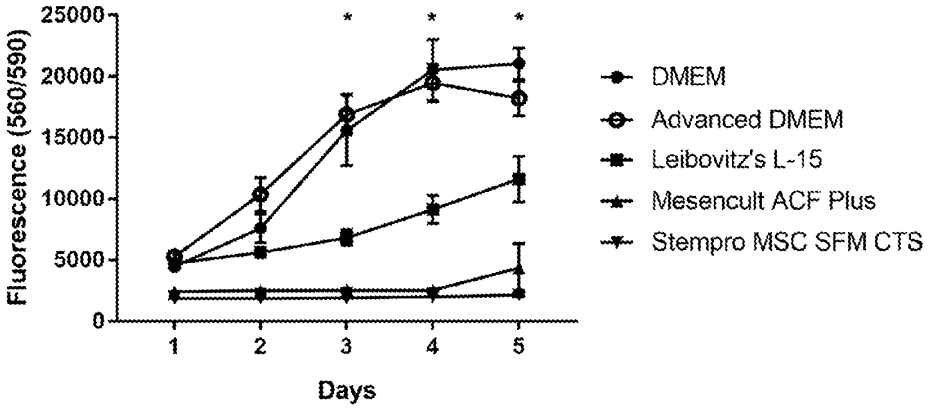


FIGURE 9

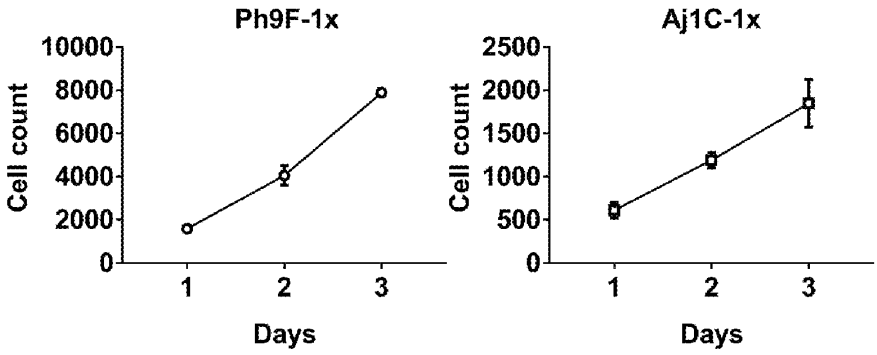


FIGURE 10

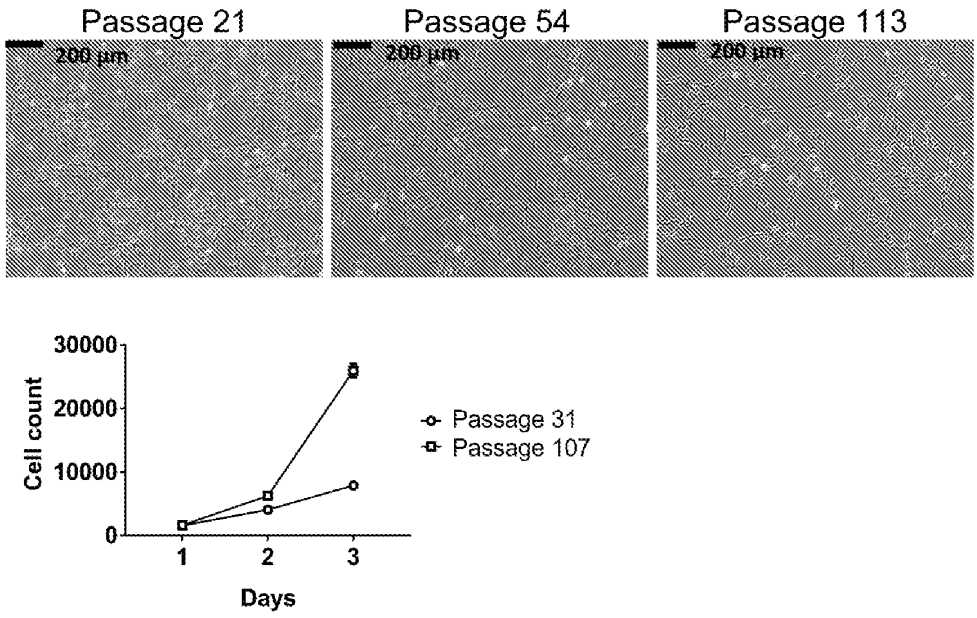

Passage 21
Passage 54
Passage 113
200 µm
200 µm
200 µm
30000
20000
10000
0
Cell count
1
2
3
Days
Passage 31
Passage 107

FIGURE 11

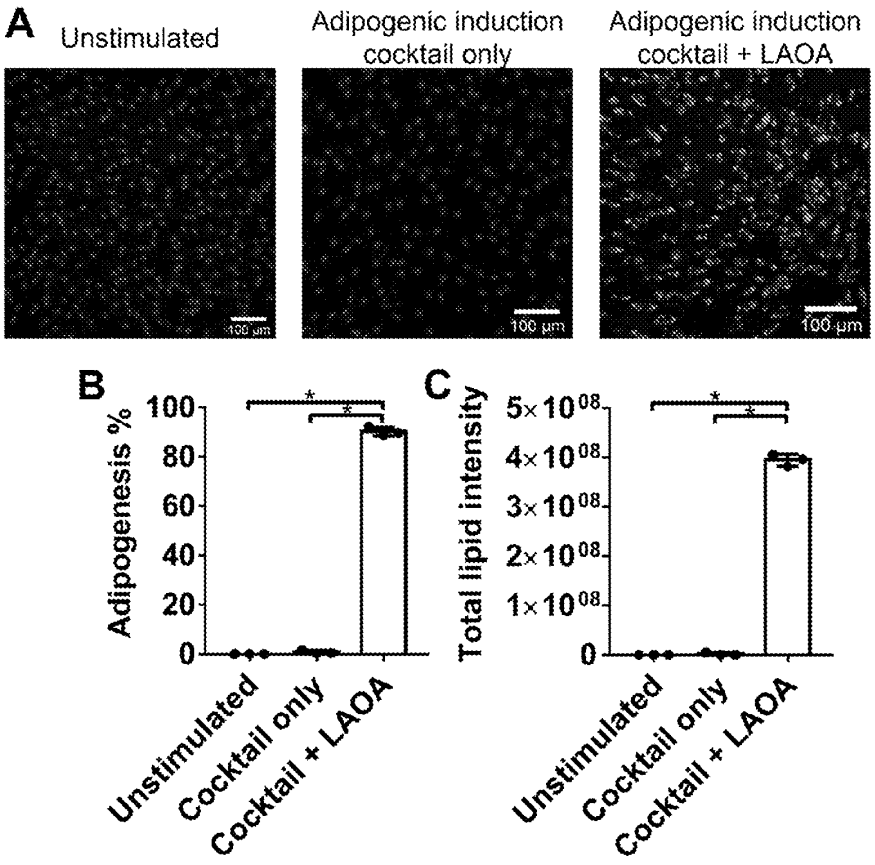

A
Unstimulated
Adipogenic induction cocktail only
Adipogenic induction cocktail + LAOA
100 µm
B
Adipogenesis %
100
80
60
40
20
0
Unstimulated
Cocktail only
Cocktail + LAOA
C
Total lipid intensity
5×10^08
4×10^08
3×10^08
2×10^08
1×10^08
0
Unstimulated
Cocktail only
Cocktail + LAOA

FIGURE 12

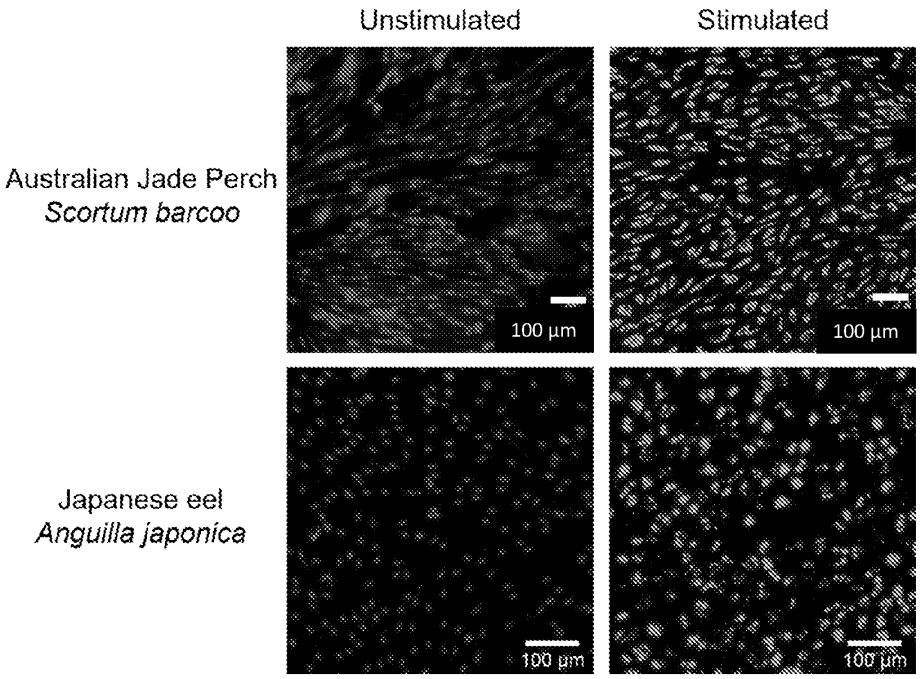

Unstimulated
Stimulated
Australian Jade Perch
Scortum barcoo
Japanese eel
Anguilla japonica
100 µm
100 µm
100 µm
100 µm

FIGURE 13

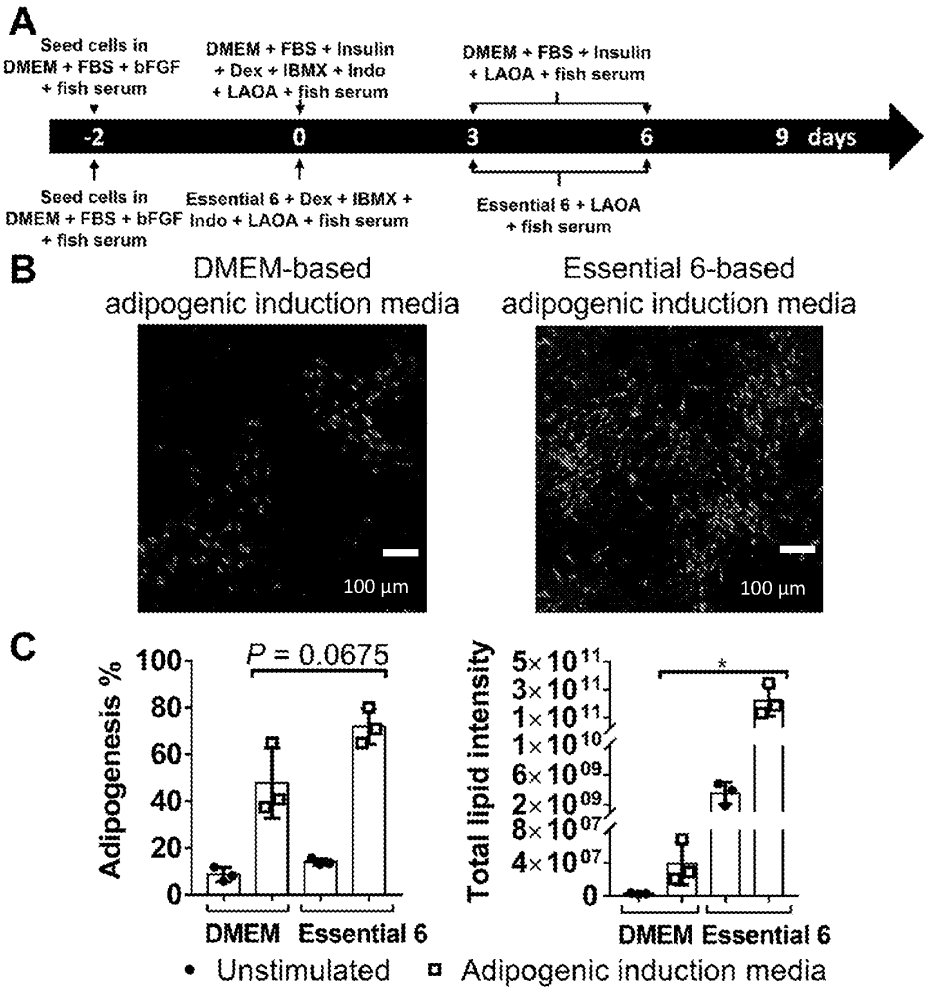

A
Seed cells in DMEM + FBS + bFGF + fish serum
DMEM + FBS + Insulin + Dex + IBMX + Indo + LAOA + fish serum
DMEM + FBS + Insulin + LAOA + fish serum
-2
0
3
6
9 days
Seed cells in DMEM + FBS + bFGF + fish serum
Essential 6 + Dex + IBMX + Indo + LAOA + fish serum
Essential 6 + LAOA + fish serum
B
DMEM-based adipogenic induction media
Essential 6-based adipogenic induction media
100 µm
100 µm
C
Adipogenesis %
P = 0.0675
Total lipid intensity
*
DMEM Essential 6
DMEM Essential 6
Unstimulated
Adipogenic induction media

FIGURE 14

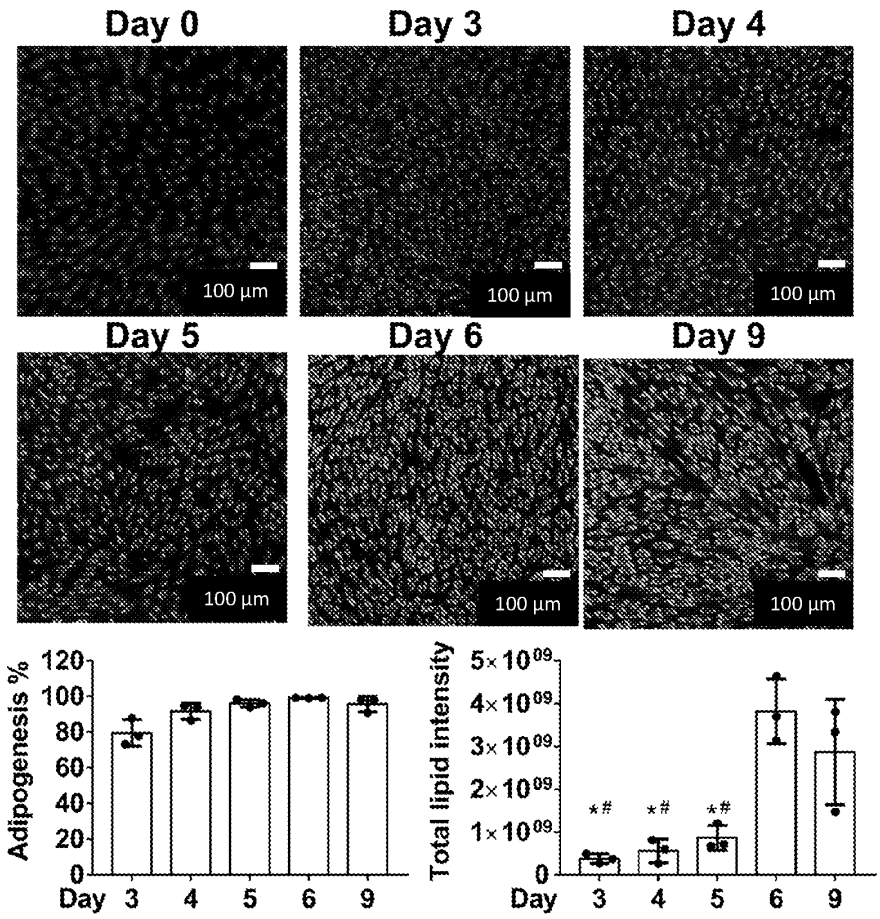

Day 0
Day 3
Day 4
Day 5
Day 6
Day 9
100 µm
Adipogenesis %
120
100
80
60
40
20
0
Day 3 4 5 6 9
Total lipid intensity
5×10^09
4×10^09
3×10^09
2×10^09
1×10^09
0
*#
Day 3 4 5 6 9

FIGURE 15

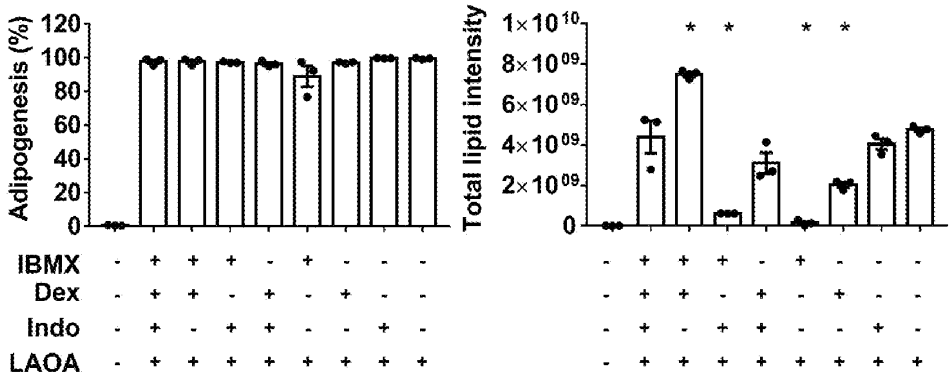


FIGURE 16

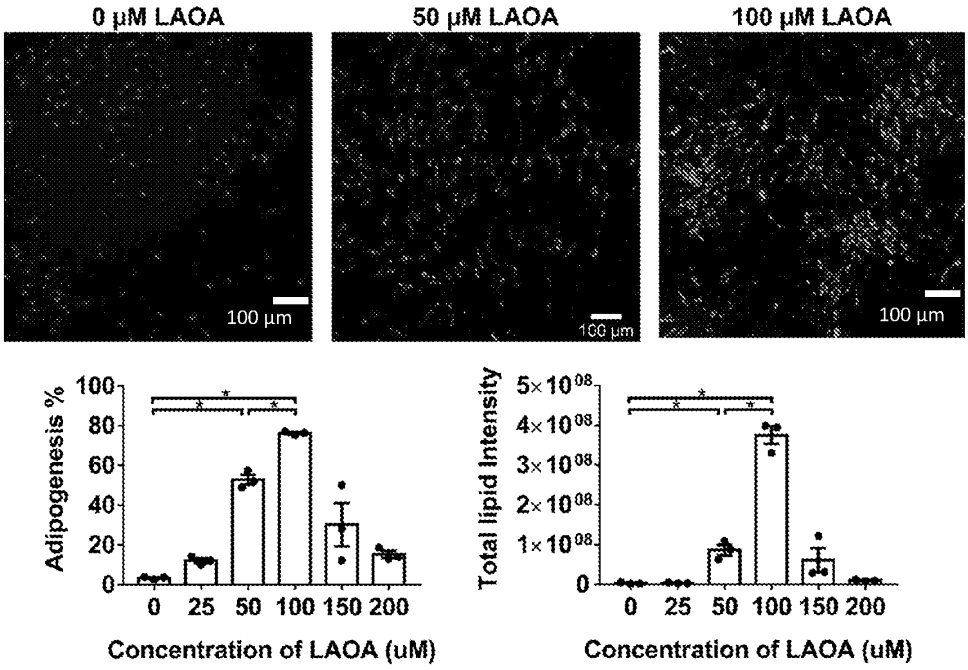


FIGURE 17

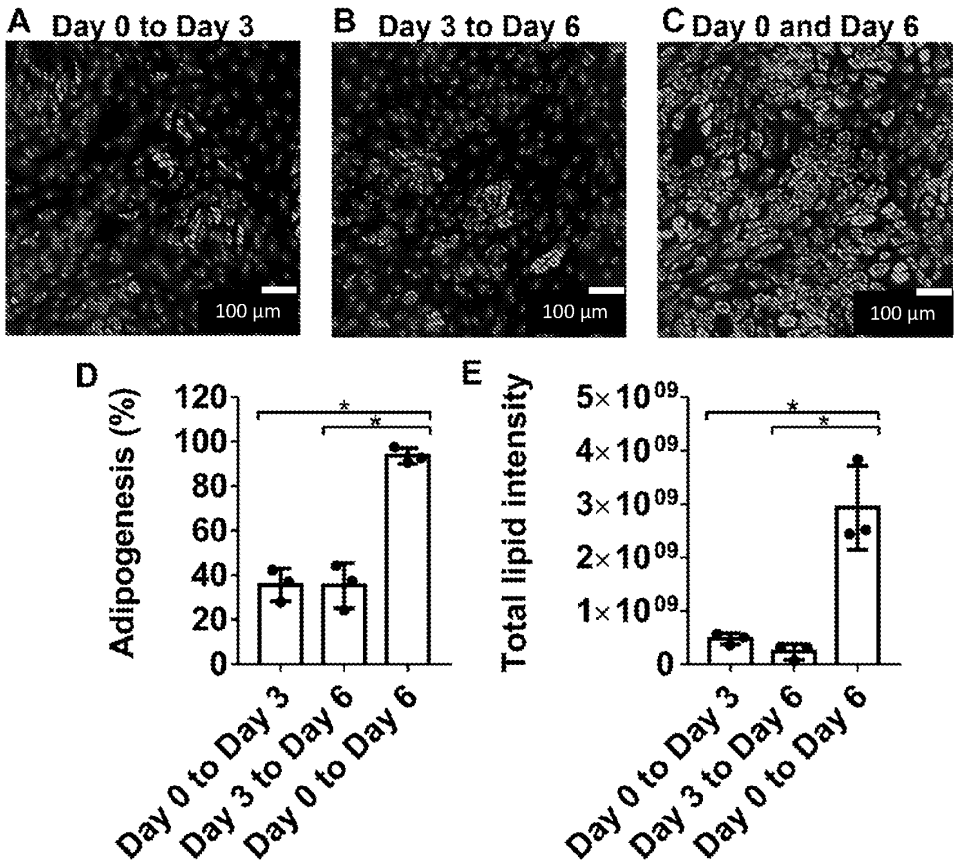

A Day 0 to Day 3
B Day 3 to Day 6
C Day 0 and Day 6
100 µm
100 µm
100 µm
D
Adipogenesis (%)
120
100
80
60
40
20
0
*
*
Day 0 to Day 3
Day 3 to Day 6
Day 0 to Day 6
E
Total lipid intensity
5×10^09
4×10^09
3×10^09
2×10^09
1×10^09
0
*
*
Day 0 to Day 3
Day 3 to Day 6
Day 0 to Day 6

FIGURE 18

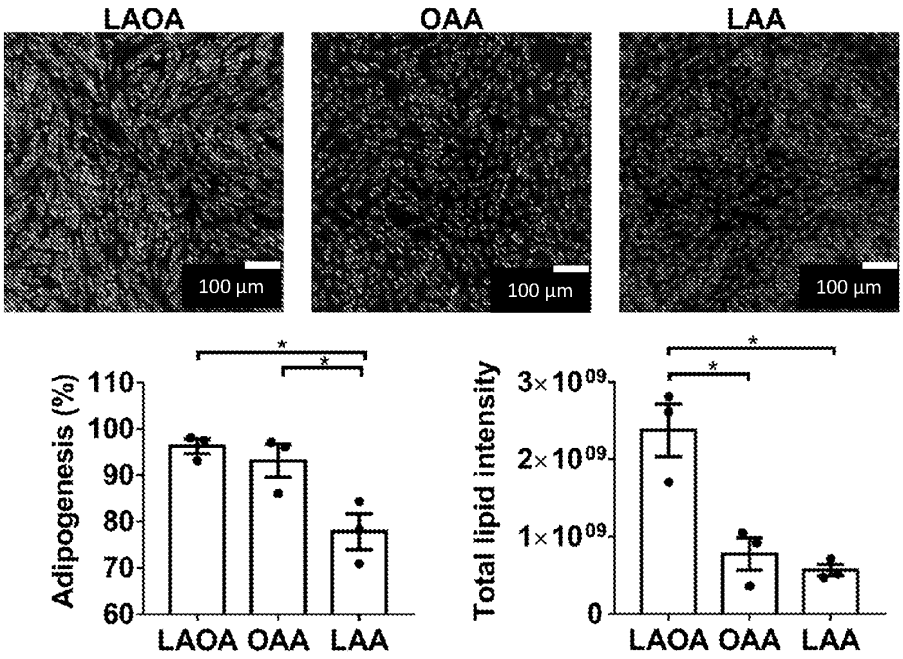

LAOA
OAA
LAA
100 µm
100 µm
100 µm
Adipogenesis (%)
110
100
90
80
70
60
LAOA OAA LAA
Total lipid intensity
3×10^09
2×10^09
1×10^09
0
LAOA OAA LAA
*
*
*
*

FIGURE 19

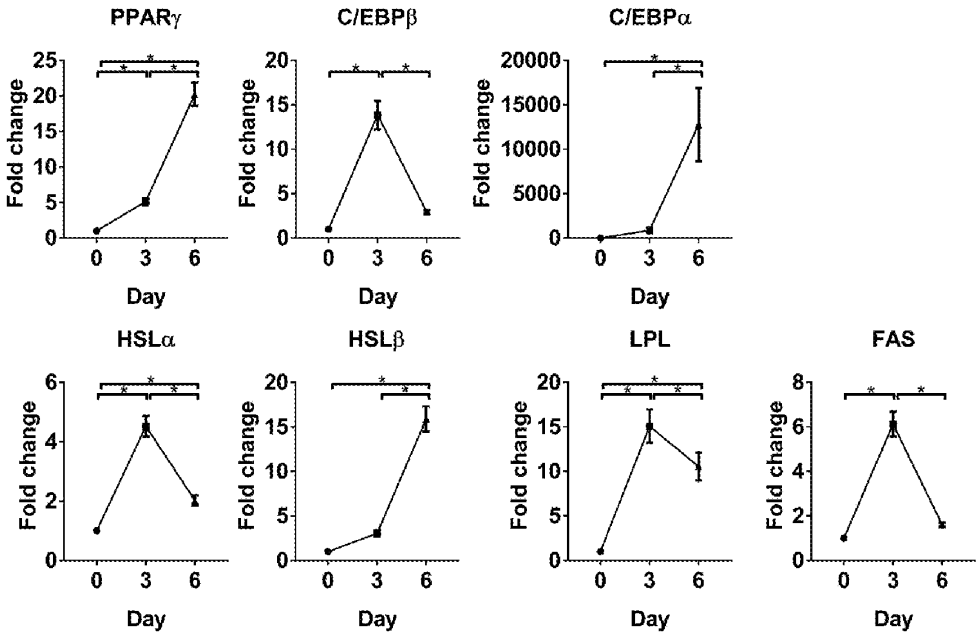


FIGURE 20

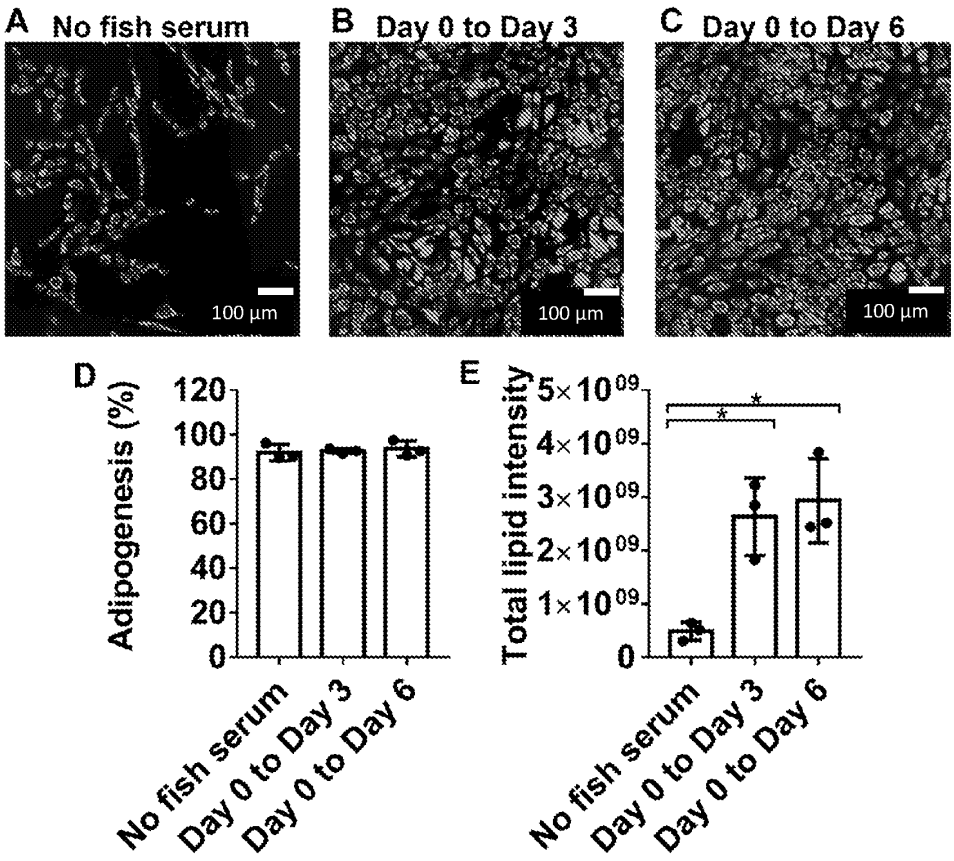

A No fish serum
B Day 0 to Day 3
C Day 0 to Day 6
100 µm
100 µm
100 µm
D
Adipogenesis (%)
120
100
80
60
40
20
0
No fish serum
Day 0 to Day 3
Day 0 to Day 6
E
Total lipid intensity
5×10^09
4×10^09
3×10^09
2×10^09
1×10^09
0
*
*
No fish serum
Day 0 to Day 3
Day 0 to Day 6

FIGURE 21

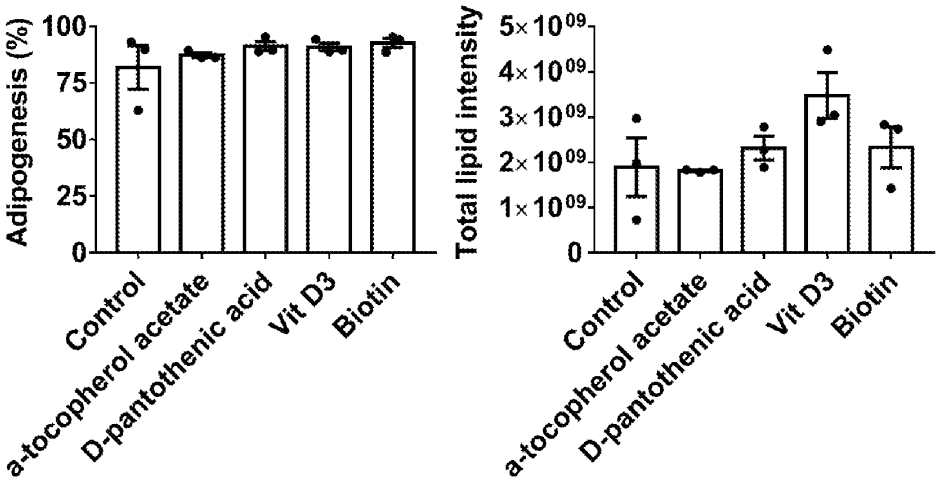


FIGURE 22

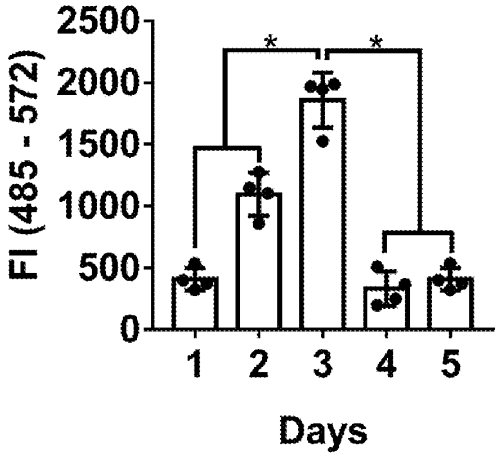


FIGURE 23

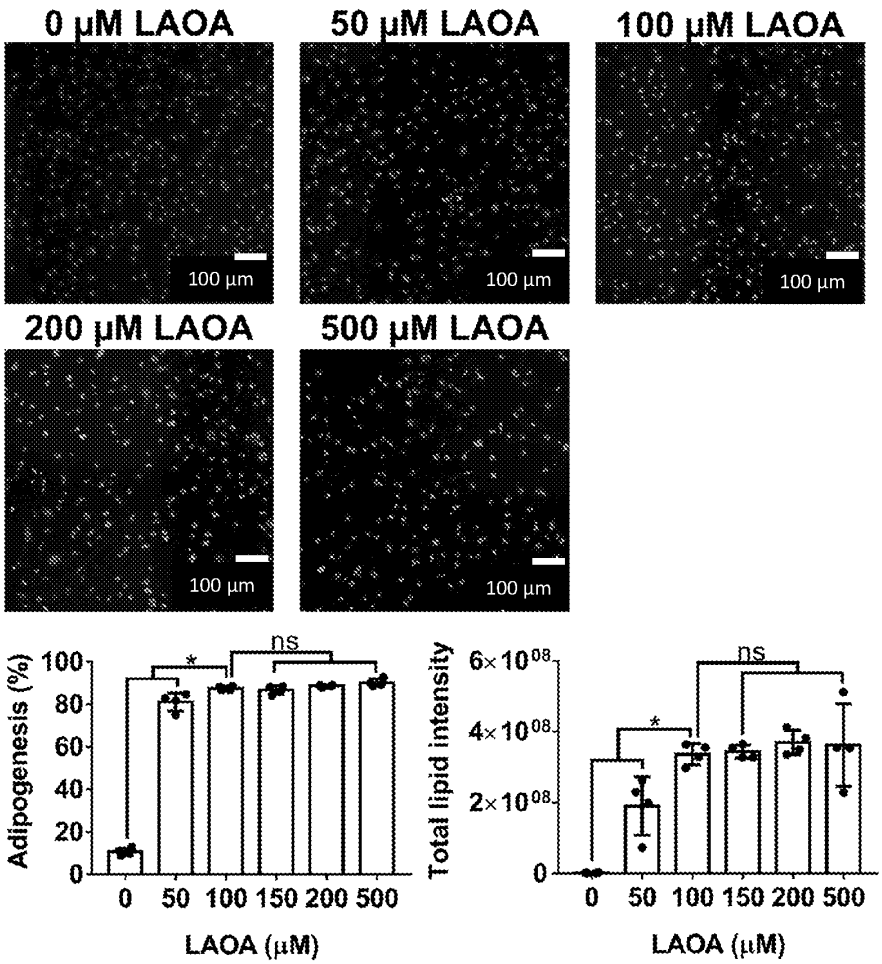

0 µM LAOA
50 µM LAOA
100 µM LAOA
200 µM LAOA
500 µM LAOA
100 µm
Adipogenesis (%)
Total lipid intensity
LAOA (µM)
ns
*
0 50 100 150 200 500

FIGURE 24

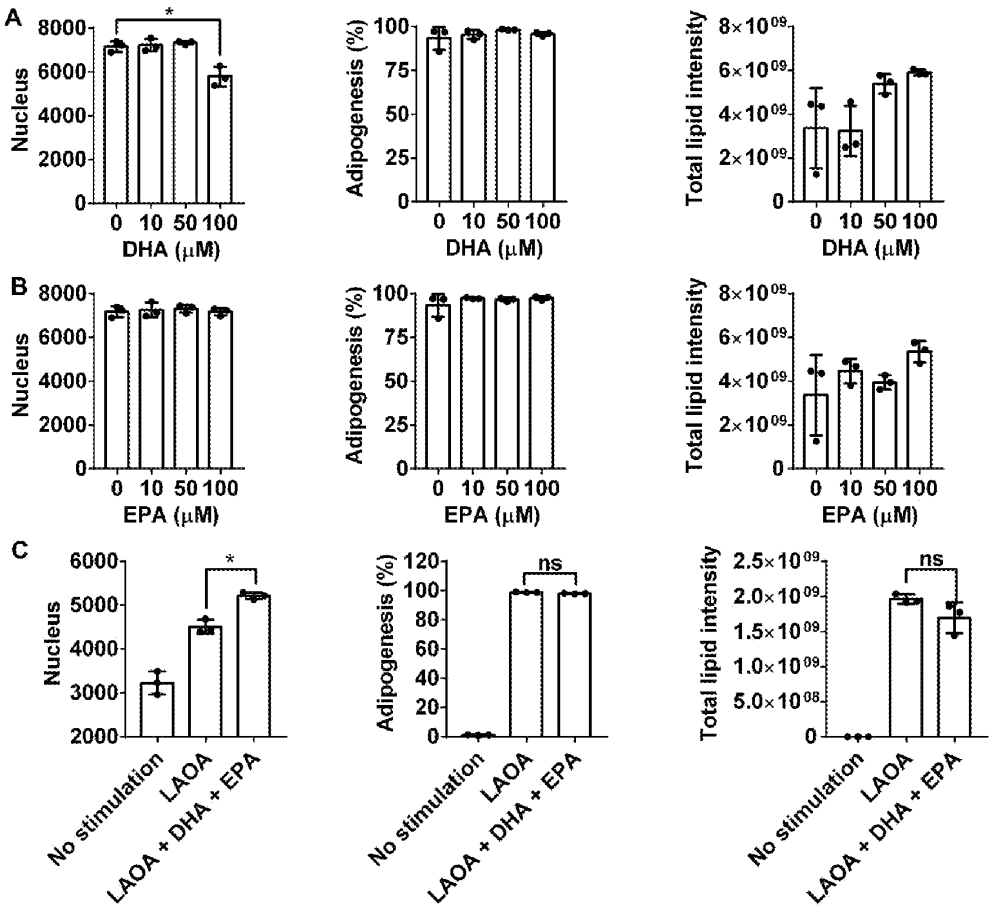

A
Nucleus
8000
6000
4000
2000
0
*
0 10 50 100
DHA (μM)
Adipogenesis (%)
100
75
50
25
0
0 10 50 100
DHA (μM)
Total lipid intensity
8×10^09
6×10^09
4×10^09
2×10^09
0
0 10 50 100
DHA (μM)
B
Nucleus
8000
6000
4000
2000
0
0 10 50 100
EPA (μM)
Adipogenesis (%)
100
75
50
25
0
0 10 50 100
EPA (μM)
Total lipid intensity
8×10^09
6×10^09
4×10^09
2×10^09
0
0 10 50 100
EPA (μM)
C
Nucleus
6000
5000
4000
3000
2000
*
No stimulation
LAOA
LAOA + DHA + EPA
Adipogenesis (%)
120
100
80
60
40
20
0
ns
No stimulation
LAOA
LAOA + DHA + EPA
Total lipid intensity
2.5×10^09
2.0×10^09
1.5×10^09
1.0×10^09
5.0×10^08
0
ns
No stimulation
LAOA
LAOA + DHA + EPA

FIGURE 25

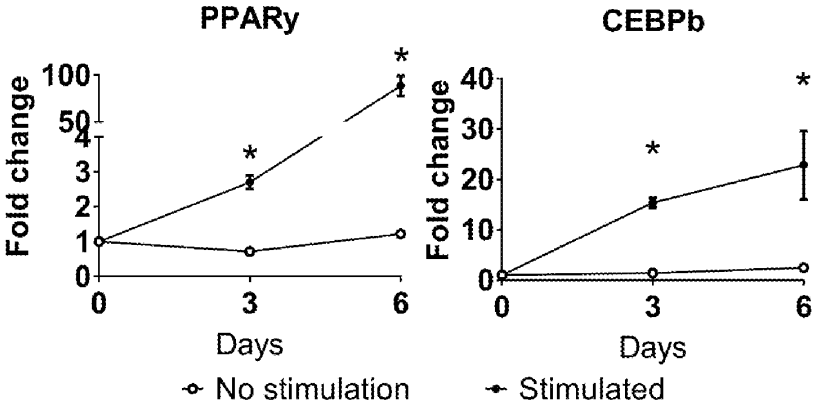


FIGURE 26

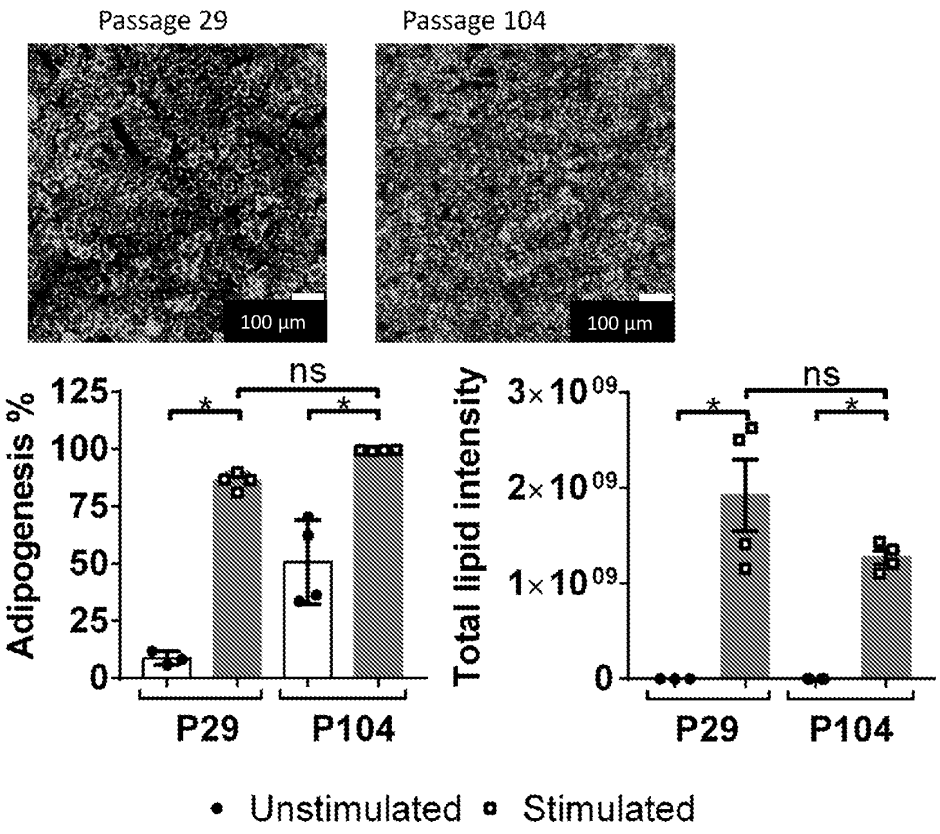


FIGURE 27

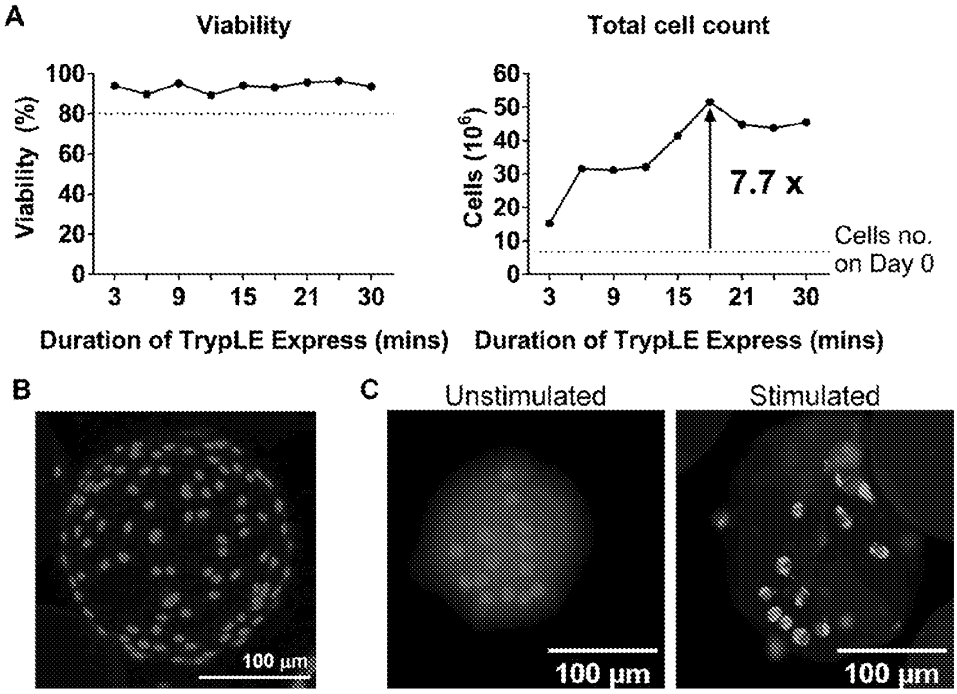

A
Viability
Viability (%)
100
80
60
40
20
0
3
9
15
21
30
Duration of TrypLE Express (mins)
Total cell count
Cells (10^6)
60
50
40
30
20
10
0
7.7 x
Cells no. on Day 0
3
9
15
21
30
Duration of TrypLE Express (mins)
B
100 µm
C
Unstimulated
Stimulated
100 µm
100 µm

FIGURE 28