Electronic Supplementary Material (ESI) for Lab on a Chip

Supplementary information

Real-Time Monitoring of Adipocyte Differentiation Using a Capacitance Sensor Array

Rimi Lee[a,‡], Inji Jung[c,‡], Miyoung Park[c,d], Hunjoo Ha[c*], Kyung Hwa Yoo[a,b*]

[a] Graduate Program for Nanomedical Science and Technology, Yonsei University, Seoul, 120-749, Republic of Korea

[b] Department of Physics, Yonsei University, Seoul, 120-749, Republic of Korea.

[c] Department of Bioinspired Science, Division of Life & Pharmaceutical Sciences, Colle of Pharmacy, Ewha Womans University, Seoul 120-750, Korea

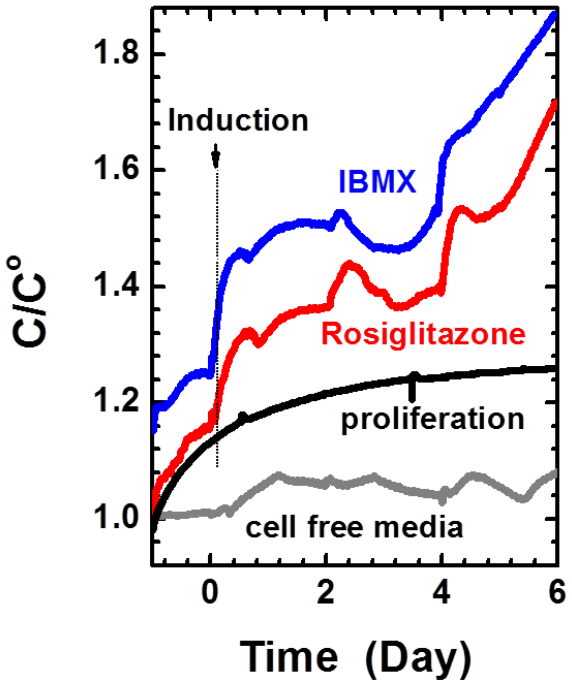
[d] Medical Beauty Research Institute, Amorepacific Corporation R&D Center, Yongin 446-729, Korea

* Corresponding author at: Graduate Program for Nanomedical Science and Technology, Yonsei University, Seoul 120-749, Republic of Korea. Tel.: +82 2 2123 3887; fax: +82 2 312 7090. E-mail address: khyoo@yonsei.ac.kr (K.-H. Yoo) and Department of Bioinspired Science, Division of Life & Pharmaceutical Sciences, College of Pharmacy, Ewha Womans University, Seoul 120-750, Republic of Korea. Tel: +82 2 3277 4075; fax: +82 2 3277 3051. E.-mail address: hha@ewha.ac.kr

‡ The authors have equal contribution to the manuscript.

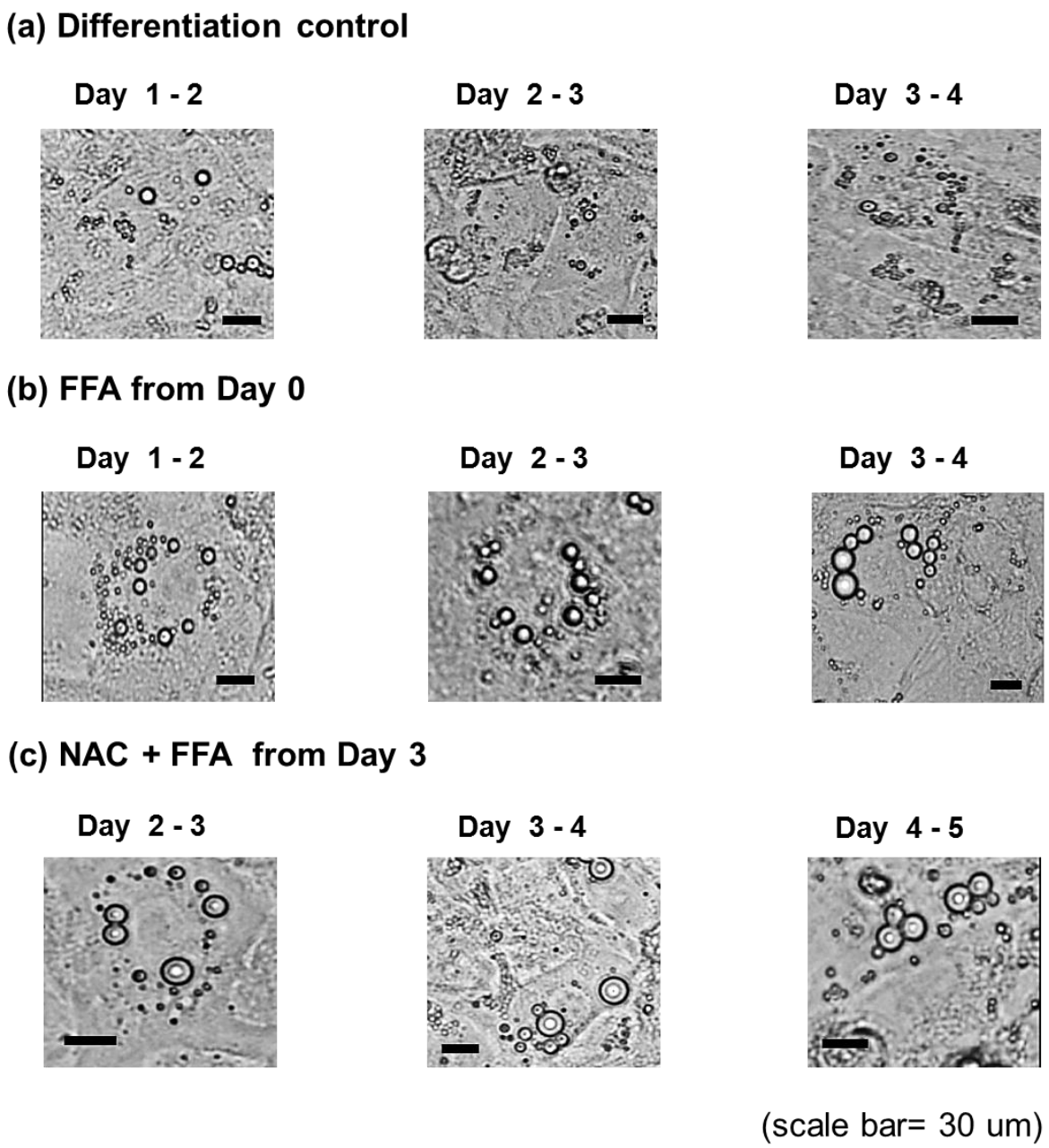
Supplementary Figure 1.

Photograph of a capacitance sensor array with media.



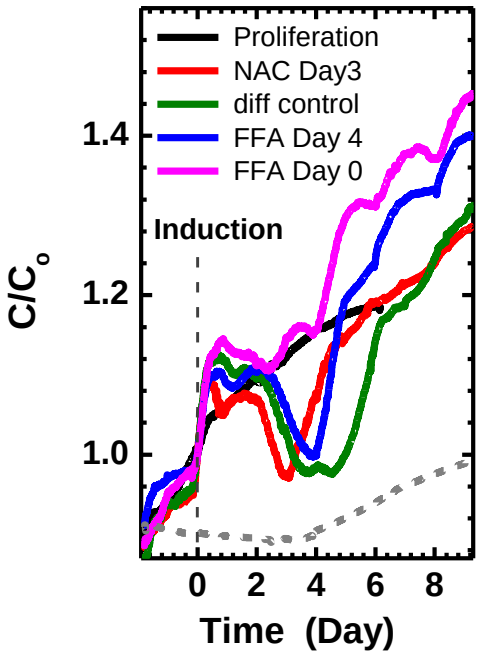
Supplementary Figure 2.

Time dependence of normalized capacitance measured at f = 3 kHz for cell-free media (gray dashes), 3T3-L1 cells during proliferation (black), and adipocyte differentiation with a hormone cocktail containing either rosiglitazone (red) or IBMX (blue). The data obtained with a hormone cocktail containing IBMX is shifted only for clarity.



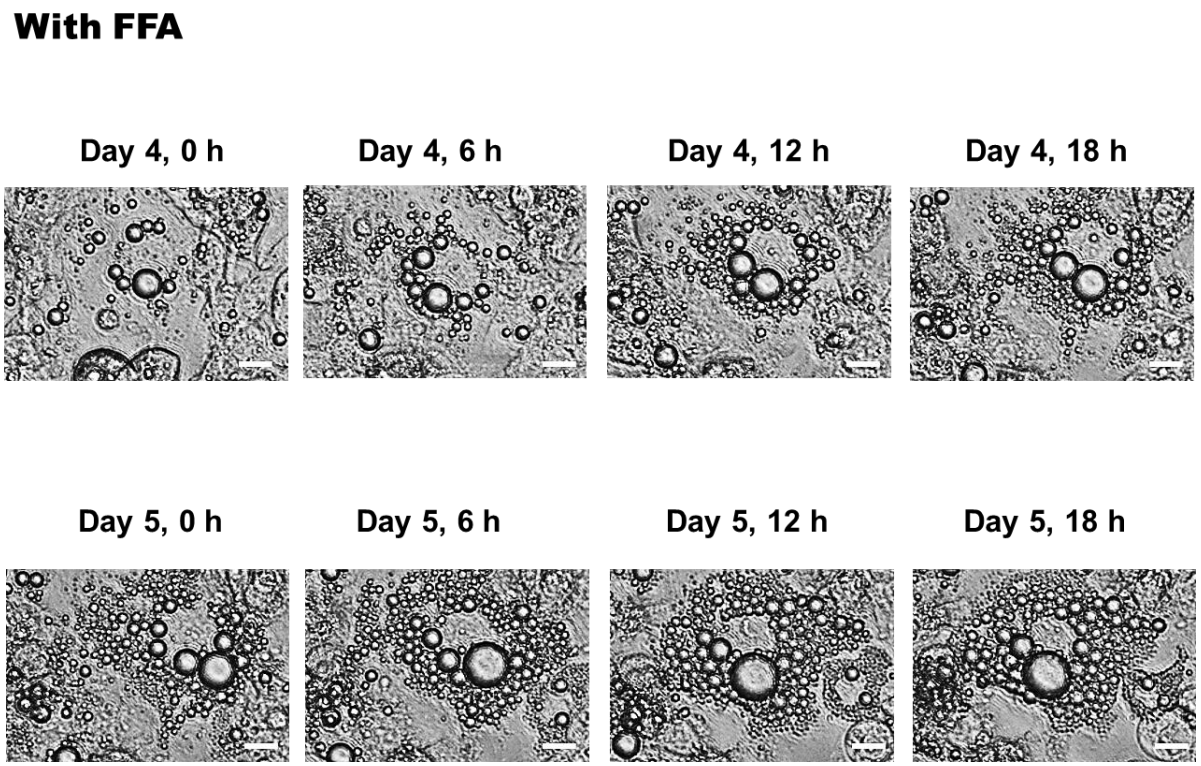
Supplementary Figure 3.

Optical images of 3T3-L1 cells during differentiation without FFA and NAC (a), with FFA added on Day 0 (b), and with NAC added on Day 3 and NAC/FFA added on Day 4 (c) (scale bar: 30 μm). The videos are on supplementary videos.



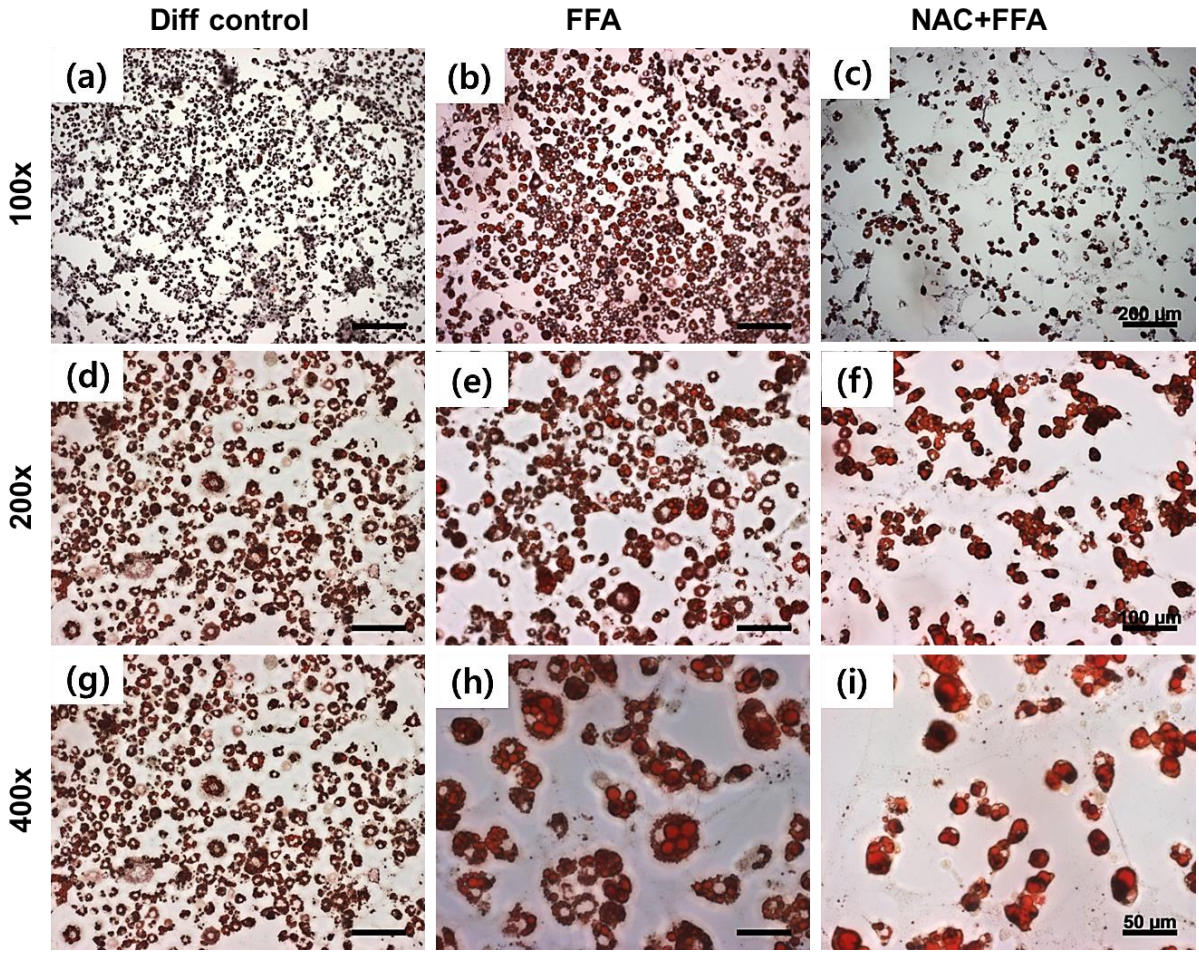
Supplementary Figure 4.

Time dependence of normalized capacitance in 3T3-L1 cells under different conditions: cell-free media (grey dashes), during proliferation (black), differentiation control (green), differentiation with FFA added on Day 0 (pink), differentiation with FFA added on Day 4 (blue), differentiation with NAC added on Day 3 and NAC and FFA added on Day 4 (red).



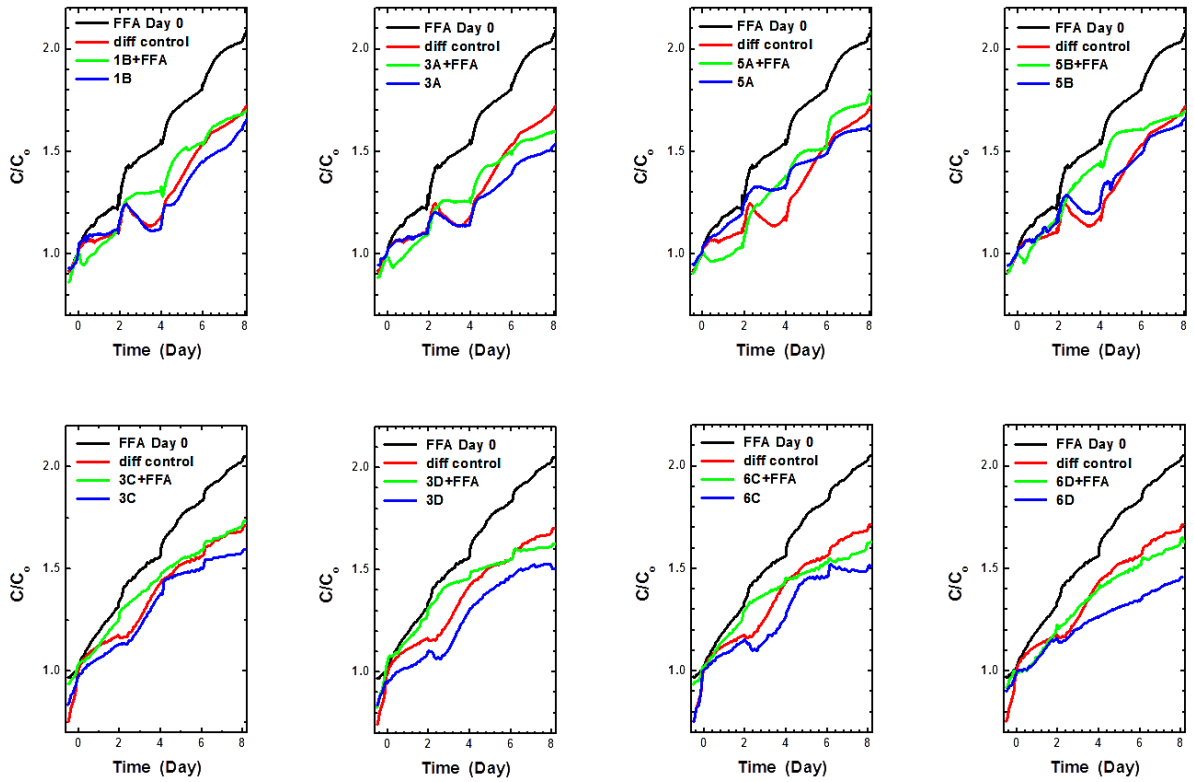
Supplementary Figure 5.

Time-lapse optical images of 3T3-L1 cells during differentiation with FFA added on Day 0. (scale bar: 30 μm).



Supplementary Figure 6.

Optical images of 3T3-L1 cells stained with Oil-Red O after 8 days of differentiation without FFA or NAC (a, d, and g), with FFA added on Day 0 (b, e, and h), and with NAC added on Day 3 and NAC/FFA added on Day 4 (c, f, and i). (100×, scale bar: 200 μm; 200×, scale bar: 100 μm; 400×, scale bar: 50 μm).



Supplementary Figure 7.

Time dependence of normalized capacitance measured in 3T3-L1 cells treated with chemicals 1B, 3A, 3C, 3D, 5A, 5B, 6C or 6D and/or FFA. FFA was added to each cell population on Day 0.