3- Extruder temperature sensor, 4- X-axis stepper motor, 5- Syringe plunger cap, 6- Syringe holder, 7- Belt and pulley-based extrusion drive, 8- Stepper motor for extrusion, 9- Modified X-axis carriage, 10- Printing bed, 11- Y-Axis stepper motor, 12- Power supply, 13- Syringe needle extruding the material, 14- Printed construct and 15- Petri plate.

of fluorescence indicating the cell surfaces with expression of membrane bound channelrhodopsin proteins on NIH 3T3 cells (visible in the inset).

C2C12 cells which are transfected (visible in the inset), (C) Merged image of (A) and (B) showing localized maximum intensity regions of fluorescence indicating the cell surfaces with expression of membrane bound channel rhodopsin proteins on C2C12 cells (visible in the inset), (D) A bright field image showing C2C12 control cells after 9 days of transfection, (E) Fluorescent image showing C2C12 control cells after 9 days of transfection.

the variation in amplitude with respect to time (ii) plot showing the power of twitch signals with regard to frequency (iii) Time series images for myotube twitching under standard conditions showing line region of interest marked within the first image (Scale: 10 µm). (B) Analysis of twitch frequency for a myotube in micropatterned culture (i) plot to demonstrate the variation in amplitude with respect to time (ii) plot showing the power of twitch signals with regard to frequency (iii) Time series images for myotube twitching under micropatterned conditions showing line region of interest marked within the first image (Scale: 10 µm).