3D Bio-Printing of Muscle Tissue

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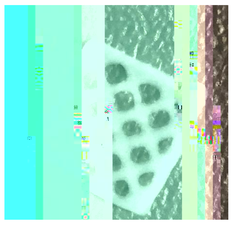
Abstract

Myoblasts, Myogenic stem cells, are capable of differentiating into functioning contractile myocytes (muscle fibers). In skeletal muscle, myocytes are aligned in parallel arrays as fascicles. This allows for contraction in only one direction, all myocytes working together cooa5tTQ40 G[Mentor: Dr)54(. Gary)18(W 0 g0 G 0.06 Tc[.)]TJETQ EMC /P &MCID 26>0.06 Tc[.)]TJETQ EMC /P &MCID 26>0.06 Tc[.)]TJETQ EMC /3n W*nBT/F4 30 Tf1 0 0 1 1248.94 1550.02 Tm0 g0 G[3046004400530057005800550048

Methods

M1: 3D Printing System



M2: Printed tissue grid

Results

Figure 1 Data

Figure 1: R1: These measurements were made using stage micrometer. What is indicated in the table is average width in millimeters of each image. The average bar width is 1.12mm with a standard deviation of .22mm

Figure 2 RNA Data

Sample ID	Nucleic Acid Conc.	Unit			Sample Type
3D 400 1.2	65.1	ng/µl	1.73	0.13	RNA
3D 400 2.2	4.6	ng/µl	2.66	0.01	RNA
3D 200 3.2	5.8	ng/µl	4.02	0.01	RNA
3D 200 4.2	4.4	ng/µl	2.5	0.01	RNA

Figure 2: This is an analytical table showing the spectral data (Nanodrop®) verifying that cells survived the printing and subsequent culture phase of tissue construction.

Discussion

To further confirm the viability of the cells embedded in the tissue future experiments will use the fluorescent DAN stain, DAPI, to confirm normal nuclear structure. Also, in future printing runs, the distribution and careful quantitation of each sample must be much more carefully controlled and recorded.
Lastly, before quantitative PCR(qPCR) analysis, the contamination

quantitative Polymerase chain reactions can be performed using select myo-specific primers.