IMPROVED PROCEDURE FOR THE PROCESSING OF CULTURED MEAT

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I. INTRODUCTION

Despite many studies related to cultured meat worldwide, cultured meat production efficiency is low and production cost is still high, so cultured meat is not industrialized. In addition, the main technology for producing cultured meat has not been disclosed. So far, many companies and university research institutes around the world have been conducting research on cultured meat, but not many basic experimental methods for producing cultured meat have been reported. For this reason, we developed a key protocol for cultured meat production in 2021 [1, 2], which presents an improved method for the commercial production of cultured meat.

II. MATERIALS AND METHODS

This experiment is shown in Figure 1 with an improved method of the protocol [1] published in 2021. During the isolation process of muscle satellite cells, we focus on reducing losses while effectively removing unnecessary cells and tissues, and supplying enhanced nutrients to differentiated muscle cells by using a secondary differentiation medium during the differentiation process. Cell viability was measured using MTT (3-[4,5-dimethylthiazol-2-yl]-2,5 diphenyl tetrazolium bromide) assay. The width of myotubes was measured using Image J software based on both bright field imaging and fluorescence imaging using selected fluorescent dyes viewed with an inverted fluorescence microscope.

III. RESULTS AND DISCUSSION

In experiments conducted under the same conditions (Ham's F-10 + 20% FBS + 1% antibiotics) [1, 2], cell viability obtained after proliferating primary cells for 3 days increased by about 5 times in the improved method compared to the previous method. By removing unnecessary cells and tissues in advance, it was possible to obtain a high yield of muscle satellite cells. Also, after the same differentiation process, the width of myotubes formed in the enhanced differentiation media increased by more than 20% compared to the myotubes formed in the first differentiation media. The use of a secondary differentiation media enhanced the formation and growth of myotubes by supplementing the nutrients lacking in the first differentiation media.

IV. CONCLUSION

Our improved method can increase the yield of muscle satellite cells during the isolation process, and can provide a more enhanced muscle tube acquisition method in the process after muscle tube formation. This provides key technologies for cultured meat production and is expected to help produce inexpensive and safe cultured meat by increasing production efficiency.

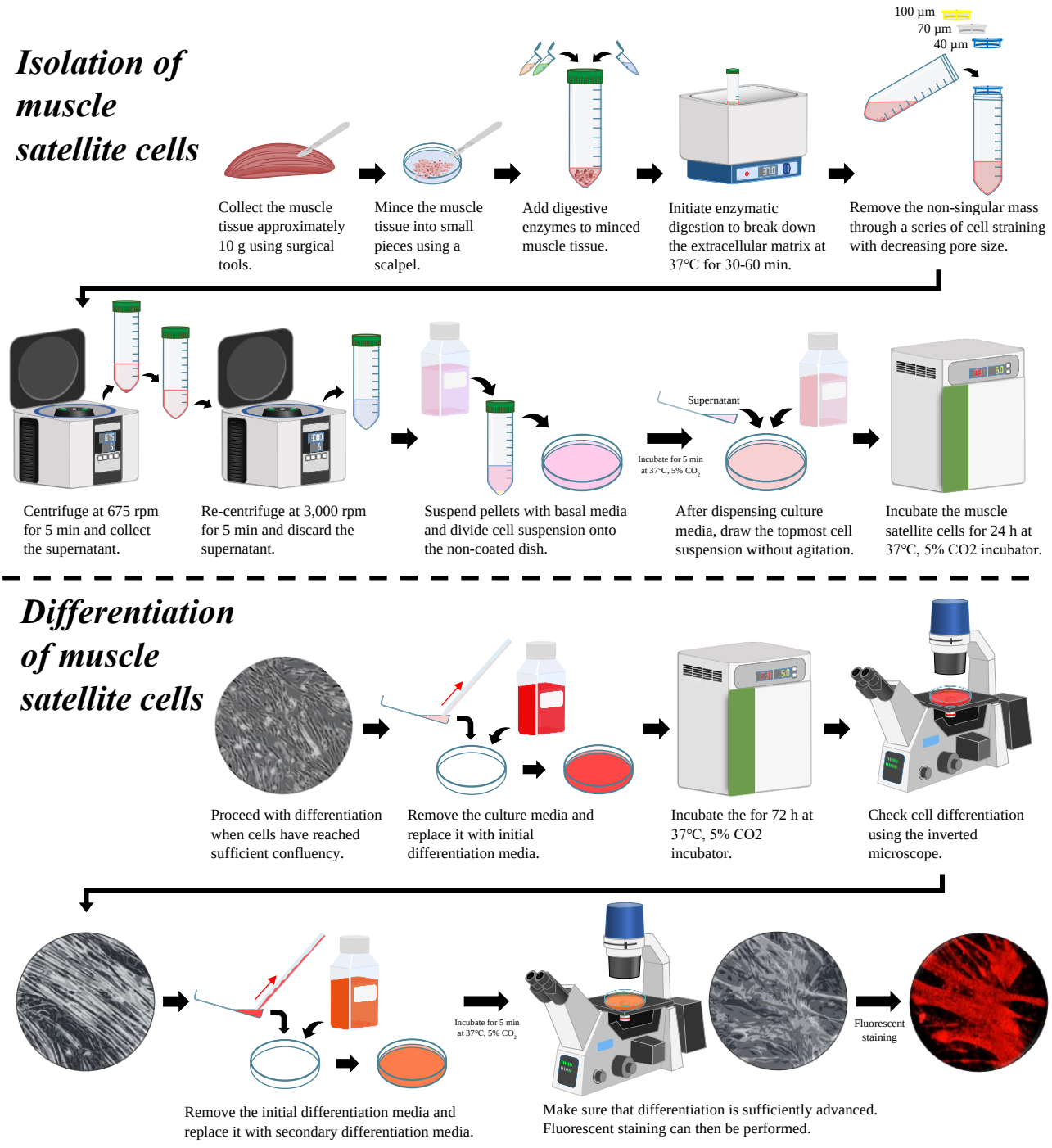

Figure 1. Overview of improved procedure

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