

Figure S1. Schematic diagrams of the hiPSC-CM with different treatments.

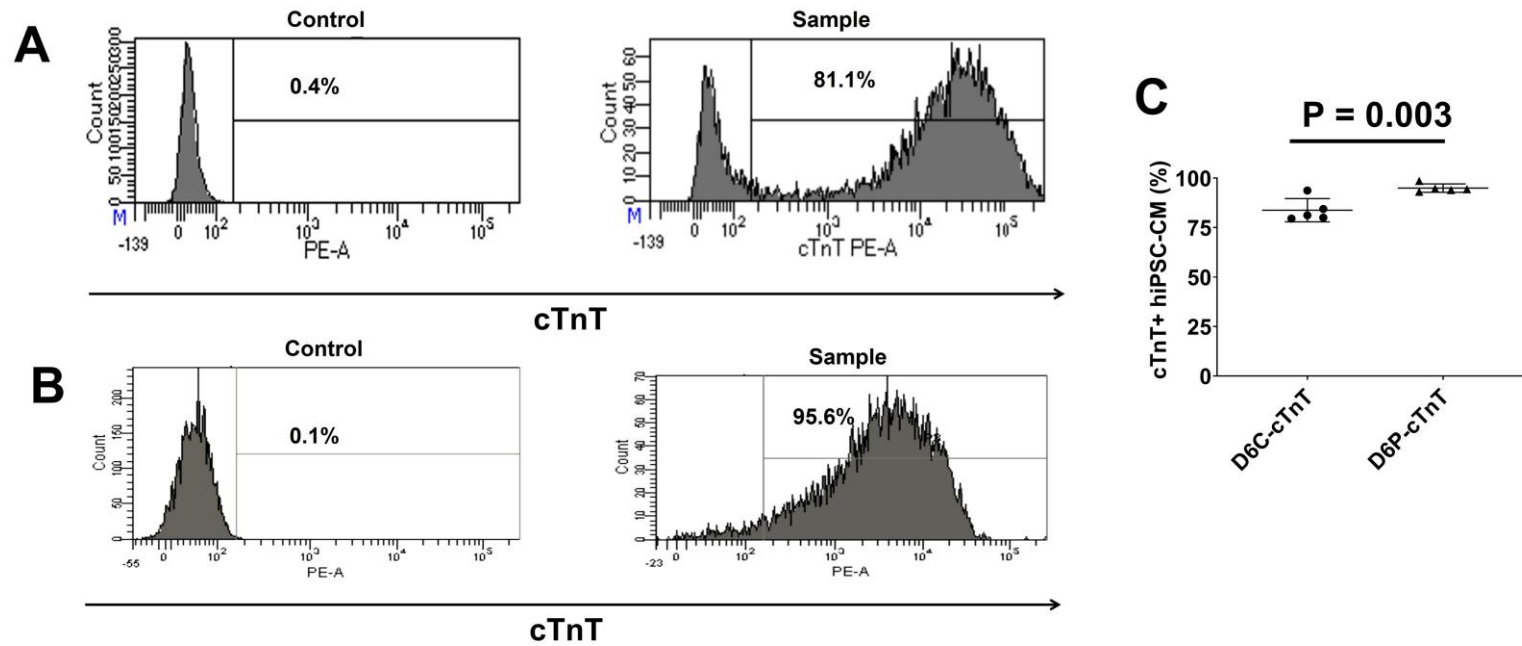


Figure S2. Purity of hiPSC-CMs. Representative flow cytometry images for assessing purity of hiPSC-CMs based on cardiac troponin T (cTnT) expression before **(A)** and after **(B)** purification. **(C)** Quantification of cTnT+hiPSC-CM before (D6C) and after purification (D6P). (n = 5 each. Values are presented as the means \pm SD. Independent T-test).

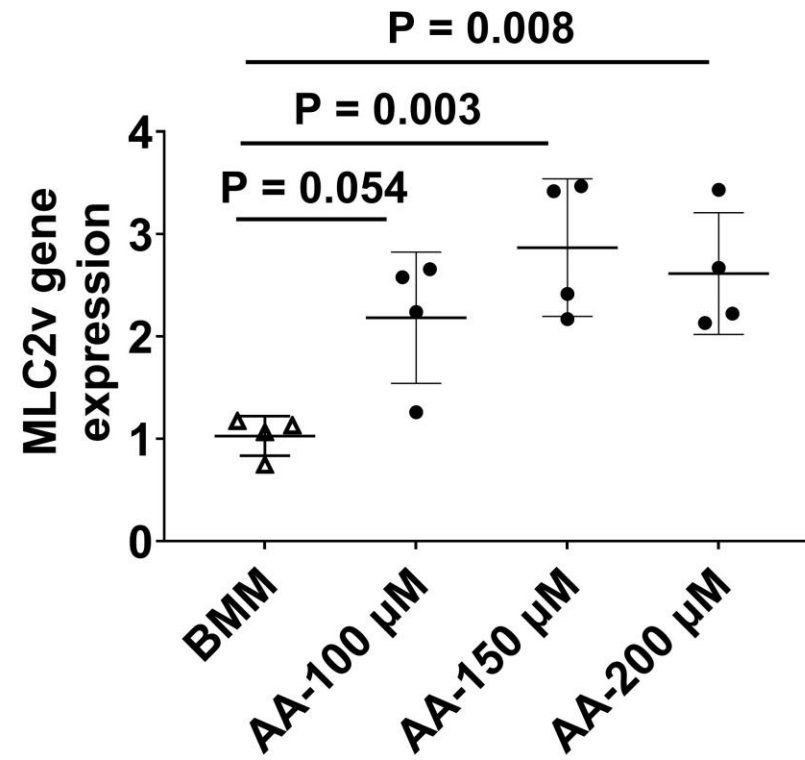


Figure S3. Dose dependent effect of ascorbic acid on MLC2v gene expression on day 7 after treatment. (n = 4 each. Values are presented as the means \pm SD. One-way ANOVA)

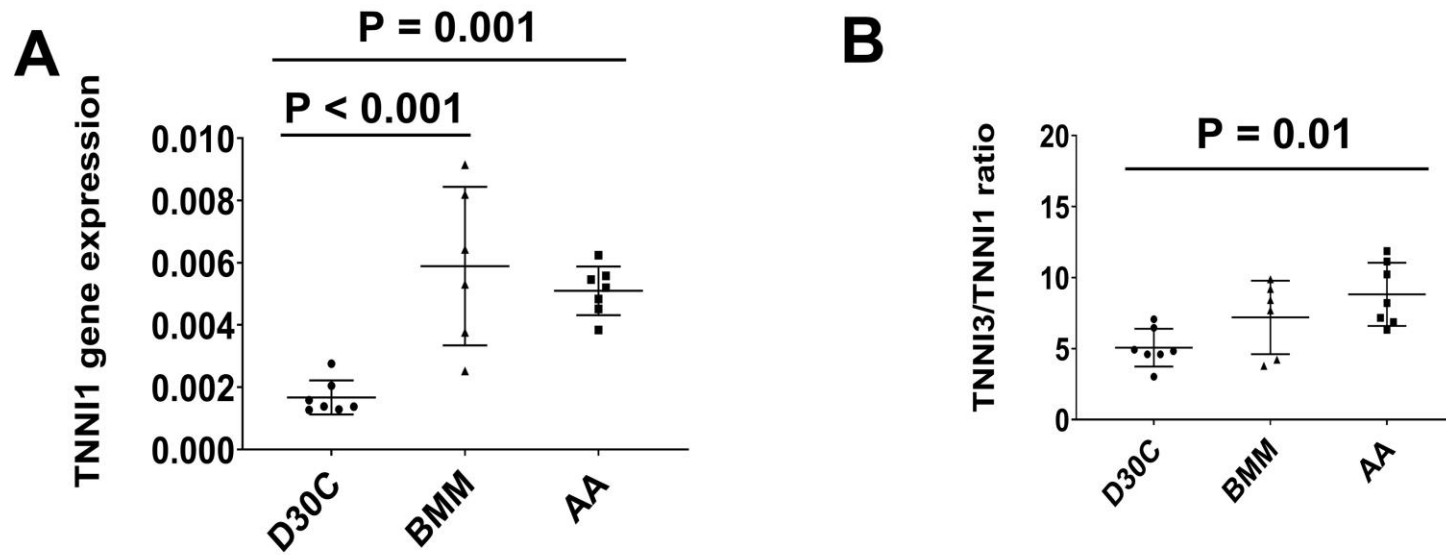


Figure S4. Gene expression levels of TNNI1 (**A**) and TNNI3/TNNI1 ratio (**B**) in D30C, BMM, or AA treated PCBC-CMs. (n = 6 or 7. Values are presented as the means \pm SD. One-way ANOVA).

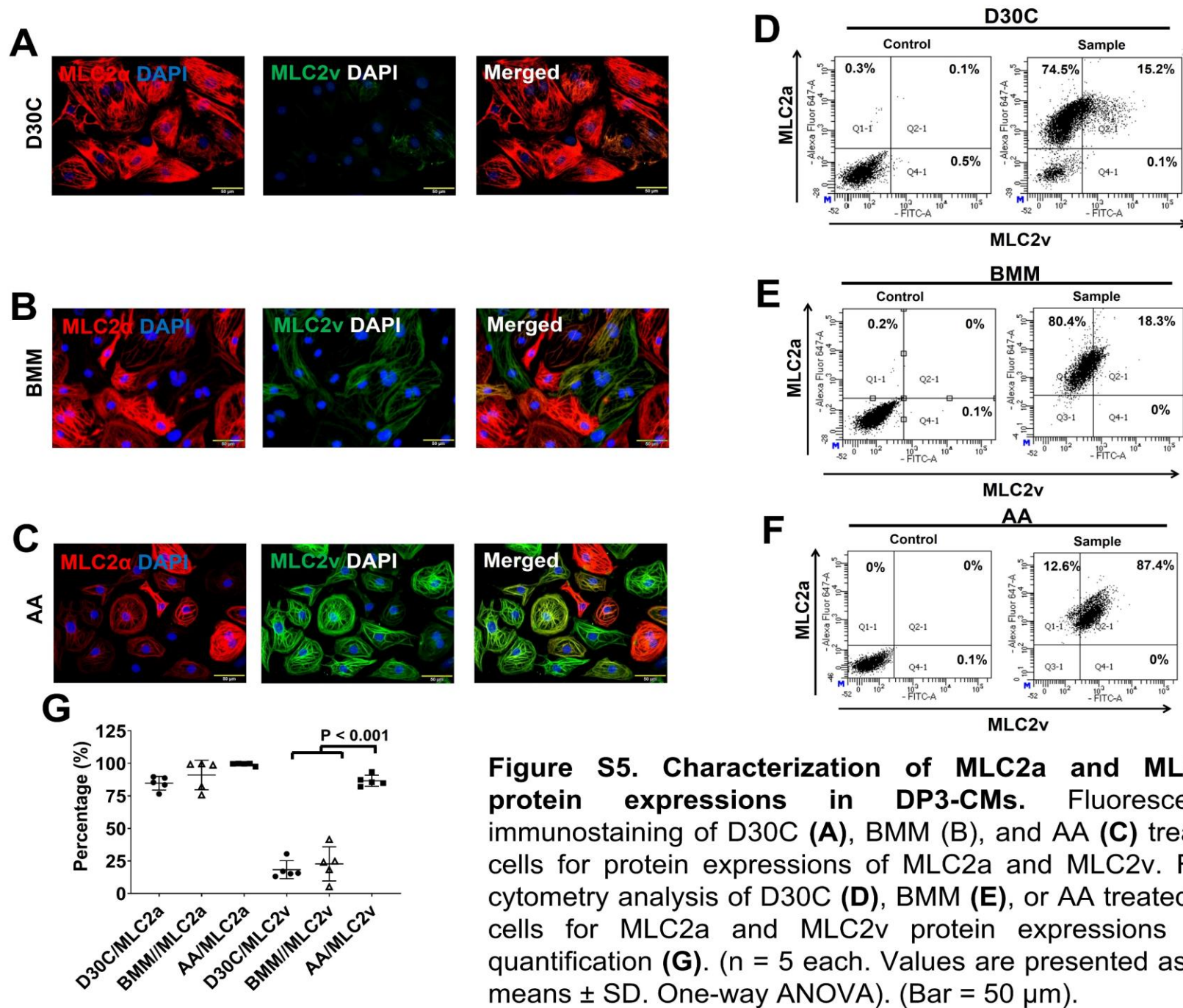


Figure S5. Characterization of MLC2a and MLC2v protein expressions in DP3-CMs. Fluorescence immunostaining of D30C (A), BMM (B), and AA (C) treated cells for protein expressions of MLC2a and MLC2v. Flow cytometry analysis of D30C (D), BMM (E), or AA treated (F) cells for MLC2a and MLC2v protein expressions and quantification (G). (n = 5 each. Values are presented as the means \pm SD. One-way ANOVA). (Bar = 50 μ m).

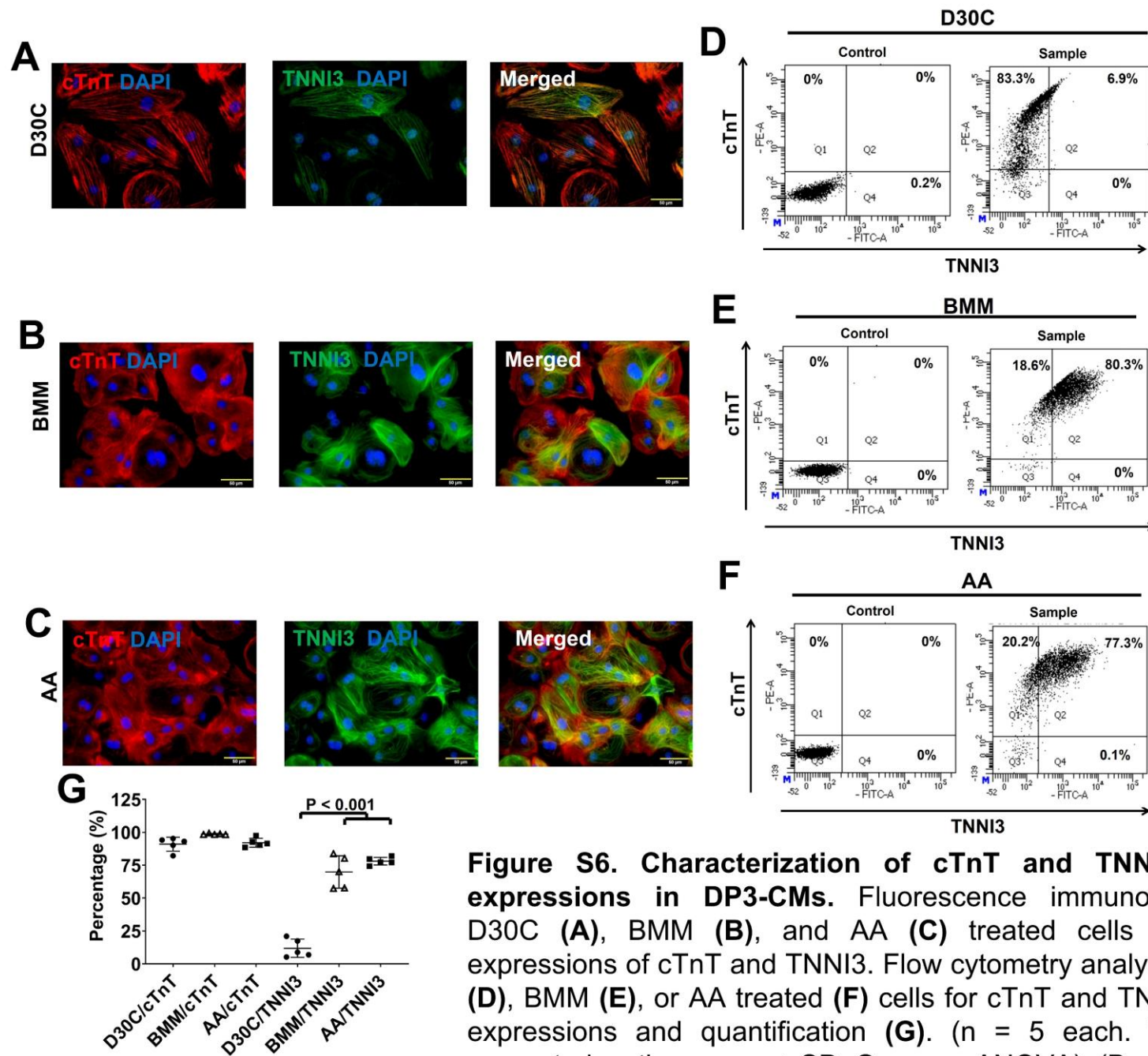
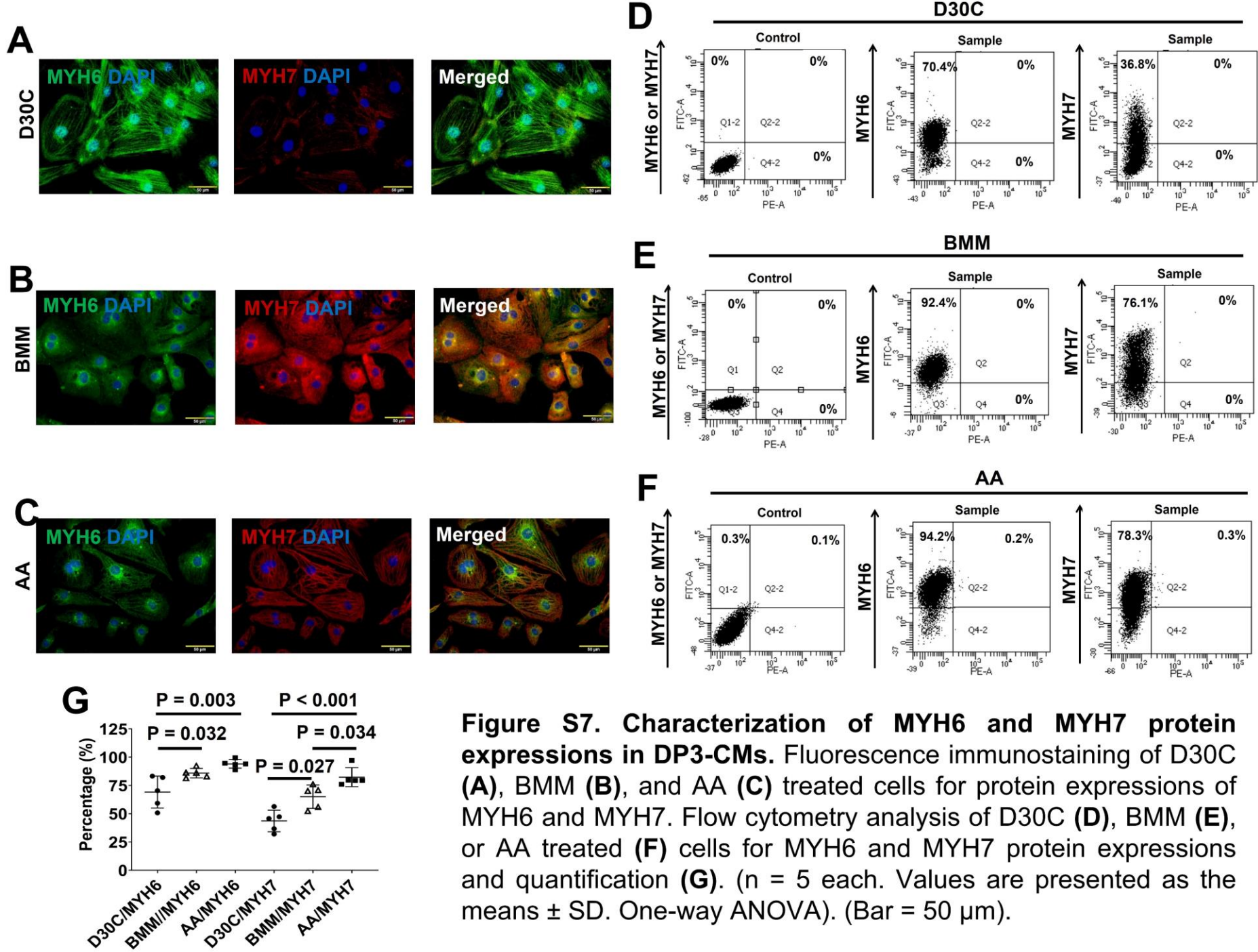


Figure S6. Characterization of cTnT and TNNI3 protein expressions in DP3-CMs. Fluorescence immunostaining of D30C (A), BMM (B), and AA (C) treated cells for protein expressions of cTnT and TNNI3. Flow cytometry analysis of D30C (D), BMM (E), or AA treated (F) cells for cTnT and TNNI3 protein expressions and quantification (G). (n = 5 each. Values are presented as the means \pm SD. One-way ANOVA). (Bar = 50 μ m).



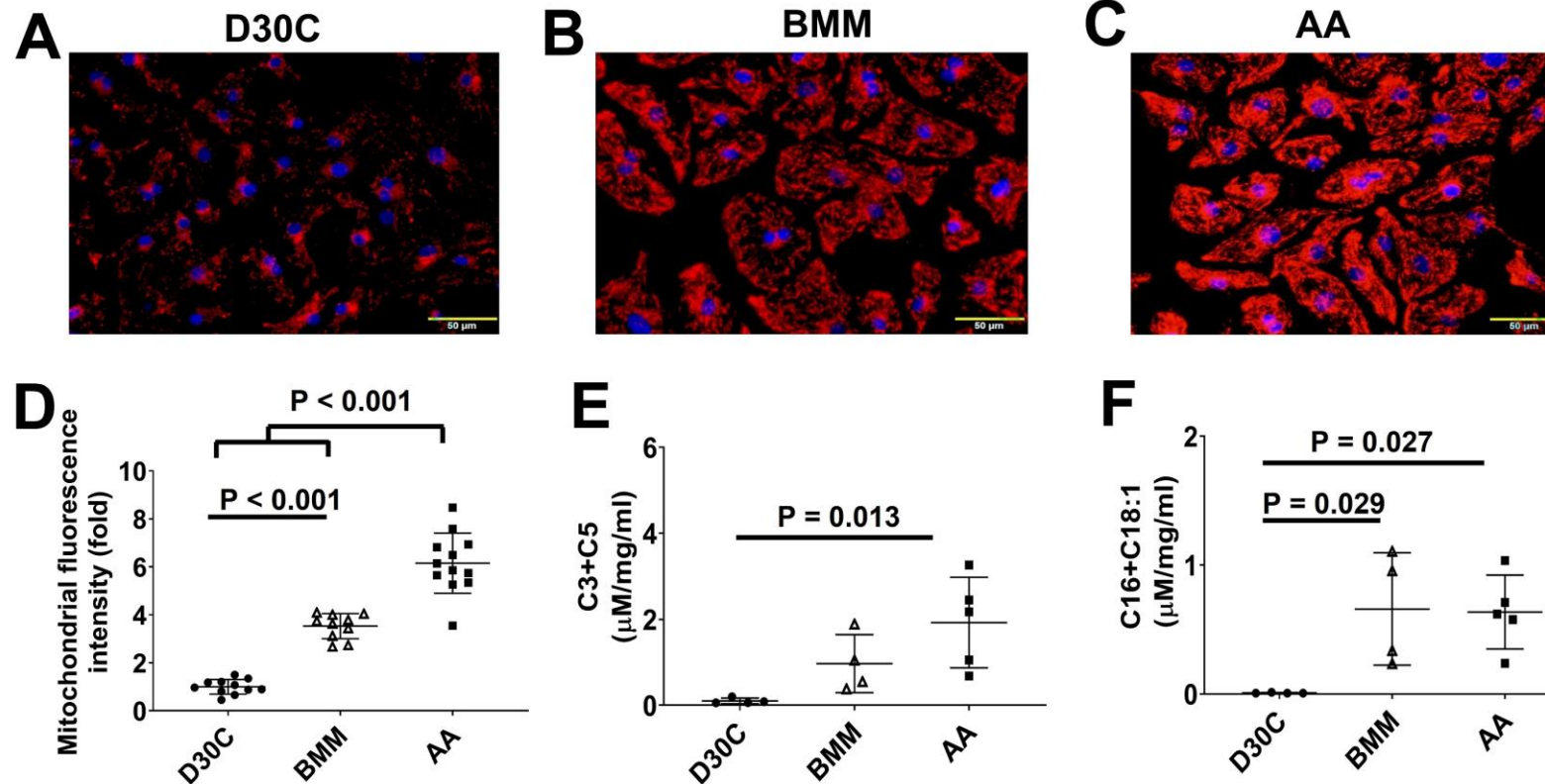


Figure S8. DP3-CM mitochondrial membrane potential and metabolism. JC-1 staining of D30C (A), BMM (B), and AA (C) treated DP3-CMs to visualize mitochondrial membrane potential. (D) Quantification of DP3-CM mitochondrial membrane potential. Metabolism of C3+C5 (E) and C16+C18:1 (F) in D30c, BMM or AA treated PCBC-CMs. (n = 10 - 12 for panel D and n = 4 - 5 for panels E & F. Values are presented as the means \pm SD. One-way ANOVA). (Bar = 50 μm).

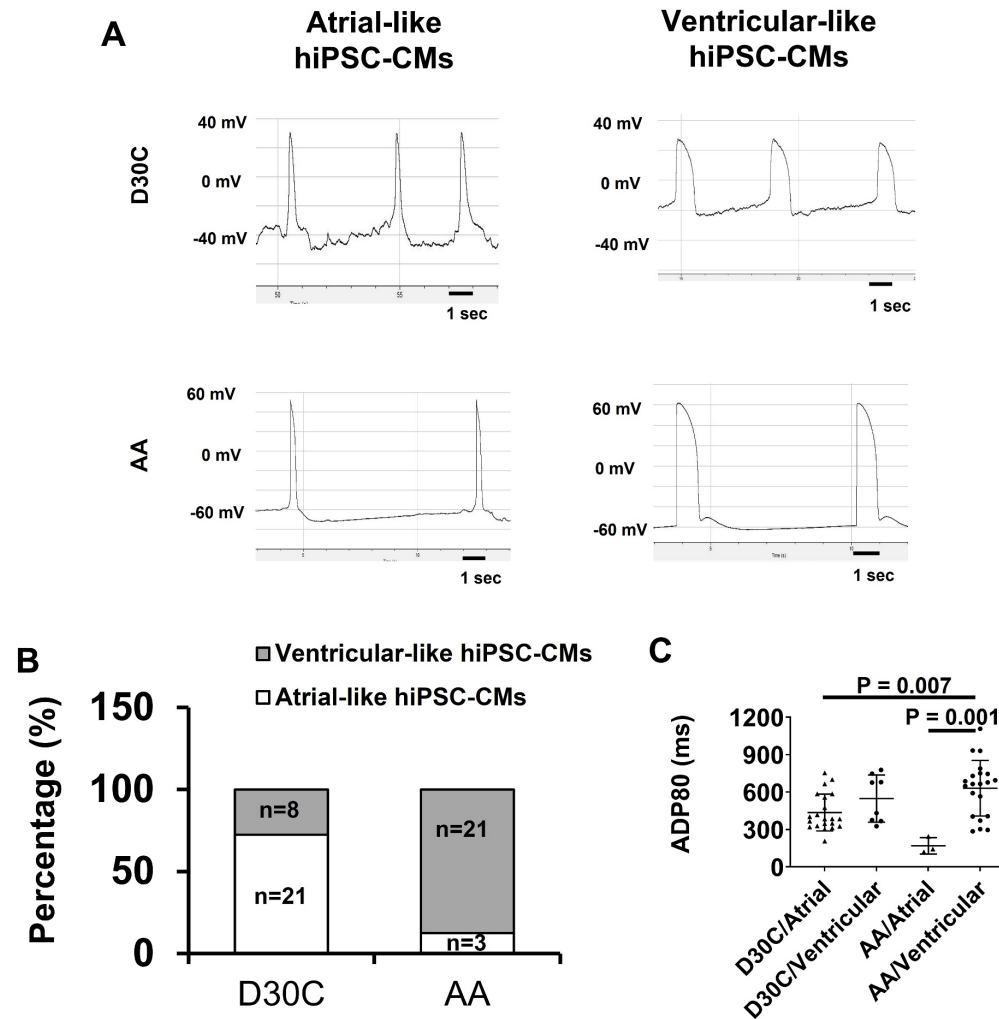


Figure S9. Patch clamp analysis of D30C and AA treated DP3-CMs. (A) Action potential of atrial or ventricular-like cells in D30C or AA treated DP3-CMs. **(B)** Percentage of atrial or ventricular-like cells in D30C or AA treated DP3-CMs based on action potential. **(C)** ADP80 of atrial or ventricular-like cells in D30C or AA treated DP3-CMs.

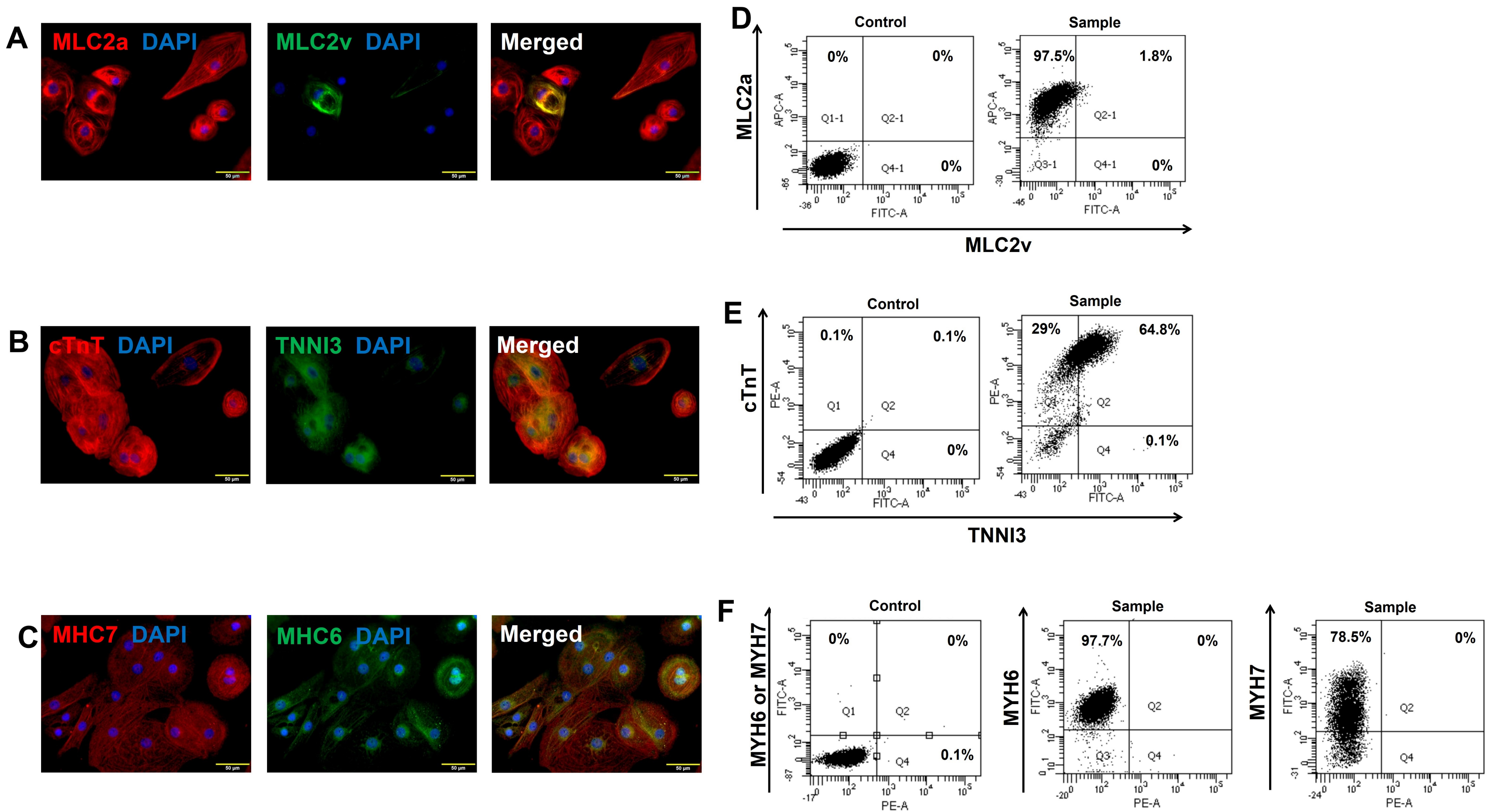


Figure S10. Fluorescence immunostaining of TETi/AA treated DP3-CMs for protein expressions of MLC2a and MLC2v (**A**), cTnT and TNNI3 (**B**), and MYH6 and MYH7 (**C**). Flow cytometry analysis of TETi/AA treated DP3-CMs for protein expressions of MLC2a and MLC2v (**D**), cTnT and TNNI3 (**E**), and MYH6 and MYH7 (**F**). (Bar = 50 μ m).

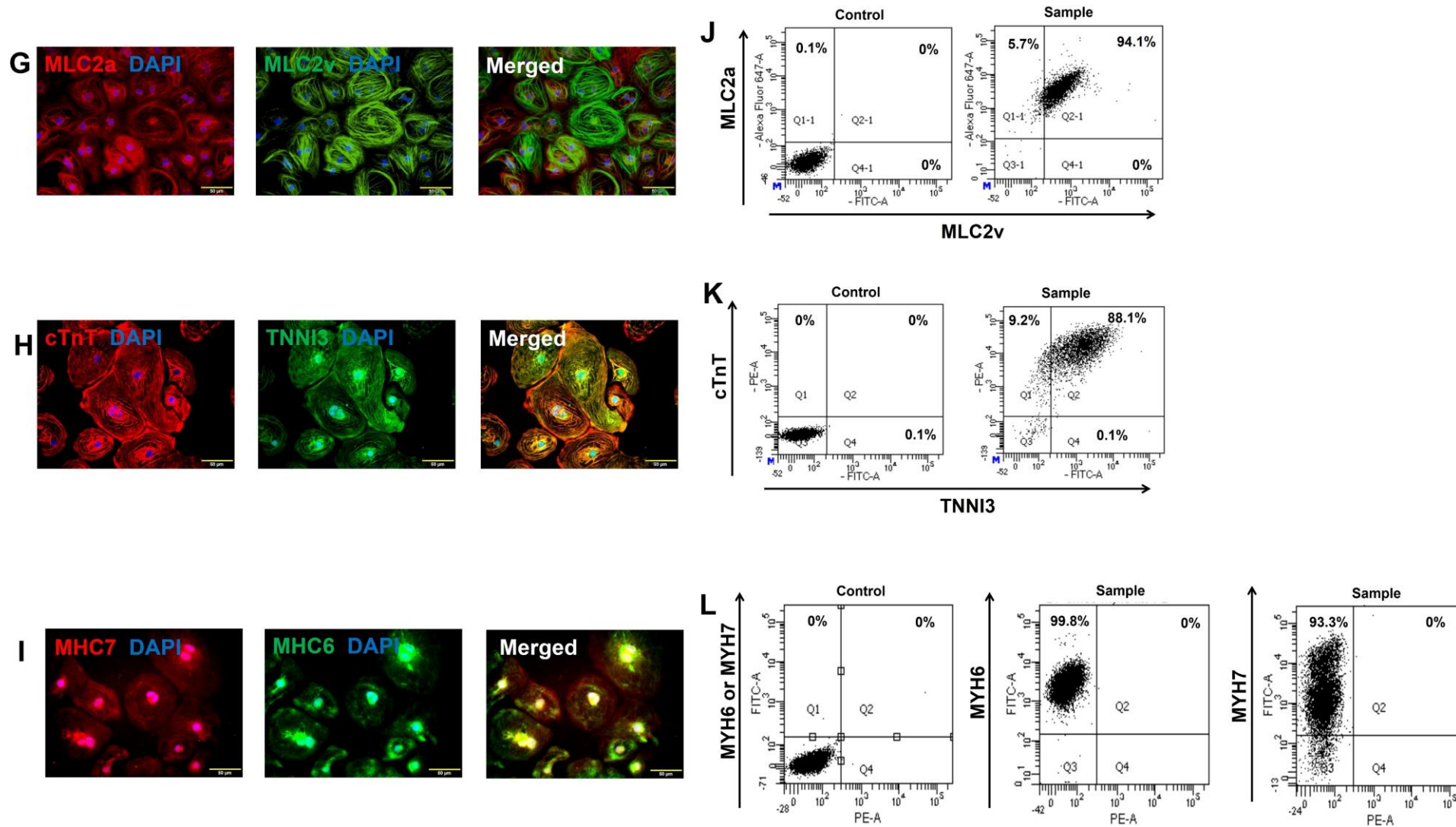


Figure S10. Fluorescence immunostaining of DMSO/AA treated DP3-CMs for protein expressions of MLC2a and MLC2v (**G**), cTnT and TNNI3 (**H**), and MYH6 and MYH7 (**I**). Flow cytometry analysis of DMSO/AA treated DP3-CMs for protein expressions of MLC2a and MLC2v (**J**), cTnT and TNNI3 (**K**), and MYH6 and MYH7 (**L**). (Bar = 50 μ m).

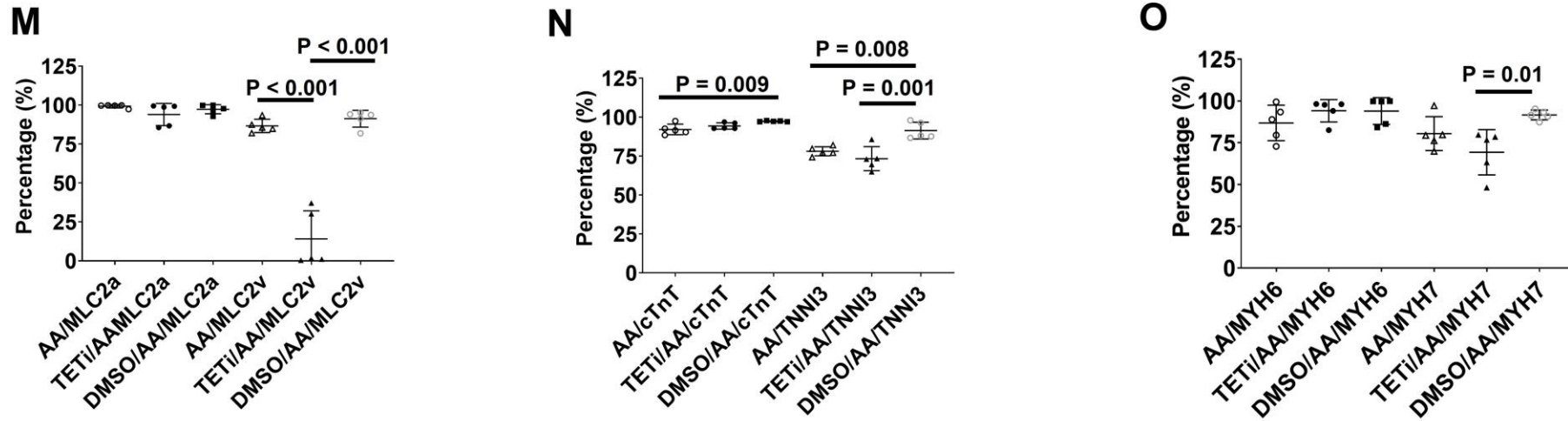


Figure S10. Quantification of AA, TETi/AA, and DMSO/AA treated DP3-CMs for protein expressions of MLC2a and MLC2v (**M**), cTnT and TNNI3 (**N**), and MYH6 and MYH7 (**O**). (n = 5 each. Values are presented as the means \pm SD. One-way ANOVA).

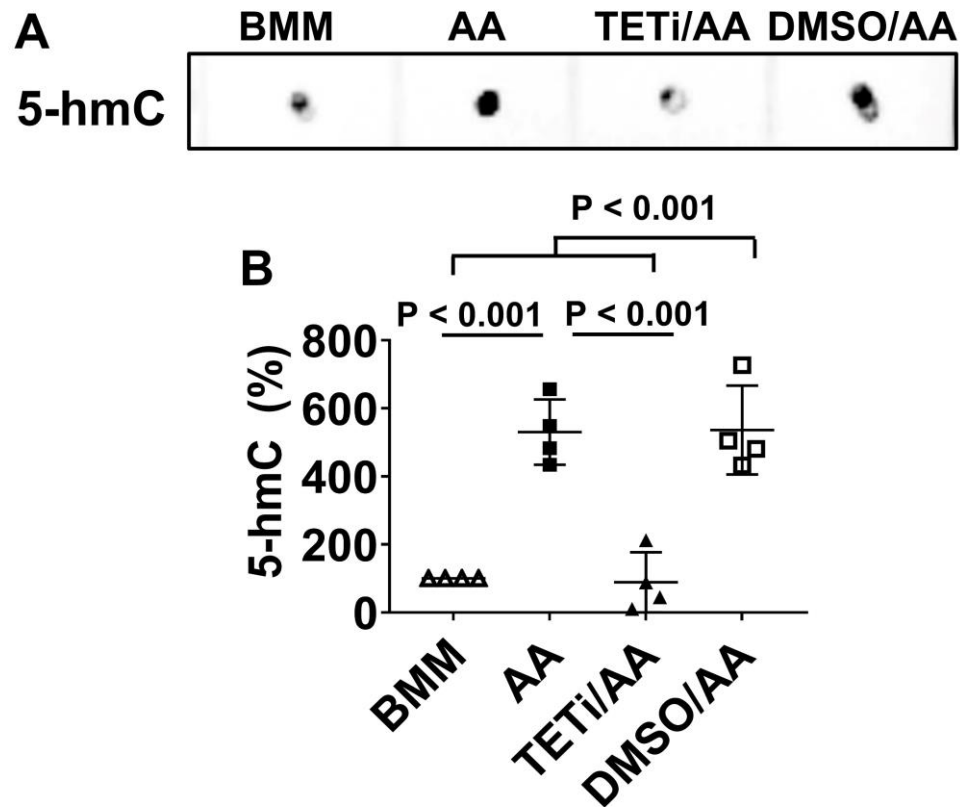


Figure S11. DNA dot plot analysis. Representative images of DNA dot-plot analysis (**A**) and quantification (**B**) for 5-hmC expression in BMM, AA, TETi/AA, or DMSO/AA treated DP3-CMs. (n = 4, values are presented as the means ± SD. One-way ANOVA).