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Data Article

Data supporting possible implication of APOBEC2 in self-renewal functions of myogenic stem satellite cells: Toward understanding the negative regulation of myoblast differentiation

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ABSTRACT

This paper provides *in vitro* phenotypical data to show that APOBEC2, a member of apoB mRNA editing enzyme, catalytic polypeptide-like family, may implicate in self-renewal functions of myogenic stem satellite cells, namely in the re-establishment of quiescent status after activation and proliferation of myoblasts in single-myofiber culture.

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Specifications Table

Subject area	*Biology*
More specific subject area	*Skeletal muscle biology, tissue-specific stem cell physiology*
Type of data	*Image (microscopy), graph*
How data was acquired	*Fluorescence Microscope (Leica DMI6000B fluorescence microscope equipped with a DFC365FX digital camera and LAS AF 3.1.0 software)*
Data format	*Raw (microscopy), analyzed (positive-cell counting)*
Experimental factors	*Single myofibers isolated from adult WT and APOBEC2-KO mice, cultured for 3 days in DMEM containing 10% normal horse serum and 0.5% chick embryo extract, and counted for Pax7/MyoD-positive cell % on fibers*
Experimental features	*Pax7/MyoD-immunofluorescence microscopy*
Data source location	*Fukuoka, Japan*
Data accessibility	*All relevant data are within the article*

Value of the data

- Resident myogenic stem satellite cell population observed here is a valuable target of research on postnatal muscle fiber growth, hyperplasia/hypertrophy, and regeneration after muscle injury.
- Molecular mechanism for myogenic cell fate determination, especially for “self-renewal” functions of satellite cells, is a big research subject and hence of value to the scientific community.
- APOBEC2 expression is predominant in skeletal and cardiac muscles and elevated exclusively at the early-differentiation phase of myoblasts in muscle regeneration; however the biological and physiological significance is still unknown.
- The particular idea of an essential role for APOBEC2 in the self-renewal functions may extend our understanding of the previous finding that APOBEC2 negatively drives regulation of myoblast differentiation and fusion (see Ref. [1]).

1. Data

We tested a hypothesis that APOBEC2 may be an important mediator in the “self-renewal” functions of satellite cells, namely in the re-establishment of quiescent status after activation and proliferation. *in vitro* experiments in mouse single-myofiber cultures prepared from APOBEC2-KO (A2KO) mice demonstrated a significant decrease in the population of Pax7(+) MyoD(−) quiescent satellite cells along with a complementary increase in Pax7(−) MyoD(+) early-differentiated myoblasts concerned in Ref. [1] ($p < 0.0005$) (Fig. 1), supporting a possible insight that APOBEC2 regulates a competitive balance between two trajectories of proliferated myoblasts during muscle regeneration: a return to cell quiescence which re-establishes the satellite cell pool and their differentiation and fusion which results in myotube formation.

2. Experimental design, materials and methods

2.1. Experimental design

To evaluate the above particular idea of a role for APOBEC2 in the self-renewal functions, single myofibers were isolated from wild-type (WT) and A2KO mice and assayed at 72 h post-plating for the population of Pax7(−) MyoD(−), Pax7(−) MyoD(+), Pax7(+) MyoD(+), and Pax7(+) MyoD(−) cells on fibers by immunofluorescence microscopy (see Fig. 1A).