Last Word on Point: Counterpoint: Satellite cell addition is/is not obligatory for skeletal muscle hypertrophy

Roddy S. O’Connor,1,2 Grace K. Pavlath,2 J. J. McCarthy,3 and K. A. Esser3

1Graduate Program in Molecular and Systems Pharmacology, 2Department of Pharmacology, Emory University, Atlanta, Georgia; and 3Department of Physiology, University of Kentucky, Lexington, Kentucky

To the Editor: The authors of the Point:Counterpoint debate (1, 2) collectively thank our colleagues for their thoughtful responses to the topic “Satellite cell addition is/is not obligatory for skeletal muscle hypertrophy.” While the goal of our initial position piece and rebuttal was to selectively present published data in a manner that supported our argument, all the authors recognize the lack of unequivocal data. However, as such, we believe that an active dialogue and debate is a healthy part of science and is especially useful in areas of controversy.

When we reviewed all the responses, we noted some common themes that emerged and we suggest that these provide a useful list of critical issues that need to be carefully considered in the research design of future studies. These issues include: the type of growth stimulus (i.e., hormonal vs. mechanical), the magnitude of the growth response, the age of the animal, potentially whether the animal is still in a more active growth phase, the species studied, and time of sampling after the applied stimulus.

In addition, the comments from Drs. Mantilla, Hikada, and Sieck (3) highlight the lack of consistent correlation between cytoplasmic volume and myonuclear number in muscle fibers. This variability suggests that increases in myonuclear number observed in some models of muscle growth cannot solely be the result of changes in fiber volume. Finally, as suggested by Dr. Bodine (3), we uniformly agree that the resolution of this debate requires the development of new methods/reagents, such as selective ablation of satellite cells, to directly assess the necessity of satellite cell addition for skeletal muscle hypertrophy.

REFERENCES


Address for reprint requests and other correspondence: G. K. Pavlath, Emory Univ., 1510 Clifton Rd., Rm. 5027, Atlanta, GA 30322 (e-mail: gpavlat@emory.edu) or K. A. Esser, Univ. of Kentucky, 800 Rose St., Lexington, KY 40536 (e-mail: karyn.esser@uky.edu).