

昆虫変態時における筋組織リモデリングの自己組織化 Self-organization of muscle remodeling during insect metamorphosis

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March 11, 2022, 13:00-14:00

Online Zoom meeting

<https://us02web.zoom.us/j/86255189485?pwd=YWZPTnNJTWkrN3diVXQ4c1RUSkwzdz09>
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Abstract:

During development and regeneration of the skeletal muscle in vertebrates and invertebrates, muscle precursors acquire the ability to migrate. However, how the migration of muscle precursor cells contribute to the muscle fiber formation *in vivo* has been largely unknown. During the *Drosophila* metamorphosis, the larval body wall muscles in the abdomen degenerate and adult muscles are newly formed within 4 days. This system provides an excellent opportunity to study behaviors and dynamics of migratory muscle precursor cells for the skeletal muscle formation *in vivo*. By establishing a long-term live imaging, I observed the process of adult muscle formation. Spheres that express a muscle marker are tightly associated with developing adult muscle fibers. Interestingly, these muscle spheres gradually disappeared and the adult muscles emerged at location where the muscle spheres were originally present. This result indicates that the muscle spheres contribute to the adult muscle formation. In order to identify the source of the muscle spheres, I observed earlier events of the muscle remodeling and found that the muscle spheres are derived from larval body wall muscles. These results raise an intriguing possibility that the old larval muscles may be recycled to generate the adult muscle. The larval muscle fibers undergo fragmentation. I found that the persisting muscle spheres moved around, shuffled and then eventually reassembled into an ordered pattern by 30 hours after the fragmentation. Since there is no apparent structure that prefigures the ordered reassembly, it is plausible that the muscle spheres organize the observed ordering *de novo*. I will discuss the cell swarm dynamics that enables the ordered reassembly of muscle fragments in a self-organizing manner.

The talk will be delivered in English. 発表言語は英語です

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