



CDB SEMINAR

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13:30~14:30 A7F Seminar Room

Role of programmed cell death in looping morphogenesis

Summary

During animal development, dynamic cellular behaviors, including cell movement, divisions and death, are precisely orchestrated. The execution mechanisms of complex behaviors has been mainly deciphered through the identification of conserved signaling pathways that control each cellular movement, however, how cellular behaviors regulate morphogenesis according to the developmental timetable is elusive. To understand the mechanisms of complex morphogenesis, we have investigated the development of *Drosophila* male terminalia. The *Drosophila* male terminalia is an asymmetric looping organ; the internal genitalia (spermiduct) loops dextrally around the hindgut. Mutants for cell death signal have the orientation defect of their male terminalia, indicating that cell death may contribute to looping morphogenesis.

We studied the role of cell death in the organogenesis of male terminalia using time-lapse imaging. In normal flies, genitalia rotation accelerated as development proceeded, to complete the full 360° rotation. The acceleration was, however, impaired by suppression of cell death. The acceleration was produced by two distinct rotations of the A8 segment that surrounded the male genitalia (A9 segment): inner ring primarily rotates with genitalia, and outer ring additionally rotates later to accelerate the primary rotation. Inhibition of cell death suppressed this additional rotation. Thus, we found that cell death coordinates two independent rotations, which drives the acceleration of genitalia rotation, enabling the complete morphogenesis of male genitalia within a limited developmental time window.

Host:

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