CDB SEMINAR

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16:00~17:00 A7F Seminar Room

Nematode Dauer Formation as a Case Study for Evolution of Developmental Plasticity

Summary

Developmental plasticity plays critical roles in the adaptation of many species and has been proposed to facilitate phenotypic evolution. One of few examples where genetic control of developmental plasticity is well-understood is dauer formation in *C. elegans*. Dauer is an arrested larval stage in nematodes that is specialized for survival and dispersal. In response to cues that indicate stressful environments, *C. elegans* redirects its development to form stress-resistant dauer larvae. Genetic control of *C. elegans* dauer formation is extensively studied and so far more than 20 genes are known to be involved in this process. To address how the genetic control of dauer formation evolved, I set out to study the regulation of dauer formation in a genetically tractable nematode *Pristionchus pacificus*. I found among the mechanisms involved in *C. elegans* dauer formation, an endocrine module employing a steroid hormone, dafachronic acid (DA), is conserved in *P. pacificus* dauer formation. The same endocrine mechanism is found to be also involved in the regulation of mouthform dimorphism that is a novel plastic trait in *Pristionchus* and related nematodes. Furthermore, DA is conserved in a parasitic nematode (*Strongyloides papillosus*) to regulate the formation of the infective larva that is a dauer-like larva essential for the host infection. These results suggest DA is a conserved steroid hormone for the regulation of developmental plasticity in nematodes. Implications of these findings for the evolution of nematode parasitism will be discussed.

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