

ASHBi SEMINAR

Modular control of time & space during vertebrate axis segmentation

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Date **Tuesday, 4 June 2024**

Time **14:00 – 15:00 [JST]**

Venue **Conference Room Onsite Only***

B1F, Faculty of Medicine Bldg. B

*Register via the right QR code



Abstract

How the timing of development is linked to organismal size is a longstanding question. Numerous studies reported a correlation of temporal and spatial traits, yet, the developmental or selective constraints underlying this link remain largely unexplored. We address this question by studying the periodic process of embryonic axis segmentation *in-vivo* in *Oryzias* fish. Our interspecies comparison revealed that the timing of segmentation correlated to segment, tissue and organismal size. Segment size in turn scaled according to tissue and organism size. To probe for underlying causes, we genetically hybridised two closely related species. The quantitative analysis in ~600 phenotypically diverse F2 embryos revealed a decoupling of timing from size control, while spatial scaling was preserved. Using developmental quantitative trait loci (*devQTL*) mapping we identified distinct loci linked to either the control of segmentation timing or tissue size. This study demonstrates that a developmental constraint mechanism underlies spatial scaling of axis segmentation, while its spatial and temporal control are dissociable modules.

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