アドバンス生命理学特論 Topics in Advanced Biological Science

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The kynurenine pathway at the intersection of aging, metabolism, and learning capacity

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Aging is generally characterized by the diminution of cognitive functions. Aging is also one of the greatest risk factors for neurodegenerative disorders. Based on experiments in *C. elegans* and mice, we hypothesize that age-dependent accumulation of a single, neuromodulatory metabolite, kynurenic acid (KYNA), is a significant reason for age-associated declines in learning and memory. In turn, our data suggest that the beneficial effects of dietary restriction on enhanced learning capacity can be, at least in *C. elegans*, largely accounted for by reductions in KYNA. Our findings indicate that reducing neural KYNA levels confers improved learning and memory capacity even to aged *C. elegans*. Finally, we have identified a novel small molecule that allows us to reduce KYNA levels. Treatment of worms and mice with this small molecule results in enhanced performance in several learning paradigms in these species. Our overall hypothesis is that modulation of KYNA levels provides a specific and direct mechanism for improving cognitive function in the course of aging and potentially neurodegenerative disorders.

*Talk in English

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理学南館１階セミナー室

Seminar Room, 1st Floor, Science South Building

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