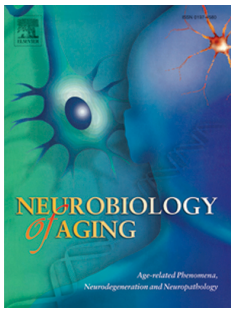
Accepted Manuscript



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PII: S0197-4580(18)30071-X

DOI: 10.1016/j.neurobiolaging.2018.02.027

Reference: NBA 10180

To appear in: *Neurobiology of Aging*

Received Date: 22 August 2017

Revised Date: 26 January 2018

Accepted Date: 27 February 2018

Please cite this article as: Augustin, H., McGourty, K., Allen, M.J., Adcott, J., Wong, C.T., Boucrot, E., Partridge, L., Impact of insulin signaling and proteasomal activity on physiological output of a neuronal circuit in aging *D. melanogaster*, *Neurobiology of Aging* (2018), doi: 10.1016/j.neurobiolaging.2018.02.027.

Impact of insulin signaling and proteasomal activity on physiological output of a neuronal circuit in aging *D. melanogaster*

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Abstract

The insulin family of growth factors plays an important role in development and function of the nervous system. Reduced insulin and insulin-growth-factor signalling (IIS), however, can improve symptoms of neurodegenerative diseases in laboratory model organisms and protect against age-associated decline in neuronal function. Recently, we showed that chronic, moderately lowered IIS rescues age-related decline in neurotransmission through the *Drosophila* Giant Fiber escape response circuit (Augustin et al., 2017). Here, we expand our initial findings by demonstrating that reduced functional output in the GFS of aging flies can be prevented by increasing proteasomal activity within the circuit. Manipulations of IIS in neurons can also affect longevity, underscoring the relevance of the nervous system for aging.

1. Introduction

Aging neural circuits undergo morphological and functional changes that underlie different types of behavioral impairment (Hof and Morrison, 2004). In humans, circuit-level changes during normal, non-pathological aging affect gustatory function