

## Einladung zum 89. ZEBET-Seminar

### Spermidine protects from age-induced memory decline

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Memories are acquired and stored through adaptive changes in the structure and functional performance of synapses. While the formation of memory declines with advancing age, the synaptic basis of this phenomenon remains unexplained. We recently found that simple feeding of the polyamine spermidine suppressed the age-dependent memory impairment by reinstalling efficient autophagy in aged *Drosophila* brains. I will report the unexpected finding that aging results in a substantial increase in release of synaptic vesicles in response to natural stimuli (odors). Meanwhile, the odor-evoked Ca<sup>2+</sup> activity remained unchanged in aged animals. Accordingly, we found the molecular components and the ultra-structural morphology of pre-synaptic active zones to be specifically elevated with advancing age. Dietary supplementation of spermidine abolished these changes in an autophagy-dependent manner. Furthermore, genetically induced increases of the active zone component Bruchpilot hampered memory formation in young flies. Our data suggest that an age-induced “ramp-up” of presynaptic activity locks synapses in an inflexible state, thereby increasing the threshold for formation of new memories, and that elevating the spermidine levels might be effective in counteracting these age-induced synaptic changes and suppress age-dependent memory impairment.

**TERMIN: Montag, 13. Juli 2015, 10:00 – 11:30 Uhr**

**ORT:** Bundesinstitut für Risikobewertung (BfR)  
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