

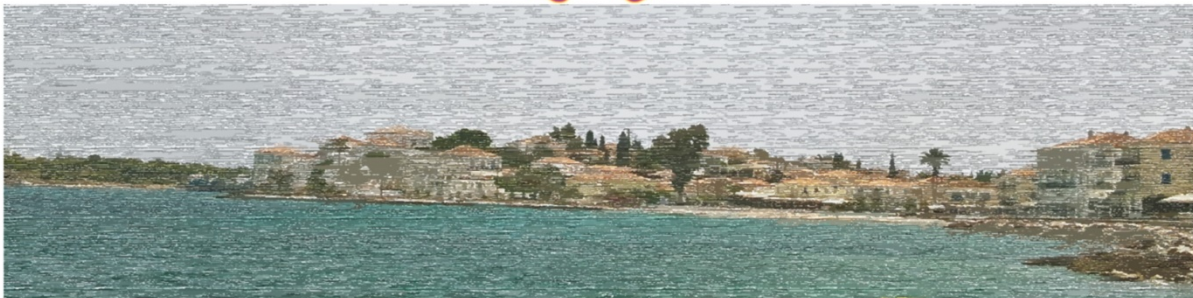
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Calorie restriction changes long-term and short-term memory in rats in an onset-, duration- and sex-dependent manner

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Calorie restriction (CR) is known as a potent intervention to prolong lifespan and healthspan. However, in recent studies it was shown that its effect is not universally beneficial, but it can vary from protective to detrimental depending on age when implemented and its duration. Herein, we tried to examine the effect of CR on short-term and long-term memory.

Ad libitum (AL) fed animals were used as controls. Wistar rats of different age (adult, middle-aged and aged) were exposed to CR (60% of AL), to examine the effect of early-onset CR (EOCR) and late-onset CR (LOCR). Novel object recognition test (NORT) was used to assess short-term (STM) and long-term memory (LTM) performance.

Different pattern of changes was observed in males and females. While preserved memory was only measured in young AL males, in females both EOCR and LOCR managed to preserve STM till 18 months of age, while LTM was preserved only with EOCR. In 24-month-old females LOCR failed to preserve memory and even worsened STM and LTM performance in comparison to the age matching AL controls, while in males neither EO- nor LOCR had effect on memory performance. EOCR succeeded to preserve STM and LTM in females, but till certain point in life. LOCR however seemed to have diametrically different effect depending on whether it was implemented at middle age or old age. Memory performance of male rats in NORT seems to be insensitive to CR treatments, since only young animals had ability to discriminate novel from old object.