**B21**

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**KIBRA-PKMζ complexes in long-term memory maintenance of spatial memory and APP/PS1 mice, an Alzheimer's Disease model.**

Background: Francis Crick recognized a fundamental problem in the study of memory— how short-lived synaptic molecules could sustain memories that last for months to years (1). Recently a possible solution was proposed to be the persistent molecular interaction between KIBRA and PKMζ. KIBRA, a postsynaptic scaffolding protein that is genetically linked to human memory performance, complexes with PKMζ, thereby anchoring the constitutively active kinase at activated synapses to maintain long-term potentiation (LTP). Here we show that KIBRA-PKMζ complexes are persistently increased in hippocampus following a spatial memory task and decreased in Alzheimer's disease model mice.

Methods: Mice were trained in active place avoidance, which requires mice to avoid a stable shock zone on a rotating arena. After 24 hours, a retention test was performed and hippocampi were analyzed by immunohistochemistry (IHC) to study the overlapping signal of KIBRA & PKMζ.

Results: Training showed a significant effect on performance ($n = 12$) ($F_{2,22} = 23.93$, $P < 0.00001$, $\eta_p^2 = 0.68$). This effect corresponds to increased KIBRA-PKMζ colocalization signal by IHC in CA1 and dentate gyrus. We've also shown that KIBRA and PKMζ are decreased in 24-month old APP-PS1 mice CA1.

Conclusion: Quantitative IHC and behavioral data suggest that putative KIBRA-PKMζ complexes are involved in maintenance of behavioral memory. Future experiments can confirm complex formation with PLA. Downregulation of both these proteins in Alzheimer's disease model mice suggests that decreased KIBRA-PKMζ complexes may underpin the principal symptom of retrograde amnesia.