TEMS TLL External Monthly Seminar

17 APR 25 THURSDAY 3PM
TLL AUDITORIUM LEVEL 1

Circadian Rhythms in Aedes Mosquitoes

Circadian clocks regulate vital behaviors in organisms, including mosquitoes, affecting flight, mating, and blood-feeding. In Aedes aegypti, a vector of dengue and Zika, we studied the roles of CYCLE (CYC) and CLOCK (CLK) proteins in the brain. Using immunohistochemistry and knockout mutants, distinct patterns of CYC and CLK were observed in clock neurons, with CYC essential for rhythmic activity and CLK influencing neuronal stability. RNA sequencing of mutant heads revealed alterations in circadian and sensory genes, suggesting roles in host-seeking. Behaviorally, CYC mutants showed increased host-seeking activity. These findings clarify CYC and CLK's roles in Ae. aegypti circadian regulation, linking core clock genes to vector behavior. This insight could support new strategies to manage mosquito-borne diseases by targeting circadian-based behaviors.

Recent Publications:

1. Huang Y-N, Lee K-Y, Shiao S-H, **Chen C-H**, Yu G-Y, Yu M-J*. Bloodmeals fueldengue virus replication in the female mosquito Aedes aegypti. J Virol.2024 Jul 23;98(7):e0070124. doi: 10.1128/jvi.00701-24. Epub 2024 Jun 18. PMID:38888345; PMCID: PMC11265399.
2. Chang YC, Liu WL, Fang PH, Li JC, Liu KL, Huang JL, Chen HW, Kao CF, **Chen CH***. Effect of C-type lectin 16 on dengue virus infection in Aedes aegypti salivary glands. PNAS Nexus. 2024 May 16;3(5):pgae188. doi:10.1093/pnasnexus/pgae188. PMID: 38813522; PMCID: PMC11134184.
3. Deshpande P , Chen CY , Chimata AV , Li JC , Sarkar A , Yeates C **Chen CH*** , Kango-Singh M* , Singh A* miR-277 targets the proapoptotic gene-hid to ameliorate Aβ42-mediated neurodegeneration in Alzheimer's model. Cell Death & Disease, 18 Jan 2024, 15(1):71

Hosted by Dr Cai Yu

Speaker

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Dr. Chun-Hong Chen earned his B.S. and M.S. from National Taiwan University and his Ph.D. from Yang Ming University. He joined NHRI in 2009, where he now serves as Executive Secretary of the National Mosquito-Borne Disease Prevention and Research Center. His research includes gene drives, transgenic mosquito studies, and mitochondrial dynamics, with over 90 publications, including 46 since 2020.

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