219th WPI-IIIS Seminar

The Convergent Evolutionary Roots of Sleep: From Genomic Imprinting to Out-of-Africa Migration of *Homo Sapiens*

Genomic imprinting is an evolutionarily convergent mechanism that regulates allelic expression while introducing non-genetic stochasticity into biological systems. Challenging earlier theories that imprinting minimizes transcriptional variance, our findings reveal that it amplifies genetic noise, influencing both imprinted genes and their co-expressed counterparts. This positions imprinting as a key regulator of neurodevelopment, with significant implications for sleep regulation. To investigate this novel aspect of sleep biology, we continuously adopt a multidisciplinary approach encompassing cellular, *in vitro* and *in vivo* mouse models, computational analyses, and evolutionary human studies. Our research uncovered cellular calcium dynamics and identified novel genes with haplotypes linked to *Homo sapiens*' adaptation into Eurasia, highlighting symmetrical evolutionary adjustments in diverse modern populations.

Overall, this unconventional approach in the field of sleep emphasize the critical role of convergent evolution in shaping the genetic and epigenetic mechanisms underlying sleep and circadian biology, particularly in response to environmental adaptation.

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Date: **Friday, January 24, 2025**

Time: **10:30 – 11:30**

Venue: **1F Auditorium, IIIS Building**

✻On-site participation only

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MOONSHOT RESEARCH & DEVELOPMENT PROGRAM

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