DNA Replication – From Yeast to Human

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The DNA replication mechanism is highly conserved in eukaryotes yet must adapt to the diverse life styles of the myriads of species within the kingdom. I will discuss two specific DNA replication complexes, the origin recognition complex, ORC [1, 2] and the MCM double hexamer bound by its activator, the Dbf4-Cdc7 kinase [3], as examples of how the DNA replication machinery evolves to adapt to the very different life cycles adopted by yeast and human.

References:

[1] Li, N, Lam WH, Zhai Y, Cheng J, Zhao Y, Gao, N and Tye, BK. *Nature* 559:217-222 (2018) Structure of the Origin Recognition Complex Bound to DNA Replication Origin

[2] Lee CSK, Cheung MF, Li J, Zhao Y, Lam WH, Ho V, Rohs R, Zhai Y, Leung D, Tye BK. *Nat Commun* 12:33 (2021) Humanizing the Yeast Origin Recognition Complex.

[3] Cheng J, Li N, Huo Y, Dang S, Tye BK, Gao N, Zhai Y. *Nat Commun* 13:1396 (2022) Structural Insight into the MCM Double Hexamer Activation by Dbf4-Cdc7 Kinase.