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Circadian genes *CLOCK* and *BMAL1* in cancer: mechanistic insights and therapeutic strategies

Key words: Circadian rhythm; Circadian locomotor output cycles kaput (*CLOCK*); Brain and muscle ARNT-like 1 (*BMAL1*); Cancer; Therapy

Research Summary

This review systematically synthesizes current knowledge on the mechanistic roles of the circadian rhythm genes CLOCK and BMAL1 in tumorigenesis and explores emerging related therapeutic strategies.

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Innovation points

- **Introduction** of the roles of CLOCK and BMAL1 in tumorigenesis through regulating the cell cycle, DNA damage response, cellular metabolism, and tumor microenvironment.

- **Summary** of therapeutic strategies targeting CLOCK and BMAL1 in the context of chrononutritional interventions, chronopharmacological modulation, and chronotherapy optimization.

- **Emphasis** of is on the implications of the non-canonical function of CLOCK as an acetyltransferase in oncology.

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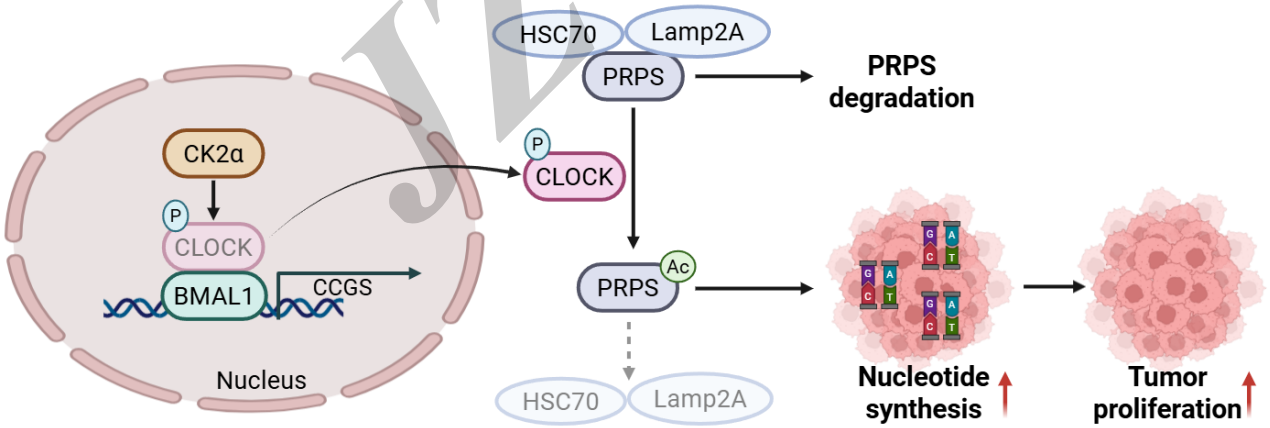

Non-canonical function of CLOCK