

Effects of protein phosphorylation inhibitor on the mating reactivity rhythm in *Paramecium bursaria*

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Paramecium bursaria shows circadian rhythms such as mating reactivity and photoaccumulation. It has been reported that the circadian rhythm mechanism includes the process of protein phosphorylation in many kinds of organisms. To understand the functions of protein phosphorylation in the circadian rhythm system in *Paramecium bursaria*, we examined the effects of the protein phosphorylation inhibitors 6-DMAP and CKI-7. The period of the mating reactivity rhythm was lengthened by treatment with 6-DMAP (6-dimethylaminopurine), suggesting that the circadian clock system includes the process of protein phosphorylation. Mating reactivity can be induced by a short light pulse at the subjective night in constant darkness. This induction of mating reactivity was also repressed in a concentration-dependent way by treatment with 6-DMAP, indicating that protein phosphorylation is part of the process of intracellular signal transduction. Next, we examined another protein phosphorylation inhibitor, CKI-7 (N-(2-aminoethyl)-5-chloro-isoquinoline-8-sulfonamide), which inhibits DBT (which phosphorylates the clock protein PER in *Drosophila*). The period length of the mating reactivity rhythm was not changed in *P. bursaria* by CKI-7. This suggests that the mechanism of the circadian clock system of *P. bursaria* is different from the *Drosophila* system.