Frontier Bioscience Seminar at Osaka University, Suita Campus

Hypothalamic control of mouse daily torpor.

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Abstract:
Hibernators save energy by entering torpor, a state characterized by active hypometabolism and low body temperature, to survive harsh environmental conditions in winter. Torpor can be found in a wide variety of homeothermic animals including bats, rodents and primates. Laboratory mice go into a short torpid state called daily torpor when they are fasted at cold ambient temperature. Although it is presumed that torpor is regulated by the central nervous system, the exact neuronal mechanism by which mice regulate daily torpor remains unclear. Using immediate early gene mapping and selective manipulation of neuronal circuits, we found that the activities of TRPM2 ion channel expressing neurons in the medial preoptic hypothalamus and VGAT-positive GABAergic neurons in the dorsomedial hypothalamus are essential for the induction of daily torpor in mice. This study is opening a new avenue of the neuronal mechanism of torpor and hibernation.

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