

Principal Researcher	Ken-ichi Honma			Number of Researchers	5	
Research Institution • Department • Title	Professor, Graduate School of Medicine, Hokkaido University,			Location of Institution	Sapporo City	
Title of Project	Understanding of the Biological Clock as a System					
Abstract of Research Project	<p>The aim of this research project is to understand the mammalian biological clock (s) as a system from molecular to behaviors.</p> <p>The molecular mechanism of circadian oscillation is investigated in the neurons of the hypothalamic suprachiasmatic nucleus (SCN) where the mammalian biological clock is located. The oscillation system is believed to involve transcriptional/translational auto-feedback loops in which multiple clock genes participate. In this project, the loop system and its dynamics are elucidated. Furthermore, transduction pathways of the circadian signals from the molecular loop to the cellular functions such as firing activity of the neuron are identified. The biological clock in the SCN consists of multiple neurons. The intercellular communication and mutual interaction of the oscillating neurons are critical for the generation of the SCN circadian rhythms. Their mechanisms are investigated. Thereby we clarify the organization of two sub-oscillating systems in the SCN which are hypothesized to exist from behavioral studies. Finally, the mechanism of interaction is investigated between the SCN circadian pacemaker and non-SCN pacemaker which directly drives the behavioral rhythms.</p> <p>The present research project is unique in understanding the functions of biological clock at the molecular, cellular and behavioral levels and integrating the hierarchical and multi-oscillatory system.</p>					
References	<p>S.Honma, ..Y.Kato and K.Honma. <i>Dec1</i> and <i>Dec2</i> are regulators of the mammalian molecular clock.. Nature, 149:821-824(2002)</p> <p>W.Nakamura, S.Honma,...and K.Honma. <i>Clock</i> mutation lengthens the circadian period without damping rhythms in individual SCN neurons. Nature Neurosci., 5:399-400 (2002)</p>					
Term of Project	Fiscal years 2003-2007 . (5years)					
Budget Allocation (in thousand of yen)	FY2003	FY2004	FY2005	FY2006	FY2007	TOTAL
	35,000	18,800	11,600	11,600	9,900	86,900
Homepage Address	http://www.med.hokudai.ac.jp/~phys-1w/					