IBS Center for Molecular Spectroscopy and Dynamics

COLLOQUIUM

- SPEAKER

  Dr. Jin Hee Hong (Department of Physics, Korea University)

- TITLE

  Circadian Waves of Cytosolic Calcium Concentration and Long-range Network Connections in Rat Suprachiasmatic Nucleus

- ABSTRACT

  The suprachiasmatic nucleus (SCN) is the master clock in mammals governing the daily physiological and behavioral rhythms. It is composed of thousands of clock cells with their own intrinsic periods varying over a wide range (20 ~ 28 h). Despite this heterogeneity, an intact SCN maintains a coherent 24 h periodic rhythm through some cell-to-cell coupling mechanisms. This study examined how the clock cells are connected to each other and how their phases are organized in space by monitoring the cytosolic free calcium ion concentration of clock cells using the calcium binding fluorescent protein, cameleon. Extensive analysis of 18 different organotypic slice cultures of SCN showed that the SCN calcium dynamics is coordinated by phase-synchronizing networks of long-range neurites as well as by diffusively propagating phase waves. The networks appear quite extensive and far-reaching, and have a role of expediting the conduction of circadian phase information throughout the SCN.
  Taken together, our study suggests that the network of long-range cellular connectivity has an important role for the SCN in achieving its phase and period coherence.

- DATE AND VENUE

  January 18, 2017 (Wednesday, 5:00-6:00 p.m.)
  Seminar room 116, KU R&D Center

- Language

  Korean