Fall 2012

The Ontogeny of Circadian Timing in the Mouse Suprachiasmatic Nucleus

Anne Sun
Washington University in St Louis

WUURD, the Washington University Undergraduate Research Digest, is published by the Office of Undergraduate Research once a semester each academic year. Applications for submission and Statement of Editorial Policy may be found online.

Follow this and additional works at: http://openscholarship.wustl.edu/vol8_iss1

Recommended Citation
Sun, Anne, "The Ontogeny of Circadian Timing in the Mouse Suprachiasmatic Nucleus " (2012). Washington University Undergraduate Research Digest, Volume 8, Issue 1.
http://openscholarship.wustl.edu/vol8_iss1/143

This publication is brought to you for free and open access by the Office of Undergraduate Research through Washington University Open Scholarship. For more information, please contact digital@wumail.wustl.edu
The Suprachiasmatic Nucleus (SCN) is situated directly above the optic chiasm and is a circadian pacemaker that regulates daily physiology and behavior, such as sleep and wake, physical activity, hormone levels, and body temperature. However, it is not known which cellular and molecular processes and connections generate and regulate circadian rhythms during the development of the SCN. Since the peak of neurogenesis occurs prior to birth, we hypothesize that by day 16 of gestation, neurons in the SCN are rhythmic. Furthermore, because neurogenesis in the SCN is complete prior to birth, we hypothesize that neurons in the SCN are rhythmic and synchronized in postnatal mice. In mammals, the Period 1 and 2 genes are essential in sustaining cellular circadian rhythms. We used PER2::LUCIFERASE knock-in mice to record bioluminescence as a reporter of PER2 protein levels from cells in bilateral SCN explants, using both photomultiplier tubes and cameras. We found that the neurons in the SCN were synchronized to each other in the postnatal day 1 (P1) SCN with a period of ~23.03 hours (n= 10; mean +/- 0.68). We found similar results in the P3 SCN (n=1). Thus we can conclude that by postnatal day 1, SCN cells are circadian and synchronized to each other indicating that cell-cell communication had developed.