



SPRING 2022

**Biochemistry and Molecular Biology
Brown Bag Series**

Billy Cvammen

BMS Ph.D. Student

***“Examination of circadian clock gene expression in
human skin explants and pharmacological
modulation with small molecule compounds”***

Tuesday, January 24, 2023

11:00 AM

Location 302 Oelman Hall

**Lab:
Mike Kemp, Ph.D.**



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<https://science-math.wright.edu/biochemistry-and-molecular-biology>

Abstract

Examination of circadian clock gene expression in human skin explants and pharmacological modulation with small molecule compounds.

The circadian clock regulates diverse physiological processes throughout the body, including in the skin. Though circadian rhythms have been monitored in various animal tissues *ex-vivo*, they have not yet been reported in human skin explants. Using discarded panniculectomy skin, we examined the epidermal mRNA expression of core circadian clock genes over the course of 24 hours. Though significant inter-individual variation in expression was observed, the compiled averages suggest that discarded surgical skin may be a useful *ex-vivo* model system for studying the skin circadian clock. We further examined whether expression of known clock-control genes can be altered by pharmacological manipulation. Skin explants were topically treated with 100 μ M of both the cryptochrome inhibitor KS15 and REV-ERB antagonist SR8278. Variable responses were observed among the different skin samples, with significant enhancement of circadian genes observed in some samples but repression seen in others. Thus, further work is needed to understand how clock-modulating compounds impact clock-regulated genes in human skin epidermis. Nonetheless, this work is the first to analyze the expression patterns of circadian genes in human skin explants and sets the stage for utilizing this model system to better understand and study pharmacological interventions relevant to the human skin circadian clock.