



Total Sleep Deprivation for 24 h may have Effects on Immune Function and Platelet Activation in Humans

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Dear Editor,

Sleep, a basic requirement for maintaining a healthy lifestyle, is extremely important for sustaining human life. However, millions of people around the world lack sleep. With the development of the economy and the increasing pace of life, activities such as study, work, and recreation are taking up human sleep time all the time. Disruptions in the sleep/wake cycle are usually caused by people staying awake due to their work or lifestyle choices. In such a competitive society today, the phenomenon of voluntary sleep reduction behaviors is naturally becoming more prevalent. There is a widespread belief that to achieve self-acceptable and desirable performance, greater effort and more time must be devoted to work and study, even at the expense of sleep. In recent years, with the increase in the use of mobile phones, computers and other electronic network media, the burden of human work tasks has been increasing, thus also leading to a further reduction in human sleep time. Sleep Deprivation (SD) is a condition in which the duration and quality of sleep is reduced and sleep is frequently interrupted [1-2]. The risk to human health from early sleep deprivation is difficult to detect, and modern medical testing equipment is difficult to determine accurately before it causes significant organic damage to the body. Proteomics holds great promise for understanding human physiology, developing health biomarkers, and precision medicine. Based on such considerations, a plasma diagnostic marker panel would, if applicable, constitute a nearly ideal test for SD.

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Received Date: 05 Nov 2020

Accepted Date: 08 Dec 2020

Published Date: 14 Dec 2020

Citation:

Yan B, Wang F, Ma T, Liu C. Total Sleep Deprivation for 24 h may have Effects on Immune Function and Platelet Activation in Humans. *Clin Surg*. 2020; 5: 3017.

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Recently, we have obtained preliminary results on the quantitative proteome of plasma samples from five healthy men by combining a series of cutting-edge techniques such as TMT labeling, high-performance liquid chromatography grading, and mass spectrometry-based quantitative proteomics. In order to minimize differences in findings that could lead to gender confounding, the current study included only males. Our researchers have recruited 5 young healthy male volunteers at a local university institute. In this study, we identified a total of 876.0 proteins, of which 690.0 proteins contained quantitative information. If 1.2-fold is used as the threshold for differential expression change, and statistical test t-test p-value <0.05 is used as the threshold for significance, then among the proteins quantified, we found 13 proteins whose expression was up-regulated and 12 proteins whose expression was down-regulated in the comparison group before and after sleep deprivation. In the results of this study, we found that these proteins with significant differences are closely related to human immune function and platelet activation. It can be tentatively suggested that total sleep deprivation in humans may have an impact on the immune system and circulatory system. By reviewing the relevant literature, in fact, scholars have previously identified 30 proteins that show strong circadian cycle regulation. Alterations in proteins have been linked to biological pathways such as immune function, metabolism, and cancer [3]. In previous studies, there has been a link between sleep deprivation and platelet activation and immunity. However, our findings are novel and have never been previously reported in the literature.

Next, we will further perform a systematic bioinformatics analysis (protein function annotation) of all identified proteins and perform functional classification, functional enrichment and clustering analysis based on functional enrichment of all differentially expressed proteins.

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