Spermatogenesis may be reflected through male rat urinary proteome changes after mating

GA, UNITED STATES, October 11, 2024 /EINPresswire.com/ -- Urine proteome of male rats on mating day and next day compared. 54 differential proteins identified, most related to spermatogenesis, showing potential of urine proteome for study.

Urine is sensitive to bodily changes and can distinguish normozoospermic infertile men from fertile ones through metabolomics. However, urine proteomics has not been studied for monitoring spermatogenesis, the process where spermatogonial cells divide and differentiate into mature sperm.

In a study (doi: https://doi.org/10.1016/j.abst.2024.08.003) by researchers from Gene Engineering Drug and Biotechnology Beijing Key Laboratory at Beijing Normal University, the urinary proteome of male rats on the day of mating and the following day was examined.

“Surprisingly, nearly two-thirds of these differential proteins were related to spermatogenesis,” shares Youhe Gao, senior and corresponding author of the study. "We initially wondered if it was caused by semen contamination.”

“At a later time point, however, there were more sperm-related proteins. If it was semen contamination, it would not have persisted as urine would have removed the semen contamination,” chimed in first author Haitong Wang.

Notably, this finding suggests that the urine proteome has the potential to reflect spermatogenesis without interfering with it, unlike methods that study spermatogenesis through semen collection, which can disrupt the process. “Almost all the differential proteins were present in higher concentrations at the later time point,” adds Wang.

The researchers reported that they used a more reliable label-free quantitative proteomics technique for analyzing proteomes.

“The identification of these differential proteins provides new insights into the biological pathways and processes involved in spermatogenesis,” says Gao. “It could potentially lead to the development of new diagnostic methods or targets for treating abnormal spermatogenesis in males.”

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