

## **Are male mice better test subjects for behavioral phenotyping?**

Fritz AK (1,2), Wolfer DP (1,2)

(1) Institute of Anatomy, University of Zurich, Switzerland

(2) Institute for Human Movement Sciences and Sport, ETH Zurich, Switzerland

Many researchers still prefer to use only males for the behavioral screening of mice, typically stating that female mice perform more variably due to their estrus cycle. Male mice are sometimes also said to perform better in spatial tasks. Even though some studies seem to support these claims, unequivocal evidence is lacking. We addressed the question by a retrospective analysis of 5550 mice which had performed the same place navigation protocol in the water-maze and of 4850 mice tested in the same open field arena.

Water-maze data comprised 550 experimental and control groups containing both male and female subjects. We found significant sex effects in favor of males in most training and probe trial measures, but on average they explained less than 1% of the variance in the data. Open field data from 480 mixed groups revealed that females were overall more explorative and deposited less fecal boli, but again effect sizes were very small. Comparison of standard deviations between female and male subgroups revealed no consistent difference. While variability was slightly higher in females for some measures of place navigation acquisition and open field behavior, the opposite was seen in many measures of spatial retention.

In conclusion, we cannot confirm the notion that male mice generally yield more reliable data. Sex differences in water-maze performance and open field behavior were present in a very large population, but excessively small. Our data do not support the recommendation to use only male mice for behavioral phenotyping.