

## **P-381 - GENETIC AND CORRELATION ANALYSIS OF SPATIAL LEARNING OF THE RAT HXB/BXH RECOMBINANT INBRED STRAINS IN THE CAROUSEL MAZE, A SPATIAL AVOIDANCE PARADIGM**

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**Introduction:** Genetic basis of complex traits including behavioral phenotypes are often studied in animal (such as rodent) sets of the recombinant inbred (RI) strains. This study evaluated hippocampus-dependent learning in the active place avoidance, referred here to as Carousel maze, in the HXB/BXH recombinant inbred (RI) strains (N = 30) derived from SHR/Ola and BN-Lx/Cub strains.

**Methods:** The Carousel maze involves avoidance of a stable unmarked sector on a slowly rotating circular arena. Moreover, we recorded the open-field behavior and beam-walking performance in the RI set.

**Results:** We observed large inter-strain variability in the carousel arena performance and analysis of within/between-strain variances suggested a significant heritability. We have analyzed possible genetic determinants of this parameter using a web-based tool [www.genenetwork.org](http://www.genenetwork.org). We detected no significant QTL for learning, suggesting that learning in HXB/BXH RI strains is determined by many loci rather than oligogenetically. From previously published phenotypes, we observed significant correlations of maximum time avoided on the final reversal session with several metabolic and cardiovascular traits. Maximum time avoided on the final reversal session also showed two suggestive QTLs and a significant QTL for locomotor activity. Several correlations with cardiovascular traits were detected.

**Conclusions:** A more detailed elaboration of behavioral parameters including further QTL mapping and also analysis of covariance of multiple parameters from the Carousel maze and open-field test with physiological traits and gene expression will contribute to understanding of regulatory genetic relationships between these phenotypes. The study was supported by GACR P303/10/J032, DFG KE615/8-1 and MSMT LC554 and 1M0517.