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BXD recombinant inbred strains participate in social preference, anxiety and depression behaviors along sex-differences in cytokines and tactile allodynia

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Highlights

- BXD84/RwwJ recombinant inbred strain exhibits anxiety disorder and socialavoidance-like behavior.
- BXD21/TyJ recombinant inbred strain shows a resistance to depression illness.
- Sex-dependent cytokine profiles and allodynia with elevated inflammatoryactivity were inherent to male BXD21/TyJ recombinant inbred mice.
- Dysregulation of oxidative system was not observed in BXD recombinant inbredstrain mice at 7 months-of-age in cortex.
- The studies establish data in favor of the use of BXD recombinant inbred mice to further understand anxiety and depression disorders.

Abstract

Depression and anxiety are the most common psychiatric disorders, representing a major public health concern. Dysregulation of oxidative and inflammatory systems may be associated with psychiatric disorders, such as depression and anxiety. Due to the need to find appropriate animal models to the understanding of such disorders, we queried whether 2 BXD recombinant inbred (RI) mice strains (BXD21/TyJ RI and BXD84/RwwJ RI mice) and C57BL/6 wild-type mice show differential performance in depression and anxiety related behaviors and biomarkers. Specifically, we assessed social preference, elevated plus maze, forced swim, and Von Frey tests at 3-4 months-of-age, as well as activation of cytokines and antioxidant mRNA levels in the cortex at 7 months-of-age. We report that (1) the BXD84/RwwJ RI strain exhibits anxiety disorder and social avoidance-like behavior (2) BXD21/TyJ RI strain shows a resistance to depression illness, and (3) sex-dependent cytokine profiles and allodynia