

## ULTRASONIC COMMUNICATION DEFICITS IN A MOUSE MODEL OF NEURODEVELOPMENTAL DISORDERS AND EFFECT OF MATERNAL ENRICHMENT

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**Introduction:** Mice emit ultrasonic vocalizations (USVs) under different social conditions: pups maternal separation, juveniles play and adults mating and social investigation. The USVs measurement has become an important instrument for behavioral phenotyping in neurodevelopmental disorders (NDDs). Many studies have shown the fundamental role of maternal enrichment with long-term positive effects on brain and behavior in mouse models of NDDs. In this study, we wanted to investigate if mice lacking the NF- $\kappa$ B p50 subunit (p50 knock-out, KO) that are a mouse model of NDDs, had alterations in ultrasonic communication and if these calling patterns were influenced by maternal behavior.

**Materials and methods:** USVs of wild type (WT), p50 KO and KO pups exposed to maternal enrichment (KO enriched) were recorded using an ultrasound sensitive microphone and quantitatively analyzed by Avisoft software. Each syllable was categorized manually.

**Results:** We previously demonstrated that p50 KO mice had cortical structure alterations and social behavior impairment. In this study, USVs analysis showed that p50 KO and KO enriched pups emitted more and longer vocalizations compared to WT pups. During adulthood, p50 KO and KO enriched emitted less USVs than WT mice. In addition, an altered qualitative ultrasonic communication in p50 KO mice has been found. Interestingly, maternal enrichment had no effects on USVs number, duration and type in p50 KO mice.

**Conclusions:** This study investigated the relationship between maternal enrichment and USVs in a mouse model of NDDs. USVs analysis revealed social communication alterations in p50 KO mice; these deficits were not recovered by maternal enrichment, strengthening the fact that genetic background prevails on environmental enrichment.