

SOCIAL DEFEAT STRESS DURING EARLY ADOLESCENCE AFFECTS SUSCEPTIBILITY TO STRESS-RELATED DISORDERS IN ADULT RATS

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Introduction: During adolescence a physiological neuronal program of growth is paramount for behavior maturation and a key feature of mental health. Adverse social experiences during early life may lead to altered trajectories of brain maturation and predispose to the development of psychiatric disorders at adulthood. Less is known on whether an early-life stress can induce alterations of coping strategies towards susceptibility or resilience for stress-related psychopathologies if a second trauma occurs later in life (two-hits model). Moreover, very little is known on the role that individual's unique characteristics can play on disease susceptibility and resilience.

Materials and methods: Male Sprague-Dawley rats were subjected to social defeat stress (SDS) during early adolescence and the behavioral outcomes after the exposure to a second acute stress, single prolonged stress (SPS), at adulthood were evaluated.

Results: We found that SDS induces susceptibility towards anxious-like phenotype and cognitive impairments, and resilience towards development of obsessive-compulsive like-behavior if rats are exposed to SPS at adulthood. Finally, using a stratification approach (25th or 75th percentile in accordance with control group's distribution), we identified rats with enhanced (susceptible) or reduced (resilient) anxiety-like behaviors and cognitive deficits.

Discussion and conclusions: Here, we showed that SDS during early adolescence leads to enhanced susceptibility towards anxious-like phenotype and cognitive impairments, and resilience towards development of obsessive-compulsive like-behavior if rats are exposed to SPS at adulthood. Finally, using a stratification approach, we considered individual differences in developmental trajectories from adolescent stress to the alteration of response to a second trauma at adulthood. Our results demonstrated that an early-life social stress affects the susceptibility and resilience to stress-related psychiatric disorders at adulthood when an additional stressful experience occurs later in life. Additional studies will be performed in susceptible and resilient rats to better understand the neurobiological underpinnings of the altered susceptibility and resilience towards behavioral modifications.