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Conditioned defeat in Syrian hamsters.

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Exposure to a stressor can have profound effects on behavior in a wide variety of organisms. Arguably, the most common stressors experienced by humans are social in nature, and exposure to social stressors is thought to contribute to the etiology and expression of depression and a variety of anxiety disorders. Animal models are useful for examining the neurobiological changes that occur following exposure to social stress, and Syrian hamsters are a particularly valuable species to use in these studies because they readily produce territorial aggression. Following a brief social defeat, however, hamsters exhibit striking changes in their subsequent social behavior, a change that has been termed conditioned defeat. Hamsters displaying conditioned defeat fail to produce normal territorial aggression. Instead, they exhibit only submissive and defensive behaviors even though they are subsequently tested in their own home cages with a smaller, non-aggressive intruder. Conditioned defeat is long-lasting, persisting for at least 33 days in the majority of defeated males. Surprisingly, the effects of social defeat are less in female hamsters and vary over the estrous cycle. In addition, it appears that social defeat may have very different effects on subsequent agonistic behavior depending on when, developmentally, the social defeat occurs. We have explored through intracranial drug injections, lesion studies and viral vector-mediated gene transfer the critical components of the neural circuit mediating defeat-induced alterations in agonistic behavior in hamsters. We believe that conditioned defeat is an extremely useful model with which to determine how exposure to social stress leads to profound and long-lasting changes in behavior.