

especially useful in elucidating the behavioral effects of antidepressant drugs. In the resident-intruder paradigm, male Wistar resident rats are housed in isolation for a minimum of 3 days before being exposed to an unfamiliar conspecific intruder. During the ensuing social encounter, control resident rats exhibit a wide range of non-social, social and conflict-related (i.e. agonistic) behaviors which are quantified during subsequent ethological analysis. In the social hierarchy model male Wistar rats are housed in triads. All group members are routinely involved in intense levels of social and agonistic behavior at the onset of the dark phase of the light:dark cycle. Ethological analysis of such behavior (where the 'winner' and 'loser' of each social encounter is identified) reveals the relative social position of each group member (the most successful group member during these encounters indicates the dominant animal).

Together these models of rodent social and agonistic behavior have demonstrated that chronic treatment with antidepressant drugs (irrespective of their acute pharmacological activity) increases rodent aggressive behavior which, in turn, results in increased hierarchical status in closed social groups. Furthermore, the increased rodent aggression is most likely a behavioral manifestation of increased assertive behavior and arguably reflects similar changes in human behavior (including the externalization of emotions) expressed during the recovery from depressive illness.

Monitoring the effects of social defeat in mice by automated observation in the home-cage and observer-based scoring during a social-interest test

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Social defeat in mice has been applied in several different paradigms and for several different reasons. However, as a model for depression it has only been studied on a few occasions. Mostly a long period of daily defeats is applied of which the effects are investigated immediately afterwards. Therefore, little is known about the time of onset and development of the effects of this chronic social stress. This study aimed to investigate the effects of a particular defeat-paradigm in mice during the long-term social-stress period of 20 days. For this, home cage behavior was automatically and continuously recorded during both the light and the dark phase in specially designed cages (PhenoTyper®, Noldus Information Technology bv, The Netherlands). Several parameters that may reveal depressive-like symptoms such as altered locomotor activity and sleep/wake cycle were analyzed.

It became apparent that social defeat resulted in several acute effects (thus, at day 1) on activity, velocity and use of the shelter that were not all persistent over time. Other measures, such as a decreased frequency of movement and increased time spent in the shelter during the first part of the dark-phase seemed to become more persistent over time indicating chronic stress effects, possibly related to the development of depressive-like symptoms.

To further validate the applied defeat-paradigm as a model for depression, a so-called Partition-test was conducted at the end of the long-term defeat-period. During this test the defeated mouse was confronted with another unfamiliar mouse at the other side of a perforated partition-wall. This test is used in several depression-studies to investigate anxiety-related behavior and social interest. Using

observer-based scoring (The Observer®, Noldus Information Technology bv, The Netherlands), 2 classes were investigated in this test: zone and behavior.

It appeared that defeated animals displayed a significant decrease in social interest, activity and exploration and an increased alertness.

The results are discussed in the light of the success of the applied social-stress paradigm as a model for depression in mice and the development and onset of the symptoms.

The impact of continuous variation in heritable personalities on the social structure in the great tit (*Parus major*)

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Great tits of both sexes show continuous variation in consistent phenotypically individual differences in exploration of a standard new environment (a gradual variation from fast to slow explorer). Although the absolute values of repeated tests varied with the year cycle, the inter-individual differences persist across time. This 'exploration score' is phenotypically correlated with many other behavioral traits related to coping with (environmental) challenges (e.g. boldness, risk-taking, aggressiveness, routine-formation, foraging patterns). Bi-directional selection and crossings experiments using a cross fostering design with guest-pairs show that these different behavioral traits are strongly genetically correlated. This all indicates a more general behavioral syndrome or coping strategy within the life history of the species, comparable with the variation in human personality.

Hand-reared and wild birds were used in an array of experiments to study the impact of these personalities on the composition, structure and hierarchy in winter flocks with a scrounger producer character. The dominant-submission interactions between the members of a group were standard scored on and around a feeding table. Males dominated females. Males with territorial status and for females mating with a territorial male have the highest position in the rank. In the hierarchy of territorial males the nearby the territory the higher the position in rank and within that: faster explorer dominated slower ones. In mixed groups of age and status classes the time of presence and the personality determined the rank between non-territorial males whereby in contrast to territorial birds long present slow explores dominated fast ones. This is caused by impact of actions of (old) territorial males on the non territorial juveniles that is different for the different personalities.

Reduction of dominant or submissive behavior as models for antimanic or antidepressant drug testing: technical considerations

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Using observer-based scoring we have previously shown that dominant behavior measured in a food competition test, can serve as a model of mania and submissive behavior as a model of depression. These two models are based on a selection of animal pairs where one animal shows the behavioral trait of dominance and another submissiveness. Three criteria have to be achieved to assign dominant or submissive status to the animal. First, there has to be a significant difference between the average daily drinking scores of both animals in a pair.