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Mood and Anxiety Related Phenotypes in Mice

Characterization Using Behavioral Tests, Volume II



P. Michael Conn

Mood and Anxiety Related Phenotypes in Mice Todd D Gould, 2012-03-07 Affecting approximately twenty percent of the world population mood and anxiety disorders have been the subject of ever increasing research This increased research parallels a remarkable growth in the use of the laboratory mouse as a tool to understand the biological and genetic basis of mood and anxiety disorders as well as to develop improved treatments In Mood and Anxiety Related Phenotypes in Mice Characterization Using Behavioral Tests world renowned researchers provide an overview of behavioral approaches utilized in the characterization of mood and anxiety related behaviors in mice as well as commonly used behavioral assays to assess the potential antidepressant and anxiolytic efficacy of novel compounds As a volume in the successful NeuromethodsTM series the chapters provide authoritative reviews including up to date detailed protocols of the most commonly used approaches in the field Mood and Anxiety Related Phenotypes in Mice Characterization Using Behavioral Tests is an ideal resource for scientists actively pursuing or interested in establishing behavioral protocols in their laboratories while also serving as a reference for those students scientists and practitioners who have an interest in better understanding the Mood and Anxiety Related Phenotypes in Mice Todd D preclinical behavioral methods used in mood and anxiety research Gould, 2016-08-23 Preclinical research related to mood and anxiety disorders relies extensively upon mouse behavioral tests and models the use of which continues to increase as a greater number of underlying susceptibility genes are discovered new targets for medications are identified and clinical studies reveal novel neurobiological risk factors Mood and Anxiety Related Phenotypes in Mice Characterization Using Behavioral Tests Volume II serves as a complement to the previous volume in order to offer a comprehensive resource for the behavioral approaches that are valuable for the characterization of mood and anxiety disorder related behaviors in mice and the techniques that are utilized in the development of effective medications As a collection presented in the Neuromethods series each chapter provides a brief background and review of the test or model as well as a complete and up to date protocol narrative Authoritative and comprehensive Mood and Anxiety Related Phenotypes in Mice Characterization Using Behavioral Tests Volume II is an ideal resource for scientists actively pursuing or interested in establishing vital behavioral protocols in their laboratories Psychiatric Vulnerability, Mood, and Anxiety **Disorders** Jaanus Harro, 2022-09-30 This volume looks at classic and novel methods currently used by researchers to understand mood and anxiety disorders and foster precision medicine Chapters in this book cover topics such as how the sucrose preference succeeds or fails as a measurement of anhedonia fear conditioning in laboratory rodents animal models for mania rodent models for studying the impact of variation in early life mother infant interactions on mood and anxiety and prediction of susceptibility resilience toward animal models of PTSD In the Neuromethods series style chapters include the kind of detail and key advice from the specialists needed to get successful results in your laboratory Comprehensive and cutting edge accommodating the novel views on how the neurobiology of psychiatric disorders should be reconceptualized

Psychiatric Vulnerability Mood and Anxiety Disorders Tests and Models in Mice and Rats is a valuable resource for all researchers interested in learning more about this important and developing field Environmental Cns Stimulation In Aging, Health And Disease Lei Cao, 2022-04-07 Social and environmental factors have profound impacts on health and diseases across the lifespan Each year hundreds of millions of animals are used in biomedical research Yet many experimental studies utilize animals housed in standard conditions conferring minimal physical social and mental stimulation Lacking appreciation of macroenvironment impacts on physiology and disease risks of the laboratory animals may not only hinder the use of appropriate animal models for human diseases but also question the validity of preclinical assessments of therapeutic agents This book summarizes our work on environmental enrichment a housing condition for laboratory animals recapitulating an active lifestyle by providing a complex physical social and cognitive stimulations Environmental enrichment exerts a wide range of benefits on energy balance cancer immunity stress behavior and healthy aging One underlying mechanism is the activation of a specific neuroendocrine brain adipocyte axis with brain derived neurotrophic factor as the key brain mediator This book integrates recent discoveries regarding mechanisms mediators and biomarkers of environmental enrichment and discusses its translational potential By providing a timely review and discussion of murine models this book should be of interest to basic translational and clinical researchers as well as psychologists nutrition scientists and students that have interest in cancer obesity aging and genetic disorders Phytopharmaceuticals for Brain Health Shahnaz Subhan, Manashi Bagchi, 2017-09-27 Research studies demonstrate diet and proper nutrition in conjunction with cognitive mental social and physical activities can significantly help in improving brain health with advancing age and potentially reduce the risk of cognitive decline These studies of phytopharmaceuticals and medicinal plants demonstrate the efficacy of Huperzine A berry anthocyanins trans resveratrol Ginkgo biloba Bacopa monniera Centella asiatica tocotrienols and palm oil in boosting brain health and physical well being In addition consumption of marine fishes and general seafood is recommended for long term nutritional intervention to preserve mental health hinder neurodegenerative processes and sustain cognitive capacities in humans Omega 3 and omega 6 polyunsaturated fatty acids n 3 n 6 PUFAs flavonoids and antioxidants prevent the initiation and progression of many neurological disorders This book is a comprehensive review of phytopharmaceuticals impacting brain health with emphasis on diverse applications in food and nutrition sciences biomedicine neurology and other scientific and medical fields It details available methods and contains numerous references making this the perfect guide for scientists who want to explore the fascinating world of phytopharmaceuticals with relation to brain health Phytopharmaceuticals for Brain Health appeals to a diverse range of readers in industry medical doctors research and academia including biologists biochemists food scientists nutritionists and health professionals Overall this book brings a classic scenario of neurological problems to possible amelioration using novel nutraceuticals and functional foods Neurobehavioural Mechanisms of Resilience and Vulnerability in Addictive Disorders

Maria Asuncion Aguilar, Antonio Ferragud, Nazzareno Cannella, Rainer Spanagel, 2021-03-03 <u>Unraveling Vulnerability Factors in Addiction Drug Use and Potential Treatments</u> Cristina Núñez, M. Victoria Milanés, Sandra Montagud Romero, Jorge Montesinos, 2022-09-05 <u>Animal Models for the Study of Human Disease</u> P. Michael Conn, 2017-06-20 Animal Models for the Study of Human Disease Second Edition provides needed information on model sharing animal alternatives animal ethics and access to databanks of models bringing together common descriptions of models for busy researchers across biomedical and biological sciences Offering easily searchable advantages and disadvantages for each animal model and organized by disease topics this resource aids researchers in finding the best animal model for research in human disease Organized by disease orientation for ease of searchability Provides information on locating resources animal alternatives and animal ethics Covers a broad range of animal models used in research for human disease Contributed by leading experts across the globe Expanded coverage of diabetes and neurological diseases <u>The British National Bibliography</u> Arthur James Wells, 2009

The Endocannabinoid System: Filling the Translational Gap between Neuromethods Todd D. Gould, 2009 Neuroscience and Psychiatry Marco Colizzi, Sagnik Bhattacharyya, Danilo De Gregorio, Mirella Ruggeri, 2022-01-24 Mood and Anxiety Related Phenotypes in Mice ,2011-09-03 Phenotyping of TRH-DE Deficient Mice for Energy Balance and Depression- and Anxiety-related Behaviors Grace Lee, 2016 Thyrotropin releasing hormone degrading ectoenzyme TRH DE specifically hydrolyzes released thyrotropin releasing hormone TRH limiting TRH action Past studies suggest released TRH exerts an anxiolytic and antidepressant like effect Additionally increased TRH promotes negative energy balance TRH DE has been shown to be highly expressed in brain regions that subserve emotional behavior Furthermore a past study in our lab found central trhde overexpression was associated with vulnerability to obesity The following studies in this thesis tested the hypothesis that reducing TRH DE function by targeted gene knockout in mice would show an antidepressant or anxiolytic like effect and would be leaner and less fatty Adult male and female mice of wild type WT heterozygous and trhde knock out KO genotypes were analyzed for whole body energy expenditure food intake and body composition after chow or high fat diet challenge To assess anxiety like and antidepressant like phenotypes adult male and female mice were tested in the elevated plus maze light dark box and forced swim behavioral tests Adult female and male mice of WT and KO genotypes were then compared for operant self administration of food water and a highly reinforcing sucrose 3% saccharin 0 125% solution Energy expenditure EE analysis at 2 months old revealed KO mice have an altered circadian profile compared to WT where KO have higher EE with the greatest difference in the later half of the dark cycle Body composition analysis after six weeks of high fat diet challenge revealed a significant Genotype p What's Wrong With My Mouse? Jacqueline N. Crawley, 2007-03-23 Dr Jacqueline N Crawley author of the First and Second Editions of What's Wrong with My Mouse Behavioral Phenotyping of Transgenic and Knockout Mice continues to field calls and e mails from molecular geneticists who ask how do I run behavioral assays to find out what s wrong with my mouse Turn to What s Wrong with My Mouse to

discover the wealth of mouse behavioral tasks and to get the guidance you need to select the best methods and necessary controls Chapters are organized by behavioral domain including measurements of general health motor functions sensory abilities learning and memory feeding and drinking reproductive social emotional and reward behaviors in mutant mice Throughout the chapters new behavioral tasks and new research discoveries have been added bringing the Second Edition up to date with the latest science In addition the Second Edition includes two new chapters Neurodevelopment and Neurodegeneration discusses mouse behavioral tasks relevant to neurodevelopmental diseases such as mental retardation and autism and to neurodegenerative diseases such as Alzheimers Parkinsons Huntingtons and amyotrophic lateral sclerosis Putting It All Together recommends strategies for optimizing a battery of behavioral phenotyping tests to address your specific hypotheses about gene functions The final chapter The Next Generation examines new and emerging technologies Throughout the book the use of behavioral testing equipment is illustrated with photographs diagrams and representative data Examples of behavioral tasks successfully applied to transgenic and knockout mouse models are provided as well as references to the primary literature and step by step methods protocols These features along with a comprehensive index listings of database and vendor websites and an extensive list of references make this book a valuable and practical resource for students and researchers Mouse Behavioral Testing Douglas Wahlsten, 2010-11-25 Mouse Behavioral Testing How to Use Mice in Behavioral Neuroscience provides detailed explanations of how to conduct an experiment on mouse behavior from the initial planning of the research design through every step of the process until the data analysis phase The book discusses the practical matters that need to be considered carefully when working with any species of animal such as how many animals need to be tested It describes the tests and techniques devised specifically for work with mice Every step of the research process is illustrated with real situations encountered in previous studies All examples are based on real experiments and extensive details of several published experiments are provided The essential features of a behavioral test protocol are outlined and several complete protocols are provided Methods to balance the order of tests and determine throughput are described then a completely balanced order of tests in a complex experiment is presented The book will be useful for those already familiar with the general principles of research but are new to the realm of behavioral testing of live mice It will also serve as a text for a formal course most likely at the graduate level A guide to running a behavioral testing lab including the many aspects of mouse research beyond the confines of the specific test Diagrams and photographs are shown for many kinds of apparatus and test situations with sufficient details such as dimensions to enable building of replicas Provides step by step instructions on planning and executing behavioral experiments in order to run them successfully

Elucidating the Interactions Between Chronic High-fat Diet Treatment and GABAergic Inhibition in the Emotional Behavior of Mice Akshilkumar Patel,2017 Major Depressive Disorder MDD is a debilitating condition that affects 6 7% of American adults and poses a serious public health concern Meta analyses of clinical studies have identified

chronic low grade inflammation as a predisposing factor in the development of MDD Obesity along with a poor diet contributes to inflammation which is especially concerning given the high prevalence of obesity in the United States Longitudinal studies have established a link between obesity and depression indicating comorbidity among these two disorders Unhealthy diets with an excessive caloric content common in modern Western nations are a risk factor in the development of obesity and may be the source of obesitys increasing pervasiveness To better study obesity induced inflammation in the context of mood disorders high fat diet HFD treatment provides a reliable method for generating animal models of obesity particularly using rodents These HFD models compared to control diet CD treated mice also display the characteristic phenotypes expected of a model of obesity including chronic metabolic inflammation and insulin resistance Neurobiological studies investigating the effects of HFD on the brain have found that rodents treated with HFD exhibit behavioral deficits in anxiety like behavior anhedonia and memory To further investigate these neurological effects of HFD and their interactions with genetic and neurophysiological factors the behavioral consequences of HFD treatment were examined in two different mutant mouse models with an altered ratio of neuronal excitation and inhibition the E I ratio Altered E I ratio is thought to underlie MDD and imbalance in the E I ratio has been shown to produce anxiety and depression related behavioral phenotypes in mice The first model 2 involves mice that are globally heterozygous for the 2 subunit of GABAA receptors In this model GABAergic inhibition is reduced leading to an increased E I ratio The 2 model has consistently produced an anxious depressive like phenotype in behavioral assessments This phenotype can be diminished by treatment with antidepressants thus implicating increased E I ratio in the onset of mood disorders A second mouse model SSTCre 2f f involves mice in which somatostatin positive SST interneurons were disinhibited by selectively deleting the 2 subunit of GABAA receptors in these cells In this model inhibitory transmission onto hippocampal pyramidal cells was increased by disinhibiting SST interneurons thereby reducing the overall E I ratio in these mice Behaviorally these mice exhibit robust anxiolytic and antidepressant like phenotypes Together results from studies involving 2 and SSTCre 2f f models suggest that an impaired E I ratio underlies anxiety and depression related behavior The hypothesis examined in the present study which aims to investigate the interactions between HFD and altered E I ratio on behavior is that increasing the E I ratio 2 model will exacerbate HFD induced anxiety and depression like behavior including defects in locomotion grooming and memory while reducing the E I ratio SSTCre 2f f model will reduce HFD induced anxiety and depression like behavior including defects in locomotion grooming and memory The results show that HFD treatment led to reductions in locomotion and grooming behavior of both the WT control and 2 mutant mice in the OFT and SSPT respectively However the effects of HFD on 2 mice were not larger than in WT mice so only an overall diet effect was present Results from tests assessing short term working Y maze and recognition NOR memory indicate that the effects of diet and genotype are nonadditive and that HFD treatment and altered E I ratio impair behavior via different mechanisms SSTCre 2f f mutant mice presented an

anxiolytic phenotype and increased locomotion in the EPM consistent with studies in the literature Additionally HFD treatment of SSTCre 2f f mice reduced locomotion in the OFT and EPM and also decreased grooming behavior in the SSPT Overall the behavioral results observed for CD treated animals in these experiments did not reproduce all of the phenotypes of 2 and SSTCre 2f f mice published in the literature most likely because the genetic backgrounds of the mice analyzed here C57BL 6] and mixed 129X1 SvJ C57BL 6] respectively were different from the mice described in earlier studies Due to these unexpected results additional behavioral experiments will be needed to further assess possible interactions between HFD treatment and altered E I balance on anxiety and depression related behavior **Behavioral Consequences of Disrupted Circadian Clock Function Within the Mouse Striatum** Mariana Alonso Mayor,2021 Daily rhythms are prominent in almost everything from sleep wake cycles body temperature and hormone regulation to even cognition motor coordination attention and mood McClung 2007 Studies have shown that individuals with mood disorders and motor dysfunction exhibit alterations in the neural circuitry and neurochemistry in both the ventral and dorsal striatum Del Donno et al 2017 and recent research brought to the attention a potential involvement of the circadian system. There is evidence to suggest that the circadian clock gene Period2 may be implicated in the vulnerability and development of striatum related illnesses Lamont et al 2007 Kim et al 2018 However the majority of these findings present mixed results and the mechanisms through which the core clock gene may influence these behaviors is still not understood Hence our aim is to elucidate how a conditional knockout of Per2 in mood and motor related brain areas such as the striatum may contribute to circadian variation in striatum related behaviors in male and female mice Male and female mice of three representative genotypes knockout SKO heterozygote HET and wild type WT were used in a battery of behavioral tests to screen for striatum related phenotypes Animals were tested at two different time points ZT2 or ZT14 for mood related behaviors and ZT6 or ZT2 for motor function Results indicated no differences in anxiety and depressive like behaviors across genotypes However SKO mice performed worse in the rotarod test in comparison to HET and WT mice suggesting poorer motor coordination in mice where the circadian clock gene is conditionally knocked out from the striatum

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