

Abstract

The study of social behavior and immune system function using an animal model of social interactions

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Previous research indicates that there is a bi-directional association between depression and heart disease, and this link represents an important public health concern. Although several theories exist to explain this relationship, the current behavioral and neurobiological mechanisms underlying depression and heart disease are not well understood. One potential mechanism that may influence both depression and heart disease involves changes in one's social environment. For instance, negative social experiences (such as the absence of positive social interactions or presence of social stressors) increase the vulnerability to both depressive disorders and heart disease. Furthermore, disruptions of the immune system, including activation of factors that promote inflammation, are also linked both to depressive disorders and cardiovascular diseases.

It is possible, therefore, that negative social experiences lead to depression and heart disease through direct effects on the immune system. To better understand these relationships, the present project will use a valid and reliable animal model, the prairie vole, to more directly study how the social environment interacts with the immune system. This unique rodent species displays social behaviors similar to those of humans, including an active engagement in and reliance on the social environment; therefore, this species provides a useful model for the study of social behavior, immune system functioning, depressive behaviors, and cardiovascular regulation. The goals of this project are to investigate the effects of social isolation in prairie voles on inflammatory factors (Experiment 1), and to investigate the effects of activation of inflammatory factors on depressive behaviors and cardiovascular function in isolated prairie voles (Experiment 2). The findings will increase our understanding of how negative social experiences can influence biology and behavior, and can provide a foundation for designing improved treatments for individuals with depression and heart disease.