Environmental and Pharmacological Treatments for Social Stress

Previous research conducted over several years indicates that social bonds are very important to psychological and biological health. Unfortunately, stress from the social environment is common, and has a significant impact on quality of life and health in humans. For example, chronic social stress, such as loneliness and social isolation, can lead to emotional and biological consequences such depression, anxiety, heart disease, and immune-related disorders. Disruption in the brain and the body, including disrupted chemical communication, hormone disturbances, and increased reactions to stress, are some of the mechanisms that may underlie the link between social stress and these disorders. There is an important need to design appropriate treatment strategies for individuals who experience social stress, to prevent or treat stress-related disorders. Therefore, the present project will employ the prairie vole animal model to investigate both environmental and pharmacological treatment strategies for social stress. Prairie voles are unique rodents that provide an extremely powerful translational model for studying the interactions of social stress and health. Prairie voles – unlike nearly all other rodents – exhibit several social behaviors similar to those of humans, including actively engaging in the surrounding social context, forming long-term social bonds, living in family groups, and responding negatively to social stressors. The results from this project will have widespread implications for designing treatment strategies for individuals who experience social stress, emotional disturbances, and associated physical diseases. The specific goals of this project are the following:

1. To compare the effects of environmental treatments (physical exercise and activities that stimulate the brain in a positive manner) and pharmacological treatments (antidepressant drugs that alter serotonin) on preventing emotional and biological effects of social stress.
    a. ***Hypothesis 1a:*** Environmental and pharmacological treatments will prevent emotional and cardiovascular disturbances in socially isolated prairie voles.
    b. ***Hypothesis 1b:*** A combination of environmental and pharmacological treatments will be more effective than either treatment alone at preventing emotional and cardiovascular consequences of social isolation in prairie voles.