A recent study published in Biological Psychiatry and conducted by researchers from Florida State University shows that testosterone, the well-known primary male sex hormone, may exhibit antidepressant properties. Researchers at FSU are currently working to determine exactly by what mechanisms they exhibit these effects. While women are much more likely to exhibit symptoms of anxiety and depression, men with hypogonadism likewise exhibit these traits, suggesting that the tendency to exhibit higher levels of anxiety and depression may be related to levels of testosterone.

The researchers likewise neutered male rats and noted that they are likewise more likely to exhibit depression-like behaviors. Furthermore, they find that these behaviors were reduced when they were provided with testosterone replacement therapy. They argue that a molecular pathway called MAPK/ERK2 (mitogen activated protein kinase/ extracellular regulated kinase 2) exists in the hippocampus, and plays an important role in producing these protective, antidepressant effects of testosterone. This pathway must therefore be functioning properly, they suggest, in order for these antidepressant effects of testosterone to successfully work. Unlike serotonergic antidepressants like imipramine and fluoxetine, however, testosterone was not associated with neurogenesis in the hippocampus. Interestingly enough, the same group also found comparable antidepressant effects of testosterone in female rats.