Use of Mono-Amine Oxidase Inhibitors to Prevent Herpes Virus Infections and Reactivation from Latency

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Technology description

Summary

Available for licensing are methods of using Monoamine Oxidase Inhibitors (MAOIs) to prevent alpha-herpesvirus lytic infections, such as those caused by Herpes simplex virus (HSV-1 or HSV-2) and Varicella zoster virus (VZV), and to possibly prevent the periodic reactivation of these viruses from latency. MAOIs have been historically used to treat depression, hypertension, and related diseases. The invention describes how MAOIs can also inhibit LSD1, a histone/protein demethylase that is required for initiation of alpha-herpesvirus lytic infection. After an initial lytic infection, alpha-herpesviruses establish latent infections in sensory neurons and undergo periodic reactivation that results in disease ranging from mild lesions to life threatening encephalitis. Investigators have determined that MAOIs may also block the reactivation process. Due to the nature of the target LSD1 and its role in modulating chromatin modifications, these drugs could also prevent infection by or reactivation of other nuclear viruses.
Alpha-herpesviruses infections are common worldwide, with 57% to 80% of adults being seropositive for HSV. Recurrent labial herpes affects roughly one third of the U.S. population, and these patients typically experience 1 to 6 episodes per year. Genital herpes can result from infection with either HSV type and HSV-1 has become an important cause of genital herpes in some developed countries. HSV keratitis is the most frequent cause of corneal blindness in the United States, is a leading indication for corneal transplantation, and is the most common cause of infectious blindness in the Western world.

Application area

Prevention and treatment of recurrent Herpes simplex virus outbreaks
Prevention and treatment of recurrent Varicella zoster infection
Treatment of HSV encephalitis
Treatment of Herpes keratitis

Institution

NIH - National Institutes of Health

联系我们

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com