
SHREK proteins known as “Surface-Hinged, Rigidly-Extended Killers” (PSGL-1, CD43, TMEM, CD164, Tim-1, CD34 and PODXL2 and others) inactivates viral infectivity and can produce live-attenuated vaccines against viruses

Problem

The use of live-attenuated viral vaccines is a very effective way to stimulate strong immunity against viral infection. However, the procedure to attenuate viruses for vaccine development is lengthy and involves multiple steps of mutagenesis and selection.

Description

The SHREK family of virion inactivators is a group of large surface cell proteins identified as possessing anti-viral activity. The SHREK proteins’ mechanism of action is unique in that they are incorporated into virions on the surface as viruses leave the host cell. George Mason researchers have found that members of the SHREK family structurally hinder the interaction between the virus and target cell receptors, thereby inactivating virion infectivity. The resulting virions with the SHREK protein attached on the surface are attenuated viruses, which have been prevented from being infectious.

Although the original research was conducted using the lentivirus, HIV-1, the research suggests that the SHREK family can be used to inactivate other enveloped viruses, such as coronaviruses, Hepadnaviruses (such as Hepatitis B) or influenza viruses.

Innovation

- SHREK proteins can provide a novel means of adding to the arsenal of therapeutic and immunization strategies in fighting infective viruses.
- SHREK proteins will be especially useful in targeting latent HIV-1 reservoirs, rendering them no-longer capable of producing infectious virions.

