HUMAN PEPTIDE FOR THE PREVENTION AND TREATMENT OF INFLUENZA AND OTHER VIRAL RESPIRATORY INFECTIONS

Description



In Spain alone, the incidence rate of influenza in the 2022-2023 season reached a peak of 261,7cases/100,000 inhabitants with a high economic and health cost. Several strategies have been developed to combat this infectious agent, such as annual vaccination campaigns for people at higher risk. However, a vaccine produced one year may not be effective the next due to the frequent and rapid mutations of the virus and the variable dominance of the different strains. Moreover, treatment is only symptomatic except in the most serious and hospital cases, where antivirals are administered, but there is a rapid emergence of resistance and they are not without toxicity. Therefore, the implementation of new strategies to prevent and/or reduce the effects of influenza and other respiratory viral pathogens will result in huge savings to the health care system, both in terms of hospital costs and in terms of sick leave and loss of performance.



Researchers from FISABIO's Genomics and Health Area have identified an antiviral peptide of human origin for use in the prevention and treatment of influenza virus and other respiratory infections such as the common cough, as well as a method for determining the level of this peptide in saliva, which can be a risk factor for influenza.

The research has identified a peptide, produced by the innate immune system, that blocks the binding between haemagglutinin of the influenza virus (HA) and sialic acid in the epithelial cells of the nasal passages, throat and lungs, inhibiting the virus adhesion stage and therefore the first stage of infection. The project also allows the development of a kit to determine the concentration of the peptide.

Technical Advantages

The new drug has the following advantages:

- It is a human protein, with all the advantages that this entails: low incidence or risk of allergies, toxicity and resistance, compared to alternatives such as Zanamivir.
- In terms of treatment, it inhibits the first phase of viral infection, by binding to a viral protein that is also located in other respiratory viruses, making it potentially effective against other respiratory viruses in addition to influenza. Its effectiveness has already been tested in vitro against different strains of the H1N1 and H3N2 subtypes of influenza A, as well as against measles and the OC43 coronavirus (the main causative agent of the common cold).
- It can detect the risk of contracting the flu due to low production of the peptide naturally and, therefore, make a diagnosis and recommendations for its prevention..
- In terms of prevention, it could help protect mucous membranes against infection by several respiratory viruses.

State of development and Industrial Property Rights

In vitro assays in cell lines against different strains of the two main influenza virus subtypes, H1N1 and H3N2, have demonstrated its antiviral activity against all of them. In addition, the mechanism of antiviral action of the peptide against the influenza virus has been characterised by affinity assays. The mechanism of action of the human peptide is through its binding to the haemagglutinin of the influenza virus, blocking the first step of the infection cycle. Thus, its activity against influenza virus would be scalable to other respiratory viruses with haemagglutinins on their surface such as the main cause of the common cold. The absence of toxicity has also been demonstrated in in vitro cultures in different cell lines, as well as its innocuousness in in vivo assays in a mouse model.

Technology protected by patent P202030468 (priority date 20/05/2020); international extension via PCT, ownership of the result: FISABIO.

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