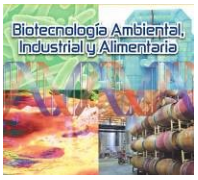
*Selecciona una categoría*




# Evaluation of the antiviral-HAdV activity of venom extracts obtained from arachnids and snakes.

Rampérez Barrajón, Jaime (1); Balsera Manzanero, María (1,2); Vassilevski, Alexander (3) and Sánchez Céspedes, Javier (1,2,4)

(1) Institute of Biomedicine of Seville (IBiS), Virgen del Rocío and Virgen Macarena University Hospitals/CSIC/University of Seville, Seville, Spain. Department of (2) Microbiology and Parasitology, Virgen del Rocío University Hospital, Institute of Biomedicine of Seville (IBiS), 41013 Seville, Spain

(3) Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, Russian Academy of Sciences, Moscow, Russia; Moscow Institute of Physics and Technology, Moscow Region, Dolgoprudny, Russia

(4) CIBERINFEC, ISCIII - CIBER of Infectious Diseases, Carlos III Health Institute, Madrid, Spain

Tutor académico: Smani, Younes

*Keywords:* antiviral; A549/HEK-293 human cells; human adenovirus (HAdVs)

## ABSTRACT

**Motivation: Human adenoviruses (HAdVs) can cause life-threatening infections and disseminated disease in hematopoietic stem cell transplant (HSCT) recipients, especially in paediatric patients, and is also a well-known cause of community-acquired pneumonia in the general population. Despite this significant impact on public health, there are no specific antiviral therapies approved by the health authorities to treat HAdV infections. Thus, it is necessary to identify and characterize molecules that exert their antiviral action against HAdVs infection as the first step in the clinical development of an specific antiviral drug. In this sense, we have selected a collection of crude extracts of arachnid and snake venoms to evaluate their antiviral activity against HAdV.**

**Methods: A total of 67 extracts from different arachnid species were subjected to a first screening at a concentration of 50 µg/ml in A549 cells infected with HAdVs-RFP at a MOI of 2000 vp/cell for 48 h. Those that showed an inhibition of the viral infection higher than 60% were tested through the same procedure using HAdV-GFP to determine if the extract exerts its antiviral action in early or late stages of the HAdV replicative cycle. In parallel, the selected compounds were subjected to a methabolic assay to determine their cytotoxicity (CC50). Finally, the selected compounds were tested at a low MOI (0.06 vp/cell) with HAdV-GFP at concentrations ranging from 10 µg/ml to 0,625 µg/ml. For the extracts that their inhibitory concentration 50% (IC50) could be calculated, the selectivity index (SI) was determined, as the coefficient between the CC50 and the IC50.**

**Results: Sixteen out of the 67 extracts analyzed with HAdVs-RFP and HAdV-GFP, showed an inhibition of the infection >60%. The CC50 values obtained ranged from 87.43 ± 27.86 to 1.24 ± 0.21 µg/ml. So far, most of the extracts evaluated present a IC50 value above 10 µg/ml, with the exception of Bothrops atrox and Bothrops pictus, with an IC50 value of 0.75 ± 0.047 µg/ml (SI = 24,26) and 1.3 ± 0.00565 µg/ml (SI = 23,20), respectively.**

**Conclusions: Sixteen extracts have been identified with the ability to inhibit HAdV infection by more than 60%, and presenting CC50 above their IC50. Thus, in this situation, the next step will be to carry out the deconvolution of these 16 extracts, to identify the molecule/s responsible for the observed activity in order to accurately characterize their antiviral activity and mechanism of action.**

## REFERENCES

Zhang, S. Y., Luo, Y. P., Huang, D. D., Fan, H., Lu, Q. B., Wo, Y., ... & Liu, W. (2016). Fatal pneumonia cases caused by human adenovirus 55 in immunocompetent adults. Infectious diseases, 48(1), 40-47.

Echavarría, M. (2008). Adenoviruses in immunocompromised hosts. Clinical microbiology reviews, 21(4), 704-715.

Lynch, J. P., Fishbein, M., & Echavarria, M. (2011, August). Adenovirus. In Seminars in respiratory and critical care medicine (Vol. 32, No. 04, pp. 494-511). © Thieme Medical Publishers.