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Olivier Reynard, Mathieu Iampietro, Claire Dumont, Sandrine Le Guellec, Marie Moroso, et al.. H. 18 Development of a Nebulization Approach of Fusion Inhibitory Lipopeptides to Protect Nonhuman Primates against Lethal Respiratory Nipah Virus Infection. The International Society for Aerosols in Medicine: 24th ISAM, Aug 2023, Saarbrücken, Germany. pp.A-1-A-39, 10.1089/jamp.2023.ab02.abstracts . hal-04743413

HAL Id: hal-04743413

<https://hal.science/hal-04743413v1>

Submitted on 18 Oct 2024

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H. 18 Development of a Nebulization Approach of Fusion Inhibitory Lipopeptides to Protect Nonhuman Primates against Lethal Respiratory Nipah Virus Infection

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Nipah virus (NiV) is a fatal zoonotic paramyxovirus that can be transmitted from person to person by the respiratory route, causing encephalitis and severe respiratory disease with an average fatality rate of 75%. There is currently no approved treatment or vaccine for this serious emerging infection. A lipopeptide-based fusion inhibitor strategy has been developed and previously evaluated for efficacy against NiV *in vitro* and *in vivo* in hamster and non-human primate (NHP) models using intratracheal administration. For human administration by inhalation, a mesh nebuliser and face mask were developed and evaluated in an African green monkey model that mimics human NiV infection. Three consecutive aerosolized doses of the lipopeptide (4mg/kg/24h) resulted in a uniform distribution of the lipopeptide in the respiratory tract. Nebulisation of the peptide was not associated with any apparent allergic reaction, toxicity or adverse haematological and biochemical effects. Peptide treatment significantly delayed lethality in monkeys following intratracheal NiV challenge. The results support the feasibility of nebulisation of antiviral lipopeptides for emergency response to NiV outbreaks. Aerosol delivery of fusion-inhibiting peptides may be used to protect against NiV and other airborne viruses that use the class 1 fusion mechanism for entry.

The study was funded by ANR ASTRID-Maturation (Nebunipastop project).