# New model for treatment of RSV

Respiratory syncytial virus (RSV) can produce acute respiratory illness in patients of all ages, but strikes the age extremes, infants and the elderly, with highest frequency. Accounting for approximately 64 million cases of respiratory disease and 200 000 deaths worldwide each year. The current treatments, a humanized monoclonal antibody against RSV-F for prophylaxis of children younger than 24 months who are at high risk of severe RSV infection, and the nucleoside analog ribavirin, are at most only moderately effective. Thus the ongoing morbidity and mortality associated with RSV infection have continued to invigorate efforts to develop additional treatments to combat RSV infection, but approved drugs have yet to emerge. RSV is a member of the Paramyxoviridae family of viruses, which contain 3 glycoproteins on the viral envelope. The RSV-F surface protein mediates fusion of the RSV envelope with the host cell membrane. By deploying paired, self-associating, heptad repeat domains of RSV-F, to form a fusogenic 6-helix bundle. In this way the virus gains entry into the host cell. In an attempt to manipulate this process this study developed hydrocarbon double-stapled RSV fusion peptides that exhibit stabilized ?-helical structure and striking proteolytic resistance. They then showed that pretreatment with double-stapled RSV peptides that specifically bound to the RSV fusion bundle inhibited infection by both laboratory and clinical RSV isolates in cells and murine infection models. Intranasal delivery of a lead double-stapled RSV peptide effectively prevented viral infection of the nares. While a chitosan-based nanoparticle preparation markedly enhanced pulmonary delivery, further preventing progression of RSV infection to the lung. Thus,

indicating a strategy for inhibiting RSV infection by mucosal and endotracheal delivery of double-stapled RSV fusion peptides.

Bird, G. et al. 2014. Mucosal delivery of a double-stapled RSV peptide prevents nasopulmonary infection. *The Journal of Clinical Investigation*.