

## Agents against common colds, SARS and other coronaviral diseases

### General information

Human coronaviruses (HCoV) are the major cause of diseases of the upper respiratory tract in humans. Apart from the common cold these include e.g. the life-threatening severe acute respiratory syndrome (SARS), that, originating in China, has appeared in other parts of the world with a mortality rate of 15%. A key enzyme for the replication cycle of the coronavirus is the HCoV proteinase  $M^{pro}$ . The functional relevance of  $M^{pro}$  makes it an attractive target for the development of drugs against SARS and other coronaviral diseases.

### State of the art

Lacking other antiviral agents, in 2003 SARS patients were first treated with the substance Ribavirin. Later it was shown that in the case of SARS Ribavirin is without any effect. Meanwhile, the 3D-structure of HCoV  $M^{pro}$  has been mapped (fig. 1), so that now crystallographic data is available for the development of substances that are able to inhibit this essential enzyme for coronaviral replication.

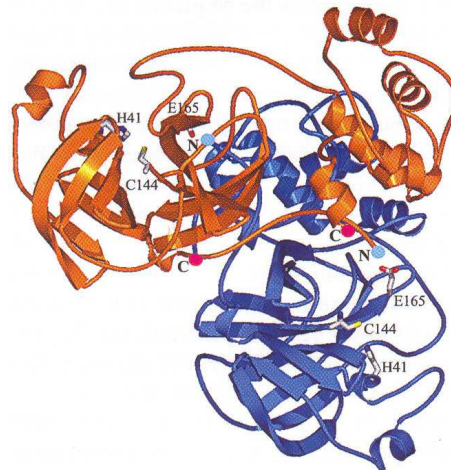


Fig. 1: 3D-structure of HCoV  $M^{pro}$ -dimers (from Anand et al., 2003)

### The invention

The present invention relates to a group of anticoronaviral agents whose functional mechanism is based on the specific blockade of the substrate binding site of HCoV  $M^{pro}$ . *In vitro* test systems have shown the substances according to the invention to be highly effective against several coronaviruses.

*Utilisation concept*

Licensing of this invention is sought to a company that will bring to market and distribute the anticoronaviral agents described and the pharmaceutical preparations containing them. If desired PVA SH GmbH will further assist utilisation through arranging contact with the inventor and financing development of a sample.

*Contact*

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*Reference*

K. Anand, J. Ziebuhr, P. Wadhvani, J.R. Mesters, R. Hilgenfeld (2003) Coronavirus Main Proteinase (3CLpro) Structure: Basis for Design of Anti-SARS Drugs. SCIENCE, Vol. 300, 5626, 1763-1767