MEDISTUS ANTIVIRUSE EFEKTIIVSUSE TEST SURROGAATVIIRUSE MVA VASTU

Suuremale osale ülemiste hingamisteede nakkustele – paragripp, respiratoorne süntsütiaalviirus, koroonaviirused – pole vaktsiini või on seda vähe, näiteks hooajalise gripi vaktsiinid. Epideemia ennetamine on aastaid keskendunud laia toimespektriga vaktsiinide arendamisele, teisisõnu pakuvad need immuunsust paljude gripiviiruse alamtüüpide vastu ning peaksid olema kergelt kohandatavad hooajalistele viirustele.

Modifitseeritud vaktsiinviirus Ankara (MVA) on vaktsiiniuuringute käigus arendatud viirus, mida kasutatakse laialdaselt surrogaatviirusena , mis esindab kõiki ümbrisega viiruseid, asendades need in vitro testides. Ümbrisega viirused hõlmavad igasuguseid viiruseid, mille ümber on lipoproteiinist kest, mis muudab viirused keskkonnamõjudele vastupidavamaks ning aitab peremeesrakus kohaneda. Kõik viirused, mis kujutavad ohtu inimpopulatsioonile ülemaailmsete epideemiate näol, on sellised ümbrisega viirused nagu **gripiviirused, herpesviirused, HIV, Zika, Ebola, ja SARS koroonaviirused (SARS-CoV).** [1]

Medistus Antivirus losengide viirusevastane toime on tõestatud mitmetes in vitro testides. 2020. aastal testiti losengide viirusevastast toimet MVA viiruse suhtes kooskõlas DIN EN 14476 nõuetega akrediteeritud laboris Saksamaal.[2]

In vitro testi eesmärk oli laboritingimustes tõestada Medistus Antivirus losengide tõhusust ümbrisega viiruste vastu, mis põhjustavad ülemiste hingamisteede infektsioone. Testimisel kasutatud MVA viirus on professionaalsetes kogukondades ja ametiasutustes üldtunnustatud asendaja ümbrisega viirustele[3].

Laboratoorse testi ajal segati losengide lahus kunstliku süljega ning testimisel kasutati kaht meetodit. Esimese meetodi ehk nn puhaste tingimuste meetodi puhul mõõdeti uuritava aine viirusevastast toimet segavate ainete lisamiseta. Teine testimismeetod oli vastavalt OECD tingimustele, mille puhul lisati testlahusesse proteiini, lima ja pärmi. Proteiini ja pärmi lisamine raskendab testimistingimusi, sekkudes Medistus Antivirus losengide toimemehhanismi, vähendades nende tõhusust, kuid tekitab siiski in vivo tingimustele lähedased tulemused.

Mõlema testmeetodi puhul loeti jääkviirused sama intervalli tagant. Puhaste tingimuste testis kinnitati Medistus Antivirus losengide viirusevastane mõju juba viie minutiga. Losengid vähendasid algset viirusehulka nelja ühiku võrra ning inaktiveerisid kõik viirused.

OECD testmeetodi tingimustel vähendas Medistus Antivirus algset viirusekontsentratsiooni viie minuti möödudes 3,5 ühiku võrra ja kümne minuti möödudes 3,67 ühiku võrra. See tähendab viiruse vähenemist 99,9% võrra kümne minuti jooksul.

Testitulemused kinnitavad Medistus Antivirus losengide viirusevastast toimet ümbrisega viiruste vastu, mis võivad epideemiaid põhjustada.

Lisainfo:

1) Fauquet, C.M. et al., Eds .: Virus Taxonomy, eighth report of the international committee on taxonomy of viruses. Elsevier Academic Press, San Diego, 2005
2) BioTeSys GmbH: Virucidal activity of the lozenge Medistus Antivirus against Modified vaccinia virus Ankara,
16.06.2020, Esslingen / Germany
3) "Activity against enveloped viruses can be claimed when MVA = Modified Vaccinia virus Ankara is tested in a
(modified) EN 14675 test." Guidance on the Biocidal Products Regulation Volume II Efficacy - Assessment and
Evaluation (Parts B + C) Version 3.0 April 2018.

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Medistus Antivirus antiviral efficacy test against the surrogate enveloped virus MVA

There is either no vaccine against the vast majority of viruses causing upper respiratory diseases - HPIV / human parainfluenza virus, RSV / respiratory synctical virus, coronaviruses (HCV) – or they have a very limited spectrum - just like the seasonal influenza vaccines. The prevention of epidemics has for many years focused on the development of vaccines of a broad-spectrum, ie. they shall offer immunity against many subtypes of influenza viruses, and should be easily adapted to seasonally active viruses.

The Modified Vaccinia Virus Ankara (MVA) is a type of vaccine virus which was developed in vaccine research. It is widely applied as a surrogate virus representing all enveloped viruses to replace these in in-vitro tests. Enveloped viruses include any virus that is surrounded by a lipoprotein envelope (peplon) that makes viruses more resistant to environmental influences and helps them adapt to the host cell. All viruses which pose a threat of global epidemics affecting the human population, are enveloped viruses such as influenza viruses, herpes viruses, HIV, ZIKA, Ebola virus, and SARS coronaviruses (SARS-CoV). [1]

The antiviral activity of Medistus Antivirus lozenges has been demonstrated in several previous in-vitro tests. In 2020, the virucidal activity of the lozenges was tested against the MVA virus in accordance with the requirements of DIN EN 14476 by an accredited laboratory in Germany. [2]
The purpose of the in vitro test was to verify the effectiveness of Medistus Antivirus lozenges against enveloped viruses causing upper respiratory infections under laboratory conditions. The MVA virus used for testing is a generally accepted surrogate in professional communities and official bodies as surrogate virus for enveloped viruses [3].

During the laboratory test, the solution of the soft lozenges mixed with artificial saliva was tested by two methods. First, by the so-called “Clean conditions” method, in which the virucidal effect of the test substance is measured without adding interfering substances. The other applied testing method was the test according to “OECD conditions” which is performed under high load conditions by adding proteins, mucin and yeast to the test solution. The inclusion of proteins and yeasts pose an aggravating testing condition. It interferes with the mechanism of action of Medistus Antivirus soft lozenges by reducing its efficacy, yet producing results close to real ‘in vivo’ conditions.

The number of residual viruses was counted in the same intervals in both test methods. In the "clean conditions" method, the virucidal effect of Medistus Antivirus soft lozenges were clearly confirmed in only 5 minutes. It reduced the initial virus load by 4 log_{10} and inactivated all viruses.
Under OECD conditions with high protein, mucin and yeast load, Medistus Antivirus reduced the original virus concentration by 3.5 log_{10} after 5 minutes and by 3.67 log_{10} in 10 minutes. This translates into a virus load reduction **> 99.9%** in 10 minutes contact time.

These test results clearly support and confirm the antiviral effect of Medistus Antivirus lozenges against enveloped viruses that may cause epidemics.

1) For more information, see Fauquet, C.M. et al., Eds .: Virus Taxonomy, eighth report of the international committee on taxonomy of viruses. Elsevier Academic Press, San Diego, 2005
2) BioTeSys GmbH: Virucidal activity of the lozenge Medistus Antivirus against Modified vaccinia virus Ankara, 16.06.2020, Esslingen / Germany
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