



Therapeutica Borealis

Press event

[5 May 2021]

Easy to use nasal spray complementary to vaccines in the fight against COVID-19



- Safe and effective medication for prevention and early treatment of viral infections
- Easy dosing, safe and convenient for personal use
- Simple idea – repurposing existing pharmaceutical compounds using precise intranasal delivery
- Novel drug that complements vaccines in the fight against COVID-19 pandemic and new variants of the SARS-CoV-2 virus

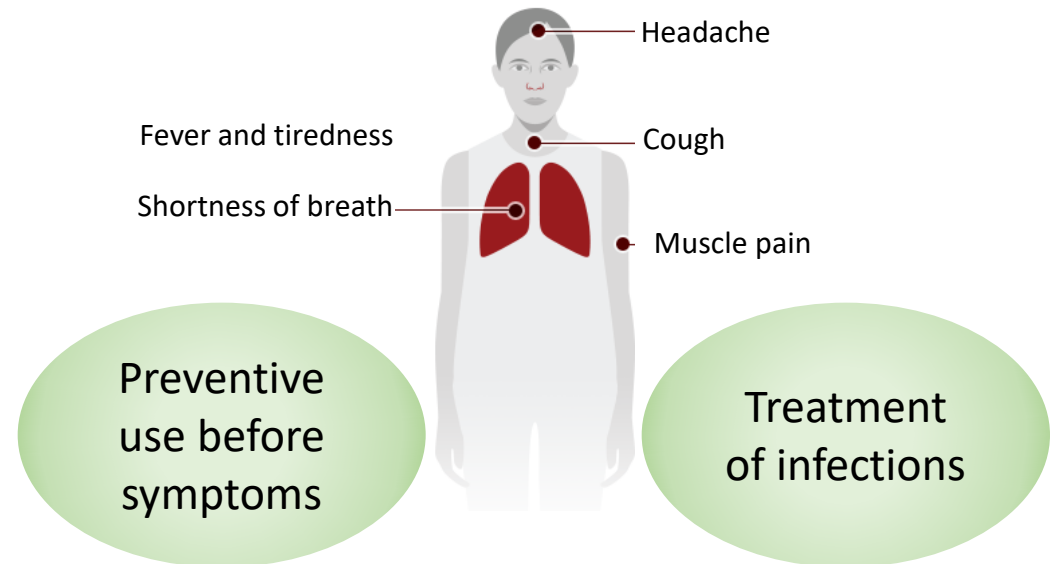
Therapeutica Borealis has received USPTO Notice of Allowance for its drug against COVID-19

- Finnish pharmaceuticals innovation company with diverse research experience in molecular biology and pharmacology
- Solid scientific basis to make a safe and effective drug against COVID-19 for use in prevention and treatment of viral infections
- US Patent and Trademark Office (USPTO) has given Notice of Allowance for patent application with a priority date of 25 March 2020
- Potential to fast track development of novel drug that is based on well known compounds that are already in medical use in different indications

Novel drug against COVID-19

- The drug is designed to prevent and mitigate infections by weakening the penetration and replication of the virus in human cells
- Effective compounds aprotinin, hydroxychloroquine and ivermectin are well known generic drugs in medical use
- The invention is to locally administer these compounds into the upper respiratory tract where the SARS-CoV-2 virus typically first penetrates the body
- Local administration of the drug enables lower dosage and makes it safe and effective
- Ambient logistics and delivery with easy to use dosing makes self-medication possible
- Targeted effect on three different cellular mechanisms – likely effective against variations of SARS-CoV-2 virus as well as other enveloped viruses infecting humans via nasal mucosa
- Complements vaccinations in the combat against Covid-19 and other viruses

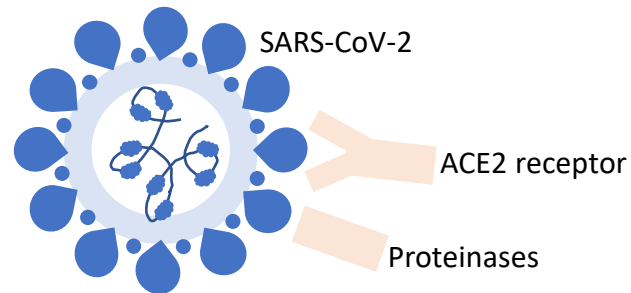
Targeted for prevention and treatment



Scientific basis of the invention

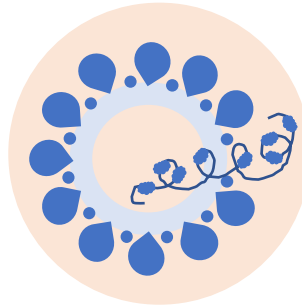
Effects on three cellular biology processes to prevent and reduce viral load

1. Attachment and entry



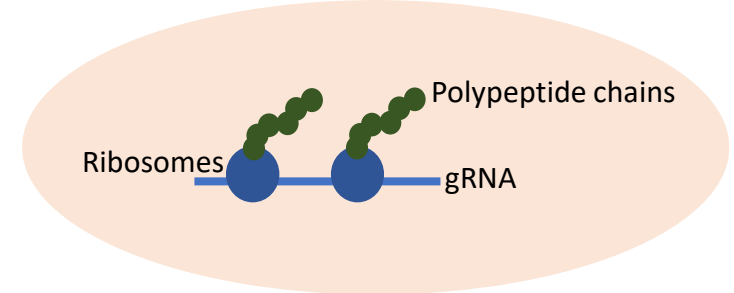
- Inhibiting entry into mucosal cells;
 - a) receptor mediated endocytosis
 - b) fusion of spike protein directly to plasma membrane

2. Release and replication of viral DNA/RNA



- Inhibiting release of RNA/DNA into cytoplasm either from endosomes or through plasma membrane

3. Glycosylation of viral proteins in Golgi complex



- Inhibiting viral protein glycosylation in Golgi complex

Potential fast track to safe and effective COVID-19 drug

- COVID-19 pandemic has severe global effects on health, society and economy that may persist for several years
- Therapeutica Borealis' invention has potential to expedite development of a safe and effective drug for prevention and treatment of infections
 - The compounds are already well known generic drugs in medical use making it possible to expedite drug development in Phase II focusing on effectiveness, dosing and administration method
 - Likely to be effective also against variants of SARS-CoV-2 and other enveloped viruses
 - The drug is complementary to other possible treatments such as vaccines
- Therapeutica Borealis is seeking a strategic partner with operational scale and global resources in the pharmaceuticals industry
 - The patent is a strong demonstration of Therapeutica Borealis' capabilities to innovate and provide solutions based on solid scientific basis and diverse research experience
 - The Company aims to find a strategic partner and proceed with product development for dosing and administration of the drug and clinical trials as soon as possible



Appendix

Therapeutica Borealis Inventors

**Kalervo
Väänänen,
Professor, Rector
Emeritus**

- Professor and Rector Emeritus, University of Turku, 30 years of research experience in molecular and cellular biology
- Kalervo has published almost 300 research papers and his research has more 16 000 citations in scientific literature. He has several national and international science and innovation prizes, several patents and has been involved in several biotech companies
- He has chaired Medical Research Council of Academy of Finland, served a board member of Academy of Finland and last ten years he acted Academic Rector of University of Eastern Finland and Rector of University of Turku

**Lauri Kangas,
PhD, Docent**

- PhD, Docent, 40 years of biochemical pharmacology research and pharmaceutical development experience
- Pharmacology research at Famos Group and Orion (1979 – 1996)
- One of the founders and Chief Scientific Officer of Hormos Medical 1997-2009. The Company developed a new hormonal compound to marketed drug in USA in the beginning of 2010's
- Docent in Biochemical Pharmacology, Turku University

**Matti Rihko,
MSc Econ, MSc
Psychology**

- CEO of Raisio 2006 – 2016; during his leadership total shareholder return of Raisio was 200%
- Former board member in Oriola (2014-2017), Terveystalo (2012-2018) and University of Turku (2010-2017)

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